

2023

## Mindfulness Skills and Retention Risk in First-Generation Undergraduate Students

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*Walden University*

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# Walden University

College of Psychology and Community Services

This is to certify that the doctoral dissertation by

Tim Morenz

has been found to be complete and satisfactory in all respects,  
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Walden University  
2023

Abstract

Mindfulness Skills and Retention Risk in First-Generation Undergraduate College

Students

by

Tim Morenz

MA, Liberty University, 1993

BS, Liberty University, 1991

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Psychology

Walden University

May 2023

## Abstract

First-generation college students experience more negative emotional states and higher stress levels than their continuing generation peers, take approximately two years longer to complete undergraduate degree programs, and are less than one percent likely to re-enroll in college. Mindfulness skills have been reported to alleviate anxiety and stress, improve adjustment to college, and improve academic performance, but a gap in the literature existed specific to first-generation college students. Guided by the theory of planned behavior and the monitor and acceptance theory, the purpose of this quantitative study was to examine the relationship between trait mindfulness skills and retention risk in 221 first-generation undergraduate students. Multiple linear regressions were conducted to determine the combined and relative effects of subscale scores of the Five Facet Mindfulness Questionnaire—Short Form (FFMQ-SF) in accounting for variance in each of four subscales of the Theory of Planned Behavior on Student Retention in College Scale (TPBSRCS). The five FFMQ-SF subscale scores best predicted variance in self-efficacy towards course and were least effective in accounting for variance in norms about course completion. As indexed by Johnson's  $\epsilon$  relative weight, the FFMQ-SF observe and nonreact subscale scores were the most important predictors, on average, across all four TPBSRCS subscale models. Specific to TPBSRCS intention to withdraw, FFMQ-SF actaware and describe subscale scores were most important. In general, significant relationships were found between trait mindfulness skills and retention risks that could inform institutional mindfulness programs to address retention risk in first-generation students leading to positive social change.

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## Dedication

This dissertation is dedicated to all the first-generation students who struggle to find their place while attaining higher education. This dissertation is dedicated to all the faculty and staff who serve first-generation students with dignity and respect. This dissertation is dedicated to the institutions that serve first-generation students. This dissertation is dedicated to the practice of mindfulness seeking to cultivate clarity in the midst of chaos. This dissertation is dedicated to those seeking a better way.

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## Chapter 1: Introduction to the Study

First-generation college students in the United States have found traditional academic culture in higher education to be a barrier to success and persistence, have unique needs, and require more unique services and support than their continuing generation counterparts (Arch & Gilman, 2019). First-generation students drop out at a higher rate than continuing-generation students (Arch & Gilman, 2019). First-generation students take, on average, two years longer to complete undergraduate degree programs than their continuing-generation peers (Gibbons et al., 2019). Students fitting in the category of first-generation college students experience more negative emotional states and higher stress levels than continuing-generation college students (Goldman et al., 2021). Continuing generation college students experience far fewer barriers to persistence when compared to their first-generation peers (Barbera et al., 2020). First-generation college students experience more financial challenges and higher levels of stress, are more likely to need remedial coursework (Barbera et al., 2020), are more likely to experience social isolation, rarely ask for help, and struggle to relate to authority figures in higher education (Bassett, 2021).

Kabat-Zinn (2013) brought the first reference to mindfulness in the context of stress reduction to the United States in 1979. Mindfulness skills are described as the ability to "pay attention, to the present moment, on purpose, and non-judgmentally" (Kabat-Zinn, 2013, p. xxix). College students have responded positively to the development of trait mindfulness skills (Diaz et al., 2020; Gardner & Kerridge, 2019; Juberg et al., 2019; Moix et al., 2021; Saraff et al., 2020; Tingaz, 2020; Torres-Imbarra &

Ibaceta, 2019; Vornontsova et al., 2021). Lindsay and Creswell (2017) found study participants with high mindfulness skills reported several positive outcomes. Meditative practices have benefited college students who have experienced high-stress levels during the COVID-19 pandemic (Lancaster & Arango, 2021). The active mechanisms of mindfulness training are attention monitoring and state acceptance (Lindsay & Creswell, 2017). However, college students with mindfulness skills have not been studied for the relationship between trait mindfulness and retention risk. First-generation college students have not been the sole participants of research regarding mindfulness. The study's purpose is to explore the relationship between trait mindfulness (observe, describe, act aware, nonjudge, and nonreact; Bohlmeijer et al., 2011a) and retention risk (attitudes towards college, self-efficacy, norms regarding college completion, and the intention to withdraw from an institution; Dewberry & Jackson, 2018a) in first-generation undergraduate college students.

### **Background**

First-generation college students have been extensively studied in the literature for their unique needs and motivations (Arch & Gilman, 2019; Barbera et al., 2020; Bassett, 2021; Gibbons et al., 2019; Goldman et al., 2021; House et al., 2020; Manzoni & Streib, 2019; Pratt et al., 2019; Salvatore et al., 2020; Schelbe et al., 2019). A number of studies have focused on retention risk of first-generation college students and the challenges and benefits of persisting. For example, Arch and Gilman (2019) noted that first-generation college students are the highest percentage who drop out of college every year and require unique services to persist in higher education. First-generation college

students experience more negative emotional states, have higher stress levels, and experience more financial challenges to persist, as negative emotional states, stress levels, and economic challenges are a predictor of success and engagement (Bassett, 2021; Goldman et al., 2021). Barbera et al. (2020) found that first-generations are more likely to benefit from college persistence, as first-generation students who graduate are less likely to experience poverty, incarceration, and unemployment; and more likely to be career ready and engage in volunteerism.

First-generation students are less likely to experience positive emotional states like joy and optimism (Goldman et al., 2020). They are more likely to experience aversive psychological states like shame and hopelessness than their continuing-generation peers (Goldman et al., 2020). Guilt and despair are deactivating emotions in first-generation students, as deactivating emotions have a negative relationship with academic success and achievement, as they stifle the intrinsic motivation levels of the student (Barbera et al., 2020). Emotions and task values are a significant predictor of college engagement, as higher levels of intrinsic motivation and lower stress levels predicted persistence in first-generation college students (Goldman et al., 2021).

College students react positively to mindfulness interventions, including improved academic performance (Boo et al., 2020; Cavanagh et al., 2019; Westlund-Stewart et al., 2020). Mindfulness skills have helped college students to mitigate anxiety and stress (Dawson et al., 2020). College students have used mindfulness skills to improve sleep (Diaz et al., 2020), improve emotional regulation skills (Akeman et al., 2020; Finkelstein-Fox et al., 2019; Hosseinazdeh et al., 2021; Kim et al., 2021), mitigate

exposure to trauma (Dolbier et al., 2021; Lim et al., 2020; Kachadourian et al., 2021), and address depression and suicidal ideation (Chesin & Jeglic, 2022; Fang et al., 2019).

Participants in mindfulness studies are often measured for their ability to observe, describe, act with awareness, nonjudging the inner experience, and non-react to the inner experience through Baer et al.'s (2006) Five-Facet Mindfulness Questionnaire or Bohlmeijer et al.'s (2011b) subsequent short form. Participants in mindfulness studies have shown drastic changes to the architecture and landscape of the human brain, including increased cortical thickness, changes in the volume, density, and location of gray matter, changes in radial diffusivity and myelination leading to more efficient processing, and increased hippocampus density and slower atrophy (Bellatosa-Batalla et al., 2020; Parkinson et al., 2019; Schoenberg & Vago, 2019; Tang et al., 2017). Research has shown a dramatic relationship between mindfulness and emotion regulation, including a more expansive expression of two-state emotional expression, increased network connectivity in the amygdala, and more positive self-representation, and changes to the default mode network (Schoenberg & Vago, 2019; Tang et al., 2017). Participants in mindfulness studies have demonstrated significant differences in physiology, including heart-rate variability, blood pressure, sleep, stress responses, and experience-dependent neuroplasticity (Koerten et al., 2020; Lentz & Brown, 2019; Loucks et al., 2019; Niraj et al., 2020).

Mindfulness applications have helped college students improve self-regulation skills (MacDonald, 2021). College students have also shown improved resilience and self-efficacy (Vidic & Cherup, 2019). Attention monitoring and acceptance are the active



mechanisms in mindfulness (Lindsay & Creswell, 2017). Attention monitoring and acceptance improve cognitive outcomes and affective formation, as well as considerably lower anxiety and stress levels (Lindsay & Creswell, 2017). First-generation college students have not been considered in any mindfulness research. The relationship between trait mindfulness and retention in college students has not been studied.

### **Problem**

The social problem that prompted me to search the literature is the current education challenges facing first-generation college students. First-generation college students have unique needs and require special services (Arch & Gilman, 2019). First-generation college students make up most students who drop out of college every year, experience more negative emotional states, higher stress levels than their continuing-generation peers, and take nearly two years longer to complete their degree programs (Goldman et al., 2021). A first-generation college student is less than 1% likely to re-enroll in college after deciding to drop out (Barbera et al., 2020). First-generation college students need assistance managing stress levels and negative emotional states (Goldman et al., 2021).

Although researchers have broadly investigated the relationship between mindfulness skills and college retention, the topic of mindfulness in first-generation college students has not been specifically explored with respect to retention risk. College students undergoing mindfulness training receive several positive outcomes, including cognitive, affective, health, and stress-related results (Lindsay & Creswell, 2017). Mindfulness training has helped college students address previous mental health

conditions, alleviate or mitigate anxiety and stress, improve adjustment to university, and improve academic performance (Dawson et al., 2020). College students experience significant stress when dropping out of college (Basset, 2021). First-generation college students have not been considered in mindfulness research, and have not been the previous subjects of any study I could find attempting to determine the combined and relative importance of the five facets of mindfulness (Bohlmeijer et al., 2011a) in accounting for variance on each of the four domains of retention risk (Dewberry & Jackson, 2018a). As described in the Significance section of this chapter, understanding the relationships between mindfulness facets and retention risks could assist first-generation college students in completing a degree and enjoying its life improving benefits.

### **Purpose**

The purpose of this quantitative study was to examine the relationship between trait mindfulness skills and retention risk in first-generation undergraduate college students. The five-facet mindfulness questionnaire measures facets of mindfulness in five dimensions. The aspects of mindfulness are observing, describing, acting with awareness, nonjudging the inner experience, and non-reacting to the inner experience (Baer et al., 2006; Bohlmeier et al., 2011a). Attention monitoring and acceptance are the active mechanisms in mindfulness training (Lindsay & Creswell, 2017). The theory of planned behavior college student retention scale measures retention risk across four domains: attitudes towards college, self-efficacy, norms regarding college completion, and the intention to withdraw from an institution (Dewberry & Jackson, 2018a). Whether

mindfulness skills (mainly acting with awareness, nonjudging the inner experience, and non-reacting to the inner experience) can help a first-generation college student retain and persist will be explored to determine any relationship.

### **Theoretical Framework**

The theories that ground this study included the theory of planned behavior (Ajzen, 2011; Dewberry & Jackson, 2018a) and the monitor and acceptance theory (Lindsay & Creswell, 2017). The theory of planned behavior was the primary theory that grounded this study. According to the theory of planned behavior (Ajzen, 2011), human behavior is guided by three kinds of considerations: beliefs about the likely consequences of the behavior (behavioral beliefs), beliefs about the normative expectations of others (normative beliefs), and beliefs about the presence of factors that may facilitate or impede the performance of the behavior (control beliefs). In their respective aggregates, behavioral beliefs produce a favorable or unfavorable attitude toward the behavior, normative beliefs result in perceived social pressure or subjective norm, and control beliefs give rise to perceived behavioral control or self-efficacy (Ajzen, 2011).

According to the theory of planned behavior, student retention behaviors are formed and determined by behavioral intentions (Dewberry & Jackson, 2018a). Behavioral intentions are determined by the student's attitude toward the behavior, subjective norms associated with the behavior, and the student's perceived level of control regarding the behavior. The theory of planned behavior student retention in college scale is a valid measure of college student retention risk and is a direct

application of the theory of planned behavior to student retention (Dewberry & Jackson, 2018a)

The monitor and acceptance theory was a second theory that grounded this study (Lindsay & Creswell, 2017). Individual student stress levels are often alleviated by mindfulness training (Crowley et al., 2020; MacDonald & Olsen, 2020). The active mechanisms of mindfulness training are attention monitoring and acceptance, specifically “the use of attention to monitor one's present moment experiences, and a mental attitude of acceptance toward momentary experience” (Lindsay & Creswell, 2017, p. 49). Attention monitoring and acceptance skills improve cognitive outcomes and affect reactivity, and reduces stress and stress-related outcomes (Dawson et al., 2020; Lindsay & Creswell, 2017; Yusufov et al., 2019), which might relate to retention in first-generation college students.

The logical connections between the framework presented and the nature of my study are the theoretical foundations of student retention in higher education and the active mechanisms of mindfulness training. First-generation college students have higher stress levels and negative emotional states than their continuing-generation peers (Goldman et al., 2021). First-generation college students are a significant portion of students who drop out every year (Arch & Gilman, 2019). College students experience stress when deciding to drop out of college. College student retention risk is shaped by attitudes, beliefs, and intentions to stay in college (Dewberry & Jackson, 2018a). The theory of planned behavior applied to student retention directly addresses these issues. The theory of planned behavior is the theoretical framework that addresses retention

issues, and the monitor and acceptance theory address the mechanisms active in mindfulness training (Dewberry & Jackson, 2018a; Lindsay & Creswell, 2017).

### **Research Questions**

For this study, the four subscale scores (attitude to course, self-efficacy towards course, norms about course completion, and intention to withdraw) of Dewberry & Jackson's (2018b) Theory of Planned Behavior on Student Retention in College Scale (TPBSRCS ) served as criterion variables (i.e., dependent variables) and Bohlmeijer et al.'s (2011a) Five Facet Mindfulness Questionnaire—Short Form (FFMQ-SF) subscale scores (observe, describe, act aware, nonjudge, and nonreact) served as predictors (i.e., independent variables). For each of the four TPBSRCS subscale scores, two research questions were posed, one with respect to the combined effect of the predictors, the other with respect to the relative importance of each predictor. Hypotheses were provided for each of the four combined effect research questions. There are no statistical tests for comparing the relative importance of each predictor, so hypotheses are not possible (i.e., a hypothesis requires a statistical test that yields a p-value).

RQ1: What is the combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS attitude to course subscale scores among first-generation undergraduate college students?

H<sub>0</sub>1: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS attitude to course subscale scores among first-generation undergraduate college students is not statistically significant at  $\alpha = .05$ .

Ha1: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS attitude to course subscale scores among first-generation undergraduate college students is statistically significant at alpha = .05.

RQ2: What are the relative effects (squared semipartial correlation,  $sr^2$ ) and relative weights (Johnson's  $\epsilon$ ) of each of the five facets of mindfulness in accounting for variance in the TPBSRCS attitude to course subscale scores among first-generation undergraduate college students?

RQ3: What is the combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS self-efficacy towards course subscale scores among first-generation undergraduate college students?

Ho3: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS self-efficacy towards course subscale scores among first-generation undergraduate college students is not statistically significant at alpha = .05.

Ha3: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS self-efficacy towards subscale scores among first-generation undergraduate college students is statistically significant at alpha = .05.

RQ4: What are the relative effects (squared semipartial correlation,  $sr^2$ ) and relative weights (Johnson's  $\epsilon$ ) of each of the five facets of mindfulness in accounting for

variance in the TPBSRCS self-efficacy towards course subscale scores among first-generation undergraduate college students?

RQ5: What is the combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS norms about course completion subscale scores among first-generation undergraduate college students?

H<sub>0</sub>5: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS norms about course completion subscale scores among first-generation undergraduate college students is not statistically significant at  $\alpha = .05$ .

H<sub>a</sub>5: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS norms about course completion subscale scores among first-generation undergraduate college students is statistically significant at  $\alpha = .05$ .

RQ6: What are the relative effects (squared semipartial correlation,  $sr^2$ ) and relative weights (Johnson's  $\epsilon$ ) of each of the five facets of mindfulness in accounting for variance in the TPBSRCS norms about course completion subscale scores among first-generation undergraduate college students?

RQ7: What is the combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS intention to withdraw subscale scores among first-generation undergraduate college students?

H<sub>0</sub>7: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS intention to withdraw subscale scores

among first-generation undergraduate college students is not statistically significant at  $\alpha = .05$ .

Ha7: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS intention to withdraw subscale scores among first-generation undergraduate college students is statistically significant at  $\alpha = .05$ .

RQ8: What are the relative effects (squared semipartial correlation,  $sr^2$ ) and relative weights (Johnson's  $\epsilon$ ) of each of the five facets of mindfulness in accounting for variance in the TPBSRCS intention to withdraw subscale scores among first-generation undergraduate college students?

### **Nature of the Study**

A correlational design was used to describe the degree of the relationship between mindfulness skills independent variables: observe, describe, act aware, nonjudge, and nonreact (Bohlmeijer et al., 2011b) and each dimension that comprises the retention risk dependent variables: attitudes toward college completion, self-efficacy, norms about college completion, and the intention to withdraw (Dewberry & Jackson, 2018b).

As detailed in Chapter 3, first-generation college students were recruited using Amazon Mechanical Turk's crowdsourcing service, and survey data were collected online using the SurveyMonkey platform. Multiple linear regression using IBM SPSS software were conducted to answer the research questions.

A correlational design is appropriate to answer the research questions about the combined and relative importance of the five mindfulness subscale scores in accounting



for variance in each of the four retention risk scores in four separate multiple linear regressions. Multiple linear regression can advance knowledge in the field because it recognizes multiple correlated influences on a dependent variable and can answer questions about theoretical expectations when the independent variables represent a theoretical set or competing sets (Cohen et al., 2003).

### **Definition of Terms**

*First-generation college students* are the first members of their family constellation to experience higher education (Arch & Gilman, 2019).

*Mindfulness* is the ability to “pay attention, to the present moment, on purpose, and non-judgmentally” (Kabat-Zin, 2013). The *facets of mindfulness* are observing, describing, acting with awareness, nonjudging the inner experience, and non-reacting to the inner experience (Baer et al., 2006).

*Monitor and Acceptance Theory* lists the active mechanisms of mindfulness training as the monitoring of attention and the acceptance of present moment experience (Lindsay & Creswell, 2017).

*Retention risk* is the combination of attitudes towards college programs, self-efficacy, norms regarding college completion, and the intention to withdraw from an institution (Dewberry & Jackson, 2018a). According to the *Theory of Planned Behavior*, human behavior is guided by three kinds of considerations: beliefs about the likely consequences of the behavior (*behavioral beliefs*), beliefs about the normative expectations of others (*normative beliefs*), and beliefs about the presence of factors that may facilitate or impede the performance of the behavior (*control beliefs*). In their

respective aggregates, behavioral beliefs produce a favorable or unfavorable attitude toward the behavior; normative beliefs result in perceived social pressure or subjective norm; control beliefs give rise to perceived behavioral control or self-efficacy (Azjen, 2011).

### **Assumptions**

In my research, I assumed that first-generation college students want to complete their degree, have the requisite academic acumen to complete a degree, and have the necessary economic and social supports to complete their degree. I am only measuring their attitude toward their degree program, their general academic self-efficacy, expectations of family and friends, intention to withdraw, and generic trait facets of mindfulness that I assumed relate to wanting to and having the ability to complete a degree and that provide resilience to any economic or social support challenges.

### **Scope and Delimitations**

The discussion regarding mindfulness skills and their development is only a recent phenomenon in the United States, approximately 43 years old, based on the earliest research I found in my literature review. Thus, the phenomenon of mindfulness is limited in the depth of scholarship and academic research, particularly with respect to first-generation college students. In general, mindfulness has been reported to improve self-regulation skills (MacDonald, 2021), resilience and self-efficacy (Vidic & Cherup, 2019), and improved academic performance (Boo et al., 2020; Cavanagh et al., 2019; Westlund-Stewart et al., 2020), all of which are ingredients that might lead to persistence in completing a college degree. Arch and Gilman (2019) reported that first-generation

college students drop out at a higher rate than continuing-generation students. First-generation college students who drop out are more likely to experience poverty, be incarcerated or unemployed, and experience higher stress levels and more negative emotional states (Barbera et al., 2020; Goldman et al., 2021). Thus, the design and scope of my study is focused on a theoretically derived conjecture that mindfulness skills are related to retention risk, particularly in first-generation college students. Although many other factors have been shown to improve college completion rates—such as perception of the classroom learning environment and institutional support (Thomas, 2014), academic coaching programs (Pechac & Slantcheva-Durst, 2019), admission profile (e.g., high school GPA, college entrance test scores; Laus, 2021), to name a few—these and other potential factors are outside the scope of my proposed research.

### **Limitations**

#### **External Validity**

External validity refers to the generalizability of results (Cook & Campbell, 1979; Reichardt, 2019). At best, the results of this study are only generalizable to first- and second-year first-generation college students in the United States who also happen to belong to the Amazon Mechanical Turk crowdsourcing network and would tend to volunteer for a study on mindfulness and college student retention. Generalizing to other types of participants, times, and settings would require conducting multiple replication studies (Reichardt, 2019). Commonly listed specific threats to external validity (e.g., Campbell & Stanley, 1963; Cook & Campbell, 1979), such as interaction effect of testing, interaction effects of selection biases and the experimental variable, reactive

effects of experimental arrangements, and multiple-treatment interference apply only to experimental and quasi-experimental studies and not to the correlational design of my research.

### **Internal Validity**

As cited by Campbell and Stanley (1963), internal validity is concerned with answering the question, "Did the experimental treatments make a difference in this specific experimental instance?" This notion of internal validity as assessing causality has been consistent across the decades since Campbell and Stanley's exemplar work (see, e.g., Cook & Campbell, 1979; Reichardt, 2019; Shadish et al., 2002). The commonly listed threats to internal validity (i.e., to concluding causality) have to do with issues of multiple measurements (e.g., pretest, posttest), including history, maturation, testing, and statistical regression; or matters related to nonequivalence of comparison groups caused by nonrandom assignment, differential mortality, and the various interaction effects with selection. None of these specific threats apply to correlational research. Specific to my research, it cannot be determined if mindfulness variables have any influence on retention variables, or if retention variables influence the mindfulness variables..

### **Construct Validity**

In general, construct validity is about the labeling and measurement of constructs that define the variables to be studied (Shadish et al., 2002). In my study, I used reliable and validated instruments to measure the five facets of mindfulness and four college student retention variables. In addition, I examined the sample-specific reliability of each subscale score as indexed by Cronbach's alpha to ensure adequate reliability for analysis.

Nonetheless, construct validity could be threatened if participants responded with social desirability bias. To some extent this is controlled for by the anonymity of response (Krumpal, 2013).

### **Significance**

Advancing knowledge in the fields of mindfulness, first generation college students, and retention risk are all important aims. Grit and resilience were found to be important predictors for course completion in first-generation college students (Bennett et al., 2019) and trait or dispositional mindfulness, particularly acting with awareness and nonjudging, were seen as significant predictors of grit and resilience in college students (Rahipattana et al., 2018). As no previous research has considered the impact of trait mindfulness on retention risk or first-generation college students, these findings could contribute to the already robust findings of the impact of trait mindfulness skills. The decision to drop out of college could be a stressful one, and trait mindfulness was found to be a significant predictor of cognitive flexibility in students (Tingaz, 2020), thus increasing probabilities of resilience.

Since trait mindfulness has been shown to significantly improve college adjustment (Finkelstein-Fox et al., 2019), trait mindfulness could help first-generation college students persist to degree completion. Also, as first-generation college students experience more negative emotional states and have higher stress levels than their continuing-generation peers (Goldman et al., 2020), trait mindfulness could alleviate or mitigate these experiences and assist with emotional regulation (MacDonald, 2021).

Colleges could add mindfulness training to their course curriculum and programs, thus meeting the unique needs of first-generation college student students (Arch & Gilman, 2019). The significance of findings with first-generation college students, mindfulness skills, and retention risk could contribute to the knowledge of the disciplines of psychology, retention, and education, allowing for students at previously higher risk for dropout to mitigate that risk and persist to degrees in higher education. The more likely a first-generation college student is to persist with a higher education degree, they are less likely to experience poverty and unemployment, less likely to be incarcerated, and more likely to be employed and engage in volunteerism (Barbera et al., 2020).

Individually, first-generation college students would be better prepared to deal with the stressful experiences of college (Hammermeister et al., 2019) and persist to degree completion. Corporately, college students as a whole could benefit from the benefits of degree completion, including increased pay, better jobs, and address the equity gaps that exist in education (Bennett et al., 2019).

First-generation college students with higher mindfulness skills could have a lower risk of a college dropout. Society would benefit from more college graduates who persist to higher degrees in education, volunteer more and participate in community activism, are incarcerated less, and experience less unemployment (Barbera et al., 2020).

### **Summary**

First-generation college students in the United States have found traditional academic culture in higher education to be a barrier to success and persistence, have unique needs, and require more unique services and support than their continuing

generation counterparts (Arch & Gilman, 2019). First-generation students drop out at a higher rate than continuing-generation students (Arch & Gilman, 2019). First-generation students take two years longer to complete undergraduate degree programs than their continuing-generation peers (Gibbons et al., 2019). First-generation college students experience more negative emotional states and higher stress levels than continuing-generation college students (Goldman et al., 2021). First-generation college students show lower levels of college academic readiness (Bassett, 2021). First-generation college students experience more aversive affective states that can negatively affect levels of motivation (House et al., 2020).

First-generation college students experience more barriers to persistence in higher education than their continuing-generation peers (Barbera et al., 2020). First-generation college students experience more financial challenges and higher levels of stress and are more likely to need remedial coursework (Barbera et al., 2020). The personality factors of first-generation college students, such as conscientiousness and trait agreeableness, are significant predictors of retention, success, and reliance on tutoring services (Barbera et al., 2020). First-generation students must rely on and develop help-seeking orientations to reduce the barriers to academic success (Bassett, 2021). First-generation students are more likely to experience social isolation, rarely ask for help, and struggle to relate to authority figures in higher education (Bassett, 2021).

Participants in mindfulness studies are measured for their ability to observe, describe, act with awareness, nonjudging the inner experience, and non-react to the inner experience (Baer et al., 2006; Brown et al., 2015; MacDonald, 2021). Research

conducted on participants in mindfulness studies have shown drastic changes to the architecture and landscape of the human brain (Bellatosa-Batalla et al., 2020; Parkinson et al., 2019; Schoenberg & Vago, 2019; Tang et al., 2017).

College students have responded positively to the development of trait mindfulness skills (Diaz et al., 2020; Gardner & Kerridge, 2019; Juberg et al., 2019; Moix et al., 2021; Saraff et al., 2020; Tingaz, 2020; Torres-Imbarra & Ibaceta, 2019; Vornontsova et al., 2021). College students with higher mindfulness skills have improved academic performance (Boo et al., 2020; Calma-Birling & Gurung, 2019; Cavanagh et al., 2019; Chase-Canterini & Christaens, 2019; Dougherty et al., 2020; Elphinstone et al., 2019; Kingery et al., 2019; Martin, 2018; Vidic & Cherup, 2019; Westlund-Stewart et al., 2020). College students with higher mindfulness skills can better regulate their emotions (Chinnery et al., 2019; Cotler et al., 2019; Enriquez et al., 2017; Majeski et al., 2017; Rowland et al., 2020). College students have used mindfulness interventions to significantly alleviate anxiety and stress (Crowley et al., 2020; MacDonald & Olsen, 2020). College students with high mindfulness skills have shown improved adjustment to university (Finkelstein-Fox et al., 2019; Flett et al., 2020; Kingery et al., 2020; Mettler et al., 2019; Yu et al., 2020). While mindfulness skills have been studied in these areas with college students, first-generation college students have not been previous subjects of mindfulness research. As there is a plethora of data regarding the numerous positive outcomes of mindfulness study, retention risk or risk for dropout has not been considered in the mindfulness research. This study considered the relationship between trait mindfulness skills and retention risk in first-generation undergraduate college students. A



thorough literature review on the research involving trait mindfulness and retention risk was conducted in chapter two.

## Chapter 2: Literature Review

The purpose of this quantitative study was to examine the relationship between trait mindfulness skills and retention risk in first-generation undergraduate college students. Out of the 40% of new students that enroll in college every year, the majority are first-generation college students, however, out of the 40% of students who drop out of college every year, the overwhelming majority are first-generation college students (Arch & Gilman, 2019). First-generation college students experience more negative emotional states, less positive emotional states, and have higher stress levels than their continuing-generation peers (Goldman et al., 2021). First-generation college students take up to two years longer to complete degree programs than their continuing generation peers, as well as less than one percent likely to re-enroll in college after deciding to drop out (Bassett, 2021). First-generation college students in the United States report higher academic distress due to working longer hours than their continuing-generation peers to mitigate their high levels of financial distress (Bennett et al., 2021), thus have lower levels of academic achievement than their continuing generation peers (Bassett, 2021).

First-generation college students need more support from colleges learning to adjust to university life and manage stress (Arch & Gilman, 2019; House et al., 2020), yet rarely seek help due to the stigma associated with it (Bassett, 2021). Mindfulness literature is rich with descriptions of how mindfulness skills can alleviate stress (An et al., 2019; Finkelstein-Fox et al., 2020). College students have responded positively to mindfulness-based interventions (Chiodelli et al., 2020; Dawson et al., 2020). College students have used mindfulness skills to alleviate anxiety and stress (Ding et al., 2019),

improve their emotional intelligence (Gorvine et al., 2019; Saraff et al., 2020), improve concentration (Guillaume et al., 2020), improve adjustment to college (Mettler et al., 2019), address previously existing mental health conditions (Akeman et al., 2020; Ritvo et al., 2021; Vidic & Cherup, 2019), and improve academic performance (Cavanagh et al., 2019; Sun, 2019). However, there is no research concerning the impact of mindfulness skills on first-generation college students, or if mindfulness skills have an impact on retention risk or could help a first-generation college student stay in college.

In this chapter, I discuss the strategies used to search the literature, the theory of planned behavior and the monitor and acceptance theory that guide the study, along with the major themes I identified. Major identified themes include: the unique makeup and needs of first-generation college students; the major themes of mindfulness identified in the literature; mindfulness applications with special populations; mindfulness effects on college student mental health; the impact of mindfulness on stress and anxiety; the impact of mindfulness skill on college students with trauma; the relationship between trait mindfulness and emotional intelligence in college students; how mindfulness skills: improve academic performance, deal with addiction, improve adjustment to university, improves physical outcomes, relate to the covid-19 pandemic, and apply to neuroscience.

### **Literature Search Strategy**

Several databases were searched in the Walden University library to conduct a literature review of topics intersecting the current literature regarding mindfulness, retention risk, and first-generation college students in the United States. Databases searched included APA PsycInfo, the official database of the American Psychological

Association, and the Educational Reference Information Collective or ERIC. Peer-reviewed journals were selected from 2019 to present. However, several resources prior to 2019 were selected for their seminal value and importance to concepts and constructs relevant to the research.

ERIC was searched for literature regarding first-generation college students. The terms *first-generation college students* and *literature review* or *meta-analysis* yielded 10 results. The terms *first-generation college students* and *retention* yielded 54 results. The terms *first-generation college students* and *resilience* yielded 24 results. The terms *first-generation college students* and *persistence* yielded 83 results. However, the results had to be thoroughly investigated, as the results yielded articles that were not directly applicable. After applying a thorough investigation, I found approximately 20 peer-reviewed articles for use in the research.

APA PsycInfo was searched for mindfulness literature. The terms *mindfulness* and *college students* yielded 234 results. The terms *mindfulness* and *neuroscience* yielded 249 results. The terms *mindfulness* and *literature review* or *meta-analysis* yielded 8 results. The terms *mindfulness* and *academic performance* yielded 18 results. The terms *mindfulness* and *emotional intelligence* yielded 31 results. The terms *mindfulness* and *theoretical framework* yielded 58 results. The terms *first-generation college students* and *theoretical framework* yielded ten results. The terms *mindfulness* and *retention* yielded zero results. The terms *mindfulness* and *first-generation college students* yielded zero results. The terms *mindfulness* and *grit* yielded two results. The terms *mindfulness* and *persistence* yielded two results.

### **Theoretical Foundations**

The theories that ground this study included the theory of planned behavior (Ajzen, 2011; Dewberry & Jackson, 2018a), and the monitor and acceptance theory (Lindsay & Creswell, 2017). The theory of planned behavior was the primary theory that grounded the study. According to the theory of planned behavior (Ajzen, 2011), human behavior is guided by three kinds of considerations: beliefs about the likely consequences of the behavior (behavioral beliefs), beliefs about the normative expectations of others (normative beliefs), and beliefs about the presence of factors that may facilitate or impede performance of the behavior (control beliefs). In their respective aggregates, behavioral beliefs produce a favorable or unfavorable attitude toward the behavior, normative beliefs result in perceived social pressure or subjective norm, and control beliefs give rise to perceived behavioral control or self-efficacy (Ajzen, 2011).

Student retention behaviors are formed and determined by behavioral intentions, according to the theory of planned behavior (Dewberry & Jackson, 2018a). Behavioral intentions are determined by the student's attitude toward the behavior, subjective norms associated with the behavior, and the student's perceived level of control regarding the behavior. The theory of planned behavior student retention in college scale (Dewberry & Jackson, 2018a) is a valid measure of college student retention risk and uses a Likert rating system to measure these subscales of retention risk.

The monitor and acceptance theory was a secondary theory that grounded this study (Lindsay & Creswell, 2017). Individual student stress levels are often alleviated by mindfulness training (Crowley et al., 2020; MacDonald & Olsen, 2020). The active

mechanisms of mindfulness training are attention monitoring and acceptance (Lindsay & Creswell, 2017). Attention monitoring and acceptance skills interact to improve cognitive outcomes and increase affect reactivity (Dawson et al., 2020; Yusufov et al., 2019). First-generation college students will be compared for scores between mindfulness skills, such as, acting with awareness, non-judging of the inner experience, and non-reacting of the inner experience (Baer et al., 2006) and scores of retention risk including attitudes towards college completion, self-efficacy towards college, norms regarding college completion, and the intention to withdraw (Dewberry & Jackson, 2018b).

The logical connections between the framework presented and the nature of my study are the theoretical foundations of student retention in higher education and the active mechanisms of mindfulness training. First-generation college students have higher stress levels and more negative emotional states than their continuing generation peers (Goldman et al. 2021). First-generation college students are a significant portion of students who drop out every year (Arch & Gilman, 2019). College students experience stress when deciding to drop out of college. College student retention risk is shaped by attitudes, beliefs, and intentions to stay in college (Dewberry & Jackson, 2018a). The theory of planned behavior applied to student retention directly addresses these issues. The theory of planned behavior is the theoretical framework that addresses retention issues, and the monitor and acceptance theory address the mechanisms active in mindfulness training (Dewberry & Jackson, 2018a; Lindsay & Creswell, 2017).

The phenomenon of mindfulness has been studied to determine its active mechanisms (Lindsay & Creswell, 2017). The active mechanisms of mindfulness practice

are attention monitoring and acceptance. The monitor and acceptance theory is used to explain the host of positive outcomes achieved by mindfulness training. College students have addressed mental health issues, alleviated anxiety and stress, improved adjustment to university, and improved academic performance through mindfulness training, as explained by the theory (Boo et al., 2020; MacDonald & Olsen, 2020; Vorontsova et al., 2021). College students have not been studied for the relationship between trait mindfulness and retention risk. The theory of planned behavior and the monitor and acceptance theory will attempt to explain and address this relationship (Ajzen, 2011; Dewberry & Jackson, 2018a; Lindsay & Creswell, 2017). The measures used in this study, the Five Facet Mindfulness Questionnaire—Short Form (FFMQ; Bohlmeijer et al., 2011a) and the Theory of Planned Behavior on Student Retention in College Scale (TPBSRCS; Dewberry & Jackson, 2018b) are thoroughly discussed in chapter three.

### **Relationship of Theoretical Foundation to My Research Questions**

Monitor and acceptance theory (Lindsay & Creswell, 2017) is the only theoretical consideration that considers the two active mechanisms of mindfulness: attention monitoring and acceptance. The observing, describing, and acting with awareness facets of mindfulness (Baer et al., 2006) are directly concerned with the placement of attention (Lindsay & Creswell, 2017). The nonjudging and nonreacting dimensions of mindfulness (Baer et al., 2006) directly address the acceptance portion of the theory (Lindsay & Creswell, 2017). Analysis at the facet level is important for examining incremental validity in the assessment of mindfulness (Baer et al., 2006). Thus, monitor and acceptance theory is the only relevant theoretical construct that addresses the facets of

mindfulness. Dewberry and Jackson (2018) applied the theory of planned behavior (Ajzen, 2011) to college student retention and found that the theory explained the majority of variance in college student retention. The variance of a student intending to retain in school is explained by attitudes toward completing the current year, subjective norms, their perceived degree of control over their decisions, and self-efficacy, which are the components that comprise retention risk (Dewberry & Jackson, 2018). Thus in combination, these theories ground my study as it's lens of focus: to explore the relationship between trait mindfulness and retention risk.

### **Key Variables and Concepts in the Literature**

The subsections that follow are titled to represent key variables or concepts in the literature. These include (a) first-generation college student retention risks; (b) mindfulness, general applications, meta-analyses, and phenomenology; (c) mindfulness and brain change; (d) mindfulness, physical outcomes, and COVID-19; (e) applications of mindfulness with special populations; and (f) mindfulness and college students (with secondary subsections of mindfulness and college adjustment; mindfulness and attention and concentration in college students; mindfulness and mental health in college students; mindfulness and academic performance in college students; mindfulness and emotional intelligence in college students; and mindfulness and college student success and retention).

### **First-Generation College Student Retention Risks**

Traditional academic culture is often a barrier to success for the first-generation college student, defined as the first member of their family constellation to attend an



institution of post-secondary education, as they lack the experience of family support, drop out at a higher rate, take two years longer to complete degree programs, are of non-traditional age, from marginalized and underrepresented communities, and usually have dependents (Arch & Gilman, 2019). First-generation students often belong in lower income brackets and experience higher levels of financial stress compared to continuing generation students; however, they rarely seek services to help due to stigma associated with it (Bassett, 2021). First-generation students experience more negative emotional states, higher stress levels, and fewer positive emotional states compared with first-generation students (Goldman et al., 2021). Once enrolled, first-generation college students are four times more likely to drop out of their first year compared with their peers (Schelbe et al., 2019). The ability to cope with financial stressors was a key predictor of resilience in first-generation students (Bennett et al., 2021). The ability to adjust to university was a key predictor of engagement and retention (Gibbons et al., 2019). Stress levels are also a significant predictor of retention risk in nontraditional age students (Barbera et al., 2020).

First-generation students with higher levels of mental fitness retained at higher rates and had higher levels of academic achievement (Hammermeister et al., 2019). Financial problems and distress cause first-generation students to work longer hours than continuing generation students, thus contributing to higher levels of academic distress because of fewer available hours to study and work on academics (House et al., 2020; Pratt et al., 2019). Wage gaps exist for students without a degree, as a college degree can often mitigate substantial wage gaps (Manzoni & Streib, 2019). First-generation students

enter college with higher levels of anxiety and fear, lower levels of family support and assistance, and social capital can considerably help a student transition successfully (Ricks & Warren, 2021). The needs of a first-generation student change over time, and students who are provided with consistent support, expectations, access to resources, and had prep assistance were able to mitigate several of the challenges that first-generation college students experience (Schelbe et al., 2019). First-generation college students are more often underprepared for the academic rigors of higher education, and more often experience higher levels of homesickness and lower levels of family support, making persistence a significant challenge (Arch & Gilman, 2019). First-generation college students need more specific help with time and stress management than universities typically provide (Arch & Gilman, 2019).

The benefits of a college degree for a first-generation college student are significant, as students who persist to degrees are less likely to experience poverty and unemployment, less likely to be incarcerated, and more likely to engage in volunteerism after graduation (Barbera et al., 2020). The personality factors of conscientiousness and agreeableness were positively associated with a help-seeking orientation and reliance on services like tutoring for help (Barbera et al., 2020; Bassett, 2021). Only 21% of low-income, first-generation college students graduate within six years, while 37% of low-income, continuing-generation, and 68% of high-income, continuing-generation students graduate within four years (Bassett, 2021). While first-generation college students are more likely to experience aversive psychological states, more negative emotional states, and less positive emotional states (Goldman et al., 2021), students who attain a higher

education degree have higher levels of life satisfaction and financial independence (House et al., 2020). Negative emotions are associated with lower levels of student engagement (Goldman et al., 2021). Support programs could assist first-generation students with help-seeking orientation (Bassett, 2021).

While trait mindfulness has numerous applications for cognition, affect, stress, and health (Lindsay & Creswell, 2017), first-generation college students have not been previous subjects of mindfulness research, nor has any research considered the impact of trait mindfulness on retention risk. Acting with awareness, observing, and describing could influence attitudes towards college completion (Baer et al., 2006; Dewberry & Jackson, 2018). Nonjudging and nonreacting (Baer et al., 2006) could directly address subjective norms, self-efficacy, and the intention to withdraw (Dewberry & Jackson, 2018).

### **Mindfulness, General Applications, Meta-Analyses, and Phenomenology**

Kabat-Zinn (2013) is credited with bringing the phenomenon of mindfulness to the United States in 1979, since then defining the term as the “ability to pay attention, to the present moment, on purpose, and non-judgmentally” (p. xxiv). Mindfulness skills have contributed to a host of positive outcomes for cognition, affect, stress, and health (Lindsay & Creswell, 2017). The literature mentions several generalized applications of the phenomenon of mindfulness. Mindfulness has been shown to significantly alleviate or mitigate stress and anxiety by modulating the stress response, improving emotional clarity, increasing cognitive flexibility, and decreasing the experiential avoidance that

comes with significant anxiety (An et al., 2019; Ding et al., 2019; Finkelstein-Fox et al., 2020; McCluskey et al., 2022; Soysa et al., 2021; Wu, Zhong, et al., 2021).

Mindfulness has significantly addressed mental health issues in general populations from modulating the relationship between emotional stability and self-esteem, improving the subjective well-being in adults, and operating as a buffer between stress, depression, and anxiety (Bajaj et al., 2019; Jarukasemthawee et al., 2019; Valikhani et al., 2020). Mindfulness skills have mitigated or alleviated issues with eating (Braun et al., 2021; Jo et al., 2022; Meyer & Leppma, 2019; Wisener & Khoury, 2022), as well as alleviated or mitigated issues with addiction (Brewer, 2019; Herchenroeder et al., 2022; Mallik et al., 2021; Regan et al., 2020; Shirk et al., 2022). Brewer (2019) posited that the trait mindfulness facet of acting with awareness might subvert the addictive process.

Numerous studies point to the effectiveness of mindfulness-based interventions for college students (Dawson et al., 2020), for people of color (Sun et al., 2021), and for individuals suffering with mental health disorders (Van Campfort et al., 2021). Randomized controlled trials of mindfulness skills improved attention, executive function, and working memory in healthy adults, with more exposure to trait mindfulness enhancing the effect (Yakobi et al., 2021). A positive correlation was discovered between the facets of mindfulness and improvement in emotional intelligence (Miao et al., 2019). The facets of mindfulness include observing, describing, acting with awareness, nonjudging of the inner experience, and nonreacting to the inner experience (Baer et al., 2006).

Mindfulness skills significantly reduced mind-wandering (Feruglio et al., 2021). College students have reported the many positive benefits of mindfulness skills for improving learning and attenuating stress (Chiodelli et al., 2020; Yusufov et al., 2019). Fifty one studies were compared with 12 control studies finding that mindfulness-based interventions were effective to mitigate anxiety, psychological distress, rumination, and depression (Dawson et al., 2020). Students stated that trait mindfulness were an effective mechanism for coping with stress and anxiety and provided beneficial tools for their future careers (Bamber & Kraenzle-Schneider, 2022). Emotional intelligence was found to have a significant association with trait mindfulness (Miao et al., 2019). When compared with other mind-body interventions such as yoga, qigong, and tai chi, trait mindfulness proved an effective intervention for adults with mental disorders (Van Campfort et al., 2021). Both expert and naïve meditators demonstrated significantly decreased default-mode network activity both during meditation and resting state (Feruglio et al., 2021).

Several of the following studies have described the phenomenon, or experience, of mindfulness. Galovan et al. (2022) described mindfulness as a key component for the flourishing of healthy adults. Hanley and Garland (2019) suggest that the development of mindfulness skill is an essential part of self-transcendence. Studies have illustrated the differences and similarities between traditional and contemporary mindfulness practices (Pematatana & Khong, 2021), mindfulness and hypnosis (Gloede et al., 2021), and the described and lived experience of mindfulness practitioners (Pettitmengen et al., 2019). Rowland et al. (2020) concluded that mindfulness skills contributed to happiness.

Verhaeghen (2020) suggested that mindfulness-based interventions served as a foundation for the development of morality and wisdom. College students with high mindfulness skills also had higher levels of humility and improved their communication about spirituality (Wrench et al., 2020). These studies reinforce the benefits of mindfulness skills, but also their application to human flourishing. While the above studies refer to the phenomenology, or the lived experiences of mindfulness, it should be noted that these studies represent advanced expressions of emotional intelligence (Bishara, 2021). Attitudes and self-efficacy are considerable components of retention and emotion regulation (Dewberry & Jackson, 2018), and mindfulness has shown significant influence on the emotion regulation capacities of college students (MacDonald, 2021)

### **Mindfulness and Brain Change**

The following studies have illustrated the significant effects of mindfulness skills on changing and shaping the landscape and architecture of the human brain. Schoenberg and Vago (2019) sought to create neural maps of before and after meditative skills were practiced, showing the dramatic effects of experience-dependent neuroplasticity, and self-directed adaptive neuroplasticity. Linn et al. (2019) illustrated the effects of mindfulness skill has on the shape and location of the frontal lobe, and the enhancement of executive functioning, such as decision making, problem-solving, and planning. Parkinson et al. (2019) showed that trait mindfulness showed increases in functional connectivity, attentional control, and interoception, while also showing decreases in functional connectivity related to mind wandering. Weng et al. (2021) introduced the term “contemplative neuroscience” and showed the impact of trait mindfulness on the number

and diversity of neural networks. In a landmark meta-analysis of 180 peer-reviewed journal articles discussing meditation and the human brain, Tang et al. (2017) found that the practice of mindfulness had impact on the thickness of the cortices, the shape, density, and location of gray matter, increases in myelination, and slower atrophy to the hippocampus, these changes are central to the processes of attentional control, emotion regulation, executive functioning, and the stress response. Study results revealed that higher trait mindfulness was related to less flanker interference on accuracy and reaction time, consistent with enhanced executive attention (Lin et al., 2019).

### **Mindfulness, Physical Outcomes, and COVID-19**

Trait mindfulness has been shown to offer profound cardiovascular benefits, including significant improvements to heart-rate variability, the amount of time that fluctuates between heartbeats, which could be present or future indicators of stress and health (Koerten et al., 2020; Krick et al., 2021). Trait mindfulness moderated the relationship between sleep and self-reported health behaviors in college students (Lentz & Brown, 2019). Loucks et al. (2019) found that trait mindfulness significantly reduced single-arm blood pressure in a randomized controlled trial. Pacic et al. (2020) suggested that trait mindfulness was a predictor of self-reported health behaviors in college students. Trait mindfulness was also a key factor in improving health promotion behavior in college nursing students (Rababah et al., 2020). Heart-rate variability is a significant predictor of stress adaptability and consistently improves with the practice of trait mindfulness (Krick et al., 2021). The mindfulness facet of nonjudging could help

perfectionists improve heart-rate variability after experiencing a significant life stressor (Koerten et al., 2020).

While traditional mindfulness practices can trace their origins to nearly 2,600 years ago (Ludwig & Kabat-Zinn, 2008), mindfulness has shown relevance during the COVID-19 pandemic. Trait mindfulness was shown to mediate between COVID-19 fear and resilience in adults (Yalcin et al., 2021). Trait mindfulness was shown to moderate the relationship between pandemic severity and symptoms of posttraumatic stress (Liu et al., 2022). Trait mindfulness served as a moderating and mediating variable between COVID-19 stress and symptoms of severe depression (Schachter et al., 2022). Trait mindfulness served as a predictor of COVID-19 resilience (Park et al., 2021), and an effective way to cope with anxiety during the pandemic (Park et al., 2021). Trait mindfulness impacted emotional intelligence during the pandemic as populations showed improvements in self-compassion (MacDonald & Neville, 2022), and equanimity which helped to lower feelings of self-isolation (Mann & Walker, 2022). College students were also subjects of mindfulness research during the pandemic, as trait mindfulness was shown to contribute to their overall health and well-being (Lancaster & Arango, 2021), assist in crisis intervention in college theatre majors (McNamara, 2021), and serve as a facilitator for both creativity and productivity during the transition to remote learning (Shirish et al., 2021). Trait mindfulness proved an effective intervention for helping students cope with unexpected, distressing, and ambiguous crises (Liu et al., 2022).



## **Applications of Mindfulness With Special Populations**

Mindfulness skills have effectively ameliorated anxiety and stress symptoms in specific populations, including Latino pre-teens (Leavitt et al., 2020; Lu et al., 2020). Couples receiving mindfulness training report improved relational well-being (Leavitt et al., 2019). Caregivers cite mindfulness as helping them to deal with aggressive client behaviors (Nevill & Havercamp, 2019). Individuals with traumatic brain injury cite mindfulness as a tool to improve executive attention and working memory (Niraj et al., 2020). Applications of mindfulness have helped social workers deal with the daily stresses of practice (Ferz & Faver, 2019; Kinmon et al., 2020). Teachers credit mindfulness for improved levels of well-being, lower levels of perceived stress, and an important tool for establishing an inclusive classroom climate (Albrecht, 2019; Davis & BehmCross, 2020; DiCarlo et al., 2020; Hegney et al., 2021; Juberg et al., 2019). Senior citizens and widowers credit the development of mindfulness skill for improved well-being, the ability to cope with childhood maltreatment, and the improved recovery from grief and loss (Fitzgerald & Graves, 2021; Hazlett-Stevens et al., 2019; Rudaz et al., 2020). Mindfulness training has been the foundation of addiction treatment programs in jails and prisons (Lyons et al., 2019).

Counselors report an increased sense of multicultural competence after developing mindfulness skills (Martinez & Dong, 2020). Veterans report significantly fewer posttraumatic stress symptoms after combat when receiving training in mindfulness (Barr & Kintzle, 2019; Meyer et al., 2019; Nasif et al., 2019). Several studies have showed the efficacy of mindfulness applications with black women, ranging from a

reduction in post-traumatic stress to improvements in well-being and resilience (Adkins & Levine, 2020; Kazanjian, 2022; Rivera et al., 2022; Russell et al., 2020; Waldron & Burnett-Zeigler, 2022). Workers and executives credit mindfulness with lower levels of job-related exhaustion and burnout, and improved leadership capacity (Aziz et al., 2020; Mizlaff, 2019; Nadler et al., 2020; Rupprecht et al., 2019; Schuh et al., 2019).

Mindfulness training has lowered perceived stress and improved sleep quality in long-haul truckers (Wise et al., 2020).

### **Mindfulness and College Students**

The following sections explicitly discuss the literature regarding college students and trait mindfulness. College students react positively to mindfulness interventions, including improved academic performance (Boo et al., 2020; Cavanagh et al., 2019; Westlund-Stewart et al., 2020). Mindfulness skills have helped college students to mitigate anxiety and stress (Dawson et al., 2020). College students have used mindfulness skills to improve sleep (Diaz et al., 2020). College students have improved emotional regulation through the skills of mindfulness (Akeman et al., 2020; Finkelstein-Fox et al., 2019; Hosseinazdeh et al., 2021; Kim et al., 2021). College students have used mindfulness to mitigate exposure to trauma (Dolbier et al., 2021; Lim et al., 2020; Kachadourian et al., 2021). College students have effectively used mindfulness skills to address depression and suicidal ideation (Chesin & Jeglic, 2022; Fang et al., 2019).

### ***Mindfulness and College Adjustment***

During the transition to college, trait mindfulness correlated with emotion regulation and subjective well-being, as well as uniquely protected college students from

depression in students who have shown poor emotion regulation (Finkelstein-Fox et al., 2019). Mobile applications of mindfulness-based interventions showed overall decreases in psychological distress and improved feelings of adjustment in randomized controlled trials (Flett et al., 2020). Several facets of mindfulness, like acting with awareness and describing, served as better predictors of adjustment over sources of social support (Kingery et al., 2020). The facets of nonreactivity and nonjudging predicted lower stress and greater emotional wellbeing in college students (Kingery et al., 2020). Trait mindfulness lowered feelings of homesickness when adjusting to college (Mettler et al., 2019). Promoting mindfulness practices at the start of college may build resilience in undergraduate students (Finkelstein-Fox et al., 2019).

### ***Mindfulness and Attention and Concentration in College Students***

A pilot study showed parallel increases in baseline attention and trait mindfulness in college students (Greif & Kaufman, 2021). In comparison with the “tranquil abiding” method, trait mindfulness showed significantly more improvement in focus, selective attention, and concentration (Guillaume et al., 2020). College graduate students also showed significant improvement in attention span through the development of trait mindfulness (Krumholtz et al., 2022), providing significant linear and quadratic trends for state mindfulness. Trait mindfulness showed significant reductions in ADHD symptoms in college students (Lester & Murrell, 2019). While showing significant improvement in attention and concentration, trait mindfulness showed a significant reduction in experiential avoidance (Sharma et al., 2021). While attention monitoring is a significant component of mindfulness (Lindsay & Creswell, 2017), trait mindfulness helped college

students with attention regulation (Wimmer et al., 2020). Better attention performance through trait mindfulness correlated with significant decreases in anxiety (Greif & Kaufman, 2021).

### *Mindfulness and Mental Health in College Students*

Thirty-one peer-reviewed journal articles were found discussing the impact of trait mindfulness on the mental health of college students. Trait mindfulness was shown to increase college student resilience at the same time decreasing symptoms of anxiety and depression (Akeman et al., 2020; Ritvo et al., 2021). Trait mindfulness was shown to be an effective intervention against internet and smartphone addiction in college students (Anslan & Coskun, 2021). Barrington et al. (2019) demonstrated that trait mindfulness was effective in reducing binge drinking and cannabis consumption in college students. Psychology students showed increases in well-being and salivary oxytocin production through development of mindfulness skills (Bellatosa-Battalla et al., 2020). University dance students showed improved recovery from rigorous training with mindfulness methods (Blevins et al., 2022). Trait mindfulness was found to be inversely correlated with alcohol consumption in college students (Brooks et al., 2019; Cotter et al., 2021). In-class mindfulness sessions helped pre-health profession majors, college nursing students, and regular college students significantly reduce stress and improve mood and well-being (Burgstahler & Stenson, 2020; Chase-Canterini & Christaens, 2019; Gardner & Kerridge, 2019; Long et al., 2021; Mathad et al., 2019).

Self-compassion and trait mindfulness were found to buffer the relationship between depression and suicidality in college students (Chesin & Jeglic, 2022). College

students taking a mediation course reported significant increases in happiness and reductions in anxiety (Crowley et al., 2020). College music students after taking a five-day mindfulness retreat reported improvements in concentration and performance (Diaz et al., 2020). Trait mindfulness was shown to dramatically improve sleep quality in college students (Ding et al., 2020). College students who meditated regularly showed significant improvements in physical and psychological health compared with non-meditating college students (Gutierrez et al., 2020; Karing et al., 2021). International college students and Hispanic students reported that trait mindfulness helped coping with stress (Altinyelkin et al., 2020; Moix et al., 2021).

College students on a waitlist for college counseling center services received mindfulness-based interventions and reported significant reductions in distress (Levin et al., 2020). Svetlak et al. (2021) found trait mindfulness was feasible to support college mental health centers. After a randomized controlled trial, college students reported significant reductions in loneliness (Lindsay et al., 2019). When virtual reality support is added to trait mindfulness, college students report significant improvements in overall life satisfaction (Modrego-Alarcon et al., 2021). Division one college athletes and college baseball players reported significant reductions in psychological distress through improving trait mindfulness, and also reported indirect effects and improvements on sleep hygiene (Moreton et al., 2022; Tingaz, 2020; Vidic & Cherup, 2021). Pre-service teachers reported significant improvements in self-awareness through the development of trait mindfulness (Park et al., 2020). In-class trait mindfulness sessions showed

significant benefit to the mental health of college students majoring in social work (Tufford et al., 2019).

Seven articles specifically focused on the relationship between trait mindfulness and the resolution of trauma symptoms in college students. South African University students reported reduction in trauma symptoms using transcendental meditation (Bandy et al., 2020). Trauma exposed college students reported that the mindfulness facet of nonjudging was significant to reduce perceived stress and improve emotion regulation (Cherry & Wilcox, 2020). Trait mindfulness was found to moderate between trauma exposure and mental health outcomes (Kachadourian et al., 2021). Trait mindfulness inversely correlated with trauma symptoms in college students (Lim et al., 2020). Military veteran college students reported significant reductions in posttraumatic stress disorder symptoms (Reyes, Bhatta, et al., 2020; Reyes, Serafica, et al., 2020). Gratitude and trait mindfulness were mediators between injurious events and psychological distress in college students (Senger et al., 2022). Trait mindfulness mediated between trauma symptoms and anxiety in college students (Tubbs et al., 2019).

### ***Mindfulness and Academic Performance in College Students***

Fifteen peer-reviewed journal articles deal with the relationship between trait mindfulness and improved academic performance in college students. A meta-analysis showed that overall academic performance is improved by trait mindfulness (Boo et al., 2020). Trait mindfulness positively impacted quiz performance in college students (Calma-Birling & Gurung, 2019). The effects of trait mindfulness on academic performance persisted through multiple courses over multiple semesters (Cavanagh et al.,

2019). College students reported improvements in their reflective writing ability through trait mindfulness (Chinnery et al., 2019; Westlund-Stewart et al., 2020). Culberg and Mihalic (2020) showed that trait mindfulness increased perceptions and peer reporting of academic dishonesty. Trait mindfulness skills were found to help support competence, autonomy, and academic performance (Goodman et al., 2021). In-class mindfulness-based interventions suggest effectiveness in lowering the perceived stress of instructors and students and suggest an improved facilitator for learning (DiCarlo et al., 2020).

Trait mindfulness supported the academic performance of developmental psychology students and transformative learning in adult learners (Kingery et al., 2019; Martin, 2018; Morris, 2020; Sun, 2019). Trait mindfulness showed significant effects on compassion, engagement, and academic performance (Miralles-Arameneros et al., 2021). Trait mindfulness mediated between self-regulation and academic performance in college students (Strait et al., 2020), as well as between psychopathology symptoms and academic performance (Vorontsova-Wenger et al., 2021). Two hundred twenty-six undergraduates were evaluated in art history, mathematics, and economics courses after performing three mindfulness-based interventions over the course of a semester and performed higher on exams the day of the intervention, as well as received higher scores on the final exams for the course (Cavanagh et al., 2019). Trait mindfulness could help students develop higher levels of self-confidence, which would assist in career development (Park et al., 2020). Trait mindfulness fostered more multicultural competence across ethnically diverse samples (Juberg et al., 2019). Surveyed students felt that trait mindfulness enhanced their levels of self-awareness and self-regulation of their

thinking, feelings and behaviors, and analysis suggests that mindfulness processes were the underpinnings of successful academic performance (Boo et al., 2020). Mindfulness skills are positively associated with academic performance (Vorontsova-Wenger et al., 2021).

### ***Mindfulness and Emotional Intelligence in College Students***

Emotional intelligence consists of self-awareness, self-regulation, motivation, and empathy (Majeski et al., 2017), and has related scales of self-compassion, self-efficacy, self-advocacy, and self-esteem (Majeski et al., 2018). Increases in trait mindfulness led to increases in cognitive load and self-efficacy in college students (Bishara, 2021). Gorvine et al. (2019) indicated an inverse correlation between self-compassion and perceived stress in college students. Trait mindfulness mediated the relationship between self-efficacy and early maladaptive schemas in college students (Hosseinazadeh et al., 2021). Trait mindfulness led to decreases in loneliness while showing increases in regulatory emotional self-efficacy (Jin et al., 2020). College organizational leaders credit trait mindfulness for overall improvements in their emotional intelligence (Kaoun, 2019). Online mindfulness-based interventions fostered emotional intelligence in adult learners (Majeski et al., 2017).

College students reported increases in their intrinsic motivation to exercise through trait mindfulness (Neace et al., 2020). Saraff et al. (2020) found that trait mindfulness moderated the relationship between self-concept, self-esteem, and growth mindset in college students. Trait mindfulness was positively associated with improvements in self-compassion and empathy (Taylor et al., 2020). College students



demonstrated significant improvements in meta-cognition through trait mindfulness (Torres-Imbarra & Ibaceta, 2019). Vidic and Cherup (2019) found that trait mindfulness moderated the relationship between perceived stress and perfectionism. Trait mindfulness also moderated the relationship between perceived social support and subjective well-being (Wilson et al., 2020). Socioeconomically disadvantaged students reported increases in resilience and decreases in perceived discrimination through trait mindfulness (Wu, Li, et al., 2021). Zhang et al. (2019) found that trait mindfulness altered early and late components of emotional regulation. Findings revealed that certain facets of mindfulness, like describing, acting with awareness, nonjudging, and nonreacting were negatively associated with difficulties in emotion regulation, and observing and acting with awareness were positively associated with delaying gratification skills in 278 undergraduates (MacDonald, 2021).

### **Mindfulness and College Student Success and Retention**

While very little has been written concerning the relationship between mindfulness, persistence, and retention, there are promising trends in the field. Trait mindfulness was found to be a significant predictor of grit, or perseverance and passion for long-term goals, in college students (Raphipattana et al., 2018). Self-efficacy was found to be a significant component of college student retention (Dewberry & Jackson, 2018), and mindfulness was found to mediate the relationship between early maladaptive schemas and self-efficacy in college students (Hosseinazadeh et al., 2021). Positive psychology factors, such as hope and trait mindfulness, were significant predictors of grit in Latina/o college students (Cavazos-Vela et al., 2018). After a seven-week mindfulness

training program, Norwegian medical and psychology students reported greater increases in problem-focused coping and decreases in avoidance-based coping after a six-year follow-up (De Vibe et al., 2018). Mindfulness-based strengths practices contributed to modestly higher retention rates in students who received the intervention (Wingert et al., 2022). Parsons (2020) contended that higher education institutions could implement mindfulness programs and see an increase in student retention and persistence to graduation and degree completion.

### **Summary**

First-generation college students have unique needs (Arch & Gilman, 2019), are often in low socioeconomic status, have dependents, are of non-traditional college age, and work longer hours than their continuing-generation peers (Bassett, 2021). First-generation college students report more psychological distress, less academic achievement, and have higher stress levels and more negative emotional states than their continuing generation peers (Bennett et al., 2021; Goldman et al., 2021; House et al., 2020; Pratt et al., 2019). First-generation college students are the majority of students who drop out of college and are less than one percent likely to re-enroll in college after deciding to leave college (Arch & Gilman, 2019). Attaining a college degree is critical for a first-generation student, as first-generation college students with a college degree are less likely to experience poverty, unemployment, and incarceration, and more likely to engage in pro-social behaviors like volunteerism and activism (Barbera et al., 2020).

Numerous studies illustrate the efficacy of trait mindfulness for alleviating stress and anxiety (An et al., 2019; Soysa et al., 2021), improving mental health (Bajaj et al.,

2019; Valikhani et al., 2020); changing the shape and architecture of the human brain (Schoenberg & Vago, 2019; Tang et al., 2017), improving physical health outcomes (Koerten et al., 2020; Loucks et al., 2019), and alleviating or mitigating issues with addiction (Brewer, 2019; Mallik et al., 2021). Trait mindfulness has been shown effective to cope with the stress, fear, and anxiety common during the COVID-19 pandemic (Liu et al., 2022; Park et al., 2021). Trait mindfulness has been shown effective in special populations ranging from veterans to senior citizens to long-haul truckers (Barr & Kintzle, 2019; Hazlett-Stevens et al., 2019; Wise et al., 2020).

Trait mindfulness has been shown effective to help college students improve attention and concentration (Greif & Kaufman, 2021), improve adjustment to college (Finkelstein-Fox et al., 2019; Mettler et al., 2019), improve academic performance (Boo et al., 2020; Vorontsova-Wenger et al., 2021), address mental health conditions (Akeman et al., 2020; Chesin & Jeglic, 2022; Tingaz, 2020), alleviate symptoms of trauma (Cherry & Wilcox, 2020; Kachadourian et al., 2021), and improve emotional intelligence (Bishara, 2021; Jin et al., 2020; Zhang et al., 2019).

First-generation college students have not been specific subjects of mindfulness research, nor has there been any effort to study the relationship between trait mindfulness and retention risk. While retention for first-generation students has been thoroughly studied (Barbera et al., 2021), it is possible that a tool which is over 2,600 years old (Kabat-Zinn, 2013) could prove effective with this population and help them stay in college to receive the benefits of a college education (Barbera et al., 2020), shorten the wage gap (Manzoni & Streib, 2019), and reduce levels of emotional distress (Goldman et

al., 2021; House et al., 2020; Ricks & Warren, 2021). The nonjudging and nonreacting components of trait mindfulness could prove effective in this study (Kingery et al., 2020). Chapter three will illustrate the key methods utilized to explore the relationship between trait mindfulness and retention risk in this study.

### Chapter 3: Research Method

The purpose of this quantitative study was to examine the relationship between trait mindfulness skills and retention risk in first-generation undergraduate college students. The population of this study was first-generation undergraduate college students, who have unique needs and require unique services (Arch & Gilman, 2019). First-generation college students experience higher stress levels and more negative emotional states than their continuing generation peers, as well as lower levels of positive emotional states as compared to their continuing generation peers (Goldman et al., 2021). This study was grounded in the theory of planned behavior (Ajzen, 2011; Dewberry & Jackson, 2018a), and monitor and acceptance theory (Lindsay & Creswell, 2017). This chapter includes the research design and rationale, population and sampling procedures, recruitment of participants, instrumentation and operationalization of constructs, data analysis, threats to validity, ethical concerns, and a summary.

#### **Research Design and Rationale**

A correlational design was used to describe the degree of the relationship between mindfulness skills independent variables: observing, describing, acting with awareness, nonjudging of the inner experience, and nonreacting to the inner experience (Baer et al., 2006; Bohlmeijer et al., 2011b) and each dimension that comprises the retention risk dependent variables: attitudes toward college, self-efficacy, norms about college completion, and the intention to withdraw (Dewberry & Jackson, 2018b).

A correlational design is appropriate to answer the research questions about the combined and relative importance of the five mindfulness subscale scores in accounting

for variance in each of the four retention risk scores in four separate multiple linear regressions. Multiple linear regression can advance knowledge in the field because it recognizes multiple correlated influences on a dependent variable and can answer questions about theoretical expectations when the independent variables represent a theoretical set or competing sets (Cohen et al., 2003).

## **Methodology**

### **Population and Sampling**

The target population in this study were first-generation undergraduate college students in their first or second year of university. The gap in the literature indicated that first-generation undergraduate college students in the United States were appropriate for this study. The literature thoroughly discusses the unique motivations and needs of first-generation undergraduate college students in the United States (Arch & Gilman, 2019; Bassett, 2021; Gibbons et al., 2019; Goldman et al., 2021; House et al., 2020; Manzoni & Streib, 2019; Pratt et al., 2019; Ricks & Warren, 2021; Salvatore et al., 2020; Schelbe et al., 2019). The literature also discusses the many benefits of mindfulness skills to college students (Bamber & Kraenzle-Scheider, 2022; Diaz et al., 2020; Gardner & Kerridge, 2019; Greif & Kaufman, 2021; Juberg et al., 2019; Moix et al., 2021; Saraff et al., 2020; Tingaz, 2020; Torres-Ibarra & Ibaceta, 2019; Vorontsova et al., 2021). However, the literature does not address the relationship of mindfulness skills to first-generation undergraduate college students, or the impact of trait mindfulness skills on retention risk.

First-generation undergraduate college students were invited to complete a survey through the Amazon Mechanical Turk crowd outsourcing service. I paid a nominal fee

for the use of the service. Only first-generation undergraduate college students in the United States in their first or second year of study were eligible to participate. While a crowd outsourcing service was used, first-generation students volunteered for the study, utilizing a purposive sampling strategy (Daniel, 2012).

### **Power Analysis for Sample Size**

Power analysis was conducted to determine the sample size needed to detect statistically significant individual predictor effects in a regression, which is more demanding than what is needed to detect a statistically significant multiple-R. Specifically, calculation was based on procedures demonstrated in Diebold's (2020-present) video podcast on manipulating G\*Power (Faul et al., 2009) to determine sample size to detect the unique effects of each predictor at  $\alpha = .05$ . Unique effects were determined based on correlations among the five mindfulness subscale scores reported by Bohlmeijer et al. (2011b) and the expectation that each predictor would have a correlation of .40 with the dependent variable. Sample size to detect the smallest unique effect of a predictor was calculated with power of .70, the minimum recommended by Stevens (2002), and .80, the traditional a priori value, which yielded sample sizes of 171 and 216, respectively. Target sample size for my study is 171, but survey access will not be closed after reaching 171 for one week or upon reaching 216, whichever occurs first.

### **Procedure for Recruitment, Participation, and Data Collection**

Amazon Mechanical Turk is a marketplace of individuals (called "workers") available to complete specified tasks, including survey research, requested by other individuals, business, or organizations who pay a nominal fee per respondent. Amazon

Mechanical Turk sent my invitation to participate (Appendix A) to eligible members of their crowdsourcing panel. Only first-generation undergraduate college students in the United States in their first or second year of study were eligible to participate. The invitation contained a link to the online survey hosted by SurveyMonkey.

Data were collected online through SurveyMonkey. The first page of the online survey included informed consent (detailed in a subsequent section of this chapter) and participants' acknowledgement and acceptance to move to the next page. Those who did not acknowledge and accept informed consent to participate were exited from the survey. Those who did acknowledge and accept affirmed their eligibility to participate, specifically that they were a first-generation college student in the United States in their first or second year of study. If eligibility was affirmed, participants continued to the survey items; if not affirmed, they were exited from the survey. Survey items included measures of mindfulness, college retention, and basic demographics as described in the Instrumentation section of this chapter. Participants exited the survey by clicking the "Done" button on the last page. As an anonymous online survey, there were no follow-up procedures.

I estimated it would take about 8 minutes to complete the survey. This was based on reading the 642-word informed consent page at the average adult silent reading speed of 238 words per minute (Brysbaert, 2019) and answering 41 survey items at an average rate of 7.5 seconds per item (Versta Research, 2011, 2022). Consistent with a \$10 per hour pay rate, I planned to pay each Amazon Mechanical Turk worker \$1.33 for a completed survey. In addition, Amazon Mechanical Turk charged a 40% commission per



worker. In total, using an online calculator (<https://morninj.github.io/mechanical-turk-cost-calculator/>), survey administration cost was estimated to be from \$318.40 to \$402.19 for 171 to 216 participants, respectively.

### **Instrumentation and Operationalization of Constructs**

The instruments for data collection through an online survey were a mindfulness measure (Bohlmeijer et al., 2011a), a college student retention measure (Dewberry & Jackson, 2018b), and a basic list of demographic items to be used for describing the sample.

#### **Mindfulness Measure**

Baer et al. (2006) validated a 39-item five-facet measure of mindfulness from an initial pool of 112 items from five other measures, including: (a) the 15-item Mindful Attention Awareness Scale (Brown & Ryan, 2003), (b) the 30-item Freiburg Mindfulness Inventory (Buchheld et al., 2001), (c) the 39-item Kentucky Inventory of Mindfulness Skills (Baer et al., 2004), (d) the 12-item unpublished Cognitive and Affective Mindfulness Scale (Feldman et al., 2004, as cited in Baer et al., 2006), and (e) the 16-item Mindfulness Questionnaire (Chadwick et al., 2005). Subsequently, Bohlmeijer et al. (2011b) validated the 24-item Five Facet Mindfulness Questionnaire—Short Form (FFMQ-SF) from Baer et al.'s 39 items.

The FFMQ-SF (Bohlmeijer et al., 2011a) uses a five-point Likert-type scale from 1 (*never or very rarely true*) to 5 (*very often or always true*) and yields five subscale scores: observe (4 items), describe (5 items), act aware (5 items), nonjudge (5 items), and nonreact (5 items). Cronbach's alpha ranged from .75 (nonreact) to .87 (describe).

The observe subscale relates to paying attention to physical experiences, sounds, smells, and visual stimuli. An example item is “I pay attention to physical experiences, such as the wind in my hair or sun on my face”. The describe subscale relates to being able to find words to express feelings, opinions, thoughts, bodily feelings, and feeling terribly upset. An example item is “It’s hard for me to find the words to describe what I’m thinking”. This item (#5) and item 11 about bodily feelings require reverse coding. The act aware subscale is about acting with awareness in the moment, doing things automatically, and paying attention. An example item is “I rush through activities without being really attentive to them”. All five items are negatively worded and require reverse coding to represent acting with awareness. The nonjudge subscale relates to nonjudging of inner experiences of feelings, thoughts, emotions, and illogical ideas. An example item is “I make judgments about whether my thoughts are good or bad”. All five items are negatively worded and require reverse coding to represent nonjudging of inner experiences. The nonreact subscale relates to nonreactivity to inner experiences of feelings and distressing thoughts or mental images. An example item is “When I have distressing thoughts or images, I feel calm soon after”.

Bohlmeijer et al. (2011b) established statistically significant concurrent validity (i.e., correlations) of each mindfulness facet with other psychological measures. Observe scores were most highly positively related to openness ( $r = .47$ ) and positive mental health ( $r = .25$ ). Describe scores were mostly highly positively related to positive mental health ( $r = .35$ ), acceptance ( $r = .32$ ), and openness ( $r = .31$ ); and negatively related to neuroticism ( $r = -.21$ ). Act aware scores were moderately positively correlated with

acceptance ( $r = .27$ ) and positive mental health ( $r = .23$ ), and negatively correlated with neuroticism ( $r = -.24$ ), depression ( $r = -.20$ ), and anxiety ( $r = -.19$ ). Nonjudge scores were positively correlated with acceptance ( $r = .51$ ) and negatively related to neuroticism ( $r = -.41$ ), depression ( $r = -.26$ ), and anxiety ( $r = -.23$ ). Nonreact scores were positively correlated with acceptance ( $r = .40$ ) and negatively correlated with neuroticism ( $r = -.40$ ) and anxiety ( $r = -.23$ ).

Mean composite scores ranging from 1 to 5 were calculated for each of the five FFMQ-SF subscales. High scores will indicate higher levels of observing, describing, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience. The FFMQ-SF may be used for research purposes without seeking written permission (Bohlmeijer et al., 2011a; Appendix B).

### **College Student Retention Measure**

Dewberry and Jackson (2018a) developed the 12-item Theory of Planned Behavior on Student Retention in College Scale (TPB-SRCS) with four subscales of three items each: attitudes to course of study, self-efficacy towards course of study, norms about course of study completion, and the intention to withdraw. Scoring occurs using a five-point Likert rating scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Two items on the scale are negatively keyed (attitude 2, intention 1). Examples of questions from the attitude subscale include “I wish I had chosen a different degree course to study at college” or “The degree course I am studying at college isn’t right for me.” Low scores on this subscale would indicate a negative attitude towards college. Examples of questions in the self-efficacy subscale include “I have the ability to complete my studies

successfully” and “I have sufficient ability to succeed at college.” High scores in this subscale would indicate high levels of self-efficacy. Examples of items on the norms subscale include “My family and friends would want me to stay at college until my studies are completed” and “The people who are important to me think I should stay at college until I have finished my studies.” Low scores on this subscale would indicate low levels of norms concerning college completion. Examples of questions in the intention subscale include “I am quite likely to quit college before my studies are finished” and “I am quite likely to leave college before completing my studies.” High scores in this subscale would indicate a high level of retention risk, or risk for dropout.

In a sample of 633 nontraditional-aged undergraduate and graduate students, Cronbach’s alpha for the four subscales ranged from .79 to .89 (Dewberry & Jackson, 2018a). Intention to withdraw was moderately negatively correlated with attitude ( $r = -.44$ ), self-efficacy ( $r = -.34$ ), and norms ( $r = -.44$ ), as expected (Dewberry & Jackson, 2018a). Attitude had medium-size correlations with self-efficacy ( $r = .36$ ) and norms ( $r = .29$ ), and self-efficacy and norms had a small-to-moderate correlation ( $r = .23$ ; Dewberry & Jackson, 2018a). Intention to withdraw was statistically significantly negatively correlated with the student integration variables of sense of belonging, friendship with other students, perceived progress, and perceived growth. Attitude, self-efficacy, and norms were positively correlated with the student integration variables.

Dewberry and Jackson (2018a) have explored the relationship between the theory of planned behavior and many aspects of social and organizational behavior, including donating blood, using condoms to prevent AIDS, choosing a career, exercising, wearing a

safety helmet, completing high school, and completing college. Davis et al. (2002) found that 51 percent of the variance in intention to stay in school has been explained by the students' attitudes towards completing their current year, subjective norms and their perceptions of the degree of perceived control they had over whether or not they would be able to complete.

Mean composite scores ranging from 1 to 5 were calculated for each of the four TPB-SRCS subscales. High scores will indicate higher levels of attitude to course of study, self-efficacy towards course of study, norms about course completion, and intention to withdraw. The TPB-SRCS may be used for research purposes without seeking written permission (Dewberry & Jackson, 2018b; Appendix C).

### **Demographics**

In addition, demographic data (Appendix D) were collected to provide context and insights to the sample and the results. Age, race, and gender data were included as well as a question to divide the subjects into groups, whether they had previous exposure to mindfulness training or had any experience meditating.

### **Research Questions**

For the purposes of this study, the four TPBSRCS subscale scores (attitude to course, self-efficacy towards course, norms about course completion, and intention to withdraw) served as criterion variables (aka dependent variables) and the set of five FFMQ-SF subscale scores (observe, describe, act aware, nonjudge, and nonreact) served as predictors (aka independent variables). For each of the four TPBSRCS subscale scores, two research questions were posed, one with respect to the combined effect of the

predictors, the other with respect to the relative importance of each predictor. Hypotheses were provided for each of the four combined effect research questions. There are no statistical tests for comparing the relative importance of each predictor, so hypotheses are not possible (i.e., a hypothesis requires a statistical test that yields a p-value).

RQ1: What is the combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS attitude to course subscale scores among first-generation undergraduate college students?

H<sub>0</sub>1: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS attitude to course subscale scores among first-generation undergraduate college students is not statistically significant at  $\alpha = .05$ .

H<sub>a</sub>1: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS attitude to course subscale scores among first-generation undergraduate college students is statistically significant at  $\alpha = .05$ .

RQ2: What are the relative effects (squared semipartial correlation,  $sr^2$ ) and relative weights (Johnson's  $\epsilon$ ) of each of the five facets of mindfulness in accounting for variance in the TPBSRCS attitude to course subscale scores among first-generation undergraduate college students?

RQ3: What is the combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS self-efficacy towards course subscale scores among first-generation undergraduate college students?

H<sub>03</sub>: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS self-efficacy towards course subscale scores among first-generation undergraduate college students is not statistically significant at  $\alpha = .05$ .

Ha<sub>3</sub>: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS self-efficacy towards subscale scores among first-generation undergraduate college students is statistically significant at  $\alpha = .05$ .

RQ4: What are the relative effects (squared semipartial correlation,  $sr^2$ ) and relative weights (Johnson's  $\epsilon$ ) of each of the five facets of mindfulness in accounting for variance in the TPBSRCS self-efficacy towards course subscale scores among first-generation undergraduate college students?

RQ5: What is the combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS norms about course completion subscale scores among first-generation undergraduate college students?

H<sub>05</sub>: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS norms about course completion subscale scores among first-generation undergraduate college students is not statistically significant at  $\alpha = .05$ .

Ha<sub>5</sub>: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS norms about course completion subscale

scores among first-generation undergraduate college students is statistically significant at  $\alpha = .05$ .

RQ6: What are the relative effects (squared semipartial correlation,  $sr^2$ ) and relative weights (Johnson's  $\epsilon$ ) of each of the five facets of mindfulness in accounting for variance in the TPBSRCS norms about course completion subscale scores among first-generation undergraduate college students?

RQ7: What is the combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS intention to withdraw subscale scores among first-generation undergraduate college students?

H<sub>0</sub>7: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS intention to withdraw subscale scores among first-generation undergraduate college students is not statistically significant at  $\alpha = .05$ .

H<sub>a</sub>7: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS intention to withdraw subscale scores among first-generation undergraduate college students is statistically significant at  $\alpha = .05$ .

RQ8: What are the relative effects (squared semipartial correlation,  $sr^2$ ) and relative weights (Johnson's  $\epsilon$ ) of each of the five facets of mindfulness in accounting for variance in the TPBSRCS intention to withdraw subscale scores among first-generation undergraduate college students?



### **Data Analysis Plan**

Data were analyzed for the study using IBM SPSS version 28 or newer. Prior to the multiple regression analyses, the data were cleaned and screened following procedures outlined in Diebold (2019) and Tabachnick and Fidell (2007). These included:

- missing data
- reliability of subscale scores
- univariate and multivariate outliers
- univariate normality
- collinearity and multicollinearity among the predictors
- standardized residual outliers in each regression
- linearity, normality, and homoscedasticity of residuals in each regression

Participant-mean substitution was used for missing item data for a subscale when there was valid data for about 70% of the other items that make up the subscale. This is a simple, reliable, and effective way to address missing data (Downey & King, 1998; Shrive et al., 2006). Cronbach's alpha was calculated to examine the reliability of each subscale, and items removed if they did not substantially contribute to the construct. Cases with standardized subscale scores exceeding  $\pm 3.29$  and that were substantially discontinuous with the distribution were considered an extreme univariate outlier (Tabachnick & Fidell, 2007) and removed from further analysis. Multivariate outliers were examined following Tabachnick and Fidell's (2007) procedure of regressing a random variable on the set of predictors. Cases with Mahalanobis values greater than 20.515 (the critical chi square value for five predictors at  $\alpha = .001$ ) and that were

substantially discontinuous with the distribution were considered an extreme multivariate outlier (Tabachnick & Fidell, 2007) and removed from further analysis. Univariate normality of each subscale score was assessed using skewness and kurtosis values. According to Kline (2016) skewness values less than  $\pm 3.0$  and kurtosis values less than  $\pm 10.0$  can be considered relatively normal and not adversely affect results.

High correlations between pairs of predictors (collinearity) and high multicollinearity of a predictor with the set of other predictors can adversely affect regression results (Tabachnick & Fidell, 2007). Bohlmeijer et al. (2011b) reported correlations among the five FFMQ-SF subscales as shown in Table 1. Correlations among predictors of .70 and higher could be cause for concern (Tabachnick & Fidell, 2007). The largest pairwise correlation was .37, so collinearity issues were not expected. Similarly, if a predictor regressed on the set of other predictors has a multiple- $R = .70$  or higher, multicollinearity could be of concern. Tolerance is the proportion of variance in a predictor not explained by the set of other predictors. If multiple- $R = .70$ , then  $R^2 = .49$  and tolerance = .51. So, tolerance values of .51 or smaller correspond to multiple- $R$  values of .70 or higher. Based on the correlations reported in Bohlmeijer et al., I calculated tolerance values for each FFMQ-SF subscale, with the smallest being .80, well above the zone of concern of .51 or smaller, so multicollinearity was not expected to be an issue. Nonetheless, I report intercorrelations and tolerance values in my actual sample.

**Table 1***Expected Correlations Among FFMQ-SF Subscale Scores*

	Tolerance <sup>1</sup>	Observe	Describe	Act aware	Nonjudge
Observe	.80				
Describe	.81	.37			
Act aware	.80	.36	.32		
Nonjudge	.88	.07	.06	.20	
Nonreact	.88	.10	.17	.16	.30

<sup>1</sup> Tolerance values calculated from the subscale correlations reported in Bohlmeijer et al. (2011).

Regression results were examined for cases with standardized residual values greater than  $\pm 3.29$  and that were discontinuous with the distribution and removed from further analysis if warranted. A scatterplot of standardized residuals ( $y$ -axis) by standardized predicted values ( $x$ -axis) was examined for linearity, normality, and homoscedasticity. Scatterplots that are u-shaped, n-shaped, or otherwise substantially curved weaken the statistical power of the regression results (Tabachnick & Fidell, 2007). Normality of residuals is evident in the scatterplot if the dots are thicker near the horizontal zero line and thinner and relatively equally disbursed above and below the zero line. Homoscedasticity of the residuals is indicated in the scatterplot if dots symmetrically fill a relatively rectangular shape. Violation does not invalidate the regression result, but does weaken statistical power (Tabachnick & Fidell, 2007).

After data cleaning and screening as described above was completed, regression results were reported. To answer research questions 1, 3, 5, and 7, the regression  $R^2$  was reported along with the observed significance value.  $R^2$  is the proportion of variance in

the criterion variable that is explained by the complete set of predictor variables with small, medium, and large effects defined as .02, .13, and .26, respectively (Cohen, 1988).

To answer research questions 2, 4, 6, and 8, the squared semipartial correlation and Johnson's  $\epsilon$  was reported for each FFMQ-SF subscale score (observe, describe, act aware, nonjudge, and nonreact). The squared semipartial correlation is the proportion of variance in the criterion variable uniquely accounted for by a predictor and is a common procedure to rank order the importance of the predictors (Tabachnick & Fidell, 2007). If two predictors are highly correlated and one is slightly more highly correlated with the criterion it is credited with accounting for more of the unique variance in the criterion. Johnson's  $\epsilon$  corrects for this by considering the intercorrelations among the predictors (Johnson, 2000; Lorenzo-Seva et al., 2010). Unlike squared semipartial correlations, the  $\epsilon$  relative weights for each predictor sum to 1, which makes interpretation unambiguous and is preferred compared to other relative importance indicators (Johnson & LeBreton, 2004). The squared semipartial correlation can be directly calculated by squaring what IBM SPSS labels the part correlation in regression output. Johnson's  $\epsilon$  relative weights for each predictor will be calculated using Lorenzo-Seva et al.'s (2010) IBM SPSS syntax program available from <https://link.springer.com/article/10.3758/BRM.42.1.29#SecESM1>.

### **Supplemental Exploratory Analyses**

For exploratory purposes only, the five mindfulness subscale scores and the four retention subscale scores were examined for correlations with age of participant, and for group mean differences based on race, gender, and prior exposure to mindfulness training

or experience meditating. No demographic was found to be statistically significantly related to a retention subscale score, so additional multiple linear regressions were not conducted to include the demographic as a covariate along with the five mindfulness subscale scores.

### **Threats to Validity**

#### **External Validity**

In general, external validity refers to the generalizability of results (Cook & Campbell, 1979; Reichardt, 2019). At best, the results of this study are only generalizable to first- and second-year first-generation college students in the United States who also happen to belong to the Amazon Mechanical Turk crowdsource network and who would tend to volunteer for a study on mindfulness and college student retention. Generalizing to other types of participants, times, and settings would require conducting multiple replication studies (Reichardt, 2019). Commonly listed specific threats to external validity (e.g., Campbell & Stanley, 1963; Cook & Campbell, 1979) such as interaction effect of testing, interaction effects of selection biases and the experimental variable, reactive effects of experimental arrangements, and multiple-treatment interference apply only to experimental and quasi-experimental studies and not to the correlational design of my study.

#### **Internal Validity**

As defined by Campbell and Stanley (1963), internal validity is concerned with answering the question “Did in fact the experimental treatments make a difference in this specific experimental instance?” (p. 5). This notion of internal validity as assessing

causality has been consistent across the decades since Campbell and Stanley's exemplar work (see, e.g., Cook & Campbell, 1979; Reichardt, 2019; Shadish et al., 2002). The commonly listed threats to internal validity (i.e., to concluding causality) have to do with issues of multiple measurement (e.g., pretest, posttest) including history, maturation, testing, and statistical regression; or issues related to nonequivalence of comparison groups caused by nonrandom assignment, differential mortality, and the various interaction affects with selection. None of these specific threats apply to correlational research. Specific to my research, it cannot be determined if mindfulness variables cause the retention variables, or vice versa.

### **Construct Validity**

In general, construct validity is about the labeling and measurement of constructs that define the variables to be studied (Shadish et al., 2002). In my study, I will use reliable and validated instruments to measure the five facets of mindfulness and four college student retention variables. In addition, I examined the sample-specific reliability of each subscale score as indexed by Cronbach's alpha to ensure adequate reliability for analysis. Nonetheless, construct validity could be threatened if participants respond with social desirability bias. To some extent this was controlled for by the anonymity of response (Krumpal, 2013).

### **Statistical Conclusion Validity**

Statistical conclusion validity is about the proper analysis to answer the research question, the statistical assumptions of an analysis, and the statistical power of analysis (Cook & Campbell, 1979). My research questions were about predicting retention scores

from a set of mindfulness scores for which multiple linear regression is the appropriate analysis (Tabachnick & Fidell, 2007). I cleaned and screened the data as detailed in the Data Analysis section of this chapter to ensure assumptions of multiple regression were reasonably met. Finally, I conducted a power analysis to determine appropriate sample size to detect the smallest expected unique effect of individual predictors.

### **Ethical Considerations**

Researchers need to protect the participants of their research, develop trust with participants in the study, promote the integrity of the research, guard against impropriety, and cope with challenging problems (Creswell & Creswell, 2017). Prior to conducting the study, I obtained approval from the Walden University Institutional Review Board. My study included informed consent procedures, disclosed the purpose of the study to examine the relationship between trait mindfulness skills and retention risk, and was sensitive to the needs of the first-generation college student (Appendix E). Instrument items and demographic items did not contain sensitive or identifying information. No information was collected or disclosed that would harm any participant.

Ethical concerns for recruitment of participants, includes early withdrawal from the study. Participants who withdrew from the study were removed from the study. Confidentiality of data was strictly protected. Participants received several notices regarding the complete confidentiality of their answers, which are provided in the appropriate appendices. The researcher and committee were the only persons with access to the data. Data will be kept on a password protected flash drive in a secured and double-

locked location. Data will be kept for five years after completing the dissertation and will then be destroyed.

### **Summary**

The purpose of this quantitative study was to examine the relationship between trait mindfulness skills and retention risk in first-generation undergraduate college students in the United States. The study was a correlational design that used multiple linear regression to account for variance in four separate retention subscale scores by a set of five mindfulness subscale scores with research questions focused on the combined effect and relative importance of the predictors. Eligible participants were recruited from the Amazon Mechanical Turk crowdsourcing network and linked to an online survey hosted by SurveyMonkey. Participants were provided informed consent and a description of the study. To ensure adequate power, the target sample size was 171 or larger. In Chapter 4, I report the time frame of data collection, descriptive demographic characteristics of the participants, results of data cleaning and screening for statistical assumptions, final descriptive statistics of the five mindfulness and four retention subscale scores, and the results of the four separate multiple linear regressions.



## Chapter 4: Results

The purpose of this quantitative study was to examine the impact of trait mindfulness skills on retention risk in first-generation undergraduate college students in the United States. Trait mindfulness skills are observing, describing, acting with awareness, nonjudging of the inner experience, and nonreacting to the inner experience (FFMQ-SF; Baer et al., 2006). Retention risk is comprised of the subscales in the theory of planned behavior student retention in college scale (TPBSRCS; Dewberry & Jackson, 2018) and is comprised of attitudes towards program or course, self-efficacy, norms about college completion, and the intention to withdraw.

For the purposes of this study, the four TPBSRCS subscale scores (attitude to course, self-efficacy towards course, norms about course completion, and intention to withdraw) served as criterion variables (aka dependent variables) and the set of five FFMQ-SF subscale scores (observe, describe, act aware, nonjudge, and nonreact) served as predictors (aka independent variables). For each of the four TPBSRCS subscale scores, two research questions were posed, one with respect to the combined effect of the predictors, the other with respect to the relative importance of each predictor. Hypotheses were provided for each of the four combined effect research questions. There are no statistical tests for comparing the relative importance of each predictor, so hypotheses were not possible (i.e., a hypothesis requires a statistical test that yields a *p*-value). The specific research questions and hypotheses are presented along with findings in the Results section of this chapter.

The structure of this chapter includes a discussion of the methods used in data collection, including timeframes and respondent demographics, results of the survey including data analysis, a summary of the findings presented in this chapter, and a preview of chapter five.

### **Data Collection**

The Walden University Institutional Review Board (“IRB”) approved the project for the final study phase on January 19, 2023, with approval number: #01-19-23-1043591. Amazon Mechanical Turk was consulted to distribute my survey on January 23, 2023, with approval granted to send the survey given on February 9, 2023. Amazon Mechanical Turk is a marketplace of individuals (called “workers”) available to complete specified tasks, including survey research, requested by other individuals, business, or organizations who pay a nominal fee per respondent. Amazon Mechanical Turk sent my invitation to participate (Appendix A) to eligible members of their crowdsourcing panel. Only first-generation undergraduate college students in the United States in their first or second year of study were eligible to participate. The invitation contained a link to the online survey hosted by SurveyMonkey.

Data were collected online through SurveyMonkey. The first page of the online survey included informed consent (Appendix E) and participants’ acknowledgement and acceptance to move to the next page. Those who did not acknowledge and accept informed consent to participate were exited from the survey. Those who acknowledged and accepted were affirmed of their eligibility to participate, specifically that they were a first-generation college student in the United States in their first or second year of study.

Once eligibility was affirmed, participants continued to the survey items; those who did not affirm were exited from the survey. Survey items included measures of mindfulness, college retention, and basic demographics as described in the Instrumentation section of Chapter 3. Participants exited the survey by clicking the “Done” button on the last page. A total of 242 participants accrued in approximately six hours. As an anonymous online survey, there were no follow-up procedures.

I estimated that it would take about 8 minutes to complete the survey. This was based on reading the 642-word informed consent page at the average adult silent reading speed of 238 words per minute (Brysbaert, 2019) and answering 41 survey items at an average rate of 7.5 seconds per item (Versta Research, 2011, 2022). Of the 242 responses collected by my survey, the average time of completion was five minutes. Consistent with a \$10 per hour pay rate, I paid each Amazon Mechanical Turk worker \$1.33 for a completed survey. In addition, Amazon Mechanical Turk charged a 40% commission per worker. The actual cost for 242 participants was \$326.61.

### **Data Cleaning**

Of the 242 responses in the survey, 16 participants reported being under the age of 18 (6.64% of respondents) and were removed from further analysis. Missing data on subscale items used participant mean substitution if about 70% of items for a participant on a subscale had valid data. This included two participants with one item of missing data on the FFMQ-SF observe subscale, nine with one item missing on the describe subscale, 10 with one item missing on the act aware subscale, two with one item missing on the nonjudge subscale, two with one item missing on the nonreact subscale, one with one

item missing on the TPBSRCS negative attitude to course subscale, three with one item missing on the self-efficacy towards course subscale, five with one item missing on the norms about course completion subscale, and four with one item missing on the intention to withdraw subscale. Two participants had missing data on two of the five describe subscale items and one participant had missing data on three of the five actaware subscale items; these three participants were removed from further analysis, leaving a valid *N* of 223.

Acceptable reliability as indexed by Cronbach's  $\alpha$  was found for all subscales except TPBSRCS negative attitude to course subscale and intention to withdraw subscale. For the negative attitude to course subscale, the reverse coded item "I am satisfied that the degree course I have chosen to study at college is the right one for me" did not fit with the other two items and was removed and the resulting two item subscale had acceptable reliability.

The three-item intention to withdraw subscale had a negative Cronbach's  $\alpha$  violating additivity. No two-item combination was found to be reliable. To determine the most valid of the three items to represent intention to withdraw, correlations with the other TPBSRCS items were examined and only the item "I am quite likely to quit college before my studies are finished" had the logically expected pattern of correlations of near zero or positive correlation with negative attitude to course items and near zero or negatively correlated with each of the self-efficacy towards course items and the norms about course completion items. Therefore, this single item was selected to represent the intention to withdraw in further analyses.

All standardized subscale scores and the standardized intention to withdraw item were within  $\pm 3.29$  except self-efficacy. One participant was found to be a lone univariate outlier discontinuous from the rest of the distribution and was removed from further analysis. Also, one participant was found to be a multivariate outlier with Mahalanobis value of 25.274 that was discontinuous with the rest of the distribution (nearest other value was 21.876 and was removed from analysis). Valid *N* was now equal to 221.

The eight valid subscales and the single item intention to withdraw all had relatively normal skewness and kurtosis values (less than  $\pm 3.0$  for skewness, and less than  $\pm 10.0$  for kurtosis). Collinearity was observed between the observe-nonreact subscale scores and the actaware-nonjudge subscale scores with correlations greater than .70. Multicollinearity was found for all five of the FFMQ-SF subscale scores as predictors with tolerance values less than .51, ranging from .29 to .46. The effect of multicollinearity on each of the four regression models is detailed in the Results section of this chapter.

## **Results**

In this section I provide descriptive statistics of the sample; descriptive statistics of the key study variables (including reliability coefficients); correlations among the key study variables; preliminary linear regressions to evaluate statistical assumptions; and final regression results for the combined effects that answer RQs 1, 3, 5, and 7, and for the relative effects that answer RQs 2, 4, 6, and 8.

## Descriptive Statistics of the Sample

With a final valid sample of 221 established, descriptive statistics of the sample is now valid (Table 2). There were 121 females (54.8%) and 100 males (45.2%). The vast majority of participants were White ( $n = 200$ , 90.5%) with all other races proportionally underrepresented. The majority of participants were in their second year of college ( $n = 136$ , 61.5%), and the majority reported having prior mindfulness training or meditative practice.

**Table 2**

### *Demographics of Sample*

Demographic	<i>n</i>	%
Gender		
Female	121	54.8
Male	100	45.2
Race		
White or Caucasian	200	90.5
Black or African American	11	5.0
Hispanic or Latino	2	0.9
Asian or Asian American	7	3.2
Missing	1	0.5
Year in college		
First year	83	37.6
Second year	136	61.5
Missing	2	0.9
Prior mindfulness practice		
Yes	198	89.6
No	18	8.1
Missing	5	2.3

*Note.*  $N = 221$ .

### Descriptive Statistics of the Key Study Variables

All subscales had acceptable reliability ranging from .613 to .861 as indexed by Cronbach's  $\alpha$  (Table 3). All subscale scores had a mean above the midpoint of the 1-5 point response scale ranging from 3.03 to 4.24, and the single item intention to withdraw had a mean of 2.89, slightly below the midpoint. All had acceptable skewness and kurtosis values (Table 4).

**Table 3**

#### *Subscale Reliability Descriptive Statistics*

Subscale	Cronbach's $\alpha$	# Items	Inter-Item correlations		
			Min.	Avg.	Max.
FFMQ-SF					
Observe	.767	4	.364	.453	.497
Describe	.613	5	.042	.245	.541
Actaware	.861	5	.450	.556	.655
Nonjudge	.851	5	.436	.534	.628
Nonreact	.793	5	.340	.434	.579
TPBSRCS					
Negative attitude to course	.656	2	.493	.493	.493
Self-efficacy toward course	.700	3	.379	.441	.488
Norms about completion	.743	3	.404	.489	.607

*Note.*  $N = 221$ .

### Correlations Among Key Study Variables

As shown in Table 5, all pairwise correlations among the 8 subscales and the single item intention to withdraw were statistically significant except the correlation between negative attitude to course and actaware ( $r = .007, p = .922$ ) and negative attitude to course and intention to withdraw ( $r = .053, p = .431$ ).

**Table 4***Key Variable Descriptive Statistics*

Variable	<i>M</i>	<i>SD</i>	Min.	Median	Max.	<i>S</i>	<i>K</i>
FFMQ-SF							
Observe	3.65	0.93	1.0	3.8	5.0	-0.26	-0.35
Describe	3.44	0.76	1.8	3.2	5.0	0.88	-0.01
Actaware	3.18	1.10	1.0	3.0	5.0	0.29	-0.84
Nonjudge	3.03	1.04	1.0	2.8	5.0	0.53	-0.42
Nonreact	3.46	0.89	1.6	3.4	5.0	0.24	-0.64
TPBSRCS							
Negative attitude to course	3.71	1.04	1.0	4.0	5.0	-0.66	0.06
Self-efficacy toward course	4.24	0.67	2.0	4.3	5.0	-0.89	0.62
Norms about completion	4.08	0.69	2.0	4.0	5.0	-0.46	-0.27
Intention to withdraw	2.89	1.42	1.0	3.0	5.0	-0.17	-1.40

*Note.*  $N = 221$ .

**Table 5***Key Variable Correlations*

Variable	1	2	3	4	5	6	7	8	9
1		.580	.188	.189	.708	.473	.427	.517	-.320
2	< .001		.641	.603	.605	.237	.392	.463	-.569
3	.005	< .001		.784	.141	.007	.253	.204	-.594
4	.005	< .001	< .001		.195	.169	.160	.250	-.531
5	< .001	< .001	.036	.004		.571	.371	.563	-.234
6	< .001	< .001	.922	.012	< .001		.220	.421	.053
7	< .001	< .001	< .001	.018	< .001	.001		.613	-.275
8	< .001	< .001	.002	< .001	< .001	< .001	< .001		-.243
9	< .001	< .001	< .001	< .001	< .001	.431	< .001	< .001	

*Note.*  $N = 221$ . Upper diagonal contains Pearson correlations; lower diagonal contains two-tailed  $p$  values; 1 = FFMQ-SF observe subscale; 2 = FFMQ-SF describe subscale; 3 = FFMQ-SF actaware subscale; 4 = FFMQ-SF nonjudge subscale; 5 = FFMQ-SF nonreact subscale; 6 = TPBSRCS negative attitude to course subscale; 7 = TPBSRCS self-efficacy toward course subscale; 8 = TPBSRCS norms about course completion subscale; 9 = TPBSRCS intention to withdraw single item.



### **Preliminary Regressions to Evaluate Statistical Assumptions**

Preliminary regressions were conducted separately for each of the three TPBSRCS subscales and the single item intention to withdraw to examine extreme outliers and linearity, normality, and homoscedasticity of the residuals. Except for the intention to withdraw model, the others had one or more standardized residuals exceeding  $\pm 3.29$  but none were substantially discontinuous with the distribution and deemed not to be extreme outliers that would affect the results.

All of the models were linear and had relatively normal distribution of residuals. The intention to withdraw model exhibited some heteroscedasticity with variance increasing at and above the mean predicted value. Each of the other three models exhibited some heteroscedasticity with variance decreasing at and above the mean predicted value. According to Tabachnick and Fidell (2007) this violation of homoscedasticity of the residuals does not invalidate the model but can weaken power, which was not evident in any of the models with all models statistically significant at  $< .001$ .

More concerning, and affecting interpretation of individual predictors, was the effect multicollinearity had on the results (Table 6). This was evident in substantive change of magnitude and sign between a predictor's simple correlation and semipartial correlation with the criterion. Although it is expected that the semipartial correlation between a predictor and the criterion will be less than the simple correlation because of correlations among the predictors, substantial change in magnitude or change in sign (e.g., from positive simple correlation to negative semipartial correlation) indicates

suppression (Pandley & Elliot, 2010; Tzelgov & Henik, 1991) and makes interpretation of relative importance based on semipartial correlation challenging. Johnson's  $\epsilon$  relative weights, however, corrects for suppression effects and provides a clear picture. As can be seen from data in the table below, in the negative attitude to course model the describe subscale had a positive simple correlation with the criterion but statistically significant negative semipartial correlation; similarly, the actaware subscale had a near zero nonsignificant simple correlation but a near significant negative semipartial correlation. Also, the nonjudge subscale had a substantially larger semipartial versus simple correlation with the criterion. All of these indicate substantial suppression effects. The model least affected by multicollinearity was the intention to withdraw model.

**Table 6**

*Multicollinearity Suppression Effects in the Four Regression Models*

Predictor	Criterion variable											
	Negative attitude to course			Self-efficacy toward course			Norms about course completion			Intention to withdraw		
	<i>p</i>	<i>r</i>	<i>sr</i>	<i>p</i>	<i>r</i>	<i>sr</i>	<i>p</i>	<i>r</i>	<i>sr</i>	<i>p</i>	<i>r</i>	<i>sr</i>
Observe	.002	.473	.161	.003	.427	.180	.011	.517	.140	.040	-.320	-.107
Describe	<.001	<b>.237</b>	<b>-.188</b>	.306	.392	.061	.453	.463	.041	.005	-.569	-.148
Actaware	.056	<b>.007</b>	<b>-.100</b>	.017	.253	.144	.823	<b>.204</b>	<b>-.012</b>	<.001	-.594	-.178
Nonjudge	<.001	<b>.169</b>	<b>.220</b>	.062	<b>.160</b>	<b>-.112</b>	.210	.250	.068	.225	-.531	-.063
Nonreact	<.001	.571	.360	.232	.371	.071	<.001	.563	.222	.178	<b>-.234</b>	<b>.070</b>

*Note.* *r* = simple correlation between predictor and criterion; *sr* = semipartial correlation controlling for other predictors; *p* values are for the variable in the model and based on the semipartial correlation.

## **Final Regression Results**

This section is divided into two subsections to report the results for the (a) combined effects that answer RQs 1, 3, 5, and 7; and (b) relative effects of the individual predictors to answer RQs 2, 4, 6, and 8.

### ***Combined Effects***

Four research questions with associated hypotheses were proposed to examine the extent to which the five FFMQ-SF subscale scores accounted for variance in each of the four TPBSRCS variables. These research questions and hypotheses were as follows:

RQ1: What is the combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS attitude to course subscale scores among first-generation undergraduate college students?

H<sub>0</sub>1: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS attitude to course subscale scores among first-generation undergraduate college students is not statistically significant at  $\alpha = .05$ .

H<sub>a</sub>1: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS attitude to course subscale scores among first-generation undergraduate college students is statistically significant at  $\alpha = .05$ .

RQ3: What is the combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS self-efficacy towards course subscale scores among first-generation undergraduate college students?

H<sub>0</sub>3: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS self-efficacy towards course subscale scores among first-generation undergraduate college students is not statistically significant at  $\alpha = .05$ .

H<sub>a</sub>3: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS self-efficacy towards subscale scores among first-generation undergraduate college students is statistically significant at  $\alpha = .05$ .

RQ5: What is the combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS norms about course completion subscale scores among first-generation undergraduate college students?

H<sub>0</sub>5: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS norms about course completion subscale scores among first-generation undergraduate college students is not statistically significant at  $\alpha = .05$ .

H<sub>a</sub>5: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS norms about course completion subscale scores among first-generation undergraduate college students is statistically significant at  $\alpha = .05$ .

RQ7: What is the combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS intention to withdraw subscale scores among first-generation undergraduate college students?

H<sub>0</sub>7: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS intention to withdraw subscale scores among first-generation undergraduate college students is not statistically significant at  $\alpha = .05$ .

H<sub>a</sub>7: The combined effect ( $R^2$ ) of the five facets of mindfulness in accounting for variance in the TPBSRCS intention to withdraw subscale scores among first-generation undergraduate college students is statistically significant at  $\alpha = .05$ .

As detailed in Table 7, the five FFMQ-SF subscale scores best predicted variance in self-efficacy towards course ( $R^2 = .487$ ) and were least effective in accounting for variance in norms about course completion ( $R^2 = .364$ ). In the negative attitude to course model, all FFMQ-SF subscales were statistically significant except actaware. In the self-efficacy towards course model, only observe and actaware subscales were statistically significant predictors. In the norms about course completion model, only observe and nonreact were statistically significant. In the intention to withdraw model, observe, describe, and actaware were statistically significant. The observe subscale was statistically significant in all four models, and nonjudge was statistically significant in only one model (negative attitude to course). The other three were statistically significant in two of the four models: describe (negative attitude to course, intention to withdraw), actaware (self-efficacy towards course, intention to withdraw), and nonreact (negative attitude to course, norms about course completion).

**Table 7**

*Summary Regression Results of the Four TPBSRCS Criterion Variables as Predicted by the Five FFMQ-SF Subscale Scores*

Model	<i>b</i>	<i>SE<sub>b</sub></i>	95% CI <sub><i>b</i></sub>	<i>t</i>	<i>p</i>
Negative attitude to course					
$R^2 = .415, F(5, 215) = 30.45, p < .001$					
Constant	1.503	.273	[.97, 2.04]	5.51	< .001
Observe	.268	.087	[.10, .44]	3.08	.002
Describe	-.477	.132	[-.74, -.22]	-3.60	< .001
Actaware	-.171	.089	[-.35, .01]	-1.92	.056
Nonjudge	.367	.087	[.20, .54]	4.22	< .001
Nonreact	.666	.097	[.48, .86]	6.90	< .001
Self-efficacy towards course					
$R^2 = .487, F(5, 215) = 13.33, p < .001$					
Constant	2.750	.202	[2.35, 3.15]	13.65	< .001
Observe	.195	.064	[.07, .32]	3.03	.003
Describe	.100	.098	[-.0937, .29]	1.03	.306
Actaware	.159	.066	[.03, .29]	2.42	.017
Nonjudge	-.120	.064	[-.25, .01]	-1.88	.062
Nonreact	.086	.071	[-.06, .23]	1.20	.232
Norms about course completion					
$R^2 = .364, F(5, 215) = 24.63, p < .001$					
Constant	2.144	.189	[1.77, 2.52]	11.373	< .001
Observe	.155	.060	[.04, .27]	2.576	.011
Describe	.069	.092	[-.11, .25]	.752	.453
Actaware	-.014	.062	[-.14, .11]	-.224	.823
Nonjudge	.075	.060	[-.04, .19]	1.258	.210
Nonreact	.273	.067	[.14, .41]	4.090	< .001
Intention to withdraw					
$R^2 = .428, F(5, 215) = 32.15, p < .001$					
Constant	6.670	.367	[5.95, 7.39]	18.18	< .001
Observe	-.242	.117	[-.47, -.01]	-2.07	.040
Describe	-.511	.178	[-.86, -.16]	-2.87	.005
Actaware	-.414	.120	[-.65, -.18]	-3.46	< .001
Nonjudge	-.142	.117	[-.37, .09]	-1.22	.225
Nonreact	.176	.130	[-.08, .43]	1.35	.178

### ***Relative Effects of Each Predictor***

Four research questions were proposed to examine the relative importance of each of the five FFMQ-SF subscale scores in accounting for variance in each of the four TPBSRCS variables. These research questions were as follows:

RQ2: What are the relative effects (squared semipartial correlation,  $sr^2$ ) and relative weights (Johnson's  $\epsilon$ ) of each of the five facets of mindfulness in accounting for variance in the TPBSRCS attitude to course subscale scores among first-generation undergraduate college students?

RQ4: What are the relative effects (squared semipartial correlation,  $sr^2$ ) and relative weights (Johnson's  $\epsilon$ ) of each of the five facets of mindfulness in accounting for variance in the TPBSRCS self-efficacy towards course subscale scores among first-generation undergraduate college students?

RQ6: What are the relative effects (squared semipartial correlation,  $sr^2$ ) and relative weights (Johnson's  $\epsilon$ ) of each of the five facets of mindfulness in accounting for variance in the TPBSRCS norms about course completion subscale scores among first-generation undergraduate college students?

RQ8: What are the relative effects (squared semipartial correlation,  $sr^2$ ) and relative weights (Johnson's  $\epsilon$ ) of each of the five facets of mindfulness in accounting for variance in the TPBSRCS intention to withdraw subscale scores among first-generation undergraduate college students?

In Table 8 several common indices of relative importance are reported and rank ordered for each of the four models. The one of primary interest is Johnson's  $\epsilon$  that takes

into account both the unique contribution of a predictor along with proportioning of shared contribution with other predictors. As previously detailed, all four models were affected, to varying extent, by multicollinearity among the predictors. Of the relative importance indices reported in the table, the most affected by multicollinearity are the standardized regression coefficient ( $\beta$ ) and the squared semipartial correlation. Least affected is Johnson's  $\epsilon$ . On average, across all four models, the observe and nonreact subscale scores were the most important predictors (average  $\epsilon$  rank = 2.25), followed by describe (average  $\epsilon$  rank = 2.75), actaware (average  $\epsilon$  rank = 2.75), and least important was nonjudge (average  $\epsilon$  rank = 4.00).

Also of importance to note is the direction of relationship of each predictor in each model. In the negative attitude to course model, describe and actaware were negative predictors (i.e., the higher one scored on these, the less negative was the attitude to course); while observe, nonjudge, and nonreact were positive predictors (i.e., the higher one scored on these, the more negative was the attitude to course). In the self-efficacy towards course model, nonjudge was a negative predictor and observe and actaware were positive predictors (describe and nonreact were not statistically significant). In the norms about course completion model, observe and nonreact were positive predictors (the others were not statistically significant). In the intention to withdraw model, observe, describe, and actaware were all negative predictors of intention to withdraw (nonjudge and nonreact were not statistically significant).



**Table 8**

*Summary Relative Effect Results of the Four TPBSRCS Criterion Variables as Predicted by the Five FFMQ-SF*

Model	$\beta$	Rank	$r$	Rank	$sr^2$ %	Rank	SC	Rank	$\epsilon$	Rank
Negative attitude to course										
Observe	.24	4	.47	2	2.59%	4	.74	2	28.8%	2
Describe	-.35	3	.24	3	3.53%	3	.37	3	7.9%	3
Actaware	-.18	5	.01	5	1.00%	5	.01	5	3.4%	5
Nonjudge	.37	2	.17	4	4.84%	2	.26	4	7.7%	4
Nonreact	.57	1	.57	1	12.96%	1	.89	1	52.2%	1
%										
Self-efficacy towards course										
Observe	.27	1	.43	1	3.24%	1	.88	1	37.5%	1
Describe	.12	4	.39	2	0.37%	5	.81	2	21.1%	3
Actaware	.26	2	.25	4	2.07%	2	.52	4	14.2%	4
Nonjudge	-.18	3	.16	5	1.25%	3	.33	5	4.4%	5
Nonreact	.11	5	.37	3	0.50%	4	.76	3	22.9%	2
Norms about course completion										
Observe	.21	2	.52	2	1.96%	2	.86	2	31.4%	2
Describe	.08	4	.46	3	0.17%	4	.77	3	17.5%	3
Actaware	-.02	5	.20	5	0.01%	5	.34	5	3.3%	5
Nonjudge	.12	3	.25	4	0.46%	3	.41	4	5.6%	4
Nonreact	.35	1	.56	1	4.93%	1	.93	1	42.2%	1
Intention to withdraw										
Observe	-.16	3	-.32	4	1.07%	3	-.49	4	9.5%	4
Describe	-.27	2	-.57	2	2.19%	2	-.87	2	26.9%	2
Actaware	-.32	1	-.59	1	3.17%	1	-.91	1	35.4%	1
Nonjudge	-.11	4	-.53	3	0.40%	5	-.81	3	24.1%	3
Nonreact	.11	5	-.23	5	0.49%	4	-.36	5	4.1%	5

### **Supplemental Exploratory Analyses**

I proposed exploratory analyses of demographic variables with each of the five FFMQ-SF subscale scores and each of the TPBSRCS variables. Because Whites made up over 90% of the sample, there is too little variance to conduct any examination of race. Similarly, because nearly 90% reported having prior mindfulness training or meditative practice, that variable cannot be further analyzed. Below is summary of results and APA table examining gender and year in college group differences.

Females had statistically significantly higher actaware subscale scores and nonjudge subscale scores than males; females also had statistically significantly lower intention to withdraw scores. Students in their first year and second year of college did not statistically significantly differ on any of key study variables.

**Table 9***Differences Across Key Study Variables by Gender and Year in College*

	Female <i>n</i> = 121		Male <i>n</i> = 100		<i>t</i>	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
FFMQ-SF							
Observe	3.72	0.91	3.56	0.94	1.25	.212	.17
Describe	3.52	0.85	3.35	0.64	1.67	.097	.23
Actaware	3.34	1.09	2.99	1.09	2.38	.018	.32
Nonjudge	3.25	1.02	2.76	0.99	3.59	< .001	.49
Nonreact	3.44	0.93	3.48	0.84	-0.35	.726	.05
TPBSRCS							
Negative attitude to course	3.77	1.01	3.65	1.08	0.88	.381	.12
Self-efficacy towards course	4.22	0.73	4.27	0.60	-0.63	.532	.09
Norms about course completion	4.06	0.70	4.09	0.69	-0.25	.801	.03
Intention to withdraw	2.60	1.41	3.23	1.36	-3.35	< .001	.45
	1st year <i>n</i> = 83		2nd year <i>n</i> = 136		<i>t</i>	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
FFMQ-SF							
Observe	3.56	1.04	3.69	0.85	-1.00	.319	.14
Describe	3.39	0.76	3.48	0.77	-0.90	.369	.13
Actaware	3.12	1.14	3.21	1.08	-0.58	.564	.08
Nonjudge	3.05	1.08	3.02	1.02	0.18	.855	.03
Nonreact	3.47	0.89	3.46	0.90	0.11	.910	.02
TPBSRCS							
Negative attitude to course	3.81	1.02	3.66	1.06	1.00	.318	.14
Self-efficacy towards course	4.23	0.73	4.24	0.64	-0.10	.922	.01
Norms about course completion	4.11	0.75	4.06	0.65	0.50	.619	.07
Intention to withdraw	2.93	1.48	2.85	1.39	0.38	.707	.05

*Note.* *d* = Cohen's *d*.

### Summary

All pairwise correlations among the 8 subscales and the single item intention to withdraw were statistically significant except the correlation between negative attitude to course and actaware and negative attitude to course and intention to withdraw. The five FFMQ-SF subscale scores best predicted variance in self-efficacy towards course and were least effective in accounting for variance in norms about course completion. In the negative attitude to course model, all FFMQ-SF subscales were statistically significant except actaware. In the self-efficacy towards course model, only observe and actaware subscales were statistically significant predictors. In the norms about course completion model, only observe and nonreact were statistically significant. In the intention to withdraw model, observe, describe, and actaware were statistically significant. The observe subscale was statistically significant in all four models, and nonjudge was statistically significant in only one model. The other three—describe, actaware, and nonreact—were statistically significant in two of the four models.

In the negative attitude to course model, describe and actaware were negative predictors (i.e., the higher one scored on these, the less negative was the attitude to course); while observe, nonjudge, and nonreact were positive predictors (i.e., the higher one scored on these, the more negative was the attitude to course). In the self-efficacy towards course model, nonjudge was a negative predictor and observe and actaware were positive predictors (describe and nonreact were not statistically significant). In the norms about course completion model, observe and nonreact were positive predictors (the others were not statistically significant). In the intention to withdraw model, observe, describe,

and actaware were all negative predictors of intention to withdraw (nonjudge and nonreact were not statistically significant). Chapter five includes interpretations of the findings, limitations of the study, recommendations, implications, and a conclusion.

## Chapter 5: Discussion

The purpose of this quantitative study was to explore the impact of trait mindfulness skills on retention risk in first-generation undergraduate college students in the United States. The five facets of mindfulness as measured by the five facet mindfulness questionnaire (FFMQ; Baer et al., 2006) were compared with the retention subscales of the theory of planned behavior student retention in college scale (TPBSRCS; Dewberry & Jackson, 2018). Initially, 242 individual survey responses were recorded by first-generation college students in the United States in either their first or second year of undergraduate study. After data cleaning, 221 participants had usable data for analysis. Multiple linear regressions were conducted analyzing the impact of the observing, describing, acting with awareness, nonjudging, and nonreacting dimensions of mindfulness (Baer et al., 2006) with the attitude towards course or program, self-efficacy, norms about college completion, and intention to withdraw dimensions of the retention measure (Dewberry & Jackson, 2018).

The results of the study indicated that there was indeed an impact of trait mindfulness skill on retention risk in first-generation undergraduate college students. The describing and acting with awareness dimensions of trait mindfulness significantly influenced the attitude to course or program dimension of the retention measure. The observing, describing, and acting with awareness dimensions of mindfulness significantly impacted the self-efficacy dimension of the retention measure. This confirms the literature on the impact of mindfulness on emotional intelligence, specifically self-efficacy, in college students (Bishara, 2021; Hosseinazadeh et al., 2021; Jin et al., 2020),

yet produces it in a population previously not studied in the mindfulness literature, the first-generation undergraduate college student. The observing and nonreacting dimensions of the mindfulness measure significantly impacted the norms regarding college completion dimension of the retention measure. The describing, acting with awareness, nonjudging, and nonreacting dimensions of the mindfulness measure significantly influenced the intention to withdraw dimension of the retention measure. As retention has not been previously considered in mindfulness literature, the findings have tremendous potential to contribute to positive social change.

### **Interpretation of the Findings**

First-generation college students pose significant retention risks as Goldman et al. (2020) posited that first-generation college students have more negative emotional states and higher stress levels than their continuing-generation peers, and they are four times more likely to drop out of college (Schelbe et al., 2019). In my study, the dimensions of describing, acting with awareness, nonjudging, and nonreacting all significantly impacted intention to withdraw, more dimensions than any other subscale in the study, indicating that trait mindfulness is a significant predictor of retention risk. As stress levels are a significant predictor of retention risk (Barbera et al., 2020), the attitude and self-efficacy scales of retention were significantly impacted by trait mindfulness skill.

The findings of the study in relationship to the domain of self-efficacy (Majeski, 2018) are meaningful, confirming previous research findings on the impact of mindfulness on self-efficacy as it contributes to the construct of emotional regulation (Akeman et al., 2020; Finkelstein-Fox et al., 2019; Hosseinazadeh et al., 2021; Kim et al.,

2021). As first-generation college students rarely ask for help (Bassett, 2021), the findings of the study on the attitude and self-efficacy dimensions of the retention measure continue to confirm that mindfulness can aid in feelings of social support and well-being (Wilson et al., 2020) and bolster both early and late components of emotional regulation (Zhang et al., 2019).

As the findings of the study suggest that first-generation college students with higher scores in the facets of mindfulness pose a lower risk of withdrawal, this would confirm the findings of Raphipattana et al. (2018) that trait mindfulness is a significant predictor of grit and resilience. Findings also conclude the confirmation that self-efficacy is a significant component of retention (Dewberry & Jackson, 2018). Students who used mindfulness practices retained at a higher rate (Wingert et al., 2022), as these findings inherently strengthen that claim. As Parsons (2020) contended that community colleges could implement mindfulness programs to improve retention and persistence to graduation, these findings posit a similar claim and propose benefit to nearly every level of higher education, especially those institutions with high populations of first-generation students.

In the context of the theoretical orientations that support this study, Lindsay and Creswell (2017) posited that the mechanisms of mindfulness are effective for cognitive, affective, stress, and health related outcomes. The findings of this study, particularly in the domains of attitude, self-efficacy, and the intention to withdraw are especially supportive of that assertion. Dewberry and Jackson (2018) posited that self-efficacy was a significant predictor of retention. The impact of the describing, acting with awareness,



nonjudging, and nonreacting facets of mindfulness vehemently support this claim, as well the role of self-efficacy as it relates to the entire theory of planned behavior (Ajzen, 2011).

### **Limitations**

External validity refers to the generalizability of results (Cook & Campbell, 1979; Reichardt, 2019). At best, the results of this study can only be generalized to first- and second-year first-generation college students in the United States who also happen to belong to the Amazon Mechanical Turk crowdsource network and would tend to volunteer for a study on mindfulness and college student retention. In this case because of the students who participated in the study, results could only be attributable to the participants in the study. Assuming generalizability to all first-generation college students would violate this assumption. However, as the sample size exceeded the power analysis, it can be assumed that this sample can yield results that can be analyzed and interpreted. While this sample yielded results that determined the impact of trait mindfulness skill on retention risk, attributing effect to the entire population would be a mistake, thus, the results can only be applied to this sample of first-generation college students in their first or second year of undergraduate study.

As defined by Campbell and Stanley (1963), internal validity is concerned with answering the question “Did in fact the experimental treatments make a difference in this specific experimental instance?” (p. 5). This notion of internal validity as assessing causality has been consistent across the decades since Campbell and Stanley’s exemplary work (see, e.g., Cook & Campbell, 1979; Reichardt, 2019; Shadish et al., 2002). The

commonly listed threats to internal validity (i.e., to concluding causality) have to do with issues of multiple measurement (e.g., pretest, posttest), thus the survey was administered at only one time, negating this internal validity threat. Threats to internal validity also include history, maturation, testing, and statistical regression; or issues related to nonequivalence of comparison groups caused by nonrandom assignment, differential mortality, and the various interaction affects with selection. None of these specific threats were present in my correlational research. As such, my research meets the standard of internal validity. As survey participants voluntarily chose to engage in my study, nonrandom assignment, mortality, and interaction effects were avoided.

Statistical conclusion validity is about the proper analysis to answer the research question, the statistical assumptions of an analysis, and the statistical power of analysis (Cook & Campbell, 1979). My research questions predicted retention scores from a set of mindfulness scores for which multiple linear regression is the appropriate analysis (Tabachnick & Fidell, 2007). I cleaned and screened the data as detailed in the Data Analysis section of a previous chapter to ensure assumptions of multiple regression are reasonably met, including linearity, homoscedasticity, and multicollinearity. Finally, I conducted a power analysis to determine an appropriate sample size to detect the smallest expected unique effect of individual predictors.

One of the limitations experienced in my study was the lack of diversity represented in the sample population. Minority groups were underrepresented, with 90.5% of the sample being white or Caucasian. First-generation students are often

represented by minority status (Arch & Gilman, 2019). However, the sample did conform to representation as most respondents were non-traditional age, or over the age of 25.

### **Recommendations**

For the purpose of this quantitative study, participants were limited to first-generation undergraduate students in their first or second year of study. For further research, I would recommend that first-generation college students in their third or fourth year of study also be included for future study. As the years of study continue, so do the demands placed upon the first-generation student. It would be enlightening to determine if mindfulness plays a similar role at the end of a first-generation student's undergraduate career, as it does in the beginning.

Longitudinal research would also be interesting, to determine which first-generation students with high levels of trait mindfulness would persist to undergraduate graduation, graduate school, and employment. Additionally, it would be interesting to select specific groups of first-generation students by major or occupational choice, such as Pre-med or STEM (science, technology, engineering, and mathematics) to determine what role trait mindfulness plays in the retention and persistence students choosing high-demand and high-stress specialties. While there is value in quantitative methodology, and it has been the focus of this study, the field could benefit from additional qualitative research of first-generation college students providing thick and rich descriptions of their lived experiences in mindfulness. Diaz et al. (2020) conducted one of the only phenomenological studies of collegiate musicians, first-generation students would be a robust source for phenomenological inquiry.

First-generation students have not been a primary source for mindfulness research. I feel that the ground is now ripe to consider first-generation students for the previous areas of mindfulness study that college students have been considered, including the areas of mental health, emotional intelligence, adjustment to university, and stress. By considering the unique needs presented by the first-generation college student, colleges and universities could be better prepared to help first-generation students navigate the landscape of college and persist to graduation and beyond. Parsons (2020) recommended that community colleges offer mindfulness training programs for the benefit of their students. Approximately 50 colleges and universities offer their students mindfulness programs or meditation training as a part of health and wellness initiatives. Only three colleges or universities offer mindfulness training for college credit (Governors State, Brown University, and Blackburn College). After witnessing the benefit of trait mindfulness to the first-generation college student, every university should offer mindfulness training for credit as a part of their curriculum, or general education requirements. These programs could readily address the complications brought about by negative emotions and higher levels of stress.

The American educational system is failing the first-generation college student. Perhaps the issue is not with first-generation students themselves, but the students within the current educational system. Colleges and universities need to provide more intensive levels of family support to first-generation college students to help them realize the value of a college degree. Liberal arts programs should also be augmented by work programs, online education, apprenticeships as certificates, as well as re-imagining financial aid

programs to offer affordability to underserved and marginalized populations. If universal healthcare has been the aim of political pundits, universal education should be the next offering.

### **Implications**

Barbera et al. (2020) found that first-generation students are more likely to benefit from college persistence, as first-generation students who graduate are less likely to experience poverty, incarceration, and unemployment; and more likely to be career ready and engage in volunteerism. First-generation students are less likely to experience positive emotional states like joy and optimism (Goldman et al., 2020). Emotions and task values are a significant predictor of college engagement, as higher levels of intrinsic motivation and lower stress levels predicted persistence in first-generation college students (Goldman et al., 2021). These facts should provide a convincing argument for the research findings to contribute to positive social change. Trait mindfulness skills pave the way for higher levels of self-efficacy in the first-generation college student, which could lead to higher levels of intrinsic motivation, better engagement, and higher levels of joy and optimism, which could lead to higher levels of persistence. What population would not benefit from more of its members with higher levels of joy and optimism, and lower levels of stress? Higher levels of graduation, employment, volunteerism, and activism, along with lower levels of unemployment, poverty, and incarceration are the fundamental building blocks to a better society and a better world.

The theories that grounded this study were the theory of planned behavior (Ajzen, 2011; Dewberry & Jackson, 2018a) and the monitor and acceptance theory (Lindsay &

Creswell, 2017). The theory of planned behavior is the primary theory that grounded this study, and the research findings have profound implications for this theory. According to the theory of planned behavior (Ajzen, 2011), human behavior is guided by three kinds of considerations: beliefs about the likely consequences of the behavior (behavioral beliefs), beliefs about the normative expectations of others (normative beliefs), and beliefs about the presence of factors that may facilitate or impede the performance of the behavior (control beliefs). In their respective aggregates, behavioral beliefs produce a favorable or unfavorable attitude toward the behavior, normative beliefs result in perceived social pressure or subjective norm, and control beliefs give rise to perceived behavioral control or self-efficacy (Ajzen, 2011).

According to the theory of planned behavior, student retention behaviors are formed and determined by behavioral intentions (Dewberry & Jackson, 2018a). Behavioral intentions are determined by the student's attitude toward the behavior, subjective norms associated with the behavior, and the student's perceived level of control regarding the behavior. The theory of planned behavior student retention in college scale is a valid measure of college student retention risk and is a direct application of the theory of planned behavior to student retention (Dewberry & Jackson, 2018a). Trait mindfulness skill and the underlying facets of mindfulness significantly influenced the attitudes that students viewed their courses and programs. Trait mindfulness significantly impacted the formation of self-efficacy, as first-generation students with higher levels of trait mindfulness had higher levels of self-efficacy. While trait mindfulness may not alter the norms surrounding behavior, it may significantly

change the perception of those norms. Trait mindfulness can impact the intention to withdraw and influence the risk of retention. This adds a new dimension to the theory of planned behavior as pathways to belief and their corresponding views can change.

The monitor and acceptance theory is the second theory that grounded this study (Lindsay & Creswell, 2017). Individual student stress levels are often alleviated by mindfulness training (Crowley et al., 2020; MacDonald & Olsen, 2020). The active mechanisms of mindfulness training are attention monitoring and acceptance, specifically “the use of attention to monitor one's present moment experiences, and a mental attitude of acceptance toward momentary experience” (Lindsay & Creswell, 2017, p. 49). Attention monitoring and acceptance skills improve cognitive outcomes and affect reactivity and reduces stress and stress-related outcomes (Dawson et al., 2020; Lindsay & Creswell, 2017; Yusufov et al., 2019), which related to retention in first-generation college students, as demonstrated by the research findings.

No previous research has proposed a bridge or a connection between the theory of planned behavior and monitor and acceptance theory. Attention monitoring and acceptance could influence belief and the perceptions by which norms are held. These connections could benefit from further robust research.

### **Conclusion**

First-generation college students in the United States are dropping out of college every year and experiencing higher levels of poverty, unemployment, incarceration, and debt. Research indicates that first-generation students have higher levels of stress and more negative emotional states, but colleges and universities do very little to address the

problem and encourage first-generation students to persist. Trait mindfulness offers academic institutions and first-generation students the opportunity to narrow the scope between curricular, co-curricular, and extra-curricular programs and aid in the development of total student well-being. Currently, first-generation students are dropping out of college at higher rates than their continuing-generation peers. However, trait mindfulness skill offers an opportunity for that trend to change and allow first-generation students the chance to persist to graduation and experience lower levels of poverty, unemployment, and incarceration.

Trait mindfulness affected the attitudes, self-efficacy, and intention to withdraw that comprised the factors of overall retention risk. Mindfulness may now add retention risk to the plethora of categories beneficial to college students, including adjustment to university, academic performance, emotional intelligence, and mental health. While never previously considered as a sole benefactor of research, first-generation college students offer a robust source of application and analysis. While numerous articles discussed the high stress levels and negative emotional states possessed by first-generation college students, trait mindfulness offers a viable path to the reduction and alleviation of those symptoms.



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### Appendix A: Text of Invitation to Participate

Hello, my name is Tim Morenz, and I am a doctoral candidate at Walden University. I am conducting a doctoral research study examining the relationship between trait mindfulness skills and retention risk in first-generation undergraduate students in the United States.

To be eligible for the study, you will need to be a first-generation college student in your first or second year of undergraduate study in the United States. I will ask a few demographic questions and then proceed to the survey questions.

If you are eligible and would like to participate, please click the link below and you will be directed to the informed consent page. The survey will take approximately eight minutes to complete, and all answers are completely confidential. If you have questions or concerns, please direct them to me at [#####.#####@waldenu.edu](mailto:#####.#####@waldenu.edu).

<https://www.surveymonkey.com/r/V87W3DH>

## Appendix B: Five Facet Mindfulness Questionnaire—Short Form

**Five Facet Mindfulness Questionnaire--Short Form****PsycTESTS Citation:**

Bohlmeijer, E., ten Klooster, P. M., Fledderus, M., Veehof, M., & Baer, R. (2011). Five Facet Mindfulness Questionnaire--Short Form [Database record]. Retrieved from PsycTESTS. doi: <https://dx.doi.org/10.1037/t35565-000>

**Instrument Type:**

Inventory/Questionnaire

**Test Format:**

The Five Facet Mindfulness Questionnaire--Short Form consisted of 24 items scored on a 5-point Likert-type scale ranging from 1 (never or very rarely true) to 5 (very often or always true).

**Source:**

Bohlmeijer, Ernst, ten Klooster, Peter M., Fledderus, Martine, Veehof, Martine, & Baer, Ruth. (2011). Psychometric properties of the Five Facet Mindfulness Questionnaire in depressed adults and development of a short form. *Assessment*, Vol 18(3), 308-320. doi: <https://dx.doi.org/10.1177/1073191111408231>, © 2011 by SAGE Publications. Reproduced by Permission of SAGE Publications.

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doi: <http://dx.doi.org/10.1037/t35565-000>

**Five Facet Mindfulness Questionnaire--Short Form  
FFMQ-SF**

Items

---

Observe

- Item 6 (15). I pay attention to physical experiences, such as the wind in my hair or sun on my face.
- Item 10 (20). Generally, I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
- Item 15 (26). I notice the smells and aromas of things.
- Item 20 (31). I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

Describe

- Item 1 (2). I'm good at finding words to describe my feelings.
- Item 2 (7). I can easily put my beliefs, opinions, and expectations into words.
- Item 5 (12). It's hard for me to find the words to describe what I'm thinking.
- Item 11 (22). When I feel something in my body, it's hard for me to find the right words to describe it.
- Item 16 (27). Even when I'm feeling terribly upset, I can find a way to put it into words.

Actaware

- Item 8 (18). I find it difficult to stay focused on what's happening in the present moment.
- Item 12 (23). It seems I am "running on automatic" without much awareness of what I'm doing.
- Item 17 (28). I rush through activities without being really attentive to them.
- Item 22 (34). I do jobs or tasks automatically without being aware of what I'm doing.
- Item 23 (38). I find myself doing things without paying attention.

Nonjudge

- Item 4 (10). I tell myself I shouldn't be feeling the way I'm feeling.
- Item 7 (17). I make judgments about whether my thoughts are good or bad.
- Item 14 (25). I tell myself that I shouldn't be thinking the way I'm thinking.
- Item 19 (30). I think some of my emotions are bad or inappropriate and I shouldn't feel them.
- Item 24 (39). I disapprove of myself when I have illogical ideas.

Nonreact

- Item 3 (9). I watch my feelings without getting carried away by them.
- Item 9 (19). When I have distressing thoughts or images, I don't let myself be carried away by them.
- Item 13 (24). When I have distressing thoughts or images, I feel calm soon after.
- Item 18 (29). Usually when I have distressing thoughts or images I can just notice them without reacting.
- Item 21 (33). When I have distressing thoughts or images, I just notice them and let them go.

---

*Note.* Actaware = acting with awareness; Nonjudge = nonjudging of inner experience; Nonreact = nonreactivity to inner experience. Numbers in parentheses refer to the original item numbers of the long-form FFMQ. The exact wording of items 3, 6, 8, 9, 10, 11, 18, and 24 was slightly changed as a result of cognitive pretesting in the fibromyalgia patients (Veefhof, ten Klooster, et al., 2011).

## Appendix C: Theory of Planned Behavior on Student Retention in College Scale

**Theory of Planned Behavior on Student Retention in College Scale**

Note: Test name created by PsycTESTS

**PsycTESTS Citation:**

Dewberry, C., & Jackson, D. J. R. (2018). Theory of Planned Behavior on Student Retention in College Scale [Database record]. Retrieved from PsycTESTS. doi: <https://dx.doi.org/10.1037/t68288-000>

**Instrument Type:**

Rating Scale

**Test Format:**

Items are rated on five-point (strongly disagree to strongly agree) Likert scales.

**Source:**

Dewberry, Chris, & Jackson, Duncan J. R. (2018). An application of the theory of planned behavior to student retention. *Journal of Vocational Behavior*, Vol 107, 100-110. doi: <https://dx.doi.org/10.1016/j.jvb.2018.03.005>, © 2018 by Elsevier. Reproduced by Permission of Elsevier.

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**Five Facet Mindfulness Questionnaire--Short Form  
FFMQ-SF**

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Actaware

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- Item 9 (19). When I have distressing thoughts or images, I don't let myself be carried away by them.
- Item 13 (24). When I have distressing thoughts or images, I feel calm soon after.
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- Item 21 (33). When I have distressing thoughts or images, I just notice them and let them go.

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*Note*. Actaware = acting with awareness; Nonjudge = nonjudging of inner experience; Nonreact = nonreactivity to inner experience. Numbers in parentheses refer to the original item numbers of the long-form FFMQ. The exact wording of items 3, 6, 8, 9, 10, 11, 18, and 24 was slightly changed as a result of cognitive pretesting in the fibromyalgia patients (Veehof, ten Klooster, et al., 2011).

## Appendix D: Demographic Items

Question 1: What is your age?

- a. Below 18
- b. 18-24
- c. 25-34
- d. 35-44
- e. 45-54
- f. 55 and above

Question 2: What is your identified gender?

- a. Female
- b. Male
- c. Non-binary
- d. Transgender
- e. Other:
- f. Prefer not to say

Question 3: What is your race/ethnicity?

- a. Caucasian
- b. Black
- c. Hispanic
- d. Asian
- e. Native American
- f. Native Hawaiian or Pacific Islander
- g. Two or more
- h. Other/Unknown
- i. Prefer not to say

Question 4: Which year of undergraduate study is this for you?

- a. Year one
- b. Year two

Question 5: Have you had any prior exposure to mindfulness training or meditative practice?

- Yes
- No

## Appendix E: Informed Consent

This introduction is part of a process called “informed consent” to allow you to understand this study before deciding whether to participate. This study is being conducted by a researcher named Tim Morenz, who is a doctoral candidate at Walden University.

### **Background information:**

The purpose of this study is to examine the relationship between trait mindfulness skills and retention risk. Trait mindfulness skills are observing, describing, acting with awareness, nonjudging the inner experience, and nonreacting to the inner experience. Retention risk is comprised of attitudes about college, self-efficacy, norms about college completion, and intention to withdraw from college. I am attempting to discern if mindfulness plays any role in the decision of a first-generation undergraduate student to stay in college.

### **Procedures:**

If you agree to be in this study, you will agree to:

- answer a few demographic questions, including whether you have had previous exposure to mindfulness training or meditative practice.
- complete the Five Facet Mindfulness Questionnaire.
- complete the Theory of Planned Behavior on Student Retention in College Scale
- A sample question from the mindfulness questionnaire is:  
“I’m good at using words to describe my feelings.”
- A sample question from the retention scale is:  
“I have the talent necessary to complete my studies successfully.”

**Voluntary Nature of the Study:**

This study is voluntary. The survey will take approximately eight minutes to complete. You are free to accept or turn down the invitation. If you decide to be in the study now, you can still change your mind later. You may stop at any time.

**Risks and Benefits of Being in the Study:**

Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as becoming upset. Being in this study would not pose a risk to your safety or wellbeing. However, if you do become anxious, depressed or experience any negative emotions from the study please reach out to your college counseling center or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255). The challenges of persisting in college while a first-generation student can be stressful or confusing. This study offers no direct benefits to its volunteers, nor does this study offer compensation. However, there are many benefits to attaining a college degree for a first-generation college student, including occupational, social, emotional, and financial. This study will promote positive social change by better understanding the needs of first-generation students and providing colleges with recommendations for services and strategies that will better meet the needs of the first-generation college student.

**Privacy:**

Reports coming out of this study will not share the identities of individual participants. Details that might identify participants, such as the location of the study, also will not be shared. Even the researcher will not know who you are. The researcher will not use your personal information for any purpose outside of this research project. While results of the survey will not be immediately available to the respondents of the surveys. I will attempt to make a summary of results available through social media posts on Walden University accounts, as well as a personal social media post, so that survey participants have access to the data. Data will be kept secure by a password-protected file and on a password-protected jump-drive that is stored on a computer's hard drive. Data will be kept for a period of at least 5 years, as required by the university.

**Contact and Questions:**

You may ask any questions you have now, or you can ask them at any time. Please direct them to the researcher, Tim Morenz, via [#####.#####@waldenu.edu](mailto:#####.#####@waldenu.edu). If you wish to talk privately, you can speak to my Research Participation Advocate at 612-312-1210. The IRB approval number is #01-19-23-1043591 and expires on 01/19/2024. Please save this consent form for your records.

**Consent:**

Once you feel you have enough information to decide about it, please continue to take the survey.

### Appendix F: Data Analysis Plan from Chapter 3

Data will be analyzed for the study using IBM SPSS version 28 or newer. Prior to the multiple regression analyses, the data will be cleaned and screened following procedures outlined in Diebold (2019) and Tabachnick and Fidell (2007). These include:

- missing data
- reliability of subscale scores
- univariate and multivariate outliers
- univariate normality
- collinearity and multicollinearity among the predictors
- standardized residual outliers in each regression
- linearity, normality, and homoscedasticity of residuals in each regression

Participant-mean substitution will be used for missing item data for a subscale when there is valid data for about 70% of the other items that make up the subscale. This is a simple, reliable, and effective way to address missing data (Downey & King, 1998; Shrive et al., 2006). Cronbach's alpha will be calculated to examine the reliability of each subscale, and items removed if they do not substantially contribute to the construct. Cases with standardized subscale scores exceeding  $\pm 3.29$  and that are substantially discontinuous with the distribution will be considered an extreme univariate outlier (Tabachnick & Fidell, 2007) and removed from further analysis. Multivariate outliers will be examined following Tabachnick and Fidell's (2007) procedure of regressing a random variable on the set of predictors. Cases with Mahalanobis values greater than 20.515 (the critical chi square value for five predictors at  $\alpha = .001$ ) and that are

substantially discontinuous with the distribution will be considered an extreme multivariate outlier (Tabachnick & Fidell, 2007) and removed from further analysis. Univariate normality of each subscale score will be assessed using skewness and kurtosis values. According to Kline (2016) skewness values less than  $\pm 3.0$  and kurtosis values less than  $\pm 10.0$  can be considered relatively normal and not adversely affect results.

High correlations between pairs of predictors (collinearity) and high multicollinearity of a predictor with the set of other predictors can adversely affect regression results (Tabachnick & Fidell, 2007). Bohlmeijer et al. (2011b) reported correlations among the five FFMQ-SF subscales as shown in Table 1. Correlations among predictors of .70 and higher could be cause for concern (Tabachnick & Fidell, 2007). The largest pairwise correlation was .37, so collinearity issues are not expected. Similarly, if a predictor regressed on the set of other predictors has a multiple- $R = .70$  or higher, multicollinearity could be of concern. Tolerance is the proportion of variance in a predictor not explained by the set of other predictors. If multiple- $R = .70$ , then  $R^2 = .49$  and tolerance = .51. So, tolerance values of .51 or smaller correspond to multiple- $R$  values of .70 or higher. Based on the correlations reported in Bohlmeijer et al., I calculated tolerance values for each FFMQ-SF subscale, with the smallest being .80, well above the zone of concern of .51 or smaller, so multicollinearity is not expected to be an issue. Nonetheless, I will report intercorrelations and tolerance values in my actual sample.

**Table 10***Expected Correlations Among FFMQ-SF Subscale Scores*

	Tolerance <sup>1</sup>	Observe	Describe	Act aware	Nonjudge
Observe	.80				
Describe	.81	.37			
Act aware	.80	.36	.32		
Nonjudge	.88	.07	.06	.20	
Nonreact	.88	.10	.17	.16	.30

<sup>1</sup> Tolerance values calculated from the subscale correlations reported in Bohlmeijer et al. (2011).

Regression results will first be examined for cases with standardized residual values greater than  $\pm 3.29$  and that are discontinuous with the distribution and will be removed from further analysis if warranted. A scatterplot of standardized residuals ( $y$ -axis) by standardized predicted values ( $x$ -axis) will be examined for linearity, normality, and homoscedasticity. Scatterplots that are u-shaped, n-shaped, or otherwise substantially curved weaken the statistical power of the regression results (Tabachnick & Fidell, 2007). If curvilinearity is substantial, pairwise scatterplots of each predictor with the criterion will be examined and the square of any predictor that is substantial nonlinear with the criterion will be added as an additional predictor (Tabachnick & Fidell, 2007). Normality of residuals is evident in the scatterplot if the dots are thicker near the horizontal zero line and thinner and relatively equally disbursed above and below the zero line. Homoscedasticity of the residuals is indicated in the scatterplot if dots symmetrically fill a relatively rectangular shape. Violation does not invalidate the regression result, but does weaken statistical power (Tabachnick & Fidell, 2007).

After data cleaning and screening as described above is completed, regression results will be reported. To answer research questions 1, 3, 5, and 7, the regression  $R^2$



will be reported along with the observed significance value.  $R^2$  is the proportion of variance in the criterion variable that is explained by the complete set of predictor variables with small, medium, and large effects defined as .02, .13, and .26, respectively (Cohen, 1988).

To answer research questions 2, 4, 6, and 8, the squared semipartial correlation and Johnson's  $\epsilon$  will be reported for each FFMQ-SF subscale score (observe, describe, act aware, nonjudge, and nonreact). The squared semipartial correlation is the proportion of variance in the criterion variable uniquely accounted for by a predictor and is a common procedure to rank order the importance of the predictors (Tabachnick & Fidell, 2007). If two predictors are highly correlated and one is slightly more highly correlated with the criterion it is credited with accounting for more of the unique variance in the criterion. Johnson's  $\epsilon$  corrects for this by considering the intercorrelations among the predictors (Johnson, 2000; Lorenzo-Seva et al., 2010). Unlike squared semipartial correlations, the  $\epsilon$  relative weights for each predictor sum to 1, which makes interpretation unambiguous and is preferred compared to other relative importance indicators (Johnson & LeBreton, 2004). The squared semipartial correlation can be directly calculated by squaring what IBM SPSS labels the part correlation in regression output. Johnson's  $\epsilon$  relative weights for each predictor will be calculated using Lorenzo-Seva et al.'s (2010) IBM SPSS syntax program available from <https://link.springer.com/article/10.3758/BRM.42.1.29#SecESM1>.

### **Supplemental Exploratory Analyses**

For exploratory purposes only, the five mindfulness subscale scores and the four retention subscale scores will be examined for correlations with age of participant, and for group mean differences based on race, gender, and prior exposure to mindfulness training or experience meditating. If a demographic is found to be statistically significantly related to a retention subscale score, an additional multiple linear regression will be conducted to include the demographic as a covariate along with the five mindfulness subscale scores.