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Associative Relationship among Mindfulness, Academic Grades, and Affective Outcomes in Adolescence

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Walden University
2016

Abstract

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MBA, New York University, 1993

BA, Leningrad University, 1978

Dissertation Submitted in Partial Fulfillment

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Abstract

Adolescents navigate through escalating academic and social pressures while undergoing major physical and psychological changes. Concerned with behavioral, mental, and emotional challenges of youth, educators seek to expand approaches to promote learning success. Research founded in mindfulness theories has suggested that mindfulness positively and significantly correlates with psychological and physical health, work performance, decision-making ability, and emotional regulation, and may be a factor in learning. Two theoretical viewpoints on mindfulness, Western- and Eastern-based, formed the conceptual framework for this study, which aimed to examine associative relationships between mindfulness and academic achievement, and between mindfulness and affective outcomes for the general population of 14 to 18 year old students.

A set of secondary data was composed of 34,375 responses derived from a nationwide survey on attitudes and behaviors of school-age children collected by Search Institute between 2011 and 2013. The data analyses consisted of descriptive statistics, cross-tabulations, and binary logistic regression analyses. The results showed that adolescent students whose attitudes and behaviors indicated mindfulness had greater likelihood to report earning high grades ($p<.001$), effect size small-to-medium, and greater likelihood to convey positive affective outcomes ($p<.001$), effect size medium-to-large. These findings provide a social change benefit to the community of scholars, educators, and youth service professionals by establishing the suitability of a mindfulness construct as a predictor of cognitive and affective learning outcomes in adolescence.

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Dedication

This work is dedicated to the memory of Alexander Ivanovich Kuzmin, the most prolific yet unacknowledged writer of countless academic essays and theses, idealist, philosopher, fisherman, and the greatest dad in the world; and to the memory of my mother Nina Georgievna whose perseverance and kind heart helped us through the toughest times.

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Chapter 1: Introduction to the Study

Adolescents face many challenges growing up as they establish their identities and try to make sense of their purpose in life (Ben-Eliyahu, Rhodes, & Scales, 2014). Today's youth navigate through escalating academic demands, peer pressure, and parental expectations, and learn to balance school, family, and social life while undergoing major physical and psychological changes. Teenagers are prone to high-risk behaviors, especially when interacting with peers, because these interactions activate the reward centers in the teenage brain, which is not the case with the adult brain (Steinberg, 2011). Yet teenage students often cannot foresee the outcomes of risk-taking or engage their executive function, because the prefrontal cortex generally does not fully develop until early- or mid-20s (Schonert-Reichl et al., 2015; Steinberg, 2011).

Statistical factsheet on the National Alliance on Mental Illness website (National Alliance on Mental Illness, n.d.) shows that at present time 20% of youth between the ages of 13 and 18 live with a mental health condition. Their mental health issues include mood disorders (11% of youth), behavior or conduct disorders (10%), anxiety (8%), and various combinations of these issues. Torio, Encinosa, Berdahl, McCormick, and Simpson (2015) cited multiple research studies in their *Annual report on health care for children and youth in the United States,* which investigated increases in harmful behaviors and conduct of various age groups, including the following statistical data on adolescents derived from a recent national study of 6,483 adolescents and their parents:

> Estimated lifetime prevalence of suicidal ideation, plans, and attempts in a national sample of adolescents were 12.1%, 4.0% and 4.1%, respectively…

> Nonsuicidal self-injury (including cutting, burning, and hitting behavior) has been reported by 14 to 24% of adolescents at least once in their lifetime (Nock et al., as cited in Torio et al., 2015, p. 31).

The research included in the annual report linked mental and emotional disorders of youth with "low educational achievement, drug and/or alcohol abuse, violence" (Torio et al., 2015, p. 19) and other negative outcomes. These are disconcerting statistics. Educators and youth service professionals concerned with the large array of adolescents' challenges and risk factors seek out effective approaches to decrease mental and emotional issues (Raes, Griffith, Van der Gucht, & Williams, 2014) and help strengthen students' skills and dispositions, with the goal to promote learning success.

My dissertation study examined self-reported academic grades and affective learning outcomes of high school-age students in relation to their attitudes and behaviors that indicate mindfulness. Examination of empirical literature presented in Chapter 2 indicated that there are direct and indirect connections between mindfulness and learning. However, most of the scholarly literature on mindfulness and learning examined either younger or older age groups, i.e. students in elementary or middle schools, and college age students. Better understanding of the relationships among the multi-layered constructs mindfulness and learning for my target population, youth between the ages of 14 and 18 living in the U.S., advances scholarly knowledge on the complexity of adolescent learning and development, and offers practical contributions for professionals working in the field of education.

Background of the Study

In 21st century education research, the central focus on learning outcomes frequently combines cognitive, emotional, social, and other spheres of learning (Cotterell, 2013; Davidson et al., 2012; Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). Focusing on advancing students' literacy in all spheres, researchers stress the importance of primary education systems to be relevant, meaningful, and holistic (Cefai & Cavioni, 2013; Corcoran & Slavin, 2016). Improvements in young students' self-awareness and social awareness "improve attitudes and beliefs about self, others, and school... [and] consequently provide a foundation for better adjustment and academic performance" (Corcoran & Slavin, 2016, p. 2). Educators have expanded their focus to include not only cognitive but also affective and social domains of learning. Some school districts consider adding mindfulness-based intervention programs to support their students' developmental outcomes.

The research literature I explored, which is presented in depth in Chapter 2, indicated that mindfulness positively and significantly affects individuals' psychological and physical wellbeing, career advancement, interpersonal relationships, learning outcomes, decision-making ability, self-regulation, and creativity. An overwhelming majority of scholarly publications on the subject of mindfulness focused on adults, with less than 5% pertaining to youth (Black, 2015). Mindfulness-based trainings reflected in the literature demonstrated positive impact on adults' wellbeing, cognition, relationships, and functioning in the workplace. As mindfulness research has recently expanded into the field of education, the researchers report encouraging results (e.g., Bakosh, Snow, Tobias,

Houlihan, & Barbosa-Leiker, 2015; Gueldner & Feuerborn, 2015; Schonert-Reichl et al., 2015; Weare, 2013), linking the outcomes of mindfulness trainings with improvements in psychological wellbeing of college-age and school-age students. These findings led me to consider that mindfulness would also positively and significantly associate with learning outcomes. The review of the literature indicated that there was insufficient research on mindfulness in relation to learning in adolescence. In this dissertation, I explored associative relationship between high school-age students' mindfulness and their outcomes in cognitive and affective domains of learning.

Problem Statement

The problem identified for this study was whether mindfulness can serve as a predictor of academic achievement and affective learning outcomes of adolescent students. Several research studies have established the benefits of mindfulness-based programs administered in colleges, such as reduction of students' anxiety and stress, escalation of attention, adaptability to the new environment, improvements in emotional response to adverse situations, expansion of working memory, and positive outlook on life (Ahmadi, Mustaffa, Haghdoost, & Alavi, 2014; Bellinger, DeCaro, & Ralston, 2015; Greeson, Juberg, Maytan, James, & Rogers, 2014). Most of the research on mindfulness involving school-age children also focused on mindfulness-based intervention programs. Researchers identified improvements in attention, executive function, and reduction in some behavioral problems as the result of the mindfulness interventions (e.g., Britton, Lepp, Niles, Rocha, Fisher, & Gold, 2014). However, the body of research has generally converged on short-term outcomes of targeted mindfulness trainings and meditation

activities. The broad-spectrum association between learning outcomes and mindfulness, regardless of whether mindfulness was training-induced or naturally occurring, has not been explored.

Purpose

My research goal was to establish how the learning outcomes for adolescents who do not exhibit mindful attitudes and behaviors differ from the learning outcomes for adolescents whose attitudes and behaviors indicate mindfulness, regardless of the origin of their mindfulness. The purpose of this study was to establish whether academic achievement and affective learning outcomes can be predicted by mindfulness, the construct defined later in this chapter. In this study, I utilized a set of secondary data, which I describe in detail in Chapters 2 and 3.

Significance

The significance of this study is both conceptual and empirical. I sought to examine the linkages between mindfulness and the domains of learning, thus contributing to overall understanding of the complexity of adolescent cognitive and non-cognitive learning and development. Additionally, the study is significant as its outcomes offer practical contributions to the field of education and positive youth psychology. Since correlative relationships among the constructs in this study were established, the findings can help educators and youth service professionals develop or refine tools, materials, and programs aimed at promoting learning success of today's youth.

Research Questions

The inquiry into differences in mindfulness and learning outcomes was narrowed down to the target population of 14 to 18 year old students who reside in the United States. I developed two research questions (RQs) in relation to this study. The first RQ pertains to academic achievement and the second to affective learning outcomes of adolescent students. Students' self-reported grades earned in school denote their academic achievement, and students' self-reported understanding of self and others, dispositions, and social integration denote their affective outcomes:

- RQ1: To what extent do adolescents whose attitudes and behaviors indicate mindfulness have a significantly different likelihood to earn high grades than when an indication of mindfulness is not evident?
  - $H_0$1. The likelihood of adolescents to earn high grades does not change if there is an indication of mindfulness.
  - H_a1. There is a significantly greater or a significantly lesser likelihood for adolescents to earn high grades if there is an indication of mindfulness.
- RQ2: To what extent do adolescents whose attitudes and behaviors indicate mindfulness have a significantly different likelihood of positive affective outcomes than when an indication of mindfulness is not evident?
  - $H_0$2. The likelihood of adolescents' positive affective outcomes does not change if there is an indication of mindfulness.

- H_a2. There is a significantly greater or a significantly lesser likelihood of adolescents' positive affective outcomes if there is an indication of mindfulness.

Theoretical Foundation

This study incorporates theoretical insights of sociocognitive mindfulness (Langer, 1989, 1992, 1997, 2000) and contemplative mindfulness (Hanh, 1976, 2008, 2010; Kabat-Zinn, 1994, 2005). Mindfulness theories differ in their origins, one founded in Western and the other in Eastern philosophical traditions, but merge in a multitude of assertions. Mindful individuals are theorized to be better adjusted to life, healthier, better at handling various tasks, and capable of tolerating adversity. I used taxonomies of learning developed by Bloom (1972, 2006) and Krathwohl (1994, 2002) to assess the outcomes related to adolescents' academic and affective learning.

The tenets of sociocognitive mindfulness theory involve cognitive and behavioral aspects of human ability and flexibility (Carson & Langer, 2006; Langer, 1989). The main tenets of meditative-contemplative mindfulness theory are nonjudgmental awareness of oneself and one's surroundings in the present moment, and introspective consciousness (Hanh, 1976; Kabat-Zinn, 1990). In multiple empirical studies I explore in Chapter 2, mindfulness has been shown to positively impact mental, emotional and social capacities of individuals that underlie wellbeing, including persistence, resiliency, compassion, relationships with others, and meaning-making (e.g., Baas, Nevicka, & Ten Velden, 2014; Davidson et al., 2012; Hanley & Garland, 2014; Rempel, 2012). Thus, the theoretical foundation of mindfulness provides a relevant framework for the analysis of

the research questions.

Nature of the Study

I used a descriptive-comparative quantitative research design to evaluate the relationship between mindfulness and learning outcomes of high school-aged adolescents in the U.S. Evaluation of how the independent variable, the indication of mindfulness, relates to the dependent variables, self-reported academic grades and affective learning outcomes, was conducted by analyzing a large subset of secondary data (N = 34,375). This research study was nonexperimental and the independent variable was not manipulated.

The data for the analysis was derived from the results of Search Institute's *Profiles of student life: Attitudes and behaviors* survey (A&B), which was administered over a 2-year period in a large variety of locations within the United States and in various educational settings. The survey instrument, developed in 1989 and subsequently revised and expanded, is a tested, validated, and reliable instrument for measuring attitudes and behaviors of school age children. However, the A&B survey is not a mindfulness measurement instrument. In Chapter 3, I describe the steps I took to conduct a preliminary evaluation of the suitability of this survey for my research purposes and address concerns with the validity and reliability issues. In Chapter 4, I describe the results of all evaluative processes including the validity and reliability testing. At the research stage of the dissertation, validation of the instrument was possible through systematic evaluation and question-by-question comparisons of the A&B survey with several valid and reliable mindfulness measurement scales and indexes used in prior

mindfulness research. I then extracted a subset of survey questions relevant to my study from the 2008-2012 version of the A&B survey. In Chapter 4, I explain how the selection was made, and present the alignment between the selected survey questions and selected mindfulness indication questions. The descriptive-comparative research design selected for this study allowed me to examine the differences in academic achievement and affective learning outcomes for the subset of adolescents whose attitudes and behaviors are predominantly mindful and those adolescents who do not exhibit mindfulness.

Definition of Terms

In this section, I briefly outline theoretical and operational definitions of the main terms used throughout the dissertation, relating to the independent, dependent, and confounding variables in my study.

Academic achievement generally denotes the outcome of learning a subject matter in a school setting, and can be expressed as grade point average (GPA), scores on a standardized achievement test, classroom test grades, and other numeric indicators. In this dissertation, I propose that information concerning cognitive learning be gathered by examining academic achievement of students, and that the overall grades earned in school provide a compelling measure of academic achievement.

Adolescence describes the period of life when a child transitions into adulthood. Dorn, Dahl, Woodward, and Biro (2006) offered the following definition: "*Adolescence* is the interval between childhood and the assumption of adult roles and responsibilities, a broad interval of maturation that encompasses physical, mental, and emotional

development, as well as coincident cognitive changes and change in social roles" (p. 33, italics in text).

Adolescent is the term referring to individuals of a certain age, maturity level, and social status as defined in the term *adolescence* above. Opinions on how broad this age range is often differ, as one cannot establish the point in time when childhood ends or when adulthood begins. In the current literature, the term *adolescent* spans the age range between 10 and 24, and various subsets of this age group are also referred to as children, youth, young people, adolescents, early adolescents, late adolescents, and young adults (e.g., Sawyer et al., 2012). In this dissertation, I narrowed down the age range to 14-18.

Affective learning refers to the emotional processes associated with learning, including the learners' feelings, sensations, interest, and attitudes. Krathwohl, Bloom and Masia (1964) stated that affective learning involves learners' willingness to receive new ideas, emotional response, and their valuing of these ideas, which result in integration of new knowledge into what has been acquired in the past. Cognitive learning is influenced by affective characteristics of individuals. In this dissertation, I present the affective learning outcomes as students' interest toward self and others, willingness to explore new ideas, positive attitudes toward school and life, and their values.

Cognitive learning refers to the mental processes associated with the learning process. Bloom's taxonomy (Bloom, 1972, 2006) identifies the cognitive domain of learning as acquisition of knowledge, comprehension of new ideas, application of these ideas, analysis and synthesis of the whole and parts, and evaluation: these result in making judgment about the ideas. In schools, students' academic achievement continues

to be the most prevalent measure of the acquisition, comprehension, and application of knowledge, and therefore of cognitive learning outcomes.

Contemplative mindfulness is a term derived from the mindfulness theories based in Eastern philosophy and Buddhist theology (Hanh, 1976; Kabat-Zinn, 1994; Thera, 1972), and is also frequently referred to as *meditative mindfulness*. The definition of the term is an inner awareness achieved through the process of contemplation or via meditation practice. Contemplative mindfulness requires redirection of the attention inward, to one's breath, body, senses, thoughts, and impulses.

Meditative mindfulness (Hart et al., 2013) is another term for the concept in the Eastern philosophical traditions, defined above as *contemplative mindfulness*. Meditation exercises lead individuals to accept facts, events, and experiences without judgment, and to deepen their observations.

Mindfulness is a term with multiple meanings. This multifaceted construct is derived from two separate theoretical viewpoints and philosophical origins: Eastern and Western (Hart, Ivtzan, & Hart, 2013; Ie, Ngnoumen, & Langer, 2014). I present a large array of definitions of the construct mindfulness in Chapter 2 and Appendix A. The concomitant Eastern/Western definition of mindfulness is directing one's attention on purpose, the process of nonjudgmental noticing, and choosing to respond rather than react.

Mindlessness is a term that describes the process of acting without attention, intention, or situational awareness, but instead automatically processing the information or responding to stimuli (Brown & Langer, 1990; Langer, 1992). Mindlessness depicts

individuals' behaviors that are neither rational nor irrational. The description offered by Langer, Chanowitz, and Blank (1985) was a conduct which is *arational* and at the same time systematic.

Social learning is a subset of affective learning. It relates to the ways in which learners establish or expand social identities, integrate into their communities, develop the sense of belonging, and develop skills essential for interacting with others. Cooley (1909) stated that self-consciousness and social consciousness are inseparable, and what is taught and what is learned depend on the learner's social environment. Cognitive learning and affective learning are influenced by social aspects of an individual's life. In this dissertation, I investigate the social learning as part of students' affective outcomes, including their self-reported successes of integrating into peer groups and community based programs and activities.

Sociocognitive mindfulness refers to a construct that is based on Western philosophical traditions. It originated in the field of psychology (Langer, 1982, 1989, 2014; Langer & Moldoveanu, 2000) and expanded into other social sciences. The term means alertness and lively awareness, the process of observing a fact, idea, situation, or notion while being open to possibilities, attending rather than reacting, and allowing oneself to see the subject of attention in a novel way. Sociocognitive mindfulness is different from contemplative mindfulness as it involves a search for distinctions and presumes an active state of functioning.

Target population for this study is defined as 14-, 15-, 16-, 17- and 18-year old adolescents residing or attending school in the U.S.

Assumptions

This study includes the following assumptions:

1. Respondents to the A&B survey had sufficient understanding of all survey questions.
2. The survey respondents provided honest responses to all questions.
3. The administrators of the survey followed the data collection procedures and guidelines developed by Search Institute.
4. The survey instrument chosen for this research accurately measured the attitudes and behaviors comparable to the variables in this study.

Scope of Research

The scope of this research differed from the targeted experimental and quasi-experimental randomized control studies described later in Chapter 2 in several ways. First, it was confined to investigating secondary data, which resulted in delimiting factors. Second, the analysis involved a larger sample of the general population due to the availability of several years of survey data, which covered a wide geographic area and involved a multitude of educational settings. Third, this study simultaneously explored academic and affective outcomes for the segment of student population defined as adolescents between the ages of 14 and 18 residing in the U.S.

Delimitations

In this study, I made the decision to use a set of secondary data because of its practicality and relativity of the information to the stated research objectives. The Profiles of student life: Attitudes and behaviors survey is an instrument designed to derive

multiple sets of information on young people's challenges, opportunities, attitudes, skills, values, and life experiences. However, this survey is not a mindfulness measurement tool, and the data used in this study was originally collected for other purposes. My decision to use the results of the A&B survey for my research stems from several considerations, including the ease of obtaining the data, the large sample size, and well-established validity and reliability of the survey instrument to measure attitudes and behaviors of youth. The survey respondents were not instructed to respond to mindfulness-related research questions; therefore, their levels of mindfulness were indirectly derived from a subset of survey questions that are similar to some of the questions contained in validated mindfulness measurement scales and indexes, but are not the same.

Another delimitation relates to the theoretical perspectives I adopted for this study. The Eastern- and Western-based philosophical views resulted in the development of two parallel mindfulness theories, as described in more detail in Chapter 2. Both theories of mindfulness predict multiple benefits for mindful individuals, but they differ in definitions of the term *mindfulness* and the processes of achieving the state of mindfulness. In this dissertation, I chose to adopt both theoretical foundations, focusing on their commonalities.

This study explored the relationship between mindfulness and learning outcomes for adolescents between the ages of 14 and 18. Although the age range attributed to the period of adolescence has a wider span, for the purposes of this research I delimited the set of available secondary data to exclude survey responses from individuals younger than 14 and older than 18. As stated earlier, a practical contribution of my research

findings to the field of education may include improvements in program design and study curricula. This narrower focus allowed me to direct attention exclusively to high school-age adolescents.

The geographic boundaries of this study was set to the data obtained only in the United States. The data set included all the venues where the surveys were administered, i.e. public schools, private schools, out-of-school youth programs, and any other settings. Since no group or population segment was intentionally excluded, the results of my study may be generalizable to the target population.

My examination did not pertain to the differences in learning outcomes for adolescents whose attitudes and behaviors are predominantly mindless, as this would have required additional research and multiple extractions of survey data. The study of the relationship between mindlessness and learning outcomes may be proposed for future research.

Limitations

This research was limited to what the survey respondents self-reported about their attitudes, behaviors, academic achievement, and social and emotional outcomes. The design of this quantitative descriptive-comparative research of data derived from the surveys did not allow either direct observation or evaluation of the study participants, nor did it include extraction of information from their school records. Some of the survey questions may have been difficult for the youth of this age, or they may have been reluctant to answer certain questions. Thus, the respondents' honesty and completeness of their responses may raise concerns with the validity of this study.

Another limitation is the indirect way of obtaining the information to answer the research questions and test the hypotheses. As stated earlier, I did not assess adolescents' mindfulness using targeted mindfulness-assessment indexes or scales, but derived a subset of the survey questions indicative of mindfulness assessment. Although the A&B survey instrument has been used to assess students' attitudes, behaviors, commitment to learning, social competencies, values, and identity, it was used for a study involving mindfulness for the first time. Preliminary steps I have taken to address this limitation started with my review of the A&B survey to establish the face validity of the questions that pertained to the variables in proposed study. Other measures to address this limitation included the review of 13 previously validated mindfulness assessment scales with the focus on their homogeneity and convergence, and my comparison of the A&B survey questions with these mindfulness scales.

I made the initial identification and selection of several A&B questions that aligned with two or more of the mindfulness measurement scales. To expand the effort of examining the face validity of the instrument for mindfulness research purposes, I designed my latest Walden University graduate-level term project (2015) to trace linkages between the A&B survey questions and selected mindfulness measurement scales questions. Additional measures to address this limitation in depth were taken during the data analysis stage, as detailed in Chapter 4, and included a number of validity and reliability testing processes.

Chapter 2: Literature Review

Introduction

The problem this dissertation addressed relates to the relationship between mindfulness and learning during the period of adolescence. Research has shown that mindfulness positively and significantly affects individuals' psychological and physical wellbeing, career advancement, interpersonal relationships, learning outcomes, decision-making ability, self-regulation, and creativity. An overwhelming majority of scholarly publications on the subject of mindfulness focus on adults, with less than 5% pertaining to youth (Black, 2015). While the research on mindfulness is expanding to include younger populations, most of the mindfulness-based studies with school-age children involve meditation interventions and trainings that target students' anxiety, stress, and other behavioral and psychological aspects. There is insufficient research on sociocognitive mindfulness in adolescence in the fields of education and positive youth development.

In this dissertation chapter, I review scholarly literature pertinent to relationships among mindfulness, learning, and skill development, with the focus on adolescent learning. I begin with the overview of mindfulness theories and current research, exploring commonalities and differences in the comprehension of the term *mindfulness* and the understanding of mindful cognitive processes. I demonstrate that the research on mindfulness proceeded along two different paths, encompassing discrete theoretical viewpoints. One path of mindfulness theories was founded in Western philosophical

ideas and traditions, and the other originated from Buddhist philosophy and theology. Both paths served as the foundation for my study.

Having established the conceptual framework, my central focus in this literature review chapter was to analyze empirical research related to mindfulness as it relates to teaching, learning, training, and skill development. Studies I reviewed, which involve cognitive and affective learning, draw from several conceptual frameworks such as learning domains (Bloom, 1972, 2006; Krathwohl, 1994, 2002) and adolescent sociocognitive development (Bandura, 1986, 1989; Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). This scholarly research encompasses the emergent practices in the field of general education and positive youth development. I summarized the limited number of studies that examined mindfulness in the field of education and the concept of mindful learning, including investigations of mindfulness in classrooms, mindful teaching and learning, and how mindfulness-based youth activities relate to non-academic learning and can support students' social development.

My review also incorporated the understanding of mindlessness, an opposite concept, which a limited number of the scholars have recognized, and its connection to learning domains. The literature review section concludes with the scarce number of scholarly articles related to research on mindful attitudes and behaviors of adolescent learners, and examination of the variables that emerged in these studies. The scope of empirical research on mindfulness and mindful learning explored here integrates a mixture of settings and population samples. Participants involved in these mindfulness studies and mindfulness-based intervention programs included the general population, i.e.

youth and adults in conventional settings, as well as individuals involved in the mental health system of care or undergoing therapy. I reviewed a broad range of studies due to the identified lack of scholarly inquiries exclusively focusing on mindfulness of teenage students (Black, 2015; Tan, 2015).

Literature Search Strategies

With the goal to conduct an exhaustive literature review and secure an adequate and comprehensive sample of published empirical research on the relationship between mindfulness and adolescent learning, I used the following four strategies. First, I identified relevant studies through various electronic search engines starting with Google Scholar and expanding into Walden library databases: Education Research Complete, Education Resource Information Center (ERIC), PsycINFO, PsycARTICLES and SAGE Journals. I further added searches through ProQuest Dissertations and Theses Global. In this explorative process I used various combinations of the following terms: *mindfulness, self awareness, attentional processing, mindlessness, cognitive and affective learning, social and emotional learning, adolescent learning, socio-cognition, skill development, sociocognitive development, youth development, adolescent education, adolescence, adolescents, learners, school programs,* and *students*. I made use of multiple advance options in conducting these searches.

Second, I examined reference lists in several key studies, including published articles, books, and also recent dissertation theses. The initial goal was to expand the range of available research studies on mindfulness and learning, but this approach also allowed me to contract the list of publications by finding the most frequently referenced

studies. The results of this strategy revealed that empirical research on mindfulness is, and has been, predominantly published in clinical psychology papers. Substantially less appeared in the publications within the fields of education or educational psychology. This discovery prompted me to adopt a third strategy.

I conducted advanced searches for relevant publications on mindfulness/learning relationships in the journals dedicated to educational research, narrowing down the search to the period of January 2000 through November 2015. These academic journals included the American Educational Research Journal, Educational Psychologist, Educational Psychology Review, Educational Researcher, Journal of Applied School Psychology, Journal of Cognition and Development, Journal of Educational Psychology, Journal of Research in Adolescence, Journal of School Psychology, Journal of Youth and Adolescence, Mind, Brain and Education, Psychology in the Schools, School Psychology Review, and Thinking Skills and Creativity. This strategy yielded additional studies on mindfulness in various educational settings.

The fourth strategy was to explore websites of organizations and professional groups whose stated purpose included promoting mindfulness, youth development, academic achievement, social and emotional learning, and educational development of adolescents. Among those were The American Mindfulness Research Association (AMRA), Association for Mindfulness in Education, Center for Investigating Healthy Minds, Center for Mindfulness at UMASS, Collaborative for Academic, Social and Emotional Learning (CASEL), The Langer Mindfulness Institute, Mind and Life Institute, Mindfulness in Education Network, Mindfulness in Schools Project, and UCLA

Mindful Awareness Research Center. Several of these websites provided helpful links to mindfulness in education research; they also identified supplementary information presented at local and national conferences or published in community prevention and education guides.

Conceptualization of Mindfulness

Although mindfulness research and applications of mindfulness-based approaches in clinical psychology, behavioral sciences, neurobiology, organization development, and related fields continue to increase (Brown, Creswell, & Ryan, 2015; Djikic, 2014; Williams & Kabat-Zinn, 2011), educators and school psychologists have not fully adopted mindfulness in educational practice (Felver, Doerner, Jones, Kaye, & Merrell, 2013). Part of the issue, observed by Felver, Doerner, Jones, Kaye, and Merrell (2013), is that despite its recent popularity as a topic of research, mindfulness is not an unambiguous or straightforward concept. This notion of ambiguity and elusiveness of the concept continues to be pointed out by other scholars (e.g., Djikic, 2014; Gueldner & Feuerborn, 2015; Pagnini & Philips, 2015). Disparate definitions of the term *mindfulness* emerged in scholarly research I explored for this dissertation, and two main paths of mindfulness research.

Two Paths of Mindfulness Research

Psychologists and behavioral science scholars generally refer to mindfulness as a concept derived from Buddhist philosophy and theology, denoting it as conscious and purposeful perceptions of oneself, one's actions, and attention paid to living the present moment (Beitel et al., 2014; Dunne, 2015). In parallel to that, another essential strand of

mindfulness research continues to be developed. This strand is based in more contemporary, Western traditions (Djikic, 2014; Hart et al., 2013). In the Western tradition, mindfulness is generally referred to as a state of being open to multiple perspectives and receptive to possibilities, as opposed to automatically accepting already established notions (Brown et al., 2015).

The differentiation between the two ways of comprehending mindfulness, Eastern and Western, may appear subtle, and many current research studies involving mindfulness and mindful awareness, which I included in the literature review section, did not make any distinction between the two (e.g. Hyland, 2015; Roeser & Eccles, 2015; Roeser & Pinela, 2014). However, other scholars have considered the two paths of mindfulness research essentially distinct. Most of them accept the two paths as equally constructive and purposeful (e.g., Brown, West, Loverich, & Biegel, 2011; Chen, Scott, & Benckendorff, 2014; Djikic, 2014; Fletcher & Hayes, 2005; Hart et al., 2013; Ostafin & Kassman, 2012), although others do not (e.g., Nilsson, 2013). Acknowledging the growing amount of mindfulness research in the West over the last decade, and the dichotomy of Eastern and Western views, Nilsson (2013) nevertheless condemned psychologists for commercializing mindfulness, stating that

> [u]nfortunately, in the process of transforming mindfulness (or sati) from a Buddhist soteriological to a postmodern Western ontology, the practice has lost a bit of its true soul. The paradox of mindfulness in the West is that while, on the one hand, its various modern formations have been effective when it comes to the

> treatment of illness, on the other, it has been commercialized as a form of quick-fix healing by certain therapists and instructors (Nilsson, 2013, p. 187).

As stated earlier, the majority of the researchers whose works are included in this literature review section did not distinguish between the two paths of mindfulness research: Eastern and Western. Only a few (e.g. Djikic, 2014; Hart, Ivtzan, & Hart, 2013; Ostafin & Kassman, 2012; Ragoonaden, 2015) clearly demarcated the differences. Djikic (2014) provided a detailed description to these two approaches to mindfulness research. The author called the traditional approach that is based in the Eastern philosophy *meditative*, and depicted the second as "the alternative, *nonmeditative* approach that is uniquely Western in its predisposition" (p. 139, italics added). Djikic pointed out that the two views on mindfulness appear to be remarkably different, yet the dichotomy can be integrated into one conceptual framework.

The Eastern-based mindfulness theory, founded in Buddhist philosophical traditions, has been expanded in current research literature primarily by Kabat-Zinn (1982, 1994, 2005) and associates, while the Western-based mindfulness theory, founded in contemporary psychology, has been expanded in current research literature primarily by Langer (1989, 1992) and associates. Ostafin and Kassman (2012), who investigated mindfulness in relation to problem-solving abilities and techniques, stated that Eastern and Western views on the concept were tangential:

> Although both have implications for creativity, mindfulness in Langer's research centers around actively searching for distinctions in external stimuli in order to shift information processing from a passive mode to an active one… In contrast,

> mindfulness from an Eastern perspective involves a nonjudgmental awareness of one's experience. The difference is one between thinking about something in a novel way (from Langer's perspective) and observing the fact that one is thinking (from a mindfulness meditation perspective). (p. 1031).

Likewise, Hart et al. (2013) declared that the difference between the Eastern and Western views on mindfulness was significant enough to necessitate adding explanatory titles to each mindfulness term. Pointing out that the two views on mindfulness continued to develop side by side for over 30 years, and yet the relationships between them are not clear to some of the scholars, Hart et al. offered the following consideration:

> In view of the differences between the two strands of research, we propose that they be given different titles that capture their prime features. We suggest "creative mindfulness" for Langer and her colleagues' scholarship, and "meditative mindfulness" for Kabat-Zinn and his associates' scholarly work (p. 453).

However, despite Hart et al.'s (2013) and Djikic's (2014) assertions, my review of the literature related to mindfulness revealed that meditation is not always a requisite practice to achieve mindfulness within the Eastern strand of research (e.g., Hanh, 1976; Kabat-Zinn, 1994). Additionally, creativity is only occasionally associated with mindfulness in the Western strand of research (e.g., Brown & Langer, 1990; Garland, Gaylord, & Park, 2009). Therefore, through the rest of this section and elsewhere in the dissertation, when I find it necessary to refer to mindfulness not as a general concept but to point out a specific philosophical tradition or path of mindfulness research, I will use

the following designations. The term *contemplative mindfulness*, instead of *meditative mindfulness*, will depict the mindfulness concept founded in Buddhist tradition. The term *sociocognitive mindfulness* will depict the Western, or Langerian use of the term (Langer, 1989, 1997).

The review of current literature on mindfulness presented in this chapter also revealed that contemplative mindfulness dominantly appears in research within the fields of behavioral therapy and psychoanalysis (Brown et al., 2015). Researchers in the field of organization development, education, educational psychology, and youth development refer to mindfulness as a contemplative as well as a sociocognitive concept, interchangeably, and in many cases combine the two.

Terminology: Mindful and Mindfulness

There are similarities and differences in how mindfulness is conceptualized, not only between the two main paths of research, Western and Eastern, but also within each path. The word *mindful* appears in the literature to describe many different attributes: as a state of being, a trait, a psychological process, a psychosomatic routine, a chain of mental endeavors, a technique, and an outcome (Ie et al., 2014). Whether viewed as a state, a trait, or a process, these attributes involve connotations of intentionality, awareness, reflection, and attention convergence.

Literature founded in the Eastern theological origins indicates that the term *mindfulness* was a translation of the word *sati* in Pali, the ancient language of Buddhist philosophy (Vipassanā Fellowship, n.d.). It denotes awareness, attention, and recognition. Buddhist philosophy teaches that mindfulness involves mental attachment to the present

moment, receptiveness to what is, and remembering without being absorbed in memories (Germer, 2013). A follower of Buddha's teaching, Nyanaponika Thera described mindfulness as a practice of bringing clear and determined awareness to what happens within our bodies and minds and around us at each moment of perception (Thera, 1972, 1986). Another theologist, Buddhist monk Thich Nhat Hanh, presented mindfulness as a routine of "keeping one's consciousness alive to the present reality" (Hanh, 1976, p. 11) not only while meditating, but in one's daily routine, regardless of what the task at hand may be. Hanh has taught his followers to remain "conscious of each breath, each movement, every thought and feeling, everything which has any relation to ourselves" (Hanh, 1976, p. 8). These descriptions of mindfulness provided the foundations to Kabat-Zinn's (1994) more contemporary definition of mindfulness:

> Mindfulness means paying attention in a particular way: on purpose, in the present moment, and non-judgmentally. This kind of attention nurtures greater awareness, clarity, and acceptance of present-moment reality. It wakes us up to the fact that our lives unfold only in moments. If we are not fully present for many of those moments, we may not only miss what is most valuable in our lives but also fail to realize the richness and the depth of our possibilities for growth and transformation. (p. 4)

Kabat-Zinn published numerous books and scientific research studies on the clinical applications of mindfulness (Center for Mindfulness, n.d.). This theorist is regarded as the most prominent scholar in the field of clinical mindfulness research, judging not only from the large number of publications (PubFacts, n.d.), but also because

current research studies on mindfulness include the highest number of Kabat-Zinn's citations. Explaining that mindfulness is a state of awareness, which emerges when one is paying purposeful attention, Kabat-Zinn (2005) suggested that individuals ought to unfold moment by moment experiences in effortless ways. This explanation is in line with the main teachings of Buddhism. The moment by moment attentiveness and alertness are Hanh's (1976, 2008, 2010) basic descriptions of mindfulness. In the foreword to Braza's (1997/2011) book on the art and practice of mindfulness, Hanh further explained that mindfulness allows one to "become fully alive in each moment" (p. ix) and to live harmoniously within one's family and society. The result of mindfulness practice is a better awareness of the here and now. Braza (2011) described mindfulness as a technique that guides an individual on the means essential to remain fully aware while performing any activity, staying alert with intention, and living every moment.

Over the last 40 years, scholars continued to describe mindfulness with slight variations. Bishop et al. (2004) observed that despite numerous research studies related to mindfulness published since 1980s, "the field has thus far proceeded in the absence of an operational definition… and general descriptions of mindfulness have not been entirely consistent across investigators" (p. 231). A decade later, Chiesa (2013) asserted that modern definitions of mindfulness are multiple and relatively different from the traditional definitions derived from Buddhist philosophy. Compared to Eastern based mindfulness scholars, "it is surprising that significantly lower effort has been directed towards the achievement of a consensus about an unequivocal definition of mindfulness within modern Western psychology" (Chiesa , 2013, p. 256). My search for empirical

research on mindfulness published over the last 10 years revealed that each of the studies I analyzed for this section included the author's explanation of what mindfulness means.

Researchers continue to undergo a certain degree of uncertainty and ambiguity related to the term itself (Chiesa, 2013). In contrast with *mindfulness*, most other concepts and terms used throughout the studies I have included in the literature review received no additional explanations. For example, scholars used the terms such as *attention*, *suffering*, *sensitivity*, *anxiety*, *consciousness*, *awareness*, *well-being*, *isolation*, etc. without offering explanations or definitions of these terms. However, when the word *mindfulness* appeared in the article, the authors invariably elected to add at least a brief and often more extensive explanations. The American Mindfulness Research Association (AMRA), an organization established in 2013 with the goal to help advance research on mindfulness, offered the definition of *mindfulness* as "[t]he state, process, and practice of remembering to observe moment-to-moment experience with openness and without automatic patterns of previously conditioned thoughts, emotions, or behaviors" (AMRA, n.d.). Mindfulness is characterized by discerning awareness, open thinking, and focused attention. I considered this a remarkably comprehensive definition, because it includes statements derived from both contemplative and sociocognitive paths of mindfulness research. However, it is important to recognize the existence of multiple definitions of mindfulness throughout the selection of scholarly research I have reviewed for this dissertation. Appendix A provides a list of 24 explanations of what the term can mean, selected from over 70 research studies. My rationale for making that particular selection of 24 definitions involved one or more of the following:

- each of these definitions added a level of divergence from commonly used or general idea
- these definitions were offered by well known and frequently cited authors
- these definitions lined up with the variables I used in the dissertation data analysis section.

Several researchers sought to find commonalities among various views on mindfulness throughout a number of empirical studies. Bishop et al. (2004) concluded that mindfulness is not one single concept. Instead, they described mindfulness as a model with two components. It is simultaneously an attention regulation skill and a process of openness and inquisitiveness toward present-moment occurrences:

> Mindfulness can be defined, in part, as the self-regulation of attention, which involves sustained attention, attention switching, and the inhibition of elaborative processing. In this context, mindfulness can be considered a metacognitive skill… Metacognition is thought to consist of two related processes – monitoring and control… Mindfulness is further defined by an orientation to experience that is adopted and cultivated in mindfulness meditation practices. This orientation begins with making a commitment to maintain an attitude of curiosity about where the mind wanders whenever it inevitably drifts away from the breath, as well as curiosity about the different objects within one's experience at any moment (p. 233).

The act of mindfulness, viewed as the state of moment-to-moment awareness and the trait of being grounded in the present experience, may have been driven by Buddhist

meditation, contemplative processes, and practicing inner and outer awareness. However, the concept permeated into the fields of social psychology, interpersonal communication, organization development, educational psychology, law, medicine, and business (Felver et al., 2013; Hart et al., 2013; Quaglia, Goodman, & Brown, 2014). Scholars in the field of education and positive youth development frequently refer to works founded in Langer's as well as Kabat-Zinn's theoretical viewpoints, often in combination, thus presenting mindfulness as a contemplative process as well as a sociocognitive concept.

Langer's and Kabat-Zinn's Mindfulness Theories

In the introduction to a compilation of current research on mindfulness, *The Wiley Blackwell Handbook of Mindfulness*, the editors, Ie, Ngnoumen, and Langer (2014) referred to a number of mindfulness theories, outlining one common theme. Staying mindful, grounded in the present moment, and keeping oneself from mindlessly reacting to what happens has been proven to increase individuals' well-being and decrease negative outcomes such as stress or pain. Langer (1989, 1992) worked on the development of mindfulness theories independent of the Eastern strand of mindfulness research. A social psychologist, Langer conducted research on perceived control, factors of success in games of chance, rationality of actions, conscious and unconscious ways of information processing, mindfulness, and mindful learning. Langer's theories explain that mindfulness diverges from many other constructs such as human intelligence or cognition (Langer, 1992). Meaning-making comes from mindful individual's conscious and implicit awareness rather than from their knowledge or experience. The theorist further stated that "mindfulness often occurs in precisely those situations where expected

successes do not occur, such as when external factors disrupt routine sequences and prevent the completion of familiar behaviors or when consequences of familiar behavior are discrepant with past experience" (Langer, 1992, p. 300). For Langer, mindfulness is a general human capacity that an individual either possesses or can develop by focusing in the present moment without the help of meditative practice. Sociocognitive mindfulness is also characterized by openness to possibility, construction of novel distinctions, willingness to embrace multiple perspectives, and novelty-seeking. According to Langer's theory, mindfulness promotes clarity and has immediate positive effect on individuals' mental, emotional, and physical well-being.

Kabat-Zinn's (1982, 1994, 2005) mindfulness theory is rooted in Buddhist philosophical views; it stipulates that mindfulness-based practices can reduce stress, improve mental and physical health, and speed individuals' recovery from traumatic experiences. The theorist expanded the Eastern philosophy based views on mindfulness, bringing these into the field of clinical psychology. Kabat-Zinn stated that when mindfulness is practiced and the individual is oriented toward achieving inner peace, relaxation, and equanimity, the results often include restoring health and relieving pain, anxiety, depression, and even chronic disorders. According to Kabat-Zinn's mindfulness theory, meditation and mindful contemplation promote mind/body healing by engaging the brain, which processes emotions, and the immune system of the individual (Kabat-Zinn, 1982).

Mindlessness

Langer (1989, 1992; Brown & Langer, 1990) described the distinctions between two constructs, mindfulness and mindlessness. A definition of *mindlessness* is the failure of being mindful. However, as shown earlier, definitions of mindfulness are multiple, and not nearly as simple as an absence of mindlessness. Langer's theories emphasize that the two constructs are not complete opposites. Langer, Chanowitz, and Blank (1985) offered a reflective perspective on mindlessness. Explaining that individuals' actions are ordinarily considered to be either rational or irrational, Langer et al. (1985) suggested to consider a possibility that at least part of the time individuals' behavior may not be rational or irrational, but rather "be *arational* and yet in some way systematic" (p. 605, italics added). The theorist and fellow researchers further expanded on this conjecture:

> … it does not necessarily follow that if persons are not acting rationally, then they are acting irrationally. For this to follow, one would have to presume that persons inescapably must constantly employ their rationality and that the only choice they have is whether to employ it rightly or wrongly. Further, mindless activity does not imply the absence of all cognitive processing - just the absence of flexible cognitive processing. Under such circumstances, individuals are neither reasoning well nor reasoning badly about the significance of the environment. They are not reasoning at all. They are engaged in cognitive activity, but it is of a reduced sort… (Langer et al., 1985, p. 605)

The difference between mindful and mindless cognitive activities is the process of drawing distinctions as opposed to relying on distinctions from past experiences,

meaning-making versus accepting what is, and creating new categories as opposed to single-mindedly receiving notions and facts unexamined.

Brown et al. (2011) shared an observation that instances of mindlessness were more common in everyday life than instances of mindful actions or mindful information processing. Much of human behavior is a habitual, mechanical process, even in seemingly thoughtful activities. A mindless person is either unaware or inattentive, functioning as if on "automatic pilot" (Langer & Moldoveanu, 2000). Sternberg (2000) saw mindlessness as homogeneity of one's perspective, as well as the lack of multi-sided consideration of an issue or a concept. There is a number of negative connotations related to mindless actions and engagement in mindless processes in the research literature, yet scholars agree that individuals cannot and perhaps should not always be mindful. Some of the literature I reviewed in this section stated, directly or indirectly, that mindlessness and reliance on automatic information retrieval may be useful in certain situations (Langer, 1992; Quinnell, Thompson, & LeBard, 2013; Ritchie & Bryant, 2012).

Expansion on Initial Mindfulness Theories

Shapiro, Carlson, Astin, and Freedman (2006) have built on Kabat-Zinn's theoretical foundations of mindfulness. Combining the three core elements of mindfulness identified as *intention, attention,* and *attitude,* Shapiro et al. (2006) introduced what they called a meta-mechanism of mindful perception. Their theory relates to the transformational effects of mindfulness process, an ability of an individual

> …to disidentify from the contents of consciousness (i.e., one's thoughts) and view his or her moment-by-moment experience with greater clarity and objectivity. We

> term this process *reperceiving* as it involves a fundamental shift in perspective. Rather than being immersed in the drama of our personal narrative or life story, we are able to stand back and simply witness it (p. 377, italics in text).

According to Shapiro et al. (2006), mindfulness and the act of reperceiving are important catalysts of human developmental process. These allow an individual to become fully aware and to accept, with openness and curiosity, experiences of the present moment. When a person has the capacity of seeing and feeling what is, instead of struggling to find experiences that may be more enjoyable, she or he gains control of the given situation, thus growing mentally and emotionally. In their theory, mindfulness increases one's "capacity for objectivity about one's own internal experience" (p. 378). Shapiro et al. summarized their theoretical model as:

intention → attention → connection → regulation → order → health

where the first part, intention/attention, denoted mindfulness.

Brown, Ryan, and Creswell (2007) and Brown, Creswell, and Ryan (2015) theorized that mindfulness has strong positive effect on human behavior, mental health, physical well-being, self-regulation, and interpersonal relationships. Both contemplative mindfulness and sociocognitive mindfulness lay emphasis on orientation to the present and active deployment of attention. Brown et al. (2007) clarified that each of the two paths of mindfulness research demonstrated that unbiased receptiveness facilitates insight and "unhindered access to all of one's relevant knowledge (e.g., intellectual, emotional, and physical/intuitive) to aid in negotiating life situations" (p. 213). Ragoonaden (2015) suggested that although the historical antecedents of contemplative and sociocognitive

mindfulness are different, both continue to emerge as theoretical foundations of research in the field of education.

Current Research on Mindfulness

While theoretical explorations and empirical research on mindfulness in adults and youth are growing in number, scholars at times question how accurately the presence of mindfulness and the levels of mindfulness or mindlessness can be measured (Ritchie & Bryant, 2012). It is also questionable whether the existing mindfulness assessment scales and measuring tools can encompass multiple facets of the construct (Chiesa, 2013). A number of instruments have been developed and validated, at the same time the existing assessment instruments and mindfulness scales continue to undergo adjustments (Beitel et al., 2014; Brown & Ryan, 2004; Ritchie & Bryant, 2012).

Measurement Instruments

Brown et al. (2011), Medvedev et al. (2015), Ostafin and Kassman (2012), Ritchie and Bryant (2012), Siegling and Petrides (2014), Kuby, McLean, and Allen (2015), and other scholars have examined the use, effectiveness, and validity of several mindfulness measurement instruments. These included the Brief Index of Self-Actualization, the Cognitive and Affective Mindfulness Scale, the Toronto Mindfulness Scale, the Five Facet Mindfulness Questionnaire, the Freiburg Mindfulness Inventory, the Kentucky Inventory of Mindfulness Skills, the Langer's Mindfulness/Mindlessness Scale, the Mindful Attention Awareness Scale, the Mindful Attention Awareness Scale for Adolescents, the Philadelphia Mindfulness Scale, the Positive State Mindfulness Scale,

Southampton Mindfulness Questionnaire, and Child and Adolescent Mindfulness Measure.

Ritchie and Bryant (2012) criticized the design and application of mindfulness measuring scales for primarily clinical conceptualizations of mindfulness concept. Ritchie and Bryant hypothesized that mindfulness is a multidimensional state rather than a unidimensional trait. The authors operationalized mindfulness dimensions based on Langer's theory and Sternberg's expansion on Langer's components of mindfulness. Ritchie and Bryant assessed various scales for validity, reliability, and applicability to diverse conditions. They also suggested that when researchers embark on constructing new mindfulness measurement scales, they should consider including mindfulness factors related to individuals' present and past, or containing both positive and negative indicators of mindful attitudes and traits.

The importance of assessing mindfulness as a state and as a trait lies in the frequently acknowledged notion that mindfulness is a multifaceted construct (Baas et al., 2014; Beitel et al., 2014; Hanley & Garland, 2014; Hart et al., 2013;). Lutz, Jha, Dunne, and Saron (2015) reviewed the research on mindfulness practices in several fields including behavioral science, neuroscience, and cognitive science, in order to construct a multidimensional phenomenological matrix for investigating the effects of mindfulness. Their multidisciplinary and transdisciplinary review explored a variety of frameworks, ranging from religion and philosophy to organization development and education. Lutz et al. (2015) also wrote that as scholars' interest in mindfulness research is growing, there

may be a risk of oversimplification and lack of rigor with regard to the construct of mindfulness.

Benefits of Mindfulness

As stated earlier, mindfulness has been linked with multiple aspects of individuals' wellbeing, including improvements in cognitive functioning, enhanced working memory capacity, emotion regulation, work and school performance, and psychological and physical health (e.g., Baas et al., 2014; Davidson et al., 2012; de Vibe, Bjørndal, Tipton, Hammerstrøm, & Kowalski 2012; MacCoon et al., 2012; Neff & Germer, 2013; Quaglia, Goodman, & Brown, 2014; Sternberg, 2000). For example, qualitative data collected by Mitchell and Heads (2015) from 149 participants (general population, mean age = 50) who completed a 5-week mindfulness-based stress reduction program demonstrated that the individuals benefited from improved psychological wellbeing and developed effective resources for regulating emotions.

Taylor et al. (2015) conducted a mixed-methods research study with 59 public school teachers in a large public school district in Canada. After completing preliminary assessments, participants were randomly assigned to receive mindfulness-based interventions over a 9-week period, or assigned to the control group. Taylor et al.'s hypothesized benefits for teachers in the mindfulness-based intervention group consisted of four main outcomes: increased efficacy for regulating emotion while performing the job, improved means for coping with work related stress, increased efficacy in handling work related conflict, and increased feeling of compassion for students and colleagues. The results of the analyses of the coded responses to post-intervention interviews and the

reports on survey results supported all of the initial hypotheses (Taylor et al., 2015). The study results demonstrated that teachers derived both personal and interpersonal benefits from the mindfulness intervention program, including positive effect on their day-to-day relationships with students and coworkers, which led the authors to suggest incorporating these types of interventions in teachers' professional development programs. This and other research conducted within educational environments supports the theoretical foundations of mindfulness presented earlier.

Greeson et al. (2014) conducted a randomized controlled trial study on the effectiveness of a mindfulness training program called *Koru* for college students (mean age = 25). The participants were 90 students from a large university, mostly in their late teens or early twenties, what the authors called *emerging adults*. The mean age was skewed by inclusion of two older graduate students, ages 42 and 59. Greeson et al. reviewed the outcomes of this program, specifically focusing on the emerging adults subset of the study participants, i.e. students between the ages of 18 and 25. The authors emphasized that emerging adulthood is a very distinct developmental stage, when the needs and challenges are unique. Greeson et al. advocated for creating brief and highly targeted mindfulness inducements, explaining that emerging adults "may not engage readily in training programs that are designed for older adults due to time constraints, skepticism about the potential benefits, and difficulty maintaining motivation to effect behavior change" (p. 223). Thus, this research team selected Koru, a different type of mindfulness program, characterized by its small group format, special characteristics attractive to emerging adults, such as guided imagery, and its brief duration. The program

is taught in only four 75-minute sessions, with short 10-minute home meditation exercises. Greeson et al. (2014) hypothesized that Koru training would result in multiple measurable benefits. The researchers used five different measurement instruments to establish baseline and post-treatment outcomes: the Cognitive and Affective Mindfulness Scale-Revised, the Perceived Stress Scale, the Medical Outcome Study Sleep Scale, the Self-Compassion Scale, and the Gratitude Questionnaire. The results confirmed the majority of their hypotheses. A fairly brief mindfulness program, Koru was found to be effective for emerging adults in a college setting in reducing symptoms of stress, alleviating sleep problems, and increasing the level of self-compassion.

Mindfulness-based practices, trainings, and interventions are becoming popular and widespread (Brown et al., 2015; Greeson et al., 2014; Gueldner & Feuerborn, 2015; Nilsson, 2013), yet there is not sufficient understanding on which elements of mindful activities produce the desired outcomes, or how long these outcomes last. Goldberg, Del Re, Hoyt, and Davis (2014) examined the effects of mindfulness practice *time* as compared to mindfulness practice *quality* on adults' psychological functioning and emotion regulation. The emotion regulation variable assessment included smoking cessation outcomes, as all of the 196 study participants were adults who smoked at least five cigarettes per day. Of this total,105 participants were randomly assigned to participate in mindfulness meditation sessions. The measure of this group's mindfulness practice quality consisted of finding perseverance and receptivity in the mindfulness activities, and the measure of time was derived from their meditation calendars. Upon the review of multiple pre- and post-treatment mindfulness practice assessments, three or

more for each of the participants, Goldberg et al. (2014) established that both quality and time were significant predictors of the experimental group participants' psychological functioning, and neither mindfulness practice quality nor time predicted their smoking outcomes after one month. However, the positive psychological functioning outcomes were different after a period of time. Goldberg et al. found that 5 months later, only mindfulness practice quality predicted psychological functioning effect. Thus, there are differences of opinion among researchers as to the extent of benefits participants derive from mindfulness trainings, interventions, and programs.

Bellinger et al. (2015) hypothesized that mindfulness is beneficial to college students in educational situations where academic pressures and ongoing tests create high levels of anxiety. Mindfulness, explained the authors, would improve students' emotional response and free up their working memory resources, thus leading them to perform at a higher level. Bellinger et al. conducted two studies, one in a laboratory setting (n = 112, mean age = 20), and the other in a calculus course for engineering students (n = 248; mean age was not stated). Students' level of mindfulness was established by using the Mindful Attention Awareness Scale and the Toronto Mindfulness Scale. The researchers found that the trait mindfulness positively correlated with students' performance on challenging problems (what the researchers called high-stakes performance) and their scores on exams and quizzes, and attributed it to mindfulness-based relief of students' cognitive anxiety. At the same time, no correlations were found between mindfulness and students' performance on homework assignments (what the researchers called lower-stakes performance).

Ahmadi et al. (2014) conducted a quantitative research study with 273 first-semester undergraduate students in Malaysia, with the goal to compare mindfulness of the incoming freshmen with results from previous studies with community adults and older university students. Ahmadi et al.'s results showed that the mean level of these freshmen's mindfulness was lower than both the adults' and their upper classmates. First semester undergraduates, stated Ahmadi et al., are "new and unfamiliar members of this atmosphere, may be at high risk as a group for the disturbance of their mindfulness in parallel with other mental difficulties" (p. 22). The authors suggested developing mindfulness-based trainings for the newly enrolled students to enhance calmness, attention concentration, and awareness skills, and to promote their adaptability to the learning environment.

Baas et al.'s (2014) research goal was to examine the relationship between mindfulness and creativity. Acknowledging that mindfulness is a multicomponential construct, the researchers conducted several studies to test two main hypotheses. Their *uniform hypothesis* stated that mindfulness and creativity relation is uniformly positive, and their *differential hypothesis* stated that the relation is not uniform but varies differentially based on what particular component of mindfulness is under examination. The results supported the second, differential hypothesis. Baas et al. (2014) extracted four components of mindfulness from their analysis of mindfulness measurement scales and review of prior studies on mindfulness:

- *observation*, the ability to carefully observe external phenomena and notice one's inner sensations and thoughts;

- *awareness*, the ability to engage in present activities with full awareness and undivided attention;
- *description*, the ability to describe what happens impartially and in a non-analytical way;
- and *nonjudgemental acceptance*, the ability to be non-evaluative and refrain from accepting what the present reality is without assessing whether it is right or wrong.

Baas et al. (2014) research team found the relationship between creativity and these mindfulness traits inconsistent. Of the four components, awareness, description, and acceptance did not show statistically significant relation to creativity. The researchers found that the first mindfulness component, the ability to observe, notice, and attend to internal and external experiences, was a strong and consistent predictor of creativity enhancement.

The fact that Baas et al. (2014) established that strong positive relationship existed only between the ability to observe / attend to various stimuli and creativity, but did not obtain consistent results analyzing the relationship between creativity and other components of mindfulness, confirmed their differential hypothesis. This confirmed my preliminary assessment that mindfulness is a multifaceted construct and should be expected to disparately relate to various concepts of learning and development. Several scholars whose studies I reviewed in this section of the dissertation claimed that mindfulness was undeniably a complex construct. Baas et al.'s work once again illustrated the need to examine the mindfulness construct from a wide range of scientific

perspectives, including the growing body of empirical literature which promotes multiple benefits of being or becoming mindful, but not limiting the scope to clearly identifiable connections.

Black (2015) reviewed research literature on mindfulness related to youth, spanning from early childhood to late adolescence. This review included articles published between 1966 and 2013. The author pointed out that fundamental differences exist between adults' and youth's cognitive, emotional, social, and behavioral spheres. Black's review included mindfulness research that empirically demonstrated that any benefits of mindfulness trainings established for adults should not necessarily be generalized to youth.

Mindfulness in Childhood and Adolescence

Citing reports by U.S. Surgeon General and American Academy of Pediatrics, Broderick and Jennings (2012) explained that one in five school age children is at risk of academic failure. Rapidly increasing pace of real-world changes, school workload anxieties, and expectations of achievement by parents and teachers create high levels of stress in adolescents. In Broderick and Jennings's opinion, these can be successfully mitigated. The authors acknowledged the research on benefits of mindfulness trainings of adults, and suggested a similar approach for adolescents. The goals of the *Learning to BREATHE* mindfulness-based program implemented in schools and afterschool programs were stress management, increase of emotional well-being, and support for learning. The authors reported that program participants demonstrated reduction in anxiety, negative thoughts and feelings, and improved ability to cope with challenges.

Mood changes and behavioral issues are very prevalent during the adolescent years (Black, 2015; Dalen, Brody, Staple, & Sedillo, 2015; Marich & Howell, 2015). More serious issues such as anxiety, depression, psychological distress, attention deficit, and various personality disorders are also known to emerge in childhood and adolescence (Black, 2015; Britton et al., 2014). Such emerging psychological issues during developmental life period can negatively affect cognitive processes, learning, and functioning, and lead to mental health issues later in individuals' lives. Unassessed or unmonitored behavioral problems and psychological distress can further result in personality disorders, psychiatric problems, suicidal ideations, and other serious mental health outcomes (Brown et al., 2007; Tan, 2015) which intensely affect youth's functioning at school. Clinical psychologists and mental health professionals have developed multiple routines and intervention techniques to address these issues once the diagnosis is made. However, prevention programs and their availability to general population are limited.

Britton et al. (2014) contended that modifications of classroom curricula and school based social programs "may offer cost-effective alternatives to after-school initiatives, which require additional resources and may not be available to students with competing demands for time, such as jobs or afterschool activities" (p. 264). Britton et al.'s (2014) conducted a randomized control study involving 6th grade students, with the goal to examine the effects of a classroom-based mindfulness meditation intervention on children's mental health. The researchers found that mindfulness related activities, both mindful contemplation and engagement in novel activities, resulted in improvements in a

number of children's behavioral problems, attention related issues, and executive function. Britton et al.'s results were in line with other findings on the relationship between mindfulness and executive function (e.g. Lyvers, Makin, Toms, Thorberg, & Samios, 2014).

In the introductory article for the special section on mindfulness in the 2015 issue of *Developmental Psychology*, Roeser and Eccles (2015) emphasized the need for more research on mindfulness in educational settings. Roeser and Eccles summarized the variety of important questions current empirical research on mindfulness was trying to address. These questions involved the relationship between mindfulness and compassion, how researchers can "validly and reliably measure these constructs, using different methods, across time and levels of analysis (e.g., brain, mind, behavior, and social relationships) in children, adolescents, and adults" (p. 1), and how can mindfulness-based trainings for youth be conducted in ways that are effective and developmentally appropriate. Other researchers pointed out the lack of studies on mindfulness in educational settings. Ragoonaden (2015) and Ricarte, Ros, Latorre, and Beltrán (2015) called for more research on the outcomes of mindfulness-based interventions in schools, emphasizing lack of attention to schools in rural communities.

Expanding on prior research with adults that established that mindful individuals are more satisfied with life, feel less anxious, and more content, Oberle, Schonert-Reichl, Lawlor, and Thomson (2011) conducted an experimental research study on the relationship between mindfulness and executive control processes of pre-adolescent children. Oberle et al. (2011) defined mindfulness as attention and self-regulation.

Executive controls were defined as the ability of an individual to organize and regulate his or her behavior, plan and manage multiple goals, and maintain cognitive flexibility (Oberle et al., 2011). The researchers viewed mindfulness as a skill that can be developed through trainings and interventions with the goal to promote health and well-being. Oberle et al. studied fourth- and fifth-graders in an urban area of Western Canada, in schools located in middle-class neighborhoods. The study participants, whose average age was 10.23, completed the Mindful Attention Awareness Scale (MAAS) questionnaire prior to taking computerized tests to determine their inhibitory controls. Oberle et al. used a clinically designed approach to their study, by first measuring the levels of cortisol in the students' saliva every morning, with the goal to control for children's levels of neuroendocrine regulation. The results of Oberle et al.'s regression analyses indicated that mindful attention awareness positively correlated with the accuracy of responses on computer-generated tasks, which were designed to measure inhibitory controls. These results, reported the research team, were consistent for all genders, ages, and also the levels of cortisol in students' saliva. Mindfulness, determined Oberle et al., was a good predictor of executive function skills in the cognitive development of pre-adolescents. The researchers offered their view that mindfulness is a skill, and that intervention programs in a school setting can further cultivate this skill.

A randomized control study conducted by Schonert-Reichl et al. (2015) expanded on mindfulness research conducted by Oberle et al. (2011). Schonert-Reichl et al. explored the benefits of a mindfulness-based school program designed for elementary school children with the goal to foster their cognitive and social-emotional development.

Prior studies, the authors pointed out, showed that social and emotional learning programs (SEL) which involve mindfulness training reduced anxiety, promoted well-being, and enhanced pro-social skills of students. Schonert-Reichl et al. offered a hypothesis that inclusion of mindfulness and compassion training into SEL, a new program they called MindUP, would deliver better results than the standard school programs aimed at promoting social responsibility. The results were outlined as positive changes in behavioral assessments conducted by teachers, students' self-assessments, and peers' nominations of their classmates for achieving prosociality. Cognitive outcomes were measured by collecting math grades from school records. Two teachers trained in conducting MindUP delivered 12 weekly lessons in two classrooms to the total of 48 4th and 5th grade students, average age 10.2. Schonert-Reichl et al. (2015) compared the behavioral and academic results of these two classrooms with two other classrooms, the control group of 51 students, average age 10.3, who received the standard social responsibility training. The children who received the MindUP training

> …(a) improved more in their cognitive control and stress physiology; (b) reported greater empathy, perspective-taking, emotional control, optimism, school self-concept, and mindfulness, (c) showed greater decreases in self-reported symptoms of depression and peer-rated aggression, (d) were rated by peers as more prosocial, and (e) increased in peer acceptance (or sociometric popularity). The results of this investigation suggest the promise of this SEL intervention and address a lacuna in the scientific literature - identifying strategies not only to

> ameliorate children's problems but also to cultivate their well-being and thriving (Schonert-Reichl et al., 2015, p. 52).

Schonert-Reichl et al. found a 24% improvement in positive social behaviors for those students who were involved in the 12-week mindfulness training (MindUP), a 20% improvement in well-being, and a 24% reduction in aggressive behaviors. Additionally, the analysis of math grades indicated that children in the MindUP performed better on math by year end than those involved in the standard social responsibility program. Report card grades were coded on a metric scale, (9 = A+, 8 = A = 8, . . . 1 = C-), and statistical tests established a higher mean score of 6.12 for MindUP program students, relative to the standard program students' mean score of 5.25. These results are notable because they demonstrated gains in all of the areas of learning I explore in this dissertation: cognitive, affective, and social. However, I found Schonert-Reichl et al.'s (2015) study particularly interesting for two additional reasons. First, the inclusion of behavioral assessments by peers validated the self-reported and teachers-reported behavioral assessments of the students. Thus, the positive results were obtained through a triangulated study. The second interesting discovery relates to the comparison of pretest and posttest differences in the control group (students in the standard social responsibility program) next to the MindUP program participants. All mean scores of the self-report measures, i.e. empathy, perspective taking, optimism, emotional control, school self-concept, mindfulness, and social responsibility increased between 0.06 and 0.34 points, on the scale of 1 to 5, for the MindUP participants, and all of the same mean scores for the social responsibility program participants, the control group, *decreased* between -0.04

and -0.30 from pretest to posttest. The same pattern, though to a smaller degree, emerged in peers' assessment scores of the behaviors and attitudes. I questioned the *decreases* in students' optimism, empathy, emotional control, and other measures after the school made an effort of teaching them a course in social responsibility. This point was not addressed in Schonert-Reichl et al.'s article, perhaps because levels of positive attitudes and behaviors were generally expected to decrease to an even lower level if the social responsibility courses were not taught in schools.

In a design similar to Schonert-Reichl et al.'s (2015) study, Flook, Goldberg, Pinger, and Davidson's (2015) randomized control study was conducted in seven kindergarten classrooms within different public elementary schools. The researchers' goal was to measure the effect of mindfulness-based training program on children's prosocial skills development, and cognitive and behavioral outcomes. Flook et al. predicted positive impact of the training on the development of social competence as well as academic performance, and also hypothesized that children with lower levels of prosocial skills and executive function at the start of the study would improve the most as the result of mindfulness-based training. The mean age of their participants was 4.67 years. Of the 68 children enrolled in the study, three classrooms with the total of 30 children were randomly selected to receive a 12-week mindfulness-based training called "Kindness Curriculum (KC) intervention" (Flook et al., 2015, p. 45), and four classrooms with the total of 38 children constituted the control group. The measurements consisted of grades progression, obtained from the report cards, and teachers' ratings of their students' skills and behaviors at the start and the second half of the academic year. The report card

grades included five main domains: approach to learning, cognition and general knowledge (e.g., ability to sort objects by size, shape, color, and the use purpose), health/physical development (e.g., balance and strength), language/communication skills development, and social and emotional development.

The group of children who received KC intervention training earned higher report card grades in three of the five domains: approach to learning, health/physical development, and social and emotional development, compared to the control group (Flook et al., 2015). Teachers reported greater improvements in the KC group children's social competence and less selfish behavior exhibited over time, relative to the control group. Additionally, the researchers demonstrated that mindfulness-based KC interventions specifically benefited the low-achievers: children "who started out with lower social competence and lower executive functioning (indexed by inhibitory control and cognitive flexibility) at baseline showed greater improvements in social competence relative to the control group" (p. 49). The findings in Flook et al.'s (2015) research confirmed previous empirical studies on the subject, and supported the initiative of some school districts to start including mindfulness-based interventions in elementary schools' curricula, deducing that both the students and the teachers would find it beneficial. Self regulation, social and cognitive competence at the start of the educational years, asserted the authors, are strong predictors of not only children's success in school, but also in life, and can be taught explicitly as part of the kindergarten curriculum. The main limitation of Flook et al.'s study was the relatively small sample size. Flook et al. suggested that more research is needed on this subject, and it ought to include more diverse settings, as this

study was conducted in predominantly white middle class school district, with approximately 38% of children residing in socioeconomically disadvantaged households.

In both Schonert-Reichl et al.'s (2015) and Flook et al.'s (2015) studies, the results indicated that inclusion of mindfulness-based programs and interventions can foster children's self-regulatory skills, well-being, prosocial disposition, positive attitudes and behaviors, decrease anxiety and depression, and improve cognitive process. Positive results of mindfulness-based interventions on children's behavioral problems have been the subject of multiple other empirical studies. At the same time, some scholars questioned lasting effects of mindfulness trainings (e.g., Goldberg et al., 2014) and their effectiveness for some types of participants' personalities (van de Weijer-Bergsma, Langenberg, Brandsma, Oort, & Bögels, 2014). Van de Weijer-Bergsma, Langenberg, Brandsma, Oort, and Bögels (2014) reported mixed results for the group of elementary school children between the ages of eight and 12 enrolled in a classroom based mindfulness intervention program called MindfulKids. Van de Weijer-Bergsma et al.'s study revealed differences in the short- and long-term effects of the intervention between children who ruminate more and children who ruminate less. Children who ruminated at low-to-medium levels had initially higher levels of anger or aggression, as reported by their parents, compared to the children who ruminated at high levels. These children achieved larger decreases in anger and aggression after the mindfulness intervention program than those who ruminated more. These two segments of participants varied in other post-intervention results, such as bodily self-awareness and attention to others. Van

de Weijer-Bergsma et al., however, criticized the use of self-selected samples in the majority of the research studies, as well as lack of follow up on their longer-term effects.

As stated earlier, empirical research on the use of mindfulness-based activities and targeted mindfulness inducements aimed at enhancing children's psychological, physical, and social development, and facilitating learning is scarce. Rempel (2012) conducted a review of literature published between 2001 and 2011, which described the outcomes of engaging children in meditation, yoga, Tai Chi, breathing exercises, mindful eating, and other mindfulness-based practices and mindfulness-based therapies. Rempel asserted that today's tumultuous environment creates unprecedented degrees of stress and pressure on children early in their lives, and suggested to look at strategies that can support them in effectively navigating through school and through life. These constant pressures, stated Rempel, are disruptive to children's thinking, making it difficult to learn. Similar to the researchers who established multiple benefits of mindfulness-based interventions and processes for adults, Rempel (2012) found that mindfulness practices with children and youth have proven to be beneficial for the most of the studies' participants. These benefits included reductions in anxiety, depression, and "tendency for depressogenic thinking" (p. 206). Mindfulness-based interventions were also shown to improve children's attention, self-esteem, and grasp on handling demanding situations. Yet some researchers obtained mixed results. For example, increasing the amount of time spent practicing mindfulness practice had positive outcomes for children in some studies, while others found no statistically significant differences. Commenting on the paucity of

studies addressing the role of mindfulness in improving students' learning, Rempel suggested that

> …future research should endeavour [*sic*] to investigate factors and processes applicable to the education settings of children and youth. An important question to explore is what conditions are most conducive to optimizing the effects of mindfulness training in a school setting. For example, is mindfulness practice at the start of the day more beneficial than mindfulness practice after lunch? Another area of interest to curriculum developers might be how the amount of time spent in mindfulness practice affects outcomes (p. 216).

Since Rempel's (2012) publication, several studies on children's mindfulness were conducted in educational settings. Hulme, Green, and Ladd (2013) described the benefits of mindfulness in relation to curiosity and student engagement. Many institutions of higher education, stated the authors, struggle with low retention and academic successes as characterized by substandard graduation rates. Aside from the traditional variables such as time and effort extended on educational pursuits, Hulme et al. (2013) suggested that other factors may positively affect students' engagement, retention, and overall learning outcomes. These factors, what the authors termed "noncognitive variables" (p. 53) such as self-efficacy, mindfulness, and curiosity, were hypothesized to increase students' academic gains. Hulme et al. (2013) reported that curious and mindful students performed better in school, stemming from their desire to explore. Song and Muschert (2014) studied the effects of mindfulness on university students who studied sociology. The majority of students in the study regarded the instructor's incorporation of

mindfulness into the course as a positive learning experience. Students reported improvements in self-awareness and awareness of others, which resulted in a greater sense of social connectedness.

Britton et al. (2014) conducted a controlled pilot trial of classroom-based teacher-implemented mindfulness meditation exercises with sixth grade students (n = 101). The children were randomly assigned to take 6-week courses in history, either a course that included daily mindfulness meditation, or a course that included experiential activities but not a mindfulness practice. Thus the children involved in the history course without mindfulness routine comprised the active control group. Britton et al. indicated that these were healthy sixth-graders in a general setting, and not undergoing psychotherapy. Still, pretest evaluations were conducted to assess any presence of clinical symptoms, such as depression, anxiety, attention problems, self-injurious behaviors, and suicidal ideations, and also to assess students' positive and negative affect. Britton et al. hypothesized that students who practice meditation would show greater reductions in clinical and subclinical symptoms, and in affect disturbance, relative to the active control group. As predicted, both the experimental and the active control groups showed significant improvements on clinical syndrome scales and on affect (Britton et al., 2014). However, most of these improvements did not differ between the experimental and the active control groups. Britton et al. established that the only statistically significant differences related to two of the major clinical scale items: suicidal ideation and thoughts of self-harm. The students in the mindfulness practice group showed greater reductions in the development of suicidality and self-harm than the students in the active control group.

Five children in the control group (10.4%) reported either suicidal ideation or self-harming behaviors, whereas none of the experimental group participants reported such ideations or behavior after completing their course with mindfulness meditation. Britton et al. calculated the difference between the two groups as statistically significant.

These results led Britton et al. (2014) to conclude that although mindfulness interventions may be more impactful on some population segments, both the engagement in mindfulness meditation and in other novel activities may yield benefits. In my opinion this is an example of how the two sets of mindfulness research, contemplative and sociocognitive, run in parallel without one common definition of the term. For instance, Langer and Moldoveanu (2000) explained that mindfulness can be "understood as the process of drawing novel distinctions... [where i]t does not matter whether what is noticed is important or trivial, as long as it is new to the viewer" (p. 1). If we are to accept this definition, and I do, then both the first and the second group in Britton et al.'s study were receiving mindfulness trainings. The experimental group students were involved in contemplative mindfulness practice while those in the active control group were exposed to novel activities, thus experiencing sociocognitive mindfulness instruction. The active control group in Britton et al.'s study, in addition to studying ancient African history, worked on constructing a 3-dimensional full size model of a Pharaoh's tomb.

A case study in Burrows' (2013) article related to a 7-year-old whose behavior at school was highly problematic, and a school counselor's use of mindfulness-based therapeutic storytelling. The story the school counselor studied with the group of

children, including the case study child, was Al-Ghani's *The Red Beast: Controlling anger in children with Asperger's syndrome*. The results of mindful analysis of this story over a period of several weeks were highly beneficial for the child and his classmates. The researcher related these positive outcomes to the story's contents as well as children's practice of mindfulness and reflection which forced an emotional response and deep awareness in the child who, as a result, figured out how to handle behavioral outbursts. Burrows' case study demonstrated that educators could involve mindfulness practice in the classrooms, to recognize the needs and emotional vulnerabilities of their students and teach self-awareness in a way of self-inquiry and deep reflection.

One of the studies included in Rempel's (2012) literature review demonstrated that school age children showed improved cognitive flexibility, better retention of material, and could navigate through larger amount of information as a result of mindfulness practices (Napoli, Krech, & Holley, as cited in Rempel, 2012). Another research project conducted with children with learning disabilities, established that in addition to decreases in anxiety, the participants involved in mindfulness-based activities showed improvements in their social skills and academic performance (Beauchemin et al., as cited in Rempel, 2012).

McNeil, Fyfe, Petersen, Dunwiddie, and Brletic-Shipley (2011) demonstrated that if math problems are presented to young students non-traditionally, this process can facilitate better understanding of mathematics. McNeil et al.'s study examined the outcomes of elementary school children working on arithmetic formulas in unusual configurations. For example, instead of a traditional 9 + 8 = 17 "left side" operation, the

study materials presented a 17 = 9 + 8 formula (McNeil et al., 2011). The total of 90 students involved in this controlled experimental research study (posttest-only, randomly assigned) were between the ages of 7 and 9 (mean = 8; 48 boys and 42 girls; 29% African American, 1% Asian, 9% Hispanic, and 61% White). The control group continued to study arithmetic and practice the assigned problems in the traditional math format. The second, experimental group, received practices as well as homework where math problems were presented as __ = 9 + 8 rather than the 9 + 8 = ? format. McNeil et al. also created a third group of study participants; these students had no extra practice hours or homework assignments, whether in traditional or non-traditional formats. McNeil et al. proposed a notion that "the sheer novelty of a nontraditional problem format may bolster children's attention during practice and lead them to be more mindful of what they are practicing" (p. 1629). The results of the study conducted by McNeil et al. demonstrated that children who participated in the non-traditional learning practice developed a better understanding of math than the other two groups, both the group whose homework and practice assignments continued in the traditional way, and children who received no additional practice time. The research team concluded that even minor novelties related to the input and methods of instruction can promote learning. McNeil et al.'s experiment resulted in substantial improvements to children's understanding of fundamental mathematical concepts. These researchers adopted Langer's definition of mindfulness as an actively engaged, flexible state of mind, being open to novelties, and sensitive to learning context.

Earlier in this section I referred to Felver et al.'s (2013) discussion on mindfulness and their suggestion to develop contemplative mindfulness as a practical instrument for various forms of educational engagement. Their assessments were in line with Burke and Hawkins' (2012) views on mindfulness as a tool for enhancing learning experiences. Burke and Hawkins referred to mindfulness as a "most sound practice for encouraging students to increase their academic achievement and their own social and emotional learning" (p. 36). Additionally, Burke and Hawkins contended that not only a student's academic endeavors can benefit from mindful activities, but her or his current and future life will be enhanced through meaning-making with the sense of purpose, what the authors called "the highest function of education" (p. 39).

Ostafin and Kassman (2012) conducted two experimental research studies with undergraduate students, examining participants' performance on solving two different types of problems, insight and non-insight. The insight problems involved uncommon encounters requiring an insight, an "aha!" moment, while the non-insight problems were of a standard analytic type. Ostafin and Kassman explained that mindfulness triggers creative thinking and would be necessary when a problem solver cannot rely on habit (insight condition), while the analytical (non-insight) problem can simply engage prior knowledge, without a search for new ideas. The participants' mindfulness traits were measured prior to the study. The results revealed that mindfulness as a trait correlated with insight problem solving, and there was no correlation between mindfulness and solving non-insight problems. The second study conducted by Ostafin and Kassman (2012) involved a brief mindfulness training prior to problem solving exercises. The

results showed that the number of insight problem solving increased after training, however the same mindfulness training had no effect on the non-insight (analytic) problem solving. Thus, Ostafin and Kassman concluded that there was a direct relation between mindfulness and creativity, and also demonstrated which learning experiences were enhanced through mindfulness trainings. The finding that mindfulness as a trait did not correlate with solving analytical problems is in line with other current research on sociocognitive mindfulness.

Being mindful is not always beneficial during the learning process. Quinnell, Thompson, and LeBard (2013) examined application of math skills by students enrolled in college-level science courses. Many undergraduate students, explained the authors, exhibit math anxiety and have poor perception of their academic numeracy skills. In order to "think, act and behave as a scientist" (Quinnell et al., 2013, p. 814) students would benefit from the ability to engage their quantitative skills automatically, making this process the opposite of mindfulness. Quinnell et al. reasoned that the best mode of engaging quantitative skills of students in a science class is a mindless transfer, so that they could retain their focus on the scientific phenomenon they study. This study demonstrated that successful students should be mindful and mindless at the same time: mindful of the scientific phenomena they are studying and have the ability to switch to a mindless process for computational activities.

Bakosh, Snow, Tobias, Houlihan, and Barbosa-Leiker (2015) demonstrated the feasibility and effectiveness of a mindful awareness audio training program on elementary students' readiness to learn and other academic outcomes. The study was

structured as quasi-experimental; the participants (N = 191) listened to fully automated recordings for 10 minutes each day, which guided them on focusing attention and provided mindful-based awareness instruction. Bakosh et al. called it a "mindful-based social emotional learning (MBSEL)" (p. 1) program, an innovative tool that did not require teachers skilled or specially trained in mindfulness awareness. Additionally, due to the program design and brevity of students' engagement, it did not necessitate curriculum changes nor additional homework assignments. The results demonstrated that compared to the control group, the experimental group students' quarterly grades showed higher improvements in both reading and science. Bakosh et al. concluded that consistent daily mindfulness practices can be easily folded in K-12 curriculum and would likely have positive on students' learning outcomes and their academic performance.

Many researchers who found improvements in students' learning advanced through mindfulness trainings (e.g., Bakosh et al., 2015; Morrison, Goolsarran, Rogers, & Jha, 2014) also pointed out that it is difficult for schools and colleges to allocate resources or fit mindfulness-based activities into their curricula. Thus, scholars are becoming interested in brief and easy to administer programs such as Koru (Greeson et al., 2014) or mindfulness-based social emotional learning (Bakosh et al., 2015). Morrison, Goolsarran, Rogers, and Jha (2014) explored whether university students would derive benefits from a brief mindfulness based course, such as working memory improvement and reduction of mind wandering. The course was administered one hour per week over a 7-week period. Of the initial 74 students who volunteered to take two working memory tests, *operation span* and *delayed-recognition with distracters*, and a

sustained attention to response test (SART) prior to group assignments, only 48 (mean age = 18.2) continued participating in the study until the end, through the data collection stage. Thirty of these students completed the mindfulness training course and 18 stayed as a wait list control group. The post-experimental results indicated that students who have completed the mindfulness-training course had better sustained attention to response test outcomes than the control group (Morrison et al., 2014). Their self-reports showed reduction of mind wandering while completing tasks, and the tests showed higher task accuracy compared to the control group students. The same self-reports by the wait list control group students indicated increases in mind wondering during this period. Morrison et al.'s other outcomes were different. Neither the operation span nor the delayed-recognition task performance results showed statistically significant variances between the two groups. The research team's overall conclusion was that although this short-term mindfulness training "did not bolster working memory task performance, it may help curb mind wandering and should, therefore, be further investigated for its use in academic contexts" (p. 1).

Mindfulness-based trainings and interventions demonstrated positive learning outcomes for many populations, including students with learning disabilities, self-regulation and attention problems, and other learning challenges (Black, 2015; Brown et al., 2007; Britton et al., 2014; Docksai, 2013; Haydicky, Wiener, Badali, Milligan, & Ducharme, 2012). Adolescents and young adults enrolled in college may have diagnosed or undiagnosed learning disability related to control centers in the brain, called executive functioning (McCloskey, 2015). The general definition of executive functioning is the

ability of an individual's mind to prioritize, systematize, and manage the daily essentials necessary for successful functioning (Barkley, as cited in McCloskey, 2015). Attention Deficit Hyperactivity Disorder (ADHD) is one example of executive functioning disorders (National Center for Learning Disabilities, n.d; Schultz, 2011). Among the empirical studies I analyzed for this literature review section, three articles examined whether mindfulness-based activities can enhance executive functioning (Flook et al., 2015; Lyvers et al., 2014; Riggs, Black, & Ritt-Olson, 2014). All found statistically significant positive associations between mindfulness and several executive function processes were tested, mindfulness was positively associated with inhibitory control and working memory, but not cognitive flexibility despite a significant bivariate correlation.

McCloskey (2015) conducted a review of recent studies that have empirically proven that mindfulness activities benefit students personally and academically. Additionally, McCloskey's meta-analysis suggested that students with executive functioning deficits and other learning disorders could particularly benefit from mindfulness programs offered in high-stress academic environments such as colleges and universities. As the postsecondary education enrollment rates continued to increase in recent years, "the rate of college attendees with diagnosed learning disabilities or learning challenges has followed suit" (Connor, as cited in McCloskey, 2015, p. 221). This segment of students needs tools for dealing with academic challenges, workload handling, and emotion management without impulsiveness or diversion of attention. Mindfulness based activities, asserted McCloskey, provide such tools in easy to implement incremental steps.

Academic benefits of mindful learning emerged in several mindfulness studies. McNeil et al. (2011) who experimented with non-traditional ways to present young students with arithmetic equations demonstrated that mindful contemplation and novelty facilitated better learning of math. Lee and Ryu (2015) conducted three experiments (n = 165, 192, and 262 respectively) with South Korean high school students with the goal to find whether mindful learning of geography would cultivate the attitudes of interest and curiosity in adolescents. In these experiments, geography texts about the Middle East and Latin America were paired with mindful questions for experimental groups, and with non-mindful (content-recall) questions for the control groups. Lee and Ryu based the design of their experiments in Langer's conceptual characterization of mindfulness as novelty seeking and novelty producing. The researchers' results demonstrated larger gains in experimental group students' curiosity about the regions, affinity, and learning efficacy. Mindfulness, concluded Lee and Ryu, ought to be considered "a practical and effective teaching and learning method because it offers simple ways to improve mental activity… useful for reducing people's prejudice or bias by teaching them to accept differences as *only differences* rather than as negative deviance" (p. 197, italics in text).

Naturally Occurring Mindfulness

Many recent studies on mindfulness in general (non-clinical) population samples of adults and adolescents demonstrated statistically strong relationship between mindfulness and several concepts such as behavior regulation, psychological health, and mental functioning (Brown et al., 2015; Hülsheger, Alberts, Feinholdt, & Lang, 2013). The majority of studies I have reviewed referred to mindfulness induced experimentally,

through interventions, or developed by targeted training programs. Several research teams, e.g., Hülsheger, Alberts, Feinholdt, and Lang's (2013), Quaglia et al. (2014a), Lyvers et al. (2014), Pearson, Brown, Bravo, and Witkiewitz, (2014), and Bellinger et al. (2015), distinguished induced mindfulness from "naturally occurring mindfulness in terms of trait and state mindfulness" (Hülsheger et al., 2013, p. 320). Hülsheger et al. (2013) saw mindfulness as both a state of consciousness and a determination of an individual to be receptive to present moment experiences in non-judgmental ways. Thus, they constructed their multiple hypotheses using two mindfulness constructs, mindfulness as a trait, what they called "the between-person level" and mindfulness as a state or "the within-person level" (p. 312). Hülsheger et al. examined benefits of naturally occurring mindfulness in a workplace, hypothesizing that it would benefit workers' emotion regulation, help with emotional exhaustion, and promote job satisfaction.

In one of two studies, 219 employees in the several companies in the Netherlands and Belgium completed daily self-reflection entries into diaries for a 5-day period, and also completed a survey. Results of this study established negative correlation between mindfulness and emotional exhaustion, and positive correlation with job satisfaction. The second study, an experimental field study by Hülsheger et al. (2013), included 203 employees working in Berlin and small cities in North Rhine-Westphalia (Germany) in service industry jobs such as schools and hospitals. Participants were randomly assigned to a mindfulness intervention group (n = 102) or a control group (n = 101). Some of the participants dropped out or were excluded from the data analysis. Of the remaining 64 whose responses were analyzed, 22 participants belonged to the mindfulness intervention

group and 42 to the control group. The results revealed that mindfulness intervention participants felt less emotional exhaustion and higher levels of job satisfaction compared to those in the control group. Hülsheger et al. confirmed 11 of their 12 hypotheses. One of Hülsheger et al.'s hypothesis related to *surface acting*, which they defined as a response-focused mode of emotion regulation by individuals working in a service industry. The person is likely to modify his or her emotional expression after evaluating experiential cues and checking physiological and behavioral tendencies to respond (Hülsheger et al., 2013). Based on theoretical foundations of mindfulness as a nonjudgmental practice the research team hypothesized that mindfulness and surface acting would produce negative correlation. They found some of the results to be inconclusive. This is indicative of considerations beyond employees' well-being, perhaps demonstrating that surface acting is a complex behavioral and emotional construct that requires multi-level testing in relation to mindfulness.

Overview of Key Variables in Current Mindfulness Research

As indicated throughout this literature review section, there is a large and growing body of research on adult mindfulness, including both the general and clinical populations (e.g., de Vibe, Bjørndal, Tipton, Hammerstrøm, & Kowalski, 2012; Leland, 2015; Stillman, Feldman, Wambach, Howard, & Howard, 2014). Additionally, researchers are starting to expand their interest in mindfulness studies involving children and adolescents (Black, 2015; Broderick & Jennings, 2012; Roeser & Eccles, 2015). Many benefits of mindfulness have been demonstrated through empirical research, however these benefits may vary for not only different populations and age groups, but

also genders, family compositions, and other demographic and socioeconomic characteristics (e.g., Black & Fernando, 2014). The age of participants frequently emerged as a variable in quantitative mindfulness research. Very few of the current research studies on mindfulness outlined in this literature review specifically targeted other demographic and socioeconomic characteristics of the participants. If mentioned, these characteristics were not distinguishing indicators in mindfulness research, although some scholars found variations in the *levels* of mindfulness depending on demographic factors of the participants. For example, Ahmadi, Mustaffa, Haghdoost, and Alavi (2014) found that the trait mindfulness was present at higher levels in males than females. Ahmadi et al. (2014) acknowledged that while the relationship between mindfulness and mental or physical health often surfaces in current research literature, studies examining the levels of mindfulness based on educational background are rare. In addition, they could not find any research examining the relationship between children's family composition and their levels of mindfulness. It would be interesting to examine demographic and geographic characteristics as control variables in further research.

Besides demographic variables, some of the mindfulness research examined predispositions or traits of the participants who then underwent mindfulness trainings or interventions. For example, when van de Weijer-Bergsma et al. (2014) analyzed the outcomes of the MindfulKids classroom-based intervention program, they found variances in how beneficial this program was for those with different initial levels of anger/aggression behaviors and different levels of rumination. Examination of personalities, traits, and characteristics of consciousness was most prevalent in research

related to naturally occurring mindfulness (e.g., Hülsheger et al., 2013) rather than studies involving mindfulness interventions or training programs. Several studies examined adults' and youth's learning outcomes in relation to mindfulness. Academic performance of students was the subject of the mindfulness research conducted by Bakosh et al. (2015), McNeil et al. (2011), Schonert-Reichl et al. (2015), and Song and Muschert (2014). Other scholars examined social and emotional learning (e.g., Schonert-Reichl et al., 2015) or multiple cognitive and affective learning outcomes of children and adults (Burrows, 2013; Flook et al., 2015; Hulme et al., 2013). The learning outcomes variables I included in my dissertation data analysis encompass several learning domains.

Current research reviewed here involved multiple concepts in relation to mindfulness, including the modes of learning. As stated in the introductory section of this dissertation chapter, learning is a tremendously complex, multifaceted concept. Thus, I limited the discussion on the concepts of learning to two main theoretical foundations. One is Bloom's theory of mastery learning, knowledge dimensions, and cognitive process dimensions, also known as Bloom's taxonomy. The other is Bandura's social learning theory (Bandura, 1986; Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). Bloom's taxonomy provides a systematic classification of knowledge acquisition and expansion processes. It describes a learner's transition from most basic skills to incrementally more advanced skills, progression from lower- to higher-order mental processes (Bloom, 1956/1972, 2006). Bloom's taxonomy, a landmark in the field of education, subsequently underwent several expansions as well as changes in terminology (Anderson & Sosniak, 1994; Krathwohl, 2002). Educators continue using the taxonomy and its expanded

concepts to develop learning objectives for students based on the hierarchy of skills (Krathwohl, 1994).

The conceptual framework in Uğur, Constantinescu, and Stevens' (2015) study of cognitive-affective transformation in an educational setting included self-determination theories, mindfulness, and positive youth psychology. Uğur et al. placed mindfulness research within the self-determination theoretical framework. Synthesizing self-determination concepts and Bloom's taxonomy, the authors recognized that "these seemingly different theoretical and empirical traditions have seldom been linked, despite the fact that their conceptual frameworks are complementary" (p. 90). Uğur et al. saw learning as cognitive-affective transformation and personal growth of students. Higher levels of mindfulness have been linked to better performance in school, at work, and in everyday life, as well as to higher levels of consciousness, mental health, and behavioral progress of children and adolescents.

The variables in current research on mindfulness included pedagogical as well as psychological benefits. Hines and Willey (2015) advocated for educational environments conducive to learning through improving teachers' and students' mindfulness, which in turn have been demonstrated to enrich everyone's educational experiences. Many studies reviewed here demonstrated differential relationships among various components of mindfulness and various learning and developmental outcomes. As stated previously, both learning and mindfulness are complex concepts, and as I continue into the next chapter of the dissertation, my data analysis design incorporates the componential multiplicity of the choice of constructs.

Summary

The review of literature conveyed scholars' findings and opinions on mindfulness in relation to cognition, behaviors, and attitudes of young adults, adolescents, and children. I briefly outlined mindfulness research related to psychological health, self-regulation, and functioning, and then centered on examining connections between mindfulness and learning. This review permeated through the fields of educational psychology, behavioral sciences, and youth development and incorporated theoretical viewpoints within Western and Eastern paths of mindfulness research. Relevant information obtained from the empirical studies encompassing these theoretical concepts revealed multifarious relationships of various components of mindfulness to the learning domains: cognitive and affective. In Chapter 3 these components are further developed into the variables for my quantitative data analysis.

Chapter 3: Research Methods

Introduction

The purpose of this nonexperimental quantitative study was to examine whether, and to what extent, students' mindful attitudes and behaviors relate to their academic achievement and affective learning outcomes. The review of scholarly literature conducted in Chapter 2 confirmed the need for more research on mindfulness during the period of adolescence (Black, 2015; Broderick & Jennings, 2012; Roeser & Eccles, 2015). A better understanding of how mindfulness associates with the learning domains could help educators and youth service professionals improve the design and delivery of school curricula, learning materials, study techniques, and youth programs targeted toward the development of 21st century competencies and skills. In this chapter, I present the methods of obtaining and analyzing secondary data from previously administered surveys and the process of extracting research variables relevant to my study. I describe the survey instrument, explain the intent and process of data collection and sampling strategies, and address the reputability of the source. Statistical tests are detailed in the methodology section. This chapter also contains discussions related to external and internal validity threats, and ethical considerations.

Research Design and Rationale

The main research goal of determining associative relationships among several groups of variables warrants the quantitative research methodology (Creswell, Plano Clark, Gutmann, & Hanson, 2003). I proposed to conduct a descriptive-comparative study. Lauer (2004) and Grinnell and Unrau (2010) recommended descriptive-

comparative assessments of differences among social groups for exploratory research in the fields of education and social work. Descriptive-comparative research design allowed me to describe the differences between groups of adolescents who are predominantly mindful and those who do not exhibit mindfulness, and compare these groups' outcomes in the main domains of learning: cognitive and affective. The design of the data analysis suggested a chi-square test of the research questions and hypotheses outlined in Chapter 1, as it establishes whether there is statistical significance of the association of two or more variables of interest (Field, 2013; Fienberg, 2007). The data analysis plan is described later in this chapter.

A&B Survey and Secondary Data

In this chapter, I introduce the survey developed by Search Institute titled *Profiles of student life: Attitudes and behaviors* (Search, 2012a, 2012b, 2014). The results of the surveys collected by Search Institute and its research partners provided the data for my study. The permission to use the A&B survey for my dissertation research and gain access to the data was received from Search Institute prior to the proposal. Appendix B contains the memorandum of understanding with Search Institute.

I cleaned and extracted a subset of secondary data for my research analysis by eliminating all results from surveys administered outside of the U.S., and from respondents younger than 14 or older than 18, and this process is fully described in Chapter 4. The A&B survey was designed to assess attitudes and behaviors of school-age students within the developmental assets framework. The framework is composed of two domains of assets: external and internal (Benson, 2007). Twenty external assets relate to

students' environment and consist of four categories of support, empowerment, boundaries, and use of time. Twenty internal assets relate to students' attitudes and self-perceptions; the four categories of internal assets are values, identity, social competencies, and commitment to learning (Benson & Scales, 2009; Leffert et al., 1998, p. 211).

My decision to use secondary data for this research stemmed from several considerations. First, a retrospective evaluation of already collected data allows researchers to conduct an ethical and feasible examination of the research questions when a study involves protected populations and includes invasive questions. Second, the survey I have chosen is a tested, validated, and reliable instrument for measuring attitudes and behaviors of school age children (Leffert et al., 1998; Paxton, Valois, & Drane, 2005; Reininger et al., 2003; Scales, Benson, Leffert, & Blyth, 2000). Third, a consideration that led to my decision to use this secondary data was the size of the data set and convenience of working with already existing data.

Reliability and Validity of the A&B Survey

Several research teams examined the reliability and validity of the A&B survey for measuring developmental assets of youth. Leffert et al. (1998) described the process of establishing the content validity of the survey questions and the construct validity of the survey in the developmental assets framework. Reininger et al. (2003) and Paxton et al. (2005) focused on the reliability of the survey instrument to measure youth empowerment, one of the external assets, while Leffert et al. (1998) and Scales et al. (2000) addressed the validity and reliability of all clusters of the survey questions. Leffert

et al. (1998) reported on the instrument's predictive validity for adolescents' risk behavior patterns, and since the measurement of each asset cluster may include one or several survey items, calculated Cronbach's alpha coefficient to assess the reliability of the scales with more than two items. The reliability coefficients of all four categories of internal assets of youth were $\alpha > .50$, whereas only two of four categories of external assets demonstrated internal consistency of the A&B survey scale. I selected the items relevant to my dissertation research from the internal assets categories of the A&B survey questions, where the reliability established by Leffert et al. encompassed *commitment to learning* ($\alpha = .55$), *positive values* ($\alpha = .73$), *social competencies* ($\alpha = .62$), and *personal identity* ($\alpha = .70$). However, despite the reported reliability and validity of the A&B survey for research on developmental attributes, attitudes, and behaviors of youth, it is not a mindfulness measurement tool, as explicated earlier. Thus, I took additional measures taken to ensure its suitability for my dissertation research, which are detailed in Chapter 4. During the data analysis stage described in Chapter 4, I made the selection of the survey questions to align with the questions contained in mindfulness measurement scales, and consulted with experts in the field of mindfulness research and education professionals to confer on the alignment.

Reliability and Validity of Secondary Data

As stated on the Search Institute's website (Search, n.d.), since the instrument's inception in 1989, the A&B survey was frequently administered in hundreds of communities. Survey users were schools, programs, and youth organizations in urban, suburban, and rural areas of the United States and in other countries such as Canada,

Venezuela, Australia, Indonesia, United Arab Emirates, China, Hong Kong, and South Korea. The A&B survey incorporates questions related to school and out-of-school activities, children's experiences, involvements, value systems, and their demographic and socioeconomic characteristics such as gender, race or ethnicity, age, and family composition. Thus, multiple variables contained in the survey align well with my variables of interest, which I explain in the next section of this chapter. Additional considerations that led to my decision to use this secondary data was the size and convenience of the data set. Five years of Search Institute's survey results, obtained in multiple settings, yielded a large data set for my designated age group, adolescents between the ages 14 and 18, and the U.S. geographic area. The reliability of the data increases with the size of the sample (Marsh, Balla, & McDonald, 1988), and working with a very large dataset indirectly addressed the reliability issue. I further describe the validity and reliability testing processes in Chapter 4 of this dissertation.

Methodology

In this section of the chapter, I explain the methodology, including the description of Search Institute's strategies and the process of obtaining the data, as well as the purposes for which the data collection was originally intended. The process of administering the survey and Search Institute's strategies and procedures for collecting, aggregating, and processing the data are described later in the data collection section. I also explain my process of obtaining the data from Search Institute and procedures I used to derive a subset of the aggregate data to fit the parameters of this dissertation research. Further, I detail my research methods and approaches to extract relevant questions from

the survey and their alignment with mindfulness scales and indexes outlined in Chapter 2. This process defines my operationalizing of mindful attitudes and behaviors of youth, the independent variable in this dissertation study.

Instrumentation and Operationalization

The A&B survey contains questions on "how students spend their time, their perceptions of their school and community, and involvement in a range of behaviors" (Search, 2012a, p. 33), as well as sociodemographic characteristics of the respondents. The respondents' answers to these questions provided the data related to all of the independent and dependent variables in my study. To help operationalize my variables of interest, I studied the survey's administrative manual (Search, 2012a) and the guide to users (Search, 2014).

Validity and reliability diagnoses are critical for identifying the components of secondary data applicable to the new research, because the information reported in the original study may not fit the proposed study. One approach to address these concerns for my dissertation was to carefully examine the design of the original instrument, the A&B survey, assess measurement scales and processes, and compare its questions with other validated and reliable instruments to establish the degree of relevancy. I have engaged in this process over the last 2 years, upon receiving the sample 2012 A&B survey instrument from Search Institute. This initial assessment was completed with the development of a matrix in which I aligned the selected questions in the A&B instrument and selected questions contained in five mindfulness scales and indexes, which I included in one of the Walden University graduate-level term papers. Selected A&B questions

were aligned with the Mindful Attention Awareness Scale (MAAS-S), the Mindful Attention Awareness Scale for Adolescents (MAAS-A), the Kentucky Inventory of Mindfulness Skills (KMS), the Mindfulness/Mindlessness Scale (MMS), and the Langer's Mindfulness Scale (LMS). Further measures to ensure validity and reliability described in detail in Chapter 4 involved statistical analyses on the clusters of selected questions to calculate the α coefficient to establish their predictive validity. Additional approaches included consultations with others, specialists in the fields of mindfulness research and youth development who opined on my questions selections and confirmed the interpretations of the context.

Survey Design

The A&B survey instrument combines measurements of school age children's attitudes and behaviors with the assessment of their everyday life functioning and performance in school (Benson & Scales, 2009; Leffert et al., 1998; Search, n.d.). Created in 1989, the original survey was founded on the Developmental Assets of Youth (DAY) conceptual framework (Benson, 2007). The research goal was to explore young individuals' strengths, skills, and indicators of thriving (Search Institute, n.d.). The survey instrument underwent a number of revisions and updates, to ensure that the questions addressed more contemporary issues and challenges that school age children faced; the last revision was completed in 2012.

The revised A&B survey used in 2008-2013 consisted of 160 questions, which encompassed the general characteristics of the respondents and included a variety of targeted questions aimed to establish "[h]ow do young people experience life in their

families, schools, and communities" (Search, n.d.). This instrument was not intended as a mindfulness measurement tool. As described earlier, validity and reliability of the survey have been established for the use in DAY studies, but I used it in this dissertation to derive the indication of mindfulness questions. Two of my earlier course papers at Walden University involved the A&B survey instrument, where I conducted initial examinations of the instrument's content. These initial examinations established that many of the questions pertaining to students' developmental assets, deficits, and thriving indicators convey the fundamental essentials related to their mindful and mindless attitudes and behaviors. In particular, one of my Walden University graduate-level course projects delineated the linkages between A&B survey questions and several mindfulness measurement instruments published and used in mindfulness research. Appendix C contains a matrix demonstrating alignment between selected A&B survey questions and selected components of five mindfulness scales and indexes, which I derived in that previous course work.

Survey Measurements

The A&B survey contains several clusters of questions. The starting and ending questions pertain to demographic and socioeconomic characteristics of the respondents. The main, middle section of the survey, is focused on students' family life, academic performance, special interests, involvement in religious activities and sports, community connections, their personal habits, relationships and attitudes toward others, and opinions. Several questions target information about high-risk behaviors of the students: drug and alcohol use, violence, involvement with weapons, and underage sexual activities. The

multiple-choice questions in the survey include a variety of response scales, depending on how the question is posed. Among 12 different multiple-choice response options there are dichotomous questions where the answer can be either *yes* or *no*, as well as 3-, 4-, 5-, 6-, and 8-point scales. Examples of the 5-point scale responses are:

- never, once in a while, sometimes, often, always
- not at all like me, a little like me, somewhat like me, quite like me, very much like me

This large variety of the response types has been addressed by the survey's developers and assessors of its initial 1989 version, as well as the subsequent 1994, 2008, and 2012 revisions (Benson, 2007; Roehlkepartain, 2012; Search, 2014), and determined to be appropriate for the complexity of the DAY research design.

Relevancy of Questions

Responses to several questions in the A&B survey provided data relevant to this dissertation research. The listing of my study variables later in this chapter includes the information on how I connected demographic and socio-economic characteristics of youth with the survey questions such as age, gender, and family composition. The respondents' outlook on life, attitudes toward school and teachers, personal and family values, risk behaviors, and out-of-school activities and involvements provided the information on affective learning outcomes of the survey responders.

Data Collection

The data I obtained from Search Institute were collected in schools and youth clubs in multiple locations over the period of 5 years. School districts, individual private

and public schools, and various youth organizations can purchase the A&B survey and engage the services of Search Institute (Search, 2014) for survey collection and evaluation of the results. The individuals selected by these organizations are then trained to be the administrators of the survey. The research team from Search Institute is the collector and aggregator of the electronic or paper survey submissions. Search Institute developed a comprehensive guide to instruct schools and community youth organizations on how to administer the A&B survey (Search, 2014). This guide provides instructions on data collection methodologies, which include sampling strategies and tables to calculate a sample size required to adequately represents each user's target population, and details ethical research practices when working with youth. With the stated goal to attain honest and thoughtful responses, survey team leaders are required to follow standardized protocols, provide consistent instructions for all study participants, and choose one of two options of administering the survey.

One option for taking the survey allows participants to complete the survey on paper or computer at the location where they study or engage in out-of-school activities. The suggested timeframe includes a 5-minute registration and welcome, an optional short icebreaker activity, 5 minutes of instructions, and 45 minutes for survey completion. The second option, recommended for youth with limited reading or comprehension skills, requires that a member of the survey project team read the questions aloud, and the participants enter their responses into computers. Examples of a setting requiring assistance from the survey project team would be a special needs group of students with visual impairment, children with learning disabilities, or students for whom English is a

second language. The estimated survey completion time under the second option is longer, 75 minutes. Anonymity of the responses is assured in both venues. To address any issues with the validity of students' responses and to reduce the incidence of missing answers, Search Institute provides additional resources, materials, and trainings for survey managers that cover specific topics on the logistics of survey administration (Search, 2014).

There is no written documentation on how the actual administration of the survey was conducted at the 818 institutions that engaged Search Institute to collect the data transferred to me for the inclusion in this study. I referenced this concern in Chapter 1, among the assumptions. Assumption 3 stated that in this dissertation I assumed that the administrators of the survey followed the data collection procedures and guidelines developed by Search Institute and printed in the administration manual (Search, 2014). The administration manual put emphasis on the importance of the participants' comfort and privacy, consistency, and adherence to the guidelines:

> The way in which you administer and monitor the A&B can affect the results. For example, if some youth complete the survey in a quiet room with a relaxed schedule while others do it in a noisy room with pressure to finish quickly, the second group may not take the survey as seriously. So it is important to follow the same procedures for all young people, wherever possible (Search, 2014, p. 29).

Although the survey is administered by survey managers within each school and youth organization, Search Institute was the collector of the data I obtained for this study.

The data collection and analysis is part of the service Search Institute offers to schools and youth service organizations interested in learning about the developmental assets, social-emotional learning, and other non-cognitive factors of the young people in their districts and communities. The data report these organizations receive from Search Institute includes descriptive statistical tables and charts, and comparison of their survey results with the aggregate national data set. I have obtained the aggregate set of data received from 818 venues (N = 287,657) which was comprised of 746 public schools, 56 private and alternative schools, and 16 non-school youth organizations. For this study, I eventually reduced the size of the data with the goals to reflect my target population of interest and other parameters described below.

Target Population

The United States Census information I obtained from the Federal Interagency Forum on Child and Family Statistics (2015) indicated that the number of children under the age of 18 in the United States averaged about 74 million over the last 10 years. To establish the population size for this study, I started by extracting the three age categories published by Federal Interagency Forum (2015), i.e. ages 0 - 1, 6 - 11, and 12 - 17 (see Figure 1) for the calendar years 2008-2013, to align with the data set obtained from Search Institute. I calculated the average number of children in each age cluster, making an assumption that there would be approximately equal number of children of each age within every cluster. Figure 1 details the basis and the process of these calculations. Column B was calculated by dividing the 5-year average in each age cluster by 6, based on the above assumption. The calculated results showed that approximately 4.0 million

children were younger than 1, (or between ages of 1 and 2, etc.); 4.1 million children were 6 years old (or 7, 8, etc.); and 4.2 million children were 12, 13, etc.

*from US Census POP1 Child Population Table**						**A**	**B**		**C**		**D**	
Number (in millions)	2008	2009	2010	2011	2012	average cluster	6 intervals each cluster = average **each interval**		estimated, ages 5 to under 18		estimated, ages 14 to under 18	
All children	74.1	74.1	74.1	73.9	73.7							
Ages 0–5	24.3	24.3	24.3	24.2	24.1	24.2	÷ 6 =	**4.0**	x 1 =	4.0	x 0 =	0.0
Ages 6–11	24.1	24.3	24.6	24.6	24.5	24.4	÷ 6 =	**4.1**	x 6 =	24.4	x 0 =	0.0
Ages 12–17	25.8	25.5	25.3	25.1	25.1	25.4	÷ 6 =	**4.2**	x 6 =	25.4	x 4 =	16.9
** Federal Interagency Forum (2015)*						**74.0**			total	**53.8**	total	**16.9**

Figure 1. *The basis and calculations of population size. Col. C = the estimated number of school age children; Col. D = the estimated number of adolescents. US Census table was derived from Federal Interagency Forum on Child and Family Statistics (2015).*

The A&B survey designers identified their target population as children and youth in kindergarten through 12th grade (Search, n.d.). Assuming that these were individuals between the ages of 5 and 18, my calculations shown in column C (Figure 1) delivered the total of 53.8 million. Further, in order to calculate the population size for my research study, U.S. adolescents, I looked at the third age cluster, *Ages 12-17*. The calculated results appear in column D of Figure 1. Four sixths of the 25.4 million total in this cluster equal approximately 16.9 million adolescents, defined as at least 14 years old and up to the age of 18.

My goal was to derive a data set with a sufficient number of surveys completed by adolescents, ages 14 – 18, to accurately represent the target population. I used a published Required Sample Size tables (Boyd, 2006) to derive the sample size based on

the population size, margin of error, and confidence levels (see Figure 2). For the population size of about 16.9 million, as determined earlier, the sample size should be between 384 and 16,584, depending on the confidence level and the margin of error I would be willing to accept. The data provided for my study by Search Institute contained the total 287,657 surveys collected in the U.S. and other countries. A preliminary review of the data set indicated that survey respondents were children in grades 5 through 12 and approximately 245,000 of them resided in the United States. This estimated count excludes the data collected in Canada and other countries. Assuming an equal distribution of ages and grades, approximately one-half of the 245,000 survey respondents from the U.S. should be adolescents. I concluded that this 122,500 estimate would provide more than sufficient sample size for my data research plan. If my estimates are inaccurate, e.g. only 25% of the 245,000 estimated U.S. responders were adolescents, the 49,000 sample size is still more than adequate at 99% confidence level and 1% margin of error. I provide explanations on the actual size of the selected sample in Chapter 4.

Population Size	Confidence = 95% Margin of error				Confidence = 99% Margin of error			
	5.00%	3.50%	2.50%	1.00%	5.00%	3.50%	2.50%	1.00%
2,500,000	384	783	1,536	9,567	663	1,353	2,651	16,478
10,000,000	384	784	1,536	9,594	663	1,354	2,653	16,560
100,000,000	384	784	1,537	9,603	663	1,354	2,654	16,584

Figure 2. *Sample size based on population size, confidence level, and margin of error*.

Variables

In this dissertation, I investigated how the indication of mindfulness derived from the survey participants' answers associates with two indicators of learning, adolescent students' academic grades and affective outcomes. Although the use of variables in my study does not imply causation, for the purposes of statistical data analysis the variable mindfulness indicator was presented as independent (IV), and grades and affective outcomes as the dependent variables (DV). Each variable was coded as dichotomous, "0" or "1", and the coding process is described in detail in Chapter 4. The 0/1 codes have no numerical value, but denote the composite classification or indicator variables. Creation of dichotomous classification variables is an acceptable practice of preparing secondary data for new research and working with composites of data (Donnellan, Trzesniewski, & Lucas, 2011; McCall & Appelbaum, 1991; Vartanian, 2011).

The IV, composite mindfulness indicator, was derived from a subset of the A&B survey questions, specifically the students' internal assets values and identity clusters. The value of 1 denotes mindful attitudes and behaviors of the survey respondents, and the value of 0 indicates that mindful attitudes and behaviors could not be established for these respondents. I describe the A&B questions selection process as part of my data analysis in Chapter 4, and address the reliability and validity issues. An example based on my preliminary selection of the questions that align with one or more indicators of mindfulness and mindlessness in the measurement scales and indexes appears in Figure 3. Three A&B survey questions aligned with six items from the Mindfulness/ Mindlessness Scale (MMS), Langer's Mindfulness Scale (LMS), and Kentucky Inventory

of Mindfulness Skills (KMS). The full set of questions in mindfulness scales I reviewed to complete the alignment are listed in Appendix D.

MMS questions	*response*	**LMS questions**	*response*	**A&B questions**	*response*
I "get involved" in almost everything I do	*agree / strongly agree*	I have an open mind about everything, even things that challenge my core beliefs	*agree / strongly agree*	Standing up for what I believe, even when it's unpopular to do so	*quite important /extremely important*
I attend to the "big picture"	*agree / strongly agree*	I like to investigate things	*agree / strongly agree*	When things don't go well for me, I am good at finding a way to make things better	*agree / strongly agree*
I am always open to new ways of doing things	*agree / strongly agree*	I like to investigate things	*agree / strongly agree*	When things don't go well for me, I am good at finding a way to make things better	*agree / strongly agree*
I try to think of new ways of doing things	*agree / strongly agree*	I like to investigate things	*agree / strongly agree*	When things don't go well for me, I am good at finding a way to make things better	*agree / strongly agree*
		KIMS question	*response*		
		I notice how foods and drinks affect my thoughts, bodily sensations, and emotions	*very often*	Taking good care of my body (such as eating foods that are good for me, exercising)	*very much like me*

Figure 3. *Examples of aligning Mindfulness Scales indicators with A&B survey questions.*

One essential methodological notion is that mindfulness and mindlessness are not dichotomous constructs. As stated earlier, there are multiple definitions of mindfulness (see Appendix A). Mindfulness is a complex construct that may or may not indicate the absence of mindlessness (Brown et al., 2011; Langer & Moldoveanu, 2000). In the Chapter 2 literature review, I demonstrated that mindless behaviors and processes, such

as automatic or instant retrieval of stored knowledge, are often useful and purposeful in the course of academic studies as well as in daily life (Quinnell et al., 2013). Although generally defined as a failure to be mindful, mindlessness it is not a mere absence of cognitive processing, but rather a paucity of flexible engagement (Langer et al., 1985). Thus, the IV value of 0 does not denote mindlessness, but indicates that the student's responses did not constitute mindfulness.

The dependent variables of interest in my dissertation research relate to students' learning outcomes. The indicators of learning include students' academic grades and social and emotional outcomes.

- DV1 – Academic grades. Grades in school generally provide a valid and effective measure of academic achievement and cognitive learning. As part of the data analyses described in Chapter 4 I examined the A&B survey questions related to students' grades.
- DV2 – Affective/social learning outcomes. Affective domain spans a large range of emotional and social learning, from simple interests, attitudes, appreciations, and biases, to more complex constructs such as quality of character, conscience, and value system (Krathwohl, Bloom, & Masia, 1964). As part of the data analyses described in Chapter 4 I extracted survey questions related to participants' outlook on life, emotional stability, social integration, and attitudes toward understanding self and others to provide the measures of affect.

DV1, the students' self-reported grades, was derived from the A&B survey question #20. My preliminary review of the data indicated that this was an ordinal

variable with eight possible values. Survey respondents were asked to mark one of the multiple choice answers to question what grades they earn in school: *mostly As*, *about half As and half Bs*, *mostly Bs*, *about half Bs and half Cs*, *mostly Cs*, *about half Cs and half Ds*, *mostly Ds*, and *mostly below Ds*. The preliminary assessment of the data and consultations with statistical experts indicated that the responses should be recoded. In Chapter 4, I explain the further examination of this variable and the reasoning for its dichotomous coding into high and low grades. This allowed me to maintain consistent coding for both the DV1 and DV2 in analyzing the associative relationships among variables in both research questions. Code "1" was used to identify high academic achievement, i.e. all Ax or mostly As and some Bs responses, and code "0" indicated lower academic grades. For the DV2 variable, I used code "1" to indicate positive affect of the survey respondents based on the selected A&B questions for the internal assets groups commitment to learning and social competencies. The value of "0" was used to indicate that positive affect indicators could not be established for these survey respondents. The actual selection of the pertinent A&B survey questions is described later in Chapter 4. The associative relationships among variables was then analyzed using cross-tabulation tables, the chi-square test, and binary logistic regression analyses.

Research Questions and Hypotheses

With the goal to determine whether there are differences in learning outcomes for adolescents whose attitudes and behaviors are determined to be mindful, and adolescents whose mindfulness cannot be established, I developed two research questions (RQs):

- RQ1: To what extent do adolescents whose attitudes and behaviors indicate mindfulness have a significantly different likelihood to earn high grades than when an indication of mindfulness is not evident?
    - $H_0$1. The likelihood of adolescents to earn high grades does not change if there is an indication of mindfulness.
    - H_a1. There is a significantly greater or a significantly lesser likelihood for adolescents to earn high grades if there is an indication of mindfulness.
- RQ2: To what extent do adolescents whose attitudes and behaviors indicate mindfulness have a significantly different likelihood of positive affective outcomes than when an indication of mindfulness is not evident?
    - $H_0$2. The likelihood of adolescents' positive affective outcomes does not change if there is an indication of mindfulness.
    - H_a2. There is a significantly greater or a significantly lesser likelihood of adolescents' positive affective outcomes if there is an indication of mindfulness.

Data Analysis Plan

My plan of analyzing the secondary data derived from the Profiles of student life: Attitudes and behaviors survey results included descriptive statistics related to the individuals who exhibited mindful attitudes and behaviors and those who did not. Agresti (2002) and Field (2013) suggested chi-square test and the use of contingency tables to tabulate frequencies of occurrences as an effective method of comparing two or more groups of variables to determine the significance of associative relationships among

them. The purpose of the chi-square in this research is to test whether any differences between the self-reported outcomes of the two groups of adolescents were due to chance or due to the introduced factor, the indicator of mindfulness.

Contingency tables are effective for comparing variable groups to determine the significance of association when variables are mutually exclusive and exhaustive (Agresti, 2002; Ingersoll, 2010; Jargowsky & Yang, 2005), which was determined by my choice of variables and data coding. As stated earlier, the rejection or confirmation of the null hypothesis of independence using chi-square statistics quantifies relationships among variables; however, these do not imply causation. The descriptive statistics and chi-square analyses were followed by logistic regression models, with the goal to establish the indication of mindfulness as a predictor of students' learning outcomes.

Regression analyses are performed when a researcher is interested in the nature of the relationships among variables and wants to make predictions about the dependent variable, the target, from variations in the independent variable, the predictor. In my research, I performed binary logistic regression analyses to explore the associative relationship between mindfulness, the predictor, and the target variables: academic achievement and affective learning outcomes of the A&B survey participants. Typically, regression analyses involve linear modeling, where the starting point is a set of observations and the goal is to establish the rate of increase or decrease of the dependent variable relative to increases and decreases in the independent variable (Fields, 2013). However, when the target variable has only two values, a linear regression analysis does not make sense, as it cannot generate a line that would fit the data. In this dissertation, the

values of “0” and “1” assigned to my dependent variables are chosen to indicate the presence or absence of an outcome. Thus, my regression analysis goal is not to predict the numerical value of the dependent variables, but to establish whether the probability of one learning outcome or another is affected by presence or absence of mindfulness. Researchers have an option of performing logistic regression analyses to generate models for predicting categorical outcomes (Field, 2013). Binary logistic regression fits models with two possible mutually exclusive outcomes and two or more predictor variables, and multinomial logistic regression is performed when the dependent variable is categorical or ordinal, mutually exclusive, but not dichotomous. My analytic design to answer research questions was to perform binary logistic regression model fitting. I used IBM Statistical Package for Social Sciences (SPSS) version 21 software for the data analysis. Data cleaning consisted of eliminating all surveys administered outside of the U.S., and extracting only the data records where the age of the respondent was between 14 and 18.

Threats to Validity

Threats to validity are present when conducting any survey study. Frankfort-Nachmias and Nachmias (1997) advised researchers to consider to what degree a study can measure what it is intended to measure. The concerns with the internal validity are whether the appropriate research instrument was selected, and do the conclusions accurately demonstrate the outcome. I have identified several internal validity threats. As stated earlier, the A&B survey was not designed as a mindfulness measurement tool. Extraction of survey questions as *mindfulness-type* indicators involved conjectures and assumptions. I also made assumptions related to survey administrators’ adherence to

Search Institute's published guidelines related to the planning process and execution of the survey studies. Another threat to the internal validity of this study was the use of self-reported data. Young individuals may find some of the survey questions to be invasive, uncomfortable, and possibly overwhelming. Despite multiple assurances of confidentiality and anonymity, the respondents may not answer truthfully. Selection and mortality, the other internal validity threats, were minimal in this study. The sample size was large, and the process of conducting the survey precluded mortality.

The concern with the external validity of a research study is whether its results are generalizable to the population. This study involved youth in many locations throughout the U.S., including rural, suburban, and urban areas. The data were comprised of results obtained in public as well as private school settings, and in out-of-school programs and clubs. Sampling procedures prescribed by Search Institute assured good representation of each local area where surveys took place. No groups or segments have been intentionally excluded during the data collection process. Thus, with the assumptions related to adherence to Search Institute's published guidelines, a large sample size, the geographic and demographic diversity, and the 1% margin of error described earlier, I contend that the results of this study can be generalized to the general population of adolescents in the United States.

Ethical Procedures

Access to the A&B survey electronic files was properly obtained from Search Institute (Appendix B). The research team employed by Search Institute removed all confidential information from the data set prior to providing this data set for my research.

All records contained in the electronic files I analyzed were anonymous and contained no identifying characteristics of individuals or groups that could connect the answers to individual participants. The Memorandum of Understanding with Search Institute details my limited, non-exclusive rights to conduct the analysis, interpretation, and dissemination of results related to this dissertation research. Search Institute's ownership of the data set is acknowledged throughout this dissertation study, and appropriate credits will be given for any future published or unpublished studies.

In accordance with the American Psychological Association (APA) guidelines, this study required approval from the Institutional Review Board (IRB) prior to conducting the data analysis (APA, 2009). The IRB application was submitted along with the dissertation proposal. It included detailed description of the study and the use of secondary data. Appendix E contains a copy of the IRB permission, obtained prior to the commencement of my research.

Summary

In this chapter, I described the design and methodology of conducting a non-experimental quantitative study, which involved an analysis of secondary data. The descriptive-comparative research method is appropriate for the stated research questions. I provided details on how the data were to be derived from the existing validated survey instrument, how this survey instrument was designed, and in what manner this instrument was used in obtaining the original set of data. The data analysis plan section offers the general outlook on the quantitative research methods I initially proposed for conducting

this research, including chi-square testing and binary logistic regression. In Chapter 4, I go over the various analyses in detail, and present the results of the study.

Chapter 4: Results

Introduction

The purpose of this descriptive-comparative study was to assess the significance of the association between adolescent students' indication of mindfulness and their learning outcomes, using a secondary data set. My research process involved several steps. First, I analyzed an original survey instrument developed by Search Institute to study positive youth development within the developmental assets framework (Benson & Scales, 2009; Leffert et al., 1998). I then extracted a subset of the survey questions relevant to my research, tested the validity and reliability of the potential groupings, and parsed the data set extracting a representative sample of the target population. The final step was to use quantitative research methods and IBM SPSS software to analyze the sample data. The descriptive statistics analyses provided information on the participants' characteristics and frequency counts for each of the derived research variables. Subsequent logistic regression analyses delivered results on the associative relationships between learning outcomes of adolescents whose attitudes and behaviors were determined to be mindful, and adolescents whose mindfulness could not be established. The research questions guided the study. I tested the null hypotheses of no difference in academic grades and in affective outcomes based on the presence or absence of mindfulness indicators. Alternative hypotheses stated that there would be a significantly different likelihood for adolescents (a) to earn high grades if there was an indication of mindfulness, and (b) to exhibit positive affective learning outcomes if there was an indication of mindfulness.

Data Collection and Selection

The secondary data used in this dissertation research were collected by Search Institute, my partnering organization, for the purposes of measuring developmental assets of youth. The data set provided to me by Search Institute consisted of 866 electronic files that contained answers to the 160-questions A&B survey administered to 287,657 school-age students in the United States and several other countries between September 2008 and May 2013. I described the design, purposes, administrative processes, the data collection procedures, and uses of the A&B survey in Chapter 3 of this dissertation. Search Institute transferred this data for my research with all sensitive information de-identified to preserve anonymity of the survey respondents. The data files were in SPSS format, accompanied by the list of file names, which contained the basic information on where and when the data in each file were collected. For each file name, the list identified the city or county, state or province, country, type of educational institution where the survey took place, number of students surveyed at that location, and the month and year of the survey administration or collection of the data.

Sample Selection

To develop a purposive sample of the target population for this study, I narrowed down the initial large dataset (N = 287,657) by applying the following three parameters. Because the target population of interest in this dissertation was adolescents residing in the United States, I excluded any data collected outside of the U.S. The remaining available 2008 – 2013 data on the U.S. school age children provided a larger than necessary sample size, based on the size requirements described in Chapter 3, Figure 2.

Thus, I excluded 3 of the 5 years of data, downloading into SPSS only the survey data collected after September 2011. Finally, I extracted only those records where the ages of survey respondents were between 14 and 18, inclusively.

This three-stage selection process delivered the sample containing 34,375 data records. With no other exclusions or inclusions of the survey data made or planned, I examined the geographic area coverage of the selected sample. It encompassed 112 unique locations in 51 cities within 22 of the U.S. states, as depicted in Figure 4.

Figure 4. *The map of geographic locations used in this research.*

Demographics

Descriptive characteristics of the participants represented in the dataset used in this research are outlined in Tables 1 through 6. The age (Table 1), gender (Table 2), race/ethnicity (Table 3), and other demographic characteristics were determined by the students' self-identification of their characteristics on the A&B multiple-choice questions. Twenty-four percent of the students in the sample were 14 years old at the time

of the survey, 25% were 15 years old, 20% were 16 years old, 22% were 17 years old, and 8% were18 years old (Table 1). There were few omissions in the data on gender, race, parental household structure, parents' level of education, and type of the community where the survey respondents reside, ranging from 0.2% to 3.2%. Fifty percent of the sample was women and 49% were men, with 1% missing responses (Table 2). The three highest race/ethnicity categories were Caucasian (74.1%), followed by 8.2% Hispanic, and 7.5% of more than one race or ethnicity (see Table 3 for additional details on the racial/ethnic composition of the sample.)

The age and gender characteristics of the sample were representative of the target population of interest for this study, as compared to the U.S. Census data (U.S. Census Bureau, 2012). In regards to the race and ethnicity characteristics, the A&B survey did not provide the same number of options for students of Hispanic origin as the U. S. Census survey. Table 3 includes a comparison of similar groupings, when applicable, between the race and ethnicity in this data sample and the general U.S. Census data.

Table 1

Age Distribution

Age	Frequency	Percent
14	8348	24.3
15	8620	25.1
16	6936	20.2
17	7601	22.1
18	2870	8.3
Total	34375	100.0

Table 2

Gender Distribution

	Gender	Frequency	Percent
Valid	Female	17180	50.0
	Male	16810	48.9
	Total	33990	98.9
System missing		385	1.1
Total		34375	100.0

Table 3

Race/Ethnicity Distribution & Comparison with U.S. Census

	Race/Ethnicity	A&B Survey		U.S. Census (%)		
		Frequency	%	Non-Hispanic	Hispanic	Total %
Valid	NativeAm/Alaskan	306	0.9	0.8	0.3	1.1
	Asian	993	2.9	4.5	0.1	4.6
	AfricanAm/Black	1293	3.8	12.3	0.6	12.9
	Hispanic/Latino	2820	8.2			-
	Hawaiian/Pacific	132	0.4	0.1		0.1
	White	25488	74.1	65.1	14.5	79.6
	Other	725	2.1			-
	More than one	2563	7.5	1.5	0.2	1.7
	Total	34320	99.8			-
System missing		55	0.2			-
Total		34375	100.0	84.2	15.8	100.0

Note. Census information extracted from the U.S. Census Bureau (2012) tables.

Although, as stated earlier, the multiple choice questions in the A&B survey did not provide the same number of options for students of Hispanic origin as the U. S. Census survey, the race and ethnicity characteristics of the A&B survey participants appear to moderately approximate the general census statistics. However, some U.S. population studies indicated that the racial and ethnic composition of the adolescent population may differ from the general census. For example, Colby and Ortman's (2015) study divided the U.S. Census Bureau's results and the 2014 projected national trends

into age categories. Colby and Ortman reported higher percentages of African Americans, Hispanics, and individuals with two or more racial or ethnic origins among children under 18 years of age as compared to adults 19 and older. The A&B data sample used in this research reflects lower than the general census percentages of African Americans and Hispanics, but higher than the general census percentages of respondents who identified themselves as belonging to more than one racial or ethnic group.

Additional socio-demographic characteristics of the data set in this study indicate that the selected sample reflects assortments of the living situations with parents or guardians (Table 4), the size and type of the community in which they live (Table 5), and their parents' levels of education (Table 6).

Table 4

Family Living Situation

	Lives with	Frequency	Percent
Valid	2 biological parents	21012	61.1
	2 adoptive parents	579	1.7
	half time mom/dad	2616	7.6
	single parent	4410	12.8
	1 bio parent 1 stepparent	3649	10.6
	1 bio parent 1 adoptive	238	.7
	foster parents	99	.3
	grandparents/relatives	680	2.0
	other living situation	817	2.4
	Total	34100	99.2
System missing		275	.8
Total		34375	100.0

Table 5

Living Area Type

	Type of Area Lives in	Frequency	Percent
Valid	on a farm	1643	4.8
	country not farm	4279	12.4
	Am.Indian reservation	315	.9
	small town under 2,500 pop	5749	16.7
	town 3,500-9,999 pop	8731	25.4
	small city 10,000-49,999 pop	6752	19.6
	medium size city 50,000-250,000 pop	4774	13.9
	large city over 250,000 pop	1025	3.0
	Total	33268	96.8
System missing		1107	3.2
Total		34375	100.0

Table 6

Parents' Levels of Education

		Father		Mother	
	Level of Education	Frequency	%	Frequency	%
Valid	grade school or less	971	2.8	889	2.6
	some high school	2306	6.7	1806	5.3
	completed high school	7823	22.8	6317	18.4
	some college	4246	12.4	5044	14.7
	completed college	9061	26.4	10986	32.0
	Grad/prof school after college	6492	18.9	6642	19.3
	don't know/does not apply	2580	7.5	1826	5.3
	Total	33479	97.4	33510	97.5
System missing		896	2.6	865	2.5
Total		34375	100.0	34375	100.0

Selection of Survey Questions

The A&B survey instrument is composed of 160 questions, with only a subset of these questions relevant for this study on mindfulness and learning outcomes. My preliminary selection of the relevant A&B survey questions is detailed in Appendix C. The validity and reliability testing of the proposed model selection, described later in this

chapter, necessitated several adjustments to the initial selection. The nature of the research questions guided the final selection of survey questions, the choice to use binary logistic regression analyses, and the recoding of the variables. Binary logistic regression is the recommended analytic procedure when the dependent variable, the learning outcome, is nominal with two values, and the predictor or explanatory variable is ordinal, interval, or categorical (Field, 2013). The main objective of this study, to determine whether there is an association between mindfulness and the presence or absence of positive learning outcomes in adolescence, guided the data coding process.

Data Coding

Certain statistical assumptions are required for the binary logistic regression analyses, to assure that the results are neither misleading nor erroneous and would be generalizable for the population. The first assumption is that the dependent variable is dichotomous. Each of the two dependent variables in this study, academic achievement and affective learning outcomes, were derived from students' responses to the A&B survey multiple-choice questions, and dichotomized through the targeted coding process.

For DV1, academic grades, I dichotomized students' responses to the survey question number 20 "What grades do you earn in school?" The top two answers, "mostly As" and "about half As and half Bs", were coded as "1", as these were indicative of high academic achievement, and all other responses as "0". The coding of the DV2, affect, involved combining four A&B survey questions, numbers 41, 76, 113, and 120, which jointly were indicative of the survey respondents' social and emotional attributes:

- A&B question 41 (Q41) “How much do you agree or disagree with the following?.. All in all, I am glad I am me”. The multiple-choice response options that the A&B survey offered were “strongly agree”, “agree”, “not sure”, “disagree”, and “strongly disagree”.
- A&B question 76 (Q76) “People who know me would say that this is... [like me] Being good at making and keeping friends”. The multiple-choice response options were “not at all like me”, “a little like me”, “somewhat like me”, “quite like me”, and “very much like me”.
- A&B question 113 (Q113) “How much do you agree or disagree with the following?.. Sometimes I feel like my life has no purpose”. The multiple-choice response options were “strongly agree”, “agree”, “not sure”, “disagree”, and “strongly disagree”.
- A&B question 120 (Q120) “How much do you agree or disagree with the following?.. When I am an adult, I’m sure I will have a good life”. The multiple-choice response options were “strongly agree”, “agree”, “not sure”, “disagree”, and “strongly disagree”.

I used the *Compute Variable* function in SPSS to divide the data set into two mutually exclusive groups. Code “1” indicated the positive affect group, assigned if the answers to all four of the affect indicators questions were positive (see Figure 5). This group provided answers “strongly agree” or “agree” to Q41 and Q120, “quite like me” or “very much like me” to Q76, and “disagree” or “strongly disagree” to Q113. Code “0” was

assigned to the remaining group; it reflected the absence of a consistent indication of positive affect.

Q41 All in all, I am glad I am me	strongly agree	agree	not sure	disagree	strongly disagree
Q76 Being good at making and keeping friends	not at all like me	a little like me	somewhat like me	quite like me	very much like me
Q113 Sometimes I feel like my life has no purpose	strongly agree	agree	not sure	disagree	strongly disagree
Q120 When I am an adult, I'm sure I will have a good life	strongly agree	agree	not sure	disagree	strongly disagree

Figure 5. *Computation of the dependent variable 2: positive affect indicator; highlights indicate positive affect answers.*

The frequencies of the dichotomous coding of the two dependent variables in this study, academic grades (DV1) and affective outcomes (DV2), are detailed in Table 7. The percentage split between high and low grade earners was 59% / 41%, and the percentage split between positive affect and lack of positive affect was 40% / 60%.

Table 7

Frequency Distribution of Dichotomously Coded Dependent Variables

	Grades coding	Frequency	%	Valid %	Affect coding	Frequency	%	Valid %
Valid	1=high grades (As&Bs)	20094	58.5	59.0	1=positive affect	13715	39.9	40.4
	0=lower(some Bs, mostly Cs Ds Fs)	13967	40.6	41.0	0=absence of positive affect indicator	20232	58.9	59.6
	Total valid	34061	99.1	100.0	Total valid	33947	98.8	100.0
System missing		314	0.9			428	1.2	
Total		34375	100.0			34375	100.0	

Another assumption required for proper use of binary logistic regression is that the model has minimal multicollinearity, i.e. each of the independent variables is independent from other variables (Allison, 2012). This assumption holds true because there is only one independent variable (IV) in this study, an indication of mindfulness. The mindfulness indication IV was derived from the adolescent participants' responses to a selected number of the A&B survey questions. The IV coding and the process of establishing validity and reliability of the selection of the mindfulness related questions are described in detail in the next section of this chapter.

The third assumption for conducting binary logistic regression analyses is a large sample size. I assured that the data set for this analysis exceeded the minimum specified for the required sample size based on the population size, the desired confidence level, and low margin of error. For the approximate population of youth between 14 and 18 years of age in the U.S., about 16.9 million, a 99% confidence level, and a 1% margin of error, the recommended sample size is 16,584 (see Figure 2 in chapter 3). Thus, my selected data set with responses from 34,375 adolescents was amply sufficient for proper execution of logistic regression analyses.

Independent Variable

In order to develop the independent variable (IV) for this study, an indication of mindfulness, I compared the A&B survey questions related to the attitudes and behaviors of youth with the questions in mindfulness measurement scales and indexes (presented in Appendix D) and extracted those that showed similarity. I then conducted several validity

and reliability analyses of the selected A&B survey questions. These consisted of the face validity, content validity, scale reliability, and the principal components analysis.

Face Validity

Face validity, also known as logical validity, is a subjective method to determine whether the item or items assess the concept of interest (Neuman, 2005). Multiple-choice answers to 12 survey questions, as I determined through informal consultations with others, were indicative of mindful or mindless attitudes or behaviors (Figure 6). Questions 8, 11, 14, 15, 33, 34, 35, 70, 79, 80, 119, and 141 exhibited sound face validity as potential mindfulness identifiers. It is recommended that validity be confirmed by soliciting opinions of others, such as the experts or skilled professionals in the area of inquiry (Bryman & Bell, 2003). I discussed this initial selection with several youth development professionals and educators involved in mindfulness trainings.

Questions 8, 11, 14, and 15:	
prompt	How important is each of the following to you in your life?
multiple-choice	1=not important, 2=somewhat important, 3=not sure, 4=quite important, 5=extremely important
Q8	Helping to make the world a better place in which to live
Q11	Getting to know people who are of a different race or ethnic group than I am
Q14	Doing what I believe is right, even if my friends make fun of me
Q15	Standing up for what I believe, even when it's unpopular to do so
Questions 33, 34, and 35:	
prompt	How often do you…?
multiple-choice	1=usually, 2=sometimes, 3=never
Q33	Come to classes without bringing paper or something to write with?
Q34	Come to classes without your homework finished?
Q35	Come to classes without your books?
Questions 70, 79, and 80:	
prompt	People who know me would say that this is…
multiple-choice	1=not at all like me, 2=a little like me, 3=somewhat like me, 4=quite like me, 5=very much like me
Q70	Thinking through the possible good and bad results of different choices before I make decisions
Q79	Being good at planning ahead
Q80	Taking good care of my body such as eating foods that are good for me, exercising regularly…
Questions 119 and 141:	
prompt	How much do you agree or disagree with the following?
multiple-choice	*1=strongly agree, 2=agree, 3=not sure, 4=disagree, 5=strongly disagree*
Q119	When things don't go well for me, I am good at finding a way to make things better
Q141	I have little control over the things that will happen in my life

Figure 6. *Initial 12 questions extracted from A&B to indicate survey participants' mindfulness or mindlessness.*

The subsequent steps were to establish the content validity of the selection and narrow down the combination of questions that would provide valid and reliable mindfulness indication content for the data analysis.

Content Validity

I developed a question-by-question matrix alignment between A&B questions and items in mindfulness measurement scales (see Appendix D for a list of the scales and

indexes.) This involved obtaining independent opinions of others, non-experts, unrelated individuals not vested in my research. I shared the initial selection of the A&B questions, along with the items extracted from the mindfulness measurement scales, with over 30 colleagues, friends, and fellow graduate students at Walden University and asked their opinions on the alignment. Sixteen individuals, all with college level education or higher, emailed their opinions to me in a form of an informal query. Instructions in the IRB Application, Form A, state that if a study involves "a trial run of survey or interview questions with acquaintances to give the applicant practice or logistical insights (with pilot data discarded)... [it] doesn't require prior IRB approval or a formal consent process" (Walden IRB, 2016).

The results of this validation, logistical insights from the acquaintances, provided the matrix alignment reflected in Table 8. A&B questions number 8, 14, 15, and 119 aligned with six questions or statements found in sociocognitive mindfulness scales LMS, LMS-14, and MMS. Questions number 33, 35, and 80 aligned with five questions or statements in contemplative mindfulness scales KIMS, MAAS-A, and MAAS-S. Question number 70 did not demonstrate a one-to-one alignment, but appeared to be indicative of a mixture of several questions or statements in mindfulness measurement scales. Questions number 11, 34, 79, and 141 did not demonstrate a good alignment. Therefore, I eliminated questions 11, 34, 79, and 141 from the final selection of mindfulness indication questions.

Table 8

Matrix of A&B Survey/Mindfulness Scales: Number of Peer Reviewers Who Found Alignment between Two Questions

Mindfulness Scales Questions		A&B Survey Questions					
		Q8	Q14	Q15	Q33&Q35	Q80	Q119
KIMS	I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted *r				10		
KIMS	I notice how foods and drinks affect my thoughts, bodily sensations, and emotions					16	
LMS	I "get involved" in almost everything I do		6				
LMS	I have an open mind about everything, even things that challenge my core beliefs		8				
LMS14	I like to figure out how things work						10
LMS14	I find it easy to create new and effective ideas.						14
MAAS-A	I do jobs or tasks automatically, without being aware of what I'm doing *r				8		
MAAS-A	I snack without being aware that I'm eating *r					13	
MAAS-S	Being without much awareness of what is done *r				11		
MMS	I am always open to new ways of doing things						14
MMS	I attend to the "big picture"	9					
MMS	I avoid thought provoking conversations *r			10			

Note. Numeric values indicate how many of 16 peer reviewers considered questions well aligned. Q33, Q35, and Q119 aligned with three mindfulness scales questions; Q14, Q35, and Q80 aligned with two mindfulness scales questions, Q8 and Q15 aligned with one mindfulness scale question. (Questions denoted with "*r" are posed in reverse.)

The input received from the experts and non-experts indicated that the total of eight questions, Q8, Q14, Q15, Q33, Q35, Q70, Q80, and Q119 would jointly provide a valid measure of the indication of mindfulness.

Scale Reliability

In parallel with the face validity and content validity inquiries, I conducted the scale reliability analyses in SPSS to determine the coefficient α for the questions selected to indicate mindfulness. The higher the coefficient α, the more confident researchers can be of the reliability and internal consistency of their chosen combination of measures (Cronbach, 1951; Field, 2013). In general, the range of coefficient values $1 \geq \alpha \geq .60$ would indicate a high to low reliability levels, the range $.60 > \alpha \geq .50$ would indicate poor but still existing reliability, and the values below .50 would not denote a reliable level of composite measures (George & Mallery, 2003). However, some scholars argue that low levels of coefficient α could be due to a number of factors such as a low number of questions in the scale or heterogeneity of the constructs (Osburn, 2000; Sijtsma, 2009; Tavakol & Dennick, 2011).

The results of the scale reliability analyses reflected in Tables 9 and 10 indicated an acceptable reliability and internal consistency of $\alpha = .74$ for the combination of 12 questions (Table 9) and a low level of reliability, $\alpha = .69$, for the combination of eight questions (Table 10):

Table 9

Coefficient Alpha – 12 Questions Measure

Reliability Statistics		Cronbach's Alpha	N of Items		
		.739	12		
Item-Total Statistics		Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q8	deg imp-make world better place to live	36.6157	33.069	.420	.715
Q11	deg imp-get know people of other race	36.9284	33.699	.339	.727
Q14	deg imp-do what believe is right	36.3384	32.600	.503	.705
Q15	deg imp-stand up for what believe	36.2819	33.119	.467	.710
Q33	freq-come to class w/o paper/pen/pencil	37.7384	37.025	.317	.730
Q34	freq-come to class w/ homework undone	38.1511	36.655	.342	.728
Q35	freq-come to class w/o books	37.8108	37.190	.276	.733
Q70	deg like me-weigh consequences deciding	36.8060	31.862	.481	.706
Q79	deg like me-good at planning ahead	37.1430	31.812	.432	.714
Q80	deg like me-good at take care of my body	36.7209	32.852	.380	.721
Q119	things go bad-good find way make better	36.7047	34.590	.360	.723
Q141	have little control what happens to me	36.8494	35.006	.224	.744

Table 10

Coefficient Alpha – 8 Questions Measure

Reliability Statistics		Cronbach's Alpha	N of Items		
		.685	8		
Item-Total Statistics		Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q8	deg imp-make world better place to live	24.1832	15.185	.401	.649
Q14	deg imp-do what believe is right	23.9078	14.587	.530	.616
Q15	deg imp-stand up for what believe	23.8497	14.925	.496	.626
Q33	freq-come to class w/o paper/pen/pencil	25.3073	18.095	.287	.676
Q35	freq-come to class w/o books	25.3794	18.206	.247	.681
Q70	deg like me-weigh consequences deciding	24.3770	14.611	.431	.642
Q80	deg like me-good at take care of my body	24.2886	15.395	.314	.676
Q119	things go bad-good find way make better	24.2735	16.402	.322	.668

As stated earlier, several researchers debated the usefulness of the coefficient α for multidimensional measures (e.g., Osburn, 2000; Sijtsma, 2009; Widhiarso, 2007). Osburn (2000) found α testing to be relatively robust for most composite measures, but noted that it may be a lower bound to the true reliability. Osburn reported "the tendency of coefficient alpha to underestimate the reliability because of item heterogeneity" (p. 344). In chapter 2 of this dissertation I pointed out the two distinctly separate strands of mindfulness research, Western and Eastern, and a large array of definitions of the term mindfulness (for a partial list see Appendix A). These explanations point out to the multidimensionality of mindfulness as a measure. Therefore, I considered the result of

my analyses with .69 <= α <=.74 to deliver a sufficiently good reliability level for of the selected combination of the A&B questions that would provide mindfulness indication covariates. The next test, the Principal Components Analysis (PCA), confirmed the selection of the eight-question measure of mindfulness.

Principal Components Analysis

An analysis recommended to streamline the number of components when formulating new variables is the principal components analysis. PCA helps with the reduction of dimensionality by identifying questions that may be redundant or extraneous (Chatfield & Collins, 1980). Table 11 presents the result of running the Kaiser-Meyer-Olkin (KMO) statistic to assess the adequacy of reducing the initial selection to eight mindfulness indication questions. The .701 KMO was greater than the recommended minimum of .600 and the Bartlett's test was significant at p<.001. The variance explained by each of the eight selected questions along with the cumulative variance is presented in Table 12.

Table 11

KMO Measure of Sampling Adequacy

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.701
Bartlett's Test of Sphericity	Approx. Chi-Square	48533.566
	df	28
	Sig.	0.000

Table 12

PCA Variances Explained

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.573	32.162	32.162	2.573	32.162	32.162
2	1.317	16.457	48.620	1.317	16.457	48.620
3	1.074	13.422	62.042	1.074	13.422	62.042
4	.751	9.393	71.435			
5	.715	8.935	80.370			
6	.689	8.609	88.979			
7	.592	7.400	96.379			
8	.290	3.621	100.000			

Extraction Method: Principal Component Analysis.

Examination of the eigenvalues and the PCA scree plot indicated that only the first three components had the magnitude above 1.0. The proposed naming of these three components stems from considering the variety of definitions of the term mindfulness detailed in Chapter 2 and Appendix A. Examination of the rotated component loadings presented in Table 13 conveyed that all eight A&B questions selected to indicate mindfulness had presence in these first three principal components:

- Rotated factors Q14, Q15, and Q8 had high positive loadings on the first principal component, which I identified as “purposeful attention to others, or outer-awareness”, and low loadings on the second and third components.

- Q80 and Q70 had high positive loadings on the second component, which I identified as “purposeful perception of self, or inner-awareness”, and low loadings on the first and third components.
- Q35 and Q33 had high positive loadings on the third principal component, which I identified as “absence of mindlessness, or situational awareness”, and low loadings on the first and second components.
- Q119 had high positive loading on the second component, low loading on the first component, and negative loading on the third component.

Table 13

PCA Rotated Components

Rotated Component Matrix[a]

	Components (with proposed name attribution)		
	1 “attention to others”	2 “perception of self”	3 “non-mindlessness”
Q14 deg imp-do what believe is right	.882	.096	.071
Q15 deg imp-stand up for what believe	.876	.073	.040
Q8 deg imp-make world better place to live	.614	.197	.077
Q80 deg like me-good at take care of my body	.039	.762	.079
Q119 things go bad-good find way make better	.115	.731	-.017
Q70 deg like me-weigh consequences deciding	.287	.557	.244
Q35 freq-come to class w/o books	.040	.081	.829
Q33 freq-come to class w/o paper/pen/pencil	.100	.089	.820

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 4 iterations.

Coding of the Composite Mindfulness Indication Variable

Upon conducting the face validity, content validity, reliability, and principal components analyses, I computed the composite measure of mindfulness indication in SPSS. The composite mindfulness IV, which I labeled MF_80_119_8_14_15_33_35_70, is a dichotomous variable. Using SPSS Compute Variable option, I divided the data set into two mutually exclusive groups. I assigned code "1" if the answers to Q80, Q119, Q8, Q14, Q15, Q33, Q35, and Q70 indicated mindfulness, and code "0" if any of the answers to the eight selected questions did not indicate mindfulness (Figure 7).

Q80	Taking good care of my body such as eating foods that are good for me, exercising regularly…	not at all like me	a little like me	somewhat like me	quite like me	very much like me
Q119	When things don't go well for me, I am good at finding a way to make things better	strongly agree	agree	not sure	disagree	strongly disagree
Q8	Helping to make the world a better place in which to live	not important	somewhat important	not sure	quite important	extremely important
Q14	Doing what I believe is right, even if my friends make fun of me	not important	somewhat important	not sure	quite important	extremely important
Q15	Standing up for what I believe, even when it's unpopular to do so	not important	somewhat important	not sure	quite important	extremely important
Q33	Come to classes without bringing paper or something to write with?	usually	sometimes	never		
Q35	Come to classes without your books?	usually	sometimes	never		
Q70	Thinking through the possible good and bad results of different choices before I make decisions	not at all like me	a little like me	somewhat like me	quite like me	very much like me

Figure 7. *Computation of the composite independent variable: highlights indicate answers indicative of mindful attitudes or behaviors.*

Statistical analyses conducted in SPSS consisted of cross-tabulation of the variables and regression analyses. The purpose of nonparametric correlations and cross-tabulations was to identify relationships between adolescents' mindfulness indication and academic grades (DV1), and between mindfulness indication and affective learning

outcomes (DV2). Cross-tabulations and chi-square tests of independence provided the information on the dependent variables' observed numbers, percentages within the independent variables, correlation coefficients, the direction of the relationships, and significance measures. I report the outcomes of these analyses later in the study results section of this chapter.

The purpose of logistic regression analyses was to establish the probabilities of academic and affective learning outcomes without and with mindfulness indication covariates. Due to dichotomy of each of the outcome parameters, academic grades and affective learning, the selected analytical method was binary logistic regression rather than linear regression. The standard binary regression model investigates the effect of one or more explanatory or predictor variables (covariates) on a dichotomously coded outcome variable (Field, 2013; Harrell, 2015). The binary logistic regression analyses were conducted to determine whether mindfulness indication could predict high level of academic grades and positive affective outcomes in adolescence, and to estimate the effect size of the predictor IV mindfulness on the DVs.

For each of the research questions I conducted two binary logistic regression analyses. The first analysis combined the eight A&B questions selected to indicate mindfulness as the predictor covariates, which were entered stepwise. The second binary logistic regression analysis examined the dichotomous composite mindfulness variable as the sole predictor of DV1 and then DV2.

Data Quality Assurance

To assure that the data I intended to use for the statistical analyses were within the appropriate coding ranges, I performed several levels of checking. First, I chose to obtain the data from Search Institute, my partnering organization, where the research team was obligated to follow a strict protocol on ensuring data quality (Search, n.d.). The data set Search Institute provided for my study already excluded all surveys with multiple unanswered questions (40 or more), surveys that contained incongruent or not viable responses, and surveys that were determined to demonstrate other data inconsistencies. As described in prior chapters, the survey administration manual (Search, 2012a) stated that the quality assurance process generally results in eliminating between 5% and 8% of total surveys used in the DAY research. Thus, the data set I worked with had substantially reduced instances of missing data and answers to survey questions outside of the allowable range. Secondly, all of the information was obtained in electronic format, which precluded any data entry errors.

Additionally, the process of extracting the A&B survey questions for this research, my exhaustive selection of the variables, the process of re-coding of the variables, and computation of the composite mindfulness IV allowed for several levels of cross-checking of the data used in the statistical analyses. The data for each of the variables were checked for within the range codes using SPSS. The final sample excluded all of the responses outside of the range, but contained data units with no responses. These instances of "system missing" frequencies and percentages, reported in Tables 2, 3, 4, 5, 6, and 7, comprised very small fractions of the data. Gender distribution (Table 2)

contained 98.9% valid responses, race/ethnicity (Table 3) contained 99.8% valid responses, living situation (Table 4) contained 99.2% valid responses, living area type (Table 5) contained 96.8% valid responses, and level of parents' education (Table 6) contained 97.4% valid responses for fathers and 97.5% valid responses for mothers. The process of dichotomously coding the two dependent variables (Table 7) resulted in 99.1% valid academic grades codes and 98.8% valid affective outcomes codes.

Level of Significance

In quantitative research, the level of significance α is specified prior to conducting the data analyses (Field, 2013). The Type I error rate is affected by the α level, i.e. the smaller the α, the lower is the likelihood of rejecting a correct null hypothesis. Social, behavioral, and educational science researchers usually set the level at $\alpha<.05$. However, I chose a more conservative level of $\alpha<.001$, following the recommendations (e.g., Browne & Cudeck, 1993; Field, 2013) that hypothesis testing using large samples be conducted at substantially smaller significance levels.

As described in chapter 3, I chose a large sample size for this study based on a number of considerations. Researchers who are able to obtain large samples for their studies benefit from the increase in power (Cohen, 1988, 1992a, 1992b). Additionally, large sample size is recommended to conduct data analyses through stepwise regression method (Tabachnick & Fidell, 1996), to better represent the characteristics of the population (Cronbach, Gleser, Nanda, & Rajaratnam, 1972), to achieve adequate logistic regression frequencies (Fidell & Tabachnick, 2003), and to increase the effect size of the analytic result (Field, 2013).

Establishing a conservatively low α level of significance lowers the likelihood of a Type I error but would not preclude a Type II error, i.e. accepting the null hypothesis that is false. A recommended way of controlling for Type II error rate is to select an adequate sample size (Cohen, 1992a). A large sample size would generally provide more power to a statistical test. The power analysis establishes the probability of successfully detecting an effect of a particular size.

A Priori Power Analysis

Using the G*Power 3.1.9 software program, I conducted a power analysis for the proposed model. The software does not offer an option to calculate output parameters for the use in binary logistic regression analysis, but has a number of supplementary alternatives. I first chose the χ^2 for contingency tables option, indicating eight degrees of freedom, the minimum α of .001, and the maximum power of 0.999. The output calculated the minimal sample sizes of >= 234 for large, >= 640 for medium, >= 5,841 for small effect size results, and >= 23,361 that would detect even a trivial effect. The next option, linear multiple regression for F test, calculated with eight predictors, the minimum α of .001 and the maximum power of 0.999, determined the sample size for large, medium, and small effect size >= 181, >= 403, and >= 2,934 respectively, and >= 11,694 to detect a trivial effect. These estimates confirmed that my selected sample of 34,375 survey responses was more than adequate to achieve the high level of power.

Study Results

The main objective of the cross-tabulation analyses and subsequent binary logistic regression analyses was to answer the following research questions and test the research hypotheses for each question:

- RQ1: To what extent do adolescents whose attitudes and behaviors indicate mindfulness have a significantly different likelihood to earn high grades than when an indication of mindfulness is not evident?
    - $H_0$1: The likelihood of adolescents to earn high grades does not change if there is an indication of mindfulness.
    - H_a1: There is a significantly greater or a significantly lesser likelihood for adolescents to earn high grades if there is an indication of mindfulness.
- RQ2: To what extent do adolescents whose attitudes and behaviors indicate mindfulness have a significantly different likelihood of positive affective outcomes than when an indication of mindfulness is not evident?
    - $H_0$2: The likelihood of adolescents' positive affective outcomes does not change if there is an indication of mindfulness.
    - H_a2: There is a significantly greater or a significantly lesser likelihood of adolescents' positive affective outcomes if there is an indication of mindfulness.

Cross Tabulation Analyses, RQ1

The purpose of cross-tabulations was to analyze the relationship between adolescents' indication of mindfulness and earning higher academic grades. I examined

the Spearman's correlation coefficients, a nonparametric measure. Unlike Pearson's correlation, the Spearman's test does not require the variables to be of continuous type, nor does it entail assumptions of linearity and normal distribution. I also examined the distribution of the counts and percentages of DV1 within each of the eight mindfulness indication questions and within the composite mindfulness indication IV.

Spearman's rho (r_s) which evaluates the strength and direction of a relationship between paired data, indicated positive but weak correlations between academic grades and mindfulness indication questions. The strength of relationship ranged from very weak for GRADES * Q15 at $r_s(4)=.09$, $p<.001$, to weak for GRADES * Q33 at $r_s(4)=.23$, $p<.001$ (see Appendix F for details on all of the r_s coefficients and the distribution of counts and percentages).

The results of the cross-tabulation analysis of academic grades in conjunction with the composite mindfulness indication variable, MF_80_119_8_14_15_33_35_70, are listed in Table 14, followed by the graphic representation (Figure 8) which visually demonstrates the percentage variances and trends.

Table 14

*Composite Mindfulness Indication * GRADES Cross-tabulation*

			GRADES		
			low (Cs Ds Fs)	high (As & Bs)	Total
Mindfulness-composite	lack of MF indication	Count	12996_a	16148_b	29144
		% within Mindfulness-composite	44.6%	55.4%	100.0%
		% within GRADES	93.3%	80.9%	86.0%
		% of Total	38.4%	47.7%	86.0%
	MF indication	Count	929_a	3810_b	4739
		% within Mindfulness-composite	19.6%	80.4%	100.0%
		% within GRADES	6.7%	19.1%	14.0%
		% of Total	2.7%	11.2%	14.0%
Total		Count	13925	19958	33883
		% within Mindfulness-composite	41.1%	58.9%	100.0%
		% within GRADES	100.0%	100.0%	100.0%
		% of Total	41.1%	58.9%	100.0%

Each subscript letter denotes a subset of GRADES categories whose column proportions do not differ significantly from each other at the .05 level.

The strength of the relationship between the variables was low-positive and statistically significant at $r_s(1)=.18$, $p<.001$. Although all adolescents were more likely to report earning higher grades, 58.9%, the percentage of high grades was proportionally higher for mindful adolescents, 80.4%, as compared to adolescents lacking mindfulness indication, 55.4%. Figure 8 shows the distribution of the DV1 (grades) within the dichotomously coded mindfulness indication composite IV.

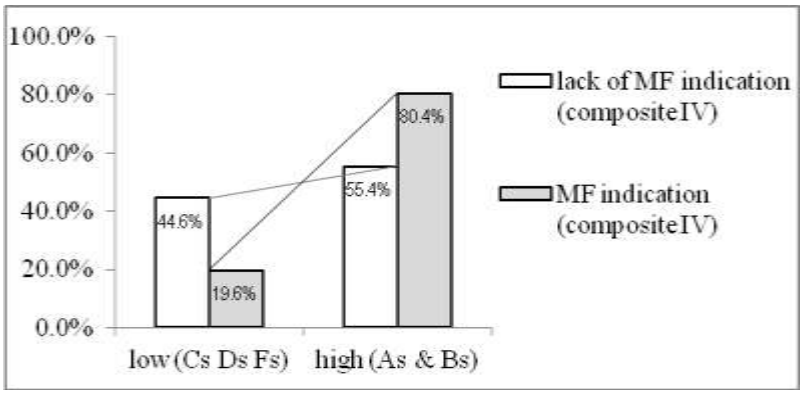

Figure 8. *Percentage distribution of DV1 (grades) within mindfulness indication composite IV, extracted from cross-tabulation tables*.

The χ^2 statistics comparing the actual frequencies of DV1 to the frequencies expected under the null hypothesis were highly significant at $p<.001$ for each of the eight selected mindfulness indication questions and for the composite mindfulness indication IV, although the strength of correlation coefficients was weak. Based on the results of these analyses, I concluded that mindful adolescents were slightly better academically than adolescents whose attitudes and behaviors did not indicate mindfulness. The statistically significant association among the variables indicated that we ought to reject the null hypothesis for RQ1. Cross-tabulation analyses were followed by two binary logistic regression analyses to further confirm this determination.

Binary Logistic Regression, RQ1

The first binary logistic regression analysis confirmed the significance of the association, and established the value of mindfulness indication covariates as valid predictors of academic achievement. A stepwise method of entering the eight mindfulness indication covariates into the logistic regression compared two models, the

frequencies of high and low grades without and with mindfulness indication covariates. The block 0 results listed in Table 15 indicated that 59.3% of adolescents were expected to earn high grades in the basic model, before the mindfulness indication covariates were introduced. The block 1 results (Table 16) demonstrated that the new model correctly classified 83.8% high grades earners in the sample, but only 39.4% of low grades earners. Overall, the model delivered correct predictions at the rate of 65.7%. Compared with the 59.3% in the basic model, the inclusion of the A&B mindfulness indication questions has improved the prediction accuracy 1.11 times.

Table 15

Block 0 (Beginning Block) - Mindfulness and Grades

Classification Table[a,b]

Observed			Predicted Q20 GRADES		
			low Cs Ds Fs	high As & Bs	% Correct
Step 0	Q20 GRADES	low Cs Ds Fs	0	13349	0.0
		high As & Bs	0	19475	100.0
	Overall Percentage				59.3

a. Constant is included in the model.

b. The cut value is .500

Table 16

Block 1 (Method = Enter) - Mindfulness and Grades

Classification Table[a]

Observed			Predicted Q20 GRADES		
			low Cs Ds Fs	high As & Bs	% Correct
Step 1	Q20 GRADES	low Cs Ds Fs	5261	8088	39.4
		high As & Bs	3162	16313	83.8
	Overall Percentage				65.7

a. The cut value is .500

The results in Table 17 indicate that mindfulness was overall a significant predictor of higher academic grades, however the likelihood varied by covariate. The covariate Q15 was negative and not statistically significant to predict higher grades, β=-.007, χ^2 (1)=.168, p=.682. The covariate Q8 at β=.029, χ^2 (1)=6.142, p=.013 was slightly less significant than the conservative significance level of α<.001, which I have established for this study. The remaining six covariates were statistically significant (p<.001). The Wald statistic, which establishes the contribution of each covariate as a predictor while controlling for other predictors, tested at p<.001 level for Q14, Q33, Q35, Q70, Q80, and Q119. Thus, there was a statistically significant association between mindfulness indication and adolescents' academic achievement. The likelihood of high academic grades measured by Exp (β) was above 1.0 level for all mindfulness indication covariates except Q15.

Table 17

Variables in the Equation - Mindfulness and Grades

Variables in the Equation								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Q80	.156	.010	231.189	1	.000	1.169	1.146	1.193
	Q119	.099	.013	59.105	1	.000	1.104	1.077	1.133
	Q8	.029	.012	6.142	1	.013	1.030	1.006	1.054
	Q14	.066	.016	16.141	1	.000	1.068	1.034	1.103
	Q15	-.007	.016	.168	1	.682	.993	.962	1.026
	Q33	.477	.022	479.963	1	.000	1.611	1.544	1.682
	Q35	.334	.021	263.328	1	.000	1.396	1.341	1.454
	Q70	.251	.011	515.403	1	.000	1.285	1.257	1.313
	Constant	-3.885	.088	1949.673	1	0.000	.021		

a. Variable(s) entered on step 1: Q80, Q119, Q8, Q14, Q15, Q33, Q35, Q70.

The Omnibus Tests of Model Coefficients (Table 18) examined the null hypothesis that adding the mindfulness indication covariates to the model would not significantly change the prediction of higher academic grades. The output of the logistic regression analyses produced χ^2 (8)=3468.231, p<.001, which indicated a statistically significant improvement in the model. The results of the binary logistic regression analyses resulted in the rejection of the null hypothesis $H_0$1. The likelihood of adolescents to earn high grades was significantly higher if there was an indication of mindfulness; the H_a1: was confirmed.

Table 18

Omnibus Tests of Model Coefficients - Mindfulness and Grades

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	3468.231	8	0.000
	Block	3468.231	8	0.000
	Model	3468.231	8	0.000

Effect Size, RQ1

The established statistical significance of the analytic results may still be questionable, especially if the sample size is too small or too large (Allen & Le, 2008; Coe, 2002). Effect size is the measure that quantifies the extent of the difference between the two models. Analyses involving very large datasets, as in this study, are likely to show significant result although the actual effect size could be very small (Coe, 2002). Several measures have been developed to assess the effect size of logistic regression results (Allen & Le, 2008; Cohen, 1988, 1992a, 1992b; Smith & McKenna, 2013): the adjusted odds-ratio, parameter β, partial η^2, the difference in the log-likelihood (-2LL) between models, and pseudo R^2 goodness-of-fit statistic. SPSS program outputs of the binary logistic regression include -2LL, Cox and Snell R^2, and Nagelkerke R^2. The Cox and Snell R^2 measure is similar to the R^2 in multiple regression but its upper limit is less than 1. Nagelkerke R^2 is a modification of the Cox and Snell R2 measure, more comparable to multiple regression R^2 (Hair, Anderson, Tatham, & Black, 1998).

The model in step 1 explained between 10.0% (Cox & Snell R^2) and 13.5% (Nagelkerke R^2) of the percentage of variance in the DV1 (academic grades) attributable

to the mindfulness covariates Q80, Q119, Q8, Q14, Q15, Q33, Q35, and Q70 (Table 19). The R^2 value within the range of .059 <= R^2 < .138 indicates a medium effect size of the difference between the initial model (no mindfulness indication) and the new model. The detected differences in this analysis, Nagelkerke R^2 = .135, were overall medium in magnitude.

Table 19

Model Summary - Mindfulness and Grades

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	40885.457[a]	.100	.135

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Composite Mindfulness IV in Logistic Regression, RQ1

The next analysis, the binary logistic regression with the composite independent variable MF_80_119_8_14_15_33_35_70 entered as the sole covariate, tested the strength of the dichotomous IV as a predictor of academic achievement. The results were positive and significant at β=1.194, χ^2 (1)=964.919, p<.001 (Table 20). The odds of reporting high grades were 3.301 times higher for altogether mindful adolescents than for adolescents whose attitudes and behaviors did not indicate mindfulness. However, the effect size was lower than in the stepwise model, Cox and Snell R^2 = .033 and Nagelkerke R^2 = .045 (Table 21). The value within the range of .010 <= R^2 < .059 indicates a small effect size of the new model. This means that as a possible explanatory

variable, mindfulness indication would be a weak yet theoretically meaningful predictor of high academic grades. The detected difference, Nagelkerke R^2 = .045, was small.

Table 20

Variables in the Equation – Composite Mindfulness Indicator and Grades

Variables in the Equation									
								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	MF_80_119_8_14_15_33_35_70	1.194	.038	964.919	1	.000	3.301	3.061	3.559
	Constant	.217	.012	339.561	1	.000	1.243		

a. Variable(s) entered on step 1: MF_80_119_8_14_15_33_35_70.

Table 21

Model Summary - Composite Mindfulness Indicator and Grades

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	44750.819a	.033	.045

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Cross Tabulation Analyses, RQ2

The Spearman's rho indicated positive, weak to moderate, correlations between affective outcomes and mindfulness indication questions. The strength of relationship ranged from very weak for AFFECT * Q8 at $r_s(4)=.12$, $p<.001$ to moderate correlation for AFFECT * Q119 at $r_s(4)=.40$, $p<.001$ (see Appendix G for details on r_s coefficients for other variables and distributions of the counts and percentages). The results of the

cross-tabulation analysis of affective outcomes in conjunction with the composite mindfulness indication variable appear in Table 22 and are visually represented by the graph in Figure 9.

Table 22

*Composite Mindfulness Indication * AFFECT Cross-tabulation*

			AFFECT		
			less than positive	positive affect	Total
Mindfulness-composite	lack of MF indication	Count	18852_a	10265_b	29117
		% within Mindfulness-composite	64.7%	35.3%	100.0%
		% within AFFECT	93.4%	75.1%	86.0%
		% of Total	55.7%	30.3%	86.0%
	MF indication	Count	1329_a	3399_b	4728
		% within Mindfulness-composite	28.1%	71.9%	100.0%
		% within AFFECT	6.6%	24.9%	14.0%
		% of Total	3.9%	10.0%	14.0%
Total		Count	20181	13664	33845
		% within Mindfulness-composite	59.6%	40.4%	100.0%
		% within AFFECT	100.0%	100.0%	100.0%
		% of Total	59.6%	40.4%	100.0%

Each subscript letter denotes a subset of AFFECT categories whose column proportions do not differ significantly from each other at the .05 level.

The strength of the relationship between the variables was positive and statistically significant at $r_s(1)=.26$, $p<.001$. In contrast with the DV1 (grades) and mindfulness indication distribution reported earlier, for DV2 a smaller percentage of adolescents exhibited positive affect overall, 40.4%. However, the percentage of adolescents who reported positive affect was significantly higher for mindful adolescents, 71.9% as

compared with the percentages of adolescents lacking mindfulness indication who exhibited positive affect, 35.3%. Figure 9 presents the distribution of the DV2 (affect) within the dichotomously coded mindfulness indication composite IV:

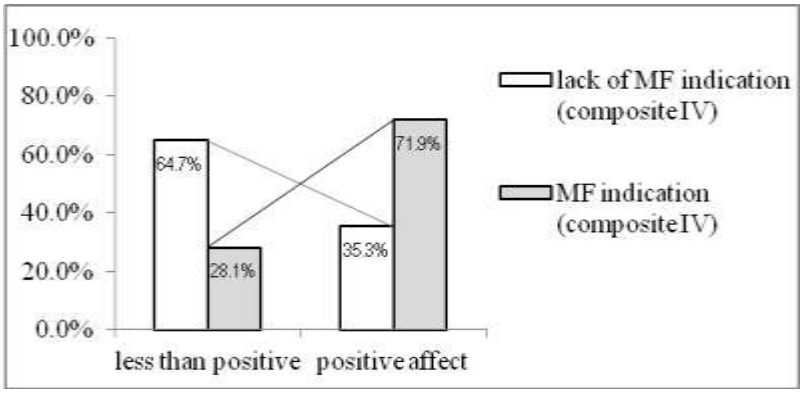

Figure 9. *Percentage distribution of DV2 (affect) within mindfulness indication composite IV, extracted from cross-tabulation tables.*

The χ^2 statistics comparing the actual frequencies of DV2 (affect) to the frequencies expected under the null hypothesis were highly significant, at $p<.001$, for each of the eight selected mindfulness indication questions and for the composite mindfulness indication IV. The correlation coefficients were weak to moderate. Based on the results of these analyses, mindful adolescents demonstrated higher positive affective outcomes than adolescents whose attitudes and behaviors did not indicate mindfulness. The statistically significant association of the variables indicated that we ought to reject the null hypothesis for RQ2. Cross-tabulation analyses were followed by two binary logistic regression analyses to further confirm this determination.

Binary Logistic Regression, RQ2

The binary logistic regression analysis further confirmed the significance of the association, and established the value of mindfulness indication covariates as valid predictors of positive affective outcomes. A stepwise method of entering the eight mindfulness indication covariates into the binary logistic regression analysis compared two models, the frequencies of affective outcomes without and with mindfulness indication covariates. The block 0 results listed in Table 23 indicated that 59.1% of adolescents were expected to exhibit positive affect in the basic model, before any of the mindfulness indication covariates were introduced. The block 1 results (Table 24) demonstrated that the new model correctly classified 59.2% participants with positive affective outcomes in the sample and 78.0% participants without positive affective outcomes. Overall, the model delivered correct predictions at the rate of 70.3%. Compared with the 59.1% in the basic model, the inclusion of the A&B mindfulness indication questions has improved the prediction accuracy 1.19 times.

Table 23

Block 0 (Beginning Block) - Mindfulness and Affect

Classification Table[a,b]

Observed			Predicted AFFECT		% Correct
			.00	1.00	
Step 0	AFFECT	.00	19470	0	100.0
		1.00	13501	0	0.0
	Overall Percentage				59.1

a. Constant is included in the model.
b. The cut value is .500

Table 24

Block 1 (Method = Enter) - Mindfulness and Affect

Classification Table[a]

Observed			Predicted AFFECT .00	Predicted AFFECT 1.00	% Correct
Step 1	AFFECT	.00	15177	4293	78.0
		1.00	5508	7993	59.2
	Overall Percentage				70.3

a. The cut value is .500

The results detailed in Table 25 indicated that mindfulness indication covariates were overall significant in predicting affective learning outcomes. However, the likelihood varied by covariate, and only five out of the eight covariates achieved statistical significance. Covariates Q8, Q14, and Q15 were not statistically significant to predict affective outcomes, at p=.191, p=.280, and p=.129 respectively. However, the Wald statistic tested at p<.001 level for Q33, Q35, Q70, Q80, and Q119. The strongest predictors were covariates Q119, β=.870, χ^2 (1)=2786.876, p<.001, and Q80, β=.400, χ^2 (1)=1176.482, p<.001. The overall results showed a significant association between mindfulness indication covariates and affective learning outcomes. The likelihood of positive affect measured by Exp (β) was above 1.000 level for all mindfulness indication covariates.

Table 25

Variables in the Equation - Mindfulness and Affect

Variables in the Equation								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Q80	.400	.012	1176.482	1	.000	1.492	1.458	1.526
	Q119	.870	.016	2786.876	1	.000	2.387	2.311	2.465
	Q8	.017	.013	1.713	1	.191	1.017	0.992	1.043
	Q14	.020	.018	1.166	1	.280	1.020	0.984	1.057
	Q15	.028	.018	2.304	1	.129	1.028	.992	1.065
	Q33	.187	.024	59.138	1	.000	1.206	1.150	1.265
	Q35	.148	.023	42.631	1	.000	1.160	1.110	1.213
	Q70	.166	.012	187.807	1	.000	1.181	1.153	1.209
	Constant	-6.883	.109	3985.621	1	0.000	.001		

a. Variable(s) entered on step 1: Q80, Q119, Q8, Q14, Q15, Q33, Q35, Q70.

The Omnibus Tests of Model Coefficients (Table 26) demonstrated a significant improvement in the model, χ^2 (8)=7724.977, p<.001. The overall results of the binary logistic regression analyses indicated that the null hypothesis $H_0$2 ought to be rejected. There was a significantly greater likelihood for adolescents to report positive affective outcomes if there was an indication of mindfulness; the H_a2: was confirmed.

Table 26

Omnibus Tests of Model Coefficients - Mindfulness and Affect

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	7724.977	8	0.000
	Block	7724.977	8	0.000
	Model	7724.977	8	0.000

Effect Size, RQ2

The model in step 1 explained between 20.9% (Cox & Snell R^2) and 28.2% (Nagelkerke R^2) of the percentage of variance in the DV1 (affective outcomes) attributable to the mindfulness covariates Q80, Q119, Q8, Q14, Q15, Q33, Q35, and Q70 (Table 27). The Nagelkerke R^2 value above the effect size threshold of .138 indicates a large effect size of the difference between the initial model (no mindfulness indication) and the new model. The detected difference, Nagelkerke R^2 = .282, revealed large effect size.

Table 27

Model Summary - Mindfulness and Affect

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	36895.938a	.209	.282

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Composite Mindfulness IV in Logistic Regression, RQ2

The binary logistic regression analysis with the composite independent variable MF_80_119_8_14_15_33_35_70 as the sole covariate tested the strength of the dichotomous mindfulness indication IV as a predictor of affective learning outcomes. The results detailed in Table 28 were positive and significant at β=1.547, χ^2 (1)=1998.978, p<.001. The odds of reporting positive affect were 4.697 times higher for altogether mindful adolescents than they for adolescents whose attitudes and behaviors did not indicate mindfulness. Similar to the results for RQ1, for the RQ2 the effect size with only

the MF_80_119_8_14_15_33_35_70 in the model was lower than in the stepwise model, Cox and Snell R^2 = .064 and Nagelkerke R^2 = .087. The Nagelkerke R^2 value within the range of .059 <= R^2 < .138 indicated a medium effect size of the new model. The effect size level suggested that mindfulness indication was a good predictor of affective outcomes in adolescence.

Table 28

Variables in the Equation – Composite Mindfulness Indicator and Affect

Variables in the Equation									
								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	MF_80_119_8_14_15_33_35_70	1.547	.035	1998.978	1	.000	4.697	4.389	5.027
	Constant	-.608	.012	2455.862	1	.000	0.545		

a. Variable(s) entered on step 1: MF_80_119_8_14_15_33_35_70.

Table 29

Model Summary - Composite Mindfulness Indicator and Affect

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	43410.946[a]	.064	.087

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Goodness of Fit Tests, RQ1 and RQ2

The Hosmer and Lemeshow goodness of fit test is used in logistic regression analyses to examine how well the predictions under the new model fit with the observed

outcomes (Allison, 2014). The Hosmer and Lemeshow values were χ^2 (8)=35.978, p<.001 for RQ1 and χ^2 (8)=82.313, p<.001 for RQ2. Since this is a test of the null hypothesis that model predictions fit perfectly with the actual data, the significance level below α=.001 level indicated lack of fit for both models. However, the *p*-value in this measure is very dependent on the size of the data set (Hosmer, Lemeshow, & Sturdivant, 2013). When the sample is very large, in thousands, the Hosmer and Lemeshow test may reach a high degree of significance even when the model fit is good. I discuss the outcomes of this analysis further in Chapter 5 and offer recommendations to partition the data to conduct future goodness of fit analyses.

Summary

In this study, I worked with a large set of secondary data, N = 34,375, which was demonstrated to be of adequate size for conducting statistical tests proposed for this research. The sample, extracted from Search Institute' nationwide survey *Profiles of student life: Attitudes and behaviors*, was demographically and geographically diverse, and representative of the target population of high school-age adolescents between the ages of 14 and 18. Tables 1 through 6 and Figure 4 show demographic and geographic details of the sample. I also described the process of establishing which questions from the original survey were in line with the variables of interest in this study. Validity and reliability analyses confirmed that survey results and the selection of variables were suitable for conducting research on mindfulness and learning in adolescence.

I tested two research questions and associated hypotheses, and found the results to be statistically significant in both instances. Significant differences in academic grades

and in affective learning outcomes were observed in adolescents whose attitudes and behaviors were indicative of mindfulness.

Results of cross-tabulation analyses indicated that although all adolescents were more likely to earn high academic grades, i.e. 58.9% reporting As and Bs and 41.1% reporting lower grades, this distribution was stronger for mindful adolescents, 80.4% and 19.6% respectively. Dichotomously coded academic grades DV1 and eight mindfulness indication variables showed low positive correlations within the range of $.09 <= r_s <= .23$. All pairwise comparisons achieved high significance level of $\alpha<.001$. These results pointed toward rejecting the null hypothesis of no association for the first research question.

Binary logistic regression analyses of mindfulness and grades confirmed the rejection of the null hypothesis and acceptance of H_a1. The results demonstrated that the model with mindfulness indication covariates improved the prediction rate from 59.3% to 65.7%. Six of the eight mindfulness indication covariates were significant predictors at $p<.001$. The omnibus test of the model with mindfulness predictors was statistically significant, $\chi^2 (8)=3468.231$, $p<.001$. There is a significantly greater likelihood for adolescents to earn high grades if an indication of mindfulness is present. The $R^2=.135$ indicated a moderate effect size, which demonstrates that the results can be generalized for the population.

Cross-tabulations of mindfulness and affective learning outcomes indicated that fewer adolescents overall exhibited positive affect, 40.4%, whereas for 59.6% of adolescents affective outcomes were less than positive. However, this distribution was in

reverse for mindful adolescents, with 71.9% of mindful adolescents exhibiting positive affect and 28.1% exhibiting less than positive affect. Dichotomously coded affect DV2 and eight mindfulness indication variables showed moderate positive correlations within a range of .12 <= r_s <= .40. All pairwise comparisons achieved high significance level of α<.001. These results pointed toward rejecting the null hypothesis of no association for the first research question.

Binary logistic regression analyses of mindfulness and grades confirmed the rejection of the null hypothesis and acceptance of H_a2. The results demonstrated that the model with mindfulness indication covariates improved the prediction rate from 59.1% to 70.3%. Five of the eight mindfulness indication covariates were significant predictors at p<.001. The omnibus test of the model with mindfulness predictors was statistically significant, χ^2 (8)=7724.977, p<.001. There is a significantly greater likelihood of adolescents' positive affective outcomes if an indication of mindfulness is present. The R^2=.282 indicated a large effect size, which demonstrated that the results can be generalized for the population.

The interpretation of these findings, as well as the strengths and limitation of my study, are further described in Chapter 5, where I offer recommendations for enhancing research on mindfulness and learning in adolescence.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The quantitative analyses described in Chapter 4 were conducted using a large set of secondary data derived from teenage students' responses to a nationwide survey collected by Search Institute, my partnering organization. I examined differences in the learning outcomes between adolescents who did and who did not exhibit mindful attitudes and behaviors, hypothesizing that a measure of learning would positively and significantly correlate with a measure of students' mindfulness. The purpose of this study was to establish whether mindfulness can serve as a predictor of academic achievement and affective learning for the target population of 14 to 18 year old students residing in the United States.

To accomplish this purpose, I posed two research questions and used SPSS descriptive-comparative analyses and binary logistic regression to test the hypotheses. Research question 1 (RQ1) asked: to what extent do adolescents whose attitudes and behaviors indicate mindfulness have a significantly different likelihood to earn high grades than when an indication of mindfulness is not evident? Research question 2 (RQ2) asked: to what extent do adolescents whose attitudes and behaviors indicate mindfulness have a significantly different likelihood of positive affective outcomes than when an indication of mindfulness is not evident? The analytic results described in Chapter 4 revealed statistically significant associative relationships between mindfulness indicators and learning outcomes in adolescence for both research questions.

Summary of the Findings

Results of the RQ1 statistical analyses led me to reject the null hypothesis of no association between mindfulness and academic achievement. These analytic results indicated that there was a greater likelihood for A&B survey responders whose attitudes and behaviors indicated mindfulness to report earning high academic grades. Cross-tabulation analyses confirmed low, positive, statistically significant correlations between the variables. Binary logistic regression results indicated a small-size predictive power of mindfulness for earning high grades in adolescence. Results of the RQ2 statistical analyses also led to rejecting the null hypothesis of no association between the variables. There was a greater likelihood for A&B survey responders whose attitudes and behaviors indicated mindfulness to exhibit positive affective learning outcomes. Cross-tabulation analyses confirmed moderate, positive, statistically significant correlations between the variables. Binary logistic regression results indicated a medium-size predictive power of mindfulness for adolescents' positive affect. My selection of a large sample size and external validity assessments indicated that the results may be generalizable for the target population of 14 to 18 year old students residing in the United States. However, based on the descriptive statistic results, the generalizability is limited due to underrepresentation of two racial/ethnic groups in the sample, African-American and Hispanic, and overrepresentation of students who identified themselves as belonging to more than one race or ethnicity.

Interpretation of Findings

This research study aimed to examine associative relationships between mindfulness and learning in a representative sample of U.S. adolescents. I chose to first run a series of descriptive analyses in SPSS to test whether the selected sample reflected demographic, geographic, and socioeconomic characteristics of the target population. As described in Chapter 3, Search Institute's A&B sampling strategies, survey administration, and data collection processes followed rigid protocols and guidelines with the goal to attain honest and thoughtful responses from the participants. The purposeful extraction of the sample for this study from the initial dataset of 287,657 A&B survey responses, detailed in Chapter 4, resulted in the final sample for my study of 34,375 survey responses obtained between September 2011 and March 2013.

Descriptive Statistics

The sample consisted of 17,180 (50%) women, 16,810 (49%) men, and 385 (1%) individuals who either failed to answer the question or chose not to report their gender. The majority of the students in this sample, 25,488 (74%) were Caucasian, 2,820 (8%) were Hispanic/Latino, 2,563 (8%) were of mixed race or ethnicity, 1,293 (4%) were African American, 993 (3%) were Asian, 306 (1%) were Native American, and the remaining 3% were of other race/ethnicity or did not identify themselves. The age distribution was 8,348 (24%) 14 years old, 8,620 (25%) 15 years old, 6,936 (20%) 16 years old, 7,601 (22%) 17 years old, and 2,870 (8%) 18 years old.

Most of the students in this sample, 21,012 (61%), lived with two biological parents. Other family living situations consisted of 4,410 (13%) in a single parent

household, 3,887 (11%) with one biological and a step- or adoptive parent, 2,616 (8%) half time with each of the separated parents, 680 (2%) with relatives, 579 (2%) with adoptive parents, 99 (0.3%) in foster homes, and 1,092 (3%) students lived in other situations or did not self-identify. These students were geographically distributed across the U.S., as the sample included data from 112 educational institutions in 51 cities within 22 of the U.S. states. The students reported living in an assortment of areas: 12,551 (37%) lived in a city, 14,480 (42%) in small or medium towns, 4,279 (12%) in countryside, 1,643 (5%) on a farm, 315 (1%) on Native American reservations, and 1,107 (3%) did not identify the type of their living area.

Comparisons of the results of descriptive analyses with the general census data (U.S. Census Bureau, 2012) and a national study on population composition and trends (Colby & Ortman, 2015) confirmed that the geographic areas, family type, and most of the demographic characteristics of the sample were representative of my target population of interest. The only demographic discrepancy related to the racial/ethnic distribution of the sample. The percentages of African American (3.8%) and Hispanic (8.2%) students in the sample were lower compared to the information derived from the U.S. Census, 12.3% and 15.8% respectively, whereas the percentage of students in the sample who reported belonging to more than one race or ethnicity was higher, 7.5% as compared to the U.S. Census of 1.5%. Thus, the generalizability may be limited due to comparative underrepresentation of African-American and Hispanic students in the sample, and overrepresentation of multiracial or multiethnic students.

Cross-tabulation analyses conducted in SPSS consisted of pair-wise comparisons of eight mindfulness indication IV covariates with the dependent variables DV1 and DV2, followed by cross-tabulations of the composite mindfulness indicator IV with each DV1 and DV2. These allowed me to examine frequency tables with the numbers and percentages of the survey respondents in each of the two-way categories, the results of chi-square tests, directional measures, and symmetric measures of association for each pair of variables. Next, I conducted binary logistic regression analyses to establish the probabilities of high academic grades (DV1) and affective learning outcomes (DV2) without and with mindfulness indication covariates. The goal of the logistic regression analyses was to determine whether an indication of mindfulness could serve as a predictor of learning outcomes.

Research Question 1 Results

Pair-wise cross-tabulations of the eight mindfulness indication covariates with the DV1 academic grades indicated weak or very weak, although statistically significant, positive correlations as measured by Spearman's rho coefficient. Appendix F provides details on coefficients and distributions of the frequencies and percentages. The strength of correlations of mindfulness indication covariates with academic grades ranged from the lowest for mindfulness IV indicator Q15 at $r_s(4)=.09$, $p<.001$ to the highest for mindfulness IV indicator Q33 at $r_s(4)=.23$, $p<.001$. All correlations were positive and statistically significant. These results point out that there was a small probability for adolescents with any one of the derived mindfulness indication components to earn higher grades, mostly As and some Bs.

Cross-tabulating the composite mindfulness indicator IV and academic grades established a moderately weak, statistically significant, positive correlation at $r_s(1)=.18$, $p<.001$. The cross-tabulation table with the composite mindfulness indicator IV and grades indicated that among all adolescent A&B survey responders in the sample, a larger group, 19,958 (58.9%) reported earning mostly As and some Bs (high grades) than lower grades, 13,925 (41.1%). These results were proportionately different for the two groups of interest in this study. In the group of mindful adolescents, those with the composite mindfulness indicator IV, 3,810 or 80.4% out of the total n = 4,739 reported earning high grades. In contrast, in the group of adolescents lacking the composite mindfulness indicator IV, 16,148 or 55.4% of the total n = 29,144 reported high grades. Based on these results, I concluded that I ought to reject the null hypothesis of no association among the variables for RQ1. Mindful adolescents were better academically than adolescents whose attitudes and behaviors did not indicate mindfulness. The results of RQ1 binary logistic regression analyses allowed me to compare two models. The basic model, extracted before entering the mindfulness indication covariates, showed the predicted percentage of correct identifications to be 59.3%. The new model with the eight mindfulness indication covariates introduced stepwise delivered correct predictions for 65.7% of the sample, which was a small improvement over the basic model. The results indicated that the likelihood of earning high grades varied by mindfulness indication covariate. The Wald statistic showed that six out of the eight mindfulness indication covariates were statistically significant in predicting high academic grades: Q80 at $\beta=.156$, $\chi^2(1)=231.189$, $p<.001$, Q119 at $\beta=.099$, $\chi^2(1)=59.105$, $p<.001$, Q14 at $\beta=.066$,

$\chi^2(1)=16.141$, $p<.001$, Q33 at $\beta=.477$, $\chi^2(1)=479.963$, $p<.001$, Q35 at $\beta=.334$, $\chi^2(1)=263.328$, $p<.001$, and Q70 at $\beta=.251$, $\chi^2(1)=515.403$, $p<.001$. The chi-square coefficient for the new model reported in the SPSS Omnibus Tests output revealed a statistically significant improvement in the new model, $\chi^2(8)=3468.231$, $p<.001$. The indication of mindfulness covariates jointly improved the prediction of academic achievement of adolescents as measured by higher grades in school. The binary logistic regression analysis with the sole composite mindfulness indicator IV delivered even stronger positive statistically significant results at $\beta=1.194$, $\chi^2(1)=964.919$, $p<.001$. The odds of reporting high grades were 3.301 times higher under the model with the composite mindfulness indicator IV.

The results of both binary logistic regression analyses for RQ1 confirmed the rejection of the null hypothesis $H_0 1$ as first suggested by the results of the cross-tabulation analyses. There was a significantly greater likelihood for adolescents to report earning high academic grades if an indication of mindfulness was present. To reduce the probability of the Type I error, i.e. incorrect rejection of the null hypothesis, I chose a highly conservative level of significance prior to conducting the study. The smaller the α, the lower would be the likelihood of rejecting a correct null hypothesis (Field, 2013). The level of $\alpha<.05$ dominates the field of social science research, and the level of $\alpha<.01$ is considered to be stronger for guarding against the Type I error. However, Browne and Cudeck (1993) recommended that researchers working with very large samples reduce the α level even further. Thus, I established a highly conservative level of significance $\alpha<.001$, and all of the analytic results reported for RQ1 tested better than this threshold.

Effect size in a regression analysis quantifies the extent of the difference between the basic model and the final model. The effect size of the RQ1 binary logistic regression analyses, as measured by Nagelkerke R^2, ranged from small to moderate. A medium effect size of 13.5% was established in the stepwise regression model with eight mindfulness indication covariates, and a small effect size of Nagelkerke R^2 = 4.5% in the model with the composite mindfulness indicator IV as the sole predictor of higher academic grades. This indicates that although the odds of earning high grades were significantly higher in the new model, 3.301 times, the indication of mindfulness was a rather weak, although theoretically meaningful predictor of high academic grades in adolescence.

Research Question 2 Results

Pair-wise cross-tabulations of the eight mindfulness indication covariates with the DV2 affective learning outcomes indicated weak to moderate, statistically significant, positive correlations as measured by Spearman's rho coefficient. Appendix G provides details on coefficients and distributions of the frequencies and percentages. The strength of correlations of mindfulness indication covariates with affective outcomes ranged from low $r_s(4)=.12$, $p<.001$ for mindfulness IV indicator Q8 to the highest of $r_s(4)=.40$, $p<.001$ for mindfulness IV indicator Q119. All correlations were positive and statistically significant. These results point out that there was a small to moderate probability for adolescents with any one of the derived mindfulness indication components to exhibit positive affect.

Cross-tabulating the composite mindfulness indicator IV and DV2 affective outcomes established a positive, moderate, statistically significant correlation at $r_s(1)=.26$, $p<.001$. The cross-tabulation of the composite mindfulness indicator IV and affective outcomes indicated that among all adolescent survey responders in the sample a minority, 13,664 (40.4%), exhibited positive affective outcomes, compared to 20,181 (59.6%) adolescents who did not exhibit positive affect. These results were vastly different for the two groups of interest in this study. The percentage of adolescents with positive affective outcomes was significantly higher for mindful adolescents. In the group of mindful adolescents, i.e. respondents with the composite mindfulness indicator IV, 3,399 or 71.9% of the total n = 4,728 exhibited positive affect, whereas in the group of adolescents lacking the composite mindfulness indicator IV, 10,265 or 35.3% of the total n = 29,117 exhibited positive affect. Based on these results, I concluded that I ought to reject the null hypothesis of no association among the variables for RQ2. Mindful adolescents had better affective learning outcomes than adolescents whose attitudes and behaviors did not indicate mindfulness.

Comparisons of the models in RQ2 binary logistic regression analyses confirmed the determination to reject the $H_0$2. The basic model, extracted before entering the mindfulness indication covariates, predicted that the percentage of correct identifications would be 59.3% of the sample. The predicted majority was adolescents with less than positive affective outcomes, dichotomous code “0”. The new model where the eight mindfulness indication covariates were introduced stepwise, delivered correct predictions for 70.3% of the sample, which was a moderate improvement over the basic model. The

results indicated that the likelihood of positive affect varied by mindfulness indication covariate. The Wald statistic showed that five out of the eight mindfulness indication covariates were statistically significant in predicting high academic grades: Q80 at $\beta=.400$, $\chi^2(1)=1176.482$, $p<.001$, Q119 at $\beta=.870$, $\chi^2(1)=2786.876$, $p<.001$, Q33 at $\beta=.187$, $\chi^2(1)=59.138$, $p<.001$, Q35 at $\beta=.148$, $\chi^2(1)=42.631$, $p<.001$, and Q70 at $\beta=.166$, $\chi^2(1)=187.807$, $p<.001$. The chi-square coefficient for the new model reported in the Omnibus Tests output revealed a significant improvement in the new model, $\chi^2(8)=7724.977$, $p<.001$. The indication of mindfulness covariates jointly improved the prediction of adolescents' affective learning outcomes. The binary logistic regression analysis with the sole composite mindfulness indicator IV and affective outcomes delivered strong positive statistically significant results at $\beta=1.547$, $\chi^2(1)=1998.978$, $p<.001$. The odds of exhibiting positive affect were 4.697 times higher under the model with the composite mindfulness indicator IV.

The results of both binary logistic regression analyses for RQ2 confirmed the rejection of the null hypothesis $H_0 2$ initially suggested by the results of cross-tabulation analyses. There was a significantly greater likelihood of adolescents' positive affective outcomes if an indication of mindfulness was present. As with RQ1, in order to reduce the probability of the Type I error I chose a highly conservative level of significance $\alpha<.001$. All of the RQ2 analytic results tested better than this threshold. The effect size of the RQ2 regression analyses ranged from medium to large. A large effect size of Nagelkerke $R^2=28.2\%$ was established in the stepwise regression model with eight mindfulness indication covariates, and a medium effect size of Nagelkerke $R^2=8.7\%$ in

the model with the composite mindfulness indicator IV as the sole predictor of positive affect. Results of these analyses established that the indication of mindfulness was a good predictor of affective learning outcomes in adolescence.

Empirical Literature Retrospection

As demonstrated in Chapter 2, there is a lack of empirical research investigating predictability of the learning outcomes for adolescents based on their attitudes and behaviors indicative of mindfulness, which this dissertation work aimed to address. Some of the scholarly literature on mindfulness examined other age groups, which provided the foundation for my research hypotheses. Other studies reported results of randomized control studies of mindfulness-based interventions, programs that included meditation activities, and the outcomes of utilizing novel teaching methods rooted in mindfulness. Most studies related mindfulness with positive cognitive and affective learning outcomes for a variety of age groups, ranging from preschoolers (Flook et al., 2015) to graduate students (Greeson et al., 2014).

The results of the RQ1 analyses in this dissertation research are in line with the empirical studies that examined mindfulness and academic achievement (Bakosh et al., 2015; Bellinger et al., 2015; McNeil et al., 2011; Schonert-Reichl et al., 2015; Song & Muschert, 2014). Bakosh et al. (2015) found that participating in a school program that included a series of mindfulness-based awareness and attention-focusing exercises, positively impacted students in U.S. public elementary schools. Experimental group participants achieved significantly higher post-intervention quarterly grades in reading and science as compared to the control group (Bakosh et al., 2015). In another study

conducted with elementary school children, McNeil et al. (2011) reported that students' understanding of mathematical concepts showed significantly higher improvement (at a p=.001 significance level) if their problem-solving practices included novel, mindful formats, as compared to those who were engaged in a traditional practice or did not engage in extra practices. A study of the outcomes of a mindfulness-based school program MindUP, conducted by Schonert-Reichl et al. (2015) in British Columbia, Canada, assessed 4th and 5th graders' executive functions, levels of stress, prosocial behaviors, and math grades. Schonert-Reichl et al. reported a consistent trend toward higher end-of-the-school-year math grades for the MindUP participants than the grades earned by students in the control group. Although I investigated a different age category, adolescents between the ages of 14 and 18, my RQ1 analytic results aligned with the results of the studies conducted with younger participants, confirming that mindful students are more likely to earn high academic grades.

My RQ1 results also appear to be in line with the outcomes of the research conducted by Song and Muschert (2014) with older participants. Undergraduate university students who took a sociology course that included elements of mindfulness-based activities were asked: "How has the practice of mindfulness helped/hindered your learning in this course? How has the practice of mindfulness helped/hindered your academic development?" (Song & Muschert, 2014, p. 322). Their self-reports revealed that 92.4% of the students thought that mindfulness practices improved their learning in this course; 82.4% reported that mindfulness practices positively impacted their general academic development. Small percentages of students indicated that mindfulness

practices had no impact, and none of the students expressed negative opinions about the inclusion of mindfulness practices in their sociology course.

In contrast with these findings, the study of college students enrolled in an undergraduate engineering math course, conducted by Bellinger et al. (2015), delivered mixed results. Students' mindfulness was measured using Mindful Attention Awareness Scale (MAAS) and Toronto Mindfulness Scale - Trait (TMS-T). The results of several correlation and regression analyses demonstrated that greater mindfulness was associated with better accuracy on high-demand math problems, i.e. when problem-solving required multiple mental calculations, but did not associate with students' accuracy when completing low-demand problems. Bellinger et al. found no correlations between students' mindfulness measurements and their scores on homework assignments, and reported that there was no direct impact of mindfulness on the students' performance on quizzes and exams. However, after adding the mediator *cognitive test anxiety* into the regression model, the results revealed that greater mindfulness was associated with better quiz scores and better grades on the exams (Bellinger et al., 2015). The full models accounted for 38.4% of the variability in quiz scores and 31.4% of the variability in exam scores. These improvements from the basic model to the final model with the mediator were greater than the improvement I derived in my RQ1 regression analyses, from 59.3% in the basic model to 65.7% in the model with the mindfulness covariates.

The study conducted by Bellinger et al. (2015) also determined positive affect indicators of more mindful undergraduate students, which is comparable to the results of my RQ2 analyses. Bellinger et al. reported that mindfulness was associated with lower

levels of pre- and post-test anxiety and better self-regulation, and these in turn allowed the students to perform well when solving high-demand problems. Lyvers et al. (2014) who examined executive functioning of college age students likewise established positive and significant correlations between mindfulness and enhanced emotion regulation, and between mindfulness and psychological well-being. The findings in Lyvers et al.'s (2014) and Bellinger et al.'s (2015) studies are compatible with the results of my RQ2 analyses on mindfulness indicators and positive affective outcomes. However, these studies on mindfulness as a trait in relation to executive function, anxiety, and emotionality involved older individuals than my target population of interest.

Oberle et al. (2011) hypothesized positive associative relationship between trait mindfulness, measured on MAAS scale, and school age students' executive function. The ages of the study participants ranged from 9 to 11. Oberle et al. established that mindfulness was a positive and significant predictor of self-regulatory functioning and inhibitory controls. The ability to inhibit, stated the authors, is an important voluntary control mechanism. Thus, Oberle et al.'s findings are indirectly indicative of positive affect, which was the dependent variable in my RQ2 analyses. Most of other research on affective outcomes of younger participants involved control trials with mindfulness-based interventions and activities. Schonert-Reichl et al. (2015) studied cognitive, social, and emotional outcomes of a mindfulness-based program for elementary school students. Their study demonstrated significant improvements in the program participants' positive social behaviors, emotional control, optimism, empathy, and self-concept, thus aligning with the results from my RQ2 research. Britton et al. (2014) studied the outcomes of

teacher-led mindfulness meditations and other novel classroom activities; the study participants were sixth-grade students. The researchers found that students who participated in these activities showed reductions in affective disturbance as compared to the active control group students. Once again, my RQ2 analytic results, which indicated that mindfulness was a positive and significant predictor of positive affect, were in line with the outcomes of Schonert-Reichl et al.'s and Britton et al.'s studies, although their focus was on younger students.

Limitations of the Study

The limitations to the validity, reliability, and generalizability of the results stem from the exploratory nature of this research, the data selection, and the chosen methodology. Although the results confirmed both research hypotheses of statistically significant associative relationships between mindfulness and academic grades (RQ1) and between mindfulness and affective learning outcomes (RQ2) in adolescence, caution ought be used in the understanding of study results. I do not rule out the likely influence of multiple other predictor variables for adolescents' learning outcomes, which may or may not relate to the indication of mindfulness.

The use of a secondary set of data was a significant limitation in this study, mostly because my research did not utilize a tested and validated direct measurement of mindfulness. The A&B survey is an instrument designed to examine the developmental assets of youths that involve attitudes, behaviors, values, experiences, challenges, and opportunities, but it was not intended to be a mindfulness measurement tool. With this limitation in mind, I devoted substantial efforts to extract relevant information on

mindfulness indicators and to ensure the face validity, content validity, and scale reliability of the mindfulness covariates, and conducted principal components analyses. Additionally, my review of 13 existing, tested and validated mindfulness assessment scales, consultations with experts and non-experts on the proposed alignment of the questions, and my prior completion of a graduate level term project comparing A&B survey questions with mindfulness scales helped streamline the alignment used in this study. However, it ought to be noted that the survey data was originally collected for other research purposes, and therefore the methodology of deriving mindful attitudes and behaviors to extract the mindfulness indication covariates had somewhat limited objectivity.

Another limitation of this study was the use of students' self-reported data to assess their attitudes, behaviors, academic achievement, and affective learning outcomes. Utilization of any survey results as the sole set of data to conduct quantitative research precludes direct observation of the participants and use of school records or archives. Some of the survey questions may have been difficult to answer, at least for some of the students. Also, depending on how uncomfortable any particular question was, a student may have been reluctant to answer it truthfully, although anonymity of this survey should have greatly reduced this limitation. In this research study, I had to make assumptions that the participants in the selected sample fully understood the A&B survey questions and were honest in providing responses.

Due to the exploratory nature of this study, I elected to conduct nonparametric tests. Nonparametric quantitative research allows running of analyses when the data may

not meet the assumptions necessary for conducting parametric tests. I also chose to run the binary logistic regression tests that involved dichotomous coding of the dependent variables, i.e. academic grades and affective learning outcomes. These methodological decisions resulted in certain limitations to the study results. In the next section, I make a suggestion for further research on mindfulness and learning that would include more robust testing of the relationships.

In this study, I aimed to achieve high statistical generalizability of the results. The control over the sample selection included external validity assessments. The selected sample size was substantially large, which increased its statistical power. Large samples are in general more representative of the target population. However, the size of my sample was also a limitation in conducting logistic regression analyses. The Hosmer and Lemeshow test of the null hypothesis was not available for me because in very large samples this test reaches a high degree of significance regardless of whether the model fit is good (Weiss & Dardick, 2015). Additionally, any study involving a sample can offer only a limited support for generalization, or as Campbell and Stanley (1966) described it "we do, in generalizing, make guesses as to yet unproven laws, including some not even explored" (p. 17). Although statistical and analytic generalizability of the results was established, the participatory generalizability was limited due to lower percentages of African-American and Hispanic students in the sample, and higher percentages of multiracial or multiethnic students, as compared to U.S. Census data.

It is important to mention that studies using quantitative methodology are in general limited in scope. Although the numeric results of this study pointed toward

mindfulness as a possible predictor of learning in adolescence and established the extent of the associative relationships between variables, they did not indicate causality, nor could they provide insight into the nature of the associations among the variables. Future studies might use qualitative methods or mixed methods research to broaden the understanding of the impact of mindfulness on learning outcomes in adolescence.

Recommendations

The strengths and limitations of this study suggest that further research be conducted on the relationships of the components of the highly divergent mindfulness construct, and cognitive and affective learning in adolescence. One of the strengths of this study was the size and diversity of the sample. However, due to the research design that involved purposeful extraction of the sample from secondary data, this geographically and demographically diverse sample may still not be representative of the target population, resulting in a limited generalizability of the results. More targeted, randomized studies and the use of qualitative methods or mixed methods research would expand the knowledge on how mindfulness relates to academic and affective learning outcomes for the general population of adolescents in the U.S. Further quantitative research can also deepen the exploration into adolescents' learning outcomes in relation to the three mindfulness indication components I identified upon conducting the principal components analysis: 1) purposeful attention to others or outer-awareness, 2) purposeful perception of self or inner-awareness, and 3) absence of mindlessness or situational awareness.

As stated earlier, I conducted this research using nonparametric tests and dichotomously coding the dependent variables. This and other methodological decisions may have contributed to the weak correlations found between the indication of mindfulness and academic grades. Future research may include expanding from the pair-wise relationship comparisons to other analyses of correlation and regression. Recommendations for the data collection in further research studies include the suggested use of validated mindfulness measurement scales and indexes to establish the independent variable in future studies, and the use of archival student records to determine students' academic grades.

Another recommendation for future research is to examine the relationships between the variables in this study more precisely, controlling for a number of socio-demographic characteristics of the sample. Although this study has established positive and significant associative relationships between the indication of mindfulness and students' grades and affective outcomes, the results may vary by age, gender, race or ethnicity, and multiple other factors. For example, I would venture to hypothesize that either academic or affective learning outcomes would be different for mindful 14 year old and mindful 18 year old high school students.

Implications

Based on this research, methodological, theoretical, and empirical implications can be drawn, as well as practical implications. Adolescence is a time span recognized as a vital period of cognitive and social-affective learning and development (Corcoran & Slavin, 2016; Crone & Dahl, 2012; Thapa et al., 2013), and the drivers of adolescents'

successful learning outcomes are not fully understood. The results of this study, i.e. establishing mindfulness as a valid predictor of academic and affective learning successes in adolescence, confirmed theoretical tenets and helped in narrowing the gap in research on mindfulness for the general population of 14 to 18 year old students. Advancing scholarly knowledge on complex issues of adolescent cognitive, social, and emotional development provides a social change benefit. The practical implications of the study's findings consist of their applicability for the design or redesign of school-based or afterschool youth programs, and development or refinement of educational tools and materials, thus further promoting positive social change.

Yet some caution is advised for the understanding and the potential use of the results of this dissertation research. As stated in earlier sections, this was an exploratory study. The quantitative analyses utilized a set of secondary data, originally collected for different research purposes. Additionally, the process of deriving and coding of the variables involved a number of subjective decisions, opinions of experts and non-experts, and investigative testing. Although I conducted several validity and reliability analyses, the cautionary implication of the study results lies in the novelty of the derived mindfulness indication variable. The exploration into the subject matter of mindfulness and learning in adolescence established positive, statistically significant, associative relationships between the variables for both research questions, and additional research can further look into and refine the outcomes of this study.

Concluding Remarks

At the onset of this dissertation, my professional experience working for an organization whose mission was nurturing the potential of youth and my educational research goals led me to review the offerings of a number of organizations and groups. Among those were the Association for Mindfulness in Education (AME), American Mindfulness Research Association (AMRA), Mindfulness in Education Network, UCSD Center for Mindfulness, and Teachings in Mindful Education (TIME). These and other groups were promoting the inclusion of mindfulness programs into the classroom curricula and out-of-school youth activities, and influencing policy makers in the field of education. Considering that a school week has a limited amount of educational hours, any modification to the curriculum would necessarily detract from other vital teaching and learning activities. I wanted to better understand the benefits of these policy-changing suggestions.

Meanwhile, the construct of mindfulness continued to reshape depending upon which book I was reading: *The power of mindfulness* (Thera, 1972), *The miracle of mindfulness* (Hanh, 1976), *Mindfulness* (Langer, 1989), *The power of mindful learning* (Langer, 1997), *Teaching children to learn* (Fisher, 2005), *Mindfulness-based cognitive therapy for anxious children* (Semple, 2007), *Mindfulness in plain English*. (Gunaratana, 2011), and many others. The concept was not a straightforward notion, and I discovered two paths of mindfulness research that had somewhat different underlying principles. Current empirical research literature was becoming inundated with multiple established and hypothesized benefits from mindfulness-based programs, trainings, interventions,

and other inducements. However, there was a lack of research connecting mindfulness with learning for the general population of adolescent students. Activities that are beneficial for one age group may not necessarily be of practical use for another.

Ideally, policy makers in the field of education should make the decisions on how to allocate limited school resources based on solid scientific research. Yet in the real world, the links between evidence-based research and policy decisions are often problematic. Cairney (2016) argued that policy making ought to be founded in research that is relevant, objective, comprehensive, scientific, and that the policymakers should "understand the evidence in the same way as scientists" (p. 42). As my exposure to mindfulness-based research in various spheres of youth development deepened, especially during the literature review stage, I discerned an intrinsic attractiveness of mindfulness shared by many individuals and groups. These considerations prompted me to refine my research questions and hypotheses with several objectives in mind. I wanted to know the overall effect of mindful attitudes and behaviors on learning outcomes, regardless of whether these attitudes and behaviors could have been triggered by mindfulness-based activities or were naturally occurring. I did not want to exclude either of the two paths of the current mindfulness research. I wanted to limit my research to a small age group, high school-age adolescents. I wanted to investigate outcomes of mindfulness in the general population of adolescents, not a clinical group or other specialized subset. I wanted to obtain a substantially large and diverse sample, so that I could generalize the study results to the population. I wanted to research two separate types of learning outcomes, cognitive and affective. Finally, I did not want the

participants to be influenced by targeted mindfulness measurement scales questions, which led me to adopt a general survey on attitudes and behaviors of youth.

Upon completing the data analyses in this dissertation, I found positive, statistically significant, predictive qualities of mindfulness, thus confirming both of my research hypotheses. Adolescent students whose attitudes and behaviors indicated mindfulness did show a greater likelihood to earn high grades. Mindfulness emerged as a valid and statistically significant predictor of high academic grades in the logistic regression analyses. The regression model with eight mindfulness indication covariates reached high level of statistical significance $p<.001$ and medium effect size $R^2=.135$, and the regression model with the composite mindfulness indicator variable reached high level of statistical significance $p<.001$ and small effect size $R^2=.045$. The odds of reporting high grades were 3.301 times higher for adolescents with the composite mindfulness indicator. The results also established that adolescent students whose attitudes and behaviors indicated mindfulness had a greater likelihood to convey positive affect. Mindfulness emerged as a valid and statistically significant predictor of positive affective outcomes in the logistic regression analyses. The regression model with eight mindfulness indication covariates reached high level of statistical significance $p<.001$ and large effect size $R^2=.282$, and the regression model with the composite mindfulness indicator variable reached high level of statistical significance $p<.001$ and medium effect size $R^2=.087$. The odds of conveying positive affect were 4.697 times higher for adolescents with the composite mindfulness indicator. The results of the data analyses are generalizable to the population of adolescents who participated in the nationwide Profiles

of Student Life: Attitudes & Behaviors survey, although it has yet to be demonstrated whether the A&B survey results are generalizable to the target population of the U.S. adolescents between the ages of 14 and 18. These positive results and the multiple considerations reported in the limitations section of this study suggest that mindfulness research advocates are on the right track, and that further research should be conducted on the relationships of the components of the highly divergent mindfulness construct and cognitive and affective learning outcomes of adolescent students.

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Appendix A: Multiple Definitions of Mindfulness
(in a chronological order of publication)

	Author(s)	*Mindfulness* definition	Notes / elaboration on the term
1.	Langer (1989)	a state of alertness and lively awareness, manifested in active information processing and characterized by the creation and refinement of categories	a social psychologist and psychology professor at Harvard University, Langer stated that mindfulness necessarily involves seeking multiple perspectives, or at least staying open of other possibilities
2.	Gunaratana (1992)	a pure and non-egotistic alertness, a "mirror-thought... [reflecting] only what is presently happening and exactly the way it is happening" (p. 133)	a Sri Lankan monk practicing Buddhism, Gunaratana distinguished two types of mental processing, stating that: "[i]f you are remembering your second-grade teacher, that is memory. When you then become aware that you are remembering your second-grade teacher, that is mindfulness" (p. 134).
3.	Kabat-Zinn (1994)	"an ancient Buddhist practice" (p. 3) of " paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally (p. 4)	the founder of the Center for Mindfulness in Medicine, Health Care, and Society at the University of Massachusetts Medical School, Kabat-Zinn did not equate mindfulness with awareness, but rather described it as a process of nurturing awareness and clarity in each moment of existence.
4.	Epstein (1995)	paying purposeful attention to the exact and immediate experiences of the individual, separating reactions "from the raw sensory events" (p. 110)	a psychotherapist and a practicing Buddhist, Epstein emphasized the value of non-evaluative inner observation
5.	Langer & Moldoveanu (2000)	the process of drawing distinctions, seeking novelty, and being aware of the context; and "not a cold cognitive process" (p. 2), but an active undertaking	Langer & Moldoveanu expanded the definition of mindfulness suggested by Langer in 1989

6.	Goldstein (2002)	an inherent capacity of mind; “the path to complete awakening” (p. 13)	a widely published follower of Western Buddhism and a co-founder of the Insight Meditation Society, Goldstein's works offered an integrative view on the Theravada, Tibetan, and Zen traditions

	Author(s)	*Mindfulness* definition	Notes / elaboration on the term
7.	Martin (2002)	"a state of psychological freedom that occurs when attention remains quiet and limber, without attachment to any particular point of view" (p. 139, italics in text)	
8.	Hayes & Wilson (2003)	a method of establishing deliberate but at the same time non-evaluative appraisal of current situations or events	
9.	Hirst (2003)	an "awareness of being aware" (p. 360)	for Hirst, mindfulness is the process of consciously recognizing phenomena and events as these take place.
10.	Baer (2003)	"the nonjudgmental observation of the ongoing stream of internal and external stimuli as they arise" (p. 125)	a clinical psychologist, Baer referred to contemplative mindfulness
11.	Brown & Ryan (2003)	a state of being aware of current experiences, and staying attentive (2003) and "a deceptively simple concept that is difficult to characterize accurately" (Brown & Ryan, 2004, p. 242)	
12.	Fletcher and Hayes (2005)	a collection of interrelated processes such as "acceptance, defusion, contact with the present moment, and the transcendent sense of self" whose function is "to undermine the dominance of verbal networks, especially involving temporal and evaluative relations" (p. 315)	Fletcher and Hayes combined the contemplative and sociocognitive definitions of mindfulness, with the purpose to expand its applicability to multiple fields of scholarly research

	Author(s)	*Mindfulness* definition	Notes / elaboration on the term
13.	Shapiro, Carlson, Astin, and Freedman (2006)	intentionality appears as the central component of mindfulness, imperative to understanding the whole of an issue; the intentionality must be dynamic, evolving, and continuously intensifying	Shapiro, Carlson, Astin, and Freedman accepted Kabat-Zinn's mindfulness triad, i.e. purposefulness or intention, paying attention, and the act of mental processing in a particular way, but emphasized intentionality as the dominating component
14.	Garland (2007)	a process of self-transcendence, a means of enhancing positive reappraisal of oneself	a psychologist, Garland studied stress-related illnesses and coping skills
15.	Brown, Ryan, and Creswell (2008)	"a quality of consciousness manifest in, but not isomorphic with, the activities through which this quality is enhanced" (p. 215)	Brown et al. adopted Eastern and Western theoretical foundations of mindfulness, and studied its role in combating mental and physical health issues, improving functionality, and interpersonal relationships
16.	Kohls, Sauer, and Walach (2009)	"the mental ability to focus on the direct and immediate perception of the present moment with a state of non-judgemental awareness, voluntarily suspending evaluative cognitive feedback" (p. 224)	Kohls et al. noted an ongoing debate on whether mindfulness ought to be conceptualized as a multidimensional construct, concluding that for measurement purposes it would be sufficient to assess mindfulness as a one-dimensional construct
17.	Dane (2010)	a state of consciousness and directing attention to present moment, unique from other attention-related concepts, but partially comparable with the process of absorption, flow, and cognitive differentiation	a scholar in the field of management training research, Dane pointed out the necessity to not only understand what mindfulness is, but to explicate what it is not

18.	Williams and Kabat-Zinn, (2011)	"the element of watchfulness, the lucid awareness of each event that presents itself on the successive occasions of experience" (p. 21)	Williams and Kabat-Zinn reviewed mindfulness from scientific as well as theological perspectives, presented it as "lucid awareness" but contrasted it with "bare attention" (p. 5)

	Author(s)	*Mindfulness* definition	Notes / elaboration on the term
19.	Albrecht, Albrecht, and Cohen (2012)	mindfulness "may be simply described as a natural human capacity, which involves observing, participating and accepting each of life's moments from a state of equilibrium or loving kindness" (p. 2)	Albrecht et al.'s review of literature on mindful teaching brought in a large array of interpretations of the term; they also presented it as a strategy for enhancing both the students' and teachers' classroom experiences
20.	Singh, Lancioni, Winton, Karazsia, and Singh (2013)	"the definition of mindfulness is partly dependent on the measure being used" (p. 214)	Singh et al. studied how preschool teachers receiving mindfulness trainings may reshape the behavior of their students, and found many inconsistencies in the researchers' definitions of the term
21.	Carlson (2013)	Carlson's two-componential definition includes both "detached observation" and non-evaluative "decentering" (p. 176)	Carlson brought scholars' attention to two core components of mindfulness, the attention/awareness component and the observation/acceptance component
22.	Djikic (2014)	mindful engagement is necessarily a voluntary process, a practice an individual could choose, or be led to by teachers or psychologists, but not a practice that could be commanded	Djikic reviewed mindfulness definitions within Eastern and Western strands of research, found remarkable differences between the two sets of interpretations, and stated that "the singularities of each approach can be placed within an underlying framework, wherein each contributes to the elucidation of the other" (p. 140)
23.	Greenberg and Mitra (2015)	"movement from attention and awareness through the related mental factors of discernment, intention, imagination, and reason toward the ends of developing wise understanding" (p. 75)	Greenberg and Mitra suggested that awareness and attention are preconditions of mindfulness practice; mindfulness engages many human faculties and processes

	Author(s)	*Mindfulness* definition	Notes / elaboration on the term
24.	The American Mindfulness Research Association (AMRA), (n.d.)	"The state, process, and practice of remembering to observe moment-to-moment experience with openness and without automatic patterns of previously conditioned thoughts, emotions, or behaviors" (online)	"Mindfulness can be cultivated through mind-body practices (such as focused attention and open monitoring meditation as well as other intrapsychic and sensory-based practices) that are founded on a discerning mode of awareness that recognizes wholesome and unwholesome states of being" (online)

Appendix B: MOU Agreement with Search Institute

Search INSTITUTE

Memorandum of Understanding

between

Search Institute®
615 First Avenue NE, Suite 125
Minneapolis, MN 55413
Phone: 612-376-8955

and

Elena Ksendzov
Walden University
Phone: 323-371-4433
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This Memorandum outlines the terms under which Search Institute grants Elena Ksendzov, limited, non-exclusive rights to access Search Institute's Profiles of Student Life: Attitudes & Behaviors 2008-2012 data set and other documentation in electronic form for analysis, interpretation, and dissemination by Ms. Ksendzov for the purpose of examining the mindfulness and mindlessness in adolescence in relation to cognitive and affective learning, skill developmental, and social integration.

Supervision: Access to and analysis of this data set is limited to Elena Ksendzov and her faculty mentor/KAM assessor, Dr. Cheryl Keen.

Confidentiality: Elena Ksendzov will maintain confidentiality of any scales, coding, or other information that Search Institute deems to be intellectual property or a trade secret.

Ownership: Search Institute will maintain sole ownership of the data set, coding, and other documentation.

Payment: Search Institute requires a payment of $450 to cover the time associated with cleaning these data and providing them to Elena Ksendzov.

Credit: Search Institute will receive mutually acceptable credit for its ownership and copyright of the dataset in any publication, presentation, or unpublished paper.

Review and Approval: A designated representative of Search Institute must approve new projects that are initiated to analyze this data set. If there is a disagreement regarding the analysis and conclusions, Search Institute's perspectives will be noted in any publication.

Right of First Publication: Elena Ksendzov will retain the right of first publication for a period of six months following the end of the agreement. If, at the end of this time, the findings have not been submitted for publication the right of first publication will be waived.

Publication: Should it be determined that the analyses merit further non-commercial academic publication (journal article or book chapter), Elena Ksendzov will confer with Justin Roskopf,

Search Institute Survey Services Coordinator, regarding the publication content. If there are substantive differences in interpretation, these will be acknowledged in any publication. Potential shared authorship of publications will be determined within the authorship guidelines of the American Psychological Association.

Additional Services: Search Institute will provide basic support in transferring the data set to Elena Ksendzov. If additional consulting services or technical assistance is needed in managing the data set, Search Institute reserves the rights to charge a service/consulting fee (with prior notice) to offset the costs of providing such services. Timelines for providing such additional consulting and technical assistance will be mutually agreed upon.

Access: Search Institute will maintain full access to new analyses, scales, and findings from analyses of this data set. Search Institute reserves the right to publish articles, chapters, books, or other materials derived from these analyses provided that appropriate credit is given and provided that such publication does not infringe on other copyrights.

Potential Earnings: No rights are granted pertaining to any revenue being generated based on any analysis or writing.

Term of Agreement: This memorandum will be in effect for two years from date of signing. It may be extended by mutual consent upon written request.

Transferability: This agreement is limited to the undersigned parties and is not transferable without the prior, written consent of Search Institute. Elena Ksendzov does not have the right to grant access to third parties; such requests will be referred to Search Institute for consideration.

Revocation: These rights may be revoked at any time should a Search Institute officer deem that the above agreements are not being followed or that such action is in the institute's best interests. In cases where such action would disrupt completion of a dissertation, good faith efforts will be made to reach a specific, mutually acceptable agreement to facilitate completion.

For Elena Ksendzov	**For Search Institute**
Signature	Signature
Elena Ksendzov	Justin Roskopf
Name	Name
Ph.D. in Education Candidate	Survey Services Coordinator
Title	
11/18/13	November 14, 2013
Date	Date

Appendix C: Preliminary Alignment of A&B Survey and Mindfulness Scales

Indicator of Mindfulness (MF)		**MAAS-S**		**MAAS-A**	
A & B survey questions	*response*	*almost always*	*almost never*	*almost always*	*almost never*
15. Doing what I believe is right even if my friends make fun of me	*quite important /extremely important*	5. Easy to stay focused in the present			3. I find it difficult to stay focused on what's happening in the present
16. Standing up for what I believe, even when it's unpopular to do so	*quite important /extremely important*	5. Easy to stay focused in the present			3. I find it difficult to stay focused on what's happening in the present
35. How often do you come to classes without bringing paper or something to write with?	*never*	7. Doing jobs or tasks with awareness	2. Being without much awareness of what is done		7. It seems I am "running on automatic" without much awareness of what I'm doing
		9. Doing things with paying attention	3. Doing jobs or tasks automatically		8. I rush through activities without being really attentive to them
					10. I do jobs or tasks automatically, without being aware of what I'm doing
					13. I find myself doing things without paying attention
36. How often do you come to classes without your homework finished?	*never*	7. Doing jobs or tasks with awareness	2. Being without much awareness of what is done		7. It seems I am "running on automatic" without much awareness of what I'm doing
		9. Doing things with paying attention	3. Doing jobs or tasks automatically		8. I rush through activities without being really attentive to them
					10. I do jobs or tasks automatically, without being aware of what I'm doing
					13. I find myself doing things without paying attention
37. How often do you come to classes without your books?	*never*	7. Doing jobs or tasks with awareness	2. Being without much awareness of what is done		7. It seems I am "running on automatic" without much awareness of what I'm doing
		9. Doing things with paying attention	3. Doing jobs or tasks automatically		8. I rush through activities without being really attentive to them
					10. I do jobs or tasks automatically, without being aware of what I'm doing
					13. I find myself doing things without paying attention
82. Taking good care of my body (such as eating foods that are good for me, exercising)	*quite like me/very much like me*				14. I snack without being aware that I'm eating

Indicator of Mindfulness (MF)		**KIMS**	
A & B survey questions	*response*	*very often*	*never*
11. Helping to make sure that all people are treated fairly	*quite important/extremely important*	6. I can easily put my beliefs, opinions, and expectations into words	
15. Doing what I believe is right even if my friends make fun of me	*quite important/extremely important*	30. I intentionally stay aware of my feelings	
16. Standing up for what I believe, even when it's unpopular to do so	*quite important/extremely important*		18. I have trouble thinking of the right words to express how I feel about things(a)
35. How often do you come to classes without bringing paper or something to write with?	*never*		3. When I do things, my mind wanders off and I'm easily distracted(a)
			11. I drive on "automatic pilot" without paying attention to what I'm doing(a)
			23. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted(a)
			27. When I'm doing chores, such as cleaning or laundry, I tend to daydream or think of other things(a)
36. How often do you come to classes without your homework finished?	*never*		3. When I do things, my mind wanders off and I'm easily distracted(a)
			11. I drive on "automatic pilot" without paying attention to what I'm doing(a)
			23. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted(a)
			27. When I'm doing chores, such as cleaning or laundry, I tend to daydream or think of other things(a)
37. How often do you come to classes without your books?	*never*		3. When I do things, my mind wanders off and I'm easily distracted(a)
			11. I drive on "automatic pilot" without paying attention to what I'm doing(a)
			23. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted(a)
			27. When I'm doing chores, such as cleaning or laundry, I tend to daydream or think of other things(a)
82. Taking good care of my body (such as eating foods that are good for me, exercising)	*very much like me*	17. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions	

Indicator of Mindfulness (MF)		**MMS**		**LMS**	
A & B survey questions	*response*	*agree / strongly agree*	*disagree / strongly disagree*	*agree / strongly agree*	*disagree / strongly disagree*
9. Helping to make the world a better place in which to live	*quite important /extremely important*	12. I attend to the "big picture"		18. I attend to the "big picture"	
11. Helping to make sure that all people are treated fairly	*quite important /extremely important*		8. I seldom notice what other people are up to		16. I seldom notice what other people are up to
15. Doing what I believe is right even if my friends make fun of me	*quite important /extremely important*		9. I avoid thought provoking conversations		10. I avoid thought-provoking conversations
16. Standing up for what I believe, even when it's unpopular to do so	*quite important /extremely important*	4. I "get involved" in almost everything I do		6. I have an open mind about everything, even things that challenge my core beliefs	
				20. I "get involved" in almost everything I do	
49. I care about the school I go to	*agree/strongly agree*	12. I attend to the "big picture"		18. I attend to the "big picture"	
72. Thinking through the possible good and bad results of different choices before I make decisions	*quite like me/very much like me*		15. I am rarely aware of changes		21. I am rarely aware of changes
			19. I am rarely alert to new developments		5. I am rarely alert to new developments
119. When things don't go well for me, I am good at finding a way to make things better	*agree/strongly agree*	1. I like to investigate things	2. I generate few novel ideas	3. I am always open to new ways of doing things	1. I generate few novel ideas
		3. I am always open to new ways of doing things	5. I do not actively seek to learn new things	4. I like to investigate things	13. I do not actively seek to learn new things
		6. I make many novel contributions	7. I stay with the old tried and true ways of doing things	7. I try to think of new ways of doing things	17. I stay with the old tried and true ways of doing things
		10. I am very creative	21. I am not an original thinker	8. I find it easy to create new and effective ideas	19. I am not an original thinker
		13. I am very curious		9. I am very curious	
		14. I try to think of new ways of doing things		11. I am very creative	
		18. I find it easy to create new and effective ideas		12. I make many novel contributions	
		20. I like to figure out how things work		15. I like to figure out how things work	

Appendix D: Mindfulness Scales

Mindful Attention Awareness Scale – Adolescent (MAAS-A)

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

Scale: 1 (almost always), 2 (very frequently), 3 (somewhat frequently), 4 (somewhat infrequently), 5 (very infrequently), 6 (almost never).

Source: Brown, K. W., West, A. M., Loverich, T. M., & Biegel, G. M. (2011). Mindful Attention Awareness Scale—Adolescent. Psyctests, doi:10.1037/t03769-000

Kentucky Inventory of Mindfulness Scale (KIMS)

Observe items

1. I notice changes in my body, such as whether my breathing slows down or speeds up.
5. I pay attention to whether my muscles are tense or relaxed.
9. When I'm walking, I deliberately notice the sensations of my body moving.
13. When I take a shower or a bath, I stay alert to the sensations of water on my body.
17. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
21. I pay attention to sensations, such as the wind in my hair or sun on my face.
25. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
29. I notice the smells and aromas of things.
30. I intentionally stay aware of my feelings.
33. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
37. I pay attention to how my emotions affect my thoughts and behavior.
39. I notice when my moods begin to change.

Describe items

2. I'm good at finding the words to describe my feelings.
6. I can easily put my beliefs, opinions, and expectations into words.
10. I'm good at thinking of words to express my perceptions, such as how things taste, smell, or sound.
14. It's hard for me to find the words to describe what I'm thinking.(a)
18. I have trouble thinking of the right words to express how I feel about things.(a)
22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.(a)
26. Even when I'm feeling terribly upset, I can find a way to put it into words.
34. My natural tendency is to put my experiences into words.

Act With Awareness items

3. When I do things, my mind wanders off and I'm easily distracted.(a)
7. When I'm doing something, I'm only focused on what I'm doing, nothing else.
11. I drive on "automatic pilot" without paying attention to what I'm doing.(a)
15. When I'm reading, I focus all my attention on what I'm reading.

19. When I do things, I get totally wrapped up in them and don't think about anything else.

23. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.(a)

27. When I'm doing chores, such as cleaning or laundry, I tend to daydream or think of other things.(a)

31. I tend to do several things at once rather than focusing on one thing at a time.(a)

35. When I'm working on something, part of my mind is occupied with other topics, such as what I'll be doing later, or things I'd rather be doing.(a)

38. I get completely absorbed in what I'm doing, so that all my attention is focused on it

Accept Without Judgment items

4. I criticize myself for having irrational or inappropriate emotions.(a)

8. I tend to evaluate whether my perceptions are right or wrong.(a)

12. I tell myself that I shouldn't be feeling the way I'm feeling.(a)

16. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.(a)

20. I make judgments about whether my thoughts are good or bad.(a)

24. I tend to make judgments about how worthwhile or worthless my experiences are.(a)

28. I tell myself that I shouldn't be thinking the way I'm thinking.(a)

32. I think some of my emotions are bad or inappropriate and I shouldn't feel them.(a)

36. I disapprove of myself when I have irrational ideas.(a)

(a) indicates reverse-scored item.

Source: Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Kentucky Inventory of Mindfulness Skills. Psyctests, doi:10.1037/t11612-000.

Mindfulness/Mindlessness Scale (MMS)

1: I like to investigate things.

2: I generate few novel ideas.

3: I am always open to new ways of doing things.

4: I "get involved" in almost everything I do.

5: I do not actively seek to learn new things.

6: I make many novel contributions.

7: I stay with the old tried and true ways of doing things.

8: I seldom notice what other people are up to.

9: I avoid thought provoking conversations.

10: I am very creative.

11: I can behave in many different ways for a given situation.

12: I attend to the "big picture."

13: I am very curious.

14: I try to think of new ways of doing things.

15: I am rarely aware of changes.

16: I have an open mind about everything, even things that challenge my core beliefs.

17: I like to be challenged intellectually.

18: I find it easy to create new and effective ideas.

19: I am rarely alert to new developments.

20: I like to figure out how things work.

21: I am not an original thinker.

Scale:
1 (strongly disagree), 2 (disagree), 3 (slightly disagree), 4 (neutral), 5 (slightly agree), 6 (agree), 7 (strongly agree).

Source: Bodner, T. E., Langer, E. J., Brown, K. W., & Ryan, R. M. (2003). Mindfulness/Mindlessness Scale. Journal of Personality and Social Psychology, 84, 822-848.

Langer Mindfulness Scale (LMS)

The Langer Mindfulness Scale assesses mindfulness in four categories that include novelty producing, flexibility, novelty seeking, and engagement.

- 1.I generate few novel ideas.
- 2.I like being challenged intellectually.
- 3.I am always open to new ways of doing things.
- 4.I like to investigate things.
- 5.I am rarely alert to new developments.
- 6.I have an open mind about everything, even things that challenge my core beliefs.
- 7.I try to think of new ways of doing things.
- 8.I find it easy to create new and effective ideas.
- 9.I am very curious.
- 10.I avoid thought-provoking conversations.
- 11.I am very creative.
- 12.I make many novel contributions.
- 13.I do not actively seek to learn new things.
- 14.I can behave in many different ways for a given situation.
- 15.I like to figure out how things work.
- 16.I seldom notice what other people are up to.
- 17.I stay with the old tried and true ways of doing things.
- 18.I attend to the "big picture."
- 19.I am not an original thinker.
- 20.I "get involved" in almost everything I do.
- 21.I am rarely aware of changes.

Scale:
1 (strongly disagree), 2 (disagree), 3 (slightly disagree), 4 (neutral), 5 (slightly agree), 6 (agree), 7 (strongly agree).

Above questions pertain to the following categories:
1, 7, 8, 11, 12, 19 – Novelty Producing (6 questions)
2, 4, 9, 10, 13, 15 – Novelty Seeking (6 questions)
5, 16, 18, 20, 21 – Engagement (5 questions)
3, 6, 14, 17 – Flexibility (4 questions)
NOTE: questions 1, 5, 10, 13, 16, 17, 19, and 21 are reverse scoring

Source: Langer, E. (2003). Langer's Mindfulness Scale. Worthington, OH: IDS Publishing

Langer Mindfulness Scale – 14 (LMS-14)

1) I like to investigate things. (NS)

2) I generate few novel ideas. (NP)

3) I make many novel contributions. (NP)

4) I seldom notice what other people are up to. (E)

5) I avoid thought provoking conversations. (E)

6) I am very creative. (NP)

7) I am very curious. (NS)

8) I try to think of new ways of doing things. (NS)

9) I am rarely aware of changes. (E)

10) I like to be challenged intellectually. (NS)

11) I find it easy to create new and effective ideas. (NP)

12) I am rarely alert to new developments. (E)

13) I like to figure out how things work. (NS)

14) I am not an original thinker. (NP)

E - Engagement, F - Flexibility, NP - Novelty Producing, NS - Novelty Seeking

Source: Pirson, M., Langer, E. J., Bodner, T., & Zilcha-Mano, S. (2012). The development and validation of the Langer Mindfulness Scale-Enabling a socio-cognitive perspective of mindfulness in organizational contexts. Fordham University Schools of Business Research Paper.

Philadelphia Mindfulness Scale (PHLMS)

1. I am aware of what thoughts are passing through my mind.
2. I try to distract myself when I feel unpleasant emotions.
3. When talking with other people, I am aware of their facial and body expressions.
4. There are aspects of myself I don't want to think about.
5. When I shower, I am aware of how the water is running over my body.
6. I try to stay busy to keep thoughts or feelings from coming to mind.
7. When I am startled, I notice what is going on inside my body.
8. I wish I could control my emotions more easily.
9. When I walk outside, I am aware of smells or how the air feels against my face.
10. I tell myself that I shouldn't have certain thoughts.
11. When someone asks how I am feeling, I can identify my emotions easily.
12. There are things I try not to think about.
13. I am aware of thoughts I'm having when my mood changes.
14. I tell myself that I shouldn't feel sad.
15. I notice changes inside my body, like my heart beating faster or my muscles getting tense.
16. If there is something I don't want to think about, I'll try many things to get it out of my mind.
17. Whenever my emotions change, I am conscious of them immediately.
18. I try to put my problems out of mind.
19. When talking with other people, I am aware of the emotions I am experiencing.
20. When I have a bad memory, I try to distract myself to make it go away.

Scale:
1 (never), 2 (rarely), 3 (sometimes), 4 (often), 5 (very often)

Source: Cardaciotto, L., Herbert, J. D., Forman, E. M., Moitra, E., & Farrow, V. (2008). Philadelphia Mindfulness Scale. Psyctests, doi:10.1037/t20686-000

Toronto Mindfulness Scale (TMS)

1. I experienced myself as separate from my changing thoughts and feelings.
2. I was more concerned with being open to my experiences than controlling or changing them.
3. I was curious about what I might learn about myself by taking notice of how I react to certain thoughts, feelings or sensations.
4. I experienced my thoughts more as events in my mind than as a necessarily accurate reflection of the way things 'really' are.
5. I was curious to see what my mind was up to from moment to moment.
6. I was curious about each of the thoughts and feelings that I was having.
7. I was receptive to observing unpleasant thoughts and feelings without interfering with them.
8. I was more invested in just watching my experiences as they arose, than in figuring out what they could mean.
9. I approached each experience by trying to accept it, no matter whether it was pleasant or unpleasant.
10. I remained curious about the nature of each experience as it arose.
11. I was aware of my thoughts and feelings without overidentifying with them.
12. I was curious about my reactions to things.
13. I was curious about what I might learn about myself by just taking notice of what my attention gets drawn to.

Scale: (1) not at all, (2) a little, (3) moderately, (4) quite a bit, (5) very much.

Summary of the components:
Curiosity score: items 3, 5, 6, 10, 12, 13 are summed.
Decentering score: items 1, 2, 4, 7, 8, 9, 11 are summed.

Source: Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., & ... Carmody, J. (2006). Toronto Mindfulness Scale. Psyctests, doi:10.1037/t05515-000

Appendix E: IRB Permission

Gmail by Google

Elena Ksendzov <elena.ksendzov@waldenu.edu>

IRB Materials Approved - Elena Ksendov

IRB <irb@waldenu.edu> Tue, May 3, 2016 at 3:15 PM
To: "Elena Ksendzov (elena.ksendzov@waldenu.edu)" <elena.ksendzov@waldenu.edu>
Cc: Cheryl Keen <cheryl.keen@waldenu.edu>

Dear Ms. Ksendov,

This email is to notify you that the Institutional Review Board (IRB) confirms that your study entitled, "Associative Relationship among Mindfulness, Academic Grades, and Affective Outcomes in Adolescence," meets Walden University's ethical standards. Our records indicate that you will be analyzing data provided to you by Search Institute as collected under its oversight. Since this study will serve as a Walden doctoral capstone, the Walden IRB will oversee your capstone data analysis and results reporting. The IRB approval number for this study is 05-03-16-0156320.

This confirmation is contingent upon your adherence to the exact procedures described in the final version of the documents that have been submitted to IRB@waldenu.edu as of this date. This includes maintaining your current status with the university and the oversight relationship is only valid while you are an actively enrolled student at Walden University. If you need to take a leave of absence or are otherwise unable to remain actively enrolled, this is suspended.

If you need to make any changes to your research staff or procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 1 week of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for research activities conducted without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards in research.

When you submitted your IRB materials, you made a commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the researcher.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained at the IRB section of the Walden website: http://academicguides.waldenu.edu/researchcenter/orec

Researchers are expected to keep detailed records of their research activities (i.e., participant log sheets, completed consent forms, etc.) for the same period of time they retain the original data. If, in the future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Appendix F:
Mindfulness and Grades: Crosstabulation Analyses

Q80 (take care of my body) * GRADES	GRADES low (Cs Ds Fs)	GRADES high (As & Bs)		Value	df	Sig
"not at all like me" COUNT	1327	863				
"not at all like me" % within Q80	60.6%	39.4%	Pearson Chi-Square	1079.942	4	0.000
"a little like me" COUNT	2255	1974	Likelihood Ratio	1073.866	4	0.000
"a little like me" % within Q80	53.3%	46.7%				
"somewhat like me" COUNT	3337	3869	Correlation & Direction Measures:			
"somewhat like me" % within Q80	46.3%	53.7%	Spearman Correlation	0.166		
"quite like me" COUNT	3290	6167	Nominal by Interval Eta	0.179		
"quite like me" % within Q80	34.8%	65.2%				
"very much like me" COUNT	3527	6944				
"very much like me" % within Q80	33.7%	66.3%				

Q119 (find new ways) * GRADES	GRADES low (Cs Ds Fs)	GRADES high (As & Bs)		Value	df	Sig
"strongly disagree" COUNT	729	479				
"strongly disagree" % within Q119	60.3%	39.7%	Pearson Chi-Square	695.658	4	0.000
"disagree" COUNT	1395	1308	Likelihood Ratio	690.395	4	0.000
"disagree" % within Q119	51.6%	48.4%				
"not sure" COUNT	3999	4412	Correlation & Direction Measures:			
"not sure" % within Q119	47.5%	52.5%	Spearman Correlation	0.127		
"agree" COUNT	5523	9921	Nominal by Interval Eta	0.143		
"agree" % within Q119	35.8%	64.2%				
"strongly agree" COUNT	2200	3881				
"strongly agree" % within Q119	36.2%	63.8%				

Q8 (make world better) * GRADES	GRADES low (Cs Ds Fs)	GRADES high (As & Bs)		Value	df	Sig
"not important" COUNT	791	492				
"not important" % within Q8	61.7%	38.3%	Pearson Chi-Square	502.676	4	0.000
"somewhat important" COUNT	2083	2432	Likelihood Ratio	497.290	4	0.000
"somewhat important" % within Q8	46.1%	53.9%				
"not sure" COUNT	2445	2682	Correlation & Direction Measures:			
"not sure" % within Q8	47.7%	52.3%	Spearman Correlation	0.099		
"quite important" COUNT	5013	8366	Nominal by Interval Eta	0.122		
"quite important" % within Q8	37.5%	62.5%				
"extremely important" COUNT	3542	6031				
"extremely important" % within Q8	37.0%	63.0%				

Q14 (do what is right) * GRADES	GRADES low (Cs Ds Fs)	GRADES high (As & Bs)		Value	df	Sig
"not important" COUNT	673	366				
"not important" % within Q14	64.8%	35.2%	Pearson Chi-Square	542.067	4	0.000
"somewhat important" COUNT	1360	1339	Likelihood Ratio	536.621	4	0.000
"somewhat important" % within Q14	50.4%	49.6%				
"not sure" COUNT	1828	2027	Correlation & Direction Measures:			
"not sure" % within Q14	47.4%	52.6%	Spearman Correlation	0.111		
"quite important" COUNT	5274	7850	Nominal by Interval Eta	0.126		
"quite important" % within Q14	40.2%	59.8%				
"extremely important" COUNT	4773	8451				
"extremely important" % within Q14	36.1%	63.9%				

Q15 (stand up for beliefs) * GRADES	GRADES low (Cs Ds Fs)	high (As & Bs)		Value	df	Sig
"not important" COUNT	562	327				
"not important" % within Q15	63.2%	36.8%	Pearson Chi-Square	403.654	4	0.000
"somewhat important" COUNT	1157	1284	Likelihood Ratio	399.254	4	0.000
"somewhat important" % within Q15	47.4%	52.6%				
"not sure" COUNT	1904	2059	Correlation & Direction Measures:			
"not sure" % within Q15	48.0%	52.0%	Spearman Correlation	0.094		
"quite important" COUNT	4969	7315	Nominal by Interval Eta	0.109		
"quite important" % within Q15	40.5%	59.5%				
"extremely important" COUNT	5280	9018				
"extremely important" % within Q15	36.9%	63.1%				

Q33 (come to class w/o paper/pen) * GRADES	GRADES low (Cs Ds Fs)	high (As & Bs)		Value	df	Sig
"usually" COUNT	1347	758				
"usually" % within Q33	64.0%	36.0%	Pearson Chi-Square	1721.493	2	0.000
"sometimes" COUNT	4671	3735	Likelihood Ratio	1708.208	2	0.000
"sometimes" % within Q33	55.6%	44.4%				
"never" COUNT	7884	15547	Correlation & Direction Measures:			
"never" % within Q33	33.6%	66.4%	Spearman Correlation	0.225		
			Nominal by Interval Eta	0.220		

Q35 (come to class w/o books) * GRADES	GRADES low (Cs Ds Fs)	high (As & Bs)		Value	df	Sig
"usually" COUNT	1503	917				
"usually" % within Q35	62.1%	37.9%	Pearson Chi-Square	1259.720	2	0.000
"sometimes" COUNT	5130	5021	Likelihood Ratio	1252.695	2	0.000
"sometimes" % within Q35	50.5%	49.5%				
"never" COUNT	7258	14087	Correlation & Direction Measures:			
"never" % within Q35	34.0%	66.0%	Spearman Correlation	0.191		
			Nominal by Interval Eta	0.192		

Q70 (weigh consequences) * GRADES	GRADES low (Cs Ds Fs)	GRADES high (As & Bs)		Value	df	Sig
"not at all like me" COUNT	1573	789				
"not at all like me" % within Q70	66.6%	33.4%	Pearson Chi-Square	1819.499	4	0.000
"a little like me" COUNT	2340	1714	Likelihood Ratio	1815.928	4	0.000
"a little like me" % within Q70	57.7%	42.3%				
"somewhat like me" COUNT	3612	4260	Correlation & Direction Measures:			
"somewhat like me" % within Q70	45.9%	54.1%	Spearman Correlation	0.219		
"quite like me" COUNT	3728	7344	Nominal by Interval Eta	0.233		
"quite like me" % within Q70	33.7%	66.3%				
"very much like me" COUNT	2501	5741				
"very much like me" % within Q70	30.3%	69.7%				

Appendix G:
Mindfulness and Affect: Crosstabulation Analyses

Q80 (take care of my body) * AFFECT	AFFECT: less than positive	AFFECT: positive affect		Value	df	Sig
"not at all like me" COUNT	1958	269				
"not at all like me" % within Q80	87.9%	12.1%	Pearson Chi-Square	3065.519	4	0.000
"a little like me" COUNT	3405	859	Likelihood Ratio	3253.662	4	0.000
"a little like me" % within Q80	79.9%	20.1%				
"somewhat like me" COUNT	5033	2218	Correlation & Direction Measures:			
"somewhat like me" % within Q80	69.4%	30.6%	Spearman Correlation	0.298		
"quite like me" COUNT	5044	4413	Nominal by Interval Eta	0.302		
"quite like me" % within Q80	53.3%	46.7%				
"very much like me" COUNT	4527	5939				
"very much like me" % within Q80	43.3%	56.7%				

Q119 (find new ways) * AFFECT	AFFECT: less than positive	AFFECT: positive affect		Value	df	Sig
"strongly disagree" COUNT	1153	71				
"strongly disagree" % within Q119	94.2%	5.8%	Pearson Chi-Square	5453.906	4	0.000
"disagree" COUNT	2444	277	Likelihood Ratio	5958.222	4	0.000
"disagree" % within Q119	89.8%	10.2%				
			Correlation & Direction Measures:			
"not sure" COUNT	6846	1619				
"not sure" % within Q119	80.9%	19.1%	Spearman Correlation	0.396		
"agree" COUNT	7557	7787	Nominal by Interval Eta	0.402		
"agree" % within Q119	49.3%	50.7%				
"strongly agree" COUNT	2099	3937				
"strongly agree" % within Q119	34.8%	65.2%				

Q8 (make world better) * AFFECT	AFFECT less than positive	AFFECT positive affect		Value	df	Sig
"not important" COUNT	1027	269				
"not important" % within Q8	79.2%	20.8%	Pearson Chi-Square	606.365	4	0.000
"somewhat important" COUNT	2913	1584	Likelihood Ratio	629.228	4	0.000
"somewhat important" % within Q8	64.8%	35.2%				
"not sure" COUNT	3503	1621	Correlation & Direction Measures: Spearman			
"not sure" % within Q8	68.4%	31.6%	Correlation	0.118		
"quite important" COUNT	7549	5757	Nominal by Interval Eta	0.134		
"quite important" % within Q8	56.7%	43.3%				
"extremely important" COUNT	5120	4422				
"extremely important" % within Q8	53.7%	46.3%				

Q14 (do what is right) * AFFECT	AFFECT less than positive	AFFECT positive affect		Value	df	Sig
"not important" COUNT	842	197				
"not important" % within Q14	81.0%	19.0%	Pearson Chi-Square	697.734	4	0.000
"somewhat important" COUNT	1886	818	Likelihood Ratio	729.137	4	0.000
"somewhat important" % within Q14	69.7%	30.3%				
"not sure" COUNT	2732	1131	Correlation & Direction Measures: Spearman			
"not sure" % within Q14	70.7%	29.3%	Correlation	0.128		
"quite important" COUNT	7576	5479	Nominal by Interval Eta	0.144		
"quite important" % within Q14	58.0%	42.0%				
"extremely important" COUNT	7108	6058				
"extremely important" % within Q14	54.0%	46.0%				

Q15 (stand up for beliefs) * AFFECT	AFFECT less than positive	AFFECT positive affect		Value	df	Sig
"not important" COUNT	714	179				
"not important" % within Q15	80.0%	20.0%	Pearson Chi-Square	658.022	4	0.000
"somewhat important" COUNT	1695	741	Likelihood Ratio	685.646	4	0.000
"somewhat important" % within Q15	69.6%	30.4%				
"not sure" COUNT	2834	1125	Correlation & Direction Measures:			
"not sure" % within Q15	71.6%	28.4%	Spearman Correlation	0.123		
"quite important" COUNT	7097	5126	Nominal by Interval Eta	0.140		
"quite important" % within Q15	58.1%	41.9%				
"extremely important" COUNT	7763	6489				
"extremely important" % within Q15	54.5%	45.5%				

Q33 (come to class w/o paper/pen) * AFFECT	AFFECT less than positive	AFFECT positive affect		Value	df	Sig
"usually" COUNT	1577	538				
"usually" % within Q33	74.6%	25.4%	Pearson Chi-Square	579.960	2	0.000
"sometimes" COUNT	5661	2742	Likelihood Ratio	595.945	2	0.000
"sometimes" % within Q33	67.4%	32.6%				
"never" COUNT	12907	10402	Correlation & Direction Measures:			
"never" % within Q33	55.4%	44.6%	Spearman Correlation	0.130		
			Nominal by Interval Eta	0.130		

Q35 (come to class w/o books) * AFFECT	AFFECT: less than positive	AFFECT: positive affect		Value	df	Sig
"usually" COUNT	1751	683				
"usually" % within Q35	71.9%	28.1%	Pearson Chi-Square	525.440	2	0.000
"sometimes" COUNT	6717	3440	Likelihood Ratio	534.684	2	0.000
"sometimes" % within Q35	66.1%	33.9%				
"never" COUNT	11651	9559	Correlation & Direction Measures: Spearman			
"never" % within Q35	54.9%	45.1%	Correlation	0.125		
			Nominal by Interval Eta	0.123		

Q70 (weigh consequences) * AFFECT	AFFECT: less than positive	AFFECT: positive affect		Value	df	Sig
"not at all like me" COUNT	1936	456				
"not at all like me" % within Q70	80.9%	19.1%	Pearson Chi-Square	1737.819	4	0.000
"a little like me" COUNT	3059	1038	Likelihood Ratio	1803.035	4	0.000
"a little like me" % within Q70	74.7%	25.3%				
"somewhat like me" COUNT	5293	2609	Correlation & Direction Measures: Spearman			
"somewhat like me" % within Q70	67.0%	33.0%	Correlation	0.220		
			Nominal by Interval			
"quite like me" COUNT	5775	5299	Eta	0.227		
"quite like me" % within Q70	52.1%	47.9%				
"very much like me" COUNT	3951	4298				
"very much like me" % within Q70	47.9%	52.1%				