

THE RELATIONSHIP BETWEEN
MINDFULNESS AND ACADEMIC ACHIEVEMENT IN MIDDLE SCHOOL STUDENTS

BY

DIANA M. GUGINO-SULLIVAN

A DISSERTATION
SUBMITTED TO THE FACULTY OF

ALFRED UNIVERSITY

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

DOCTOR OF PSYCHOLOGY

IN

SCHOOL PSYCHOLOGY

ALFRED, NEW YORK

AUGUST, 2019

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DIANA M. GUGINO-SULLIVAN

THE STATE UNIVERSITY OF NEW YORK AT POTSDAM, B.A. (2014)

ALFRED UNIVERSITY, M.A. (2016), C.A.S. (2018)

APPROVED BY

Rachel A. Roth, Ph.D.

Committee Co-Chairperson

Jana Atlas, Ph.D.

Committee Co-Chairperson

Nancy Furlong, Ph.D.

Committee Member

ACCEPTED BY

Kevin Curtin, Ph.D.

Chairperson, Division of Counseling & School Psychology

ACCEPTED BY

John D. Cerio, Ph.D.

Dean, School of Graduate Studies and Continuing Education

ACCEPTED BY

Beth Ann Dobie, Ph.D.

Interim Provost & Vice President for Academic Affairs

ACKNOWLEDGEMENTS

It is not easy to summarize my acknowledgements for several years worth of work and an unmeasurable amount of support. My gratitude goes far beyond the work shared in this paper. In fact, I feel as though the support for my dissertation began during my undergraduate studies when I worked with Dr. William Herman to complete an honors thesis at SUNY Potsdam. Dr. Herman taught me the true value of conducting and contributing to the field of psychological research, mentored me throughout the process of completing my own research study, and served as a role model in the field. Thank you, Dr. Herman, for all the knowledge and encouragement you have shared with me over the years.

I would also like to acknowledge Dr. Rachel Roth, Dr. Jana Atlas, and Dr. Nancy Furlong for serving on my dissertation committee and for their continued support throughout the dissertation process. This strong team of intellectuals has made the completion of this milestone possible. I have learned a great deal from the time I initially began this research, and the knowledge that has been shared with me along the way is invaluable. Words cannot truly express my gratitude for the great deal of support that my committee has shown me.

Last, but far from least, has been the endless love and support from my family and friends. The process of completing a doctoral degree is far from easy. None of it would have been obtainable without the unconditional love and encouragement from the family and friends who were always there to congratulate me in the successes and encourage me during the trials. No great accomplishment is done alone, and this is yet an example of that very fact.

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Abstract

The field of mindfulness has grown significantly in terms of interest, research, and practice. However, as mindfulness-related research regarding the adult population has significantly increased, there is limited mindfulness-focused research as it relates to youth. Additionally, research is needed to identify whether measures of mindfulness relate to children's academic achievement. Given that a great deal of the existing research related to mindfulness is based on intervention studies, it is important to recognize the importance of correlational data in order to determine potential relationships between variables. Therefore, the current study evaluated scores from two psychometrically-sound measures of trait mindfulness for youth (i.e., the Child and Adolescent Mindfulness Measure, the Mindful Attention Awareness Scale-Children) and New York State standardized English language arts (ELA) and mathematic academic scores. Participants were 161 sixth, seventh, and eighth grade students from a public school in upstate New York. Results supported internal consistency reliability and concurrent validity for both the CAMM and MAAS-C. Further, a significant and positive relationship was found between the MAAS-C and mathematic scaled scores and ELA level scores, although the CAMM was not significantly correlated with any of the academic measures. Lastly, the sample was analyzed by grade level and a significant relationship was found between the MAAS-C and ELA and math achievement among sixth grade students. These findings indicate that the MAAS-C may be the better measure when evaluating mindfulness among sixth grade students. Further research should investigate the predictive power of the MAAS-C and academic achievement.

Chapter 1

Introduction

Mindfulness is a topic that has gained a significant amount of interest and research in more recent years. Although the roots of mindfulness originated in Eastern meditation practices and date back hundreds of years, a secular and evidence-based form of mindfulness has made its way to Western civilizations (Baer, 2003). Kabat-Zinn (1994) defined mindfulness as the act of intentionally paying attention to the present moment without making evaluative judgments. Mindfulness is conceptualized as a skill that can be practiced and enhanced. Further, once an individual has developed the skill of mindful thinking, it is believed to be relatively stable over time and across settings. There are several skills that contribute to mindful thinking (i.e., sensory awareness, cognitive control, emotional regulation, acceptance, attention regulation; Jones, 2011).

Jones (2011) explained that the following experiences occur during mindfulness practice. Sensory awareness, or the experience of becoming aware of and attending to the present surroundings, allows an individual to be in the moment and can be enjoyable and pleasant. Cognitive control relates to an individual's ability to allow thoughts to enter and exit his or her mind freely. This means that one is aware of his or her thoughts, but does not focus on them at that moment. Emotional regulation is similar in that an individual is encouraged to recognize his or her emotions without responding to them. This allows an individual to reflect on his or her feelings and decide how he or she will respond. Acceptance of thoughts and emotions is also a skill related to mindfulness. Accepting thoughts and emotions in a nonjudgmental manner is considered beneficial for personal well-being. Lastly, mindfulness also involves the capacity to regulate attention. This refers to the ability to control and refocus

attention; it involves recognizing what one is paying attention to and redirecting attention when needed. Taken together, mindfulness is a multifaceted construct.

The online *Mindfulness Fundamentals* course by Mindful Schools (2018), explained that mindfulness can be considered a state, a trait, or a practice. When one experiences a moment of mindfulness it is considered state mindfulness. However, trait mindfulness explains a longer lasting and consistent practice of mindfulness in one's day-to-day life. Further, there are various mindfulness practices in which people may choose to engage (e.g., different postures and activities such as seated mindfulness, mindful walking, and mindful eating). The more one practices mindfulness in a formal and intentional way, the more moments of mindfulness one will experience. This ultimately leads to an elevated trait-level mindfulness, or being more mindful unintentionally. In an effort to teach, practice, and enhance trait mindfulness, researchers have developed mindfulness interventions.

Mindfulness Interventions

The majority of research related to adolescents, children, and mindfulness is highly focused around applied interventions aimed at improving outcomes related to, but different than, mindfulness (e.g., Flook et al., 2010; Parker, Kupersmidt, Mathis, Scull, & Sims, 2014). For example, measures of constructs such as well-being, self-concept, or anxiety have been completed before and after a mindfulness intervention was implemented (e.g., Brown & Ryan, 2003; Greco, Baer, & Smith, 2011; Lawlor, Schonert-Reichl, Gadermann, & Zumbo, 2014). These measures were then used to determine whether the intervention was beneficial or not. However, a study conducted by Lechtenberg (2012) was unique in that the researcher administered a measure of mindfulness (CAMM; Greco et al., 2011) before and after a nine-week mindfulness intervention to assess for potential change. Results indicated that participants

in the intervention group experienced a significant increase in mindfulness compared to the control group, based on pre- and post-intervention measures. This study will be discussed in greater detail in Chapter 2. Investigating mindfulness as it relates to other constructs has also been studied in mindfulness intervention research.

Mindfulness in Relation to other Characteristics

Mindfulness in children is correlated with several school-related attitudes and behaviors including well-being, classroom autonomy, academic efficiency, personal achievement goals (Lawlor et al., 2014), executive functioning skills (Parker et al., 2014), feelings about quality of life, academic competence, social skills (Greco et al., 2011), behavioral regulation, metacognition, overall global executive control (Flook et al., 2010), and inhibitory control (Oberle, Schonert-Reichl, Lawlor, & Thomson, 2012) to name a few. Mindfulness has also been inversely correlated with several maladaptive constructs including depression, anxiety, negative affect, rumination (Lawlor et al., 2014), somatic complaints, internalizing symptoms, and externalizing behavior problems (Greco et al., 2011). These studies will also be discussed in greater detail in Chapter 2 of this dissertation study. Collectively, the research base relates mindfulness to a variety of areas of life functioning. Therefore, it is likely that practicing and fostering mindfulness skills in the school setting would also prove to be beneficial. However, it is important that research investigates mindfulness as it relates to other constructs in order to develop support for such relationships. This can be done by evaluating measures of mindfulness.

Measuring Mindfulness

Currently, there are multiple measures of mindfulness available for the adult population (e.g., the Kentucky Inventory of Mindfulness Skills; Baer, Smith, & Allen, 2004; the Mindful Attention Awareness Scale; MAAS; Brown & Ryan, 2003; the Five Facet Mindfulness

Questionnaire; FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; the Freiburg Mindfulness Inventory; FMI; Walach, Buchheld, Büttenmüller, Kleinknecht, & Schmidt, 2006; and the Cognitive and Affective Mindfulness Scale-Revised; CAMS-R; Feldman, Hayes, Kumar, Greeson & Laurenceau, 2007). There are far fewer research studies and tools available to assess mindfulness in children and adolescents than adults.

One difficulty with measuring mindfulness in children is their cognitive ability to reflect on thoughts, feelings, and experiences, which is required when reporting on personal mindfulness. The ability to practice mindfulness skills and the ability to report on one's own mindful experiences likely require different levels of cognitive development. That is, although a child in early stages of cognitive development may be able to engage in practices that are believed to enhance mindfulness, they may not yet have the ability to reflect on such processes. This creates a practical challenge in determining levels of mindfulness among children before they develop the cognitive capacity to reflect and report on inner-personal thoughts, feelings, and behaviors.

It is important to note that the majority of mindfulness measures for children and adolescents are very new. Whereas recent published research by Goodman, Madni, and Semple (2017) reported seven measures of mindfulness for children and adolescents, six of which are validated measures, this may not be an accurate depiction of how many scales are readily available for use. That is, although certain measures of mindfulness are in the early stages of development and validation, after extensive review of the literature, they are not published measures that are readily available to researchers to utilize in their own studies. The validated scales, or those that have been psychometrically evaluated and demonstrated good internal consistency include the Child and Adolescent Mindfulness Measure (CAMM; Greco et al.,

2011), the Mindful Attention Awareness Scale-Adolescent (Brown, West, Loverich, & Biegel, 2011), the Mindful Attention Awareness Scale-Children (MAAS-C; Benn, 2004 as cited in Lawlor et al., 2014), the Comprehensive Inventory of Mindfulness Experiences-Adolescents (CHIME-A; Johnson, Burke, Brinkman, & Wade, 2017), Mindful Thinking and Action Scale for Adolescents (MTASA; West, Penix-Sbraga, & Poole, 2005), and the Mindfulness Scale for Pre-Teens, Teens, and Adults (MSPTA; Droutman, 2015 as cited in Goodman et al., 2017). Lastly, the Mindfulness Inventory for Children and Adolescents (MICA; Briere, 2011 as cited in Goodman et al., 2017) has not been psychometrically evaluated and is a non-validated measure. Further, an extensive literature review conducted by Pallozzi, Wertheim, Paxton, and Ong (2016) found that the MAAS (Brown & Ryan, 2004), a measure developed for use with adults, has also been utilized among samples of children ages nine to 20 with good internal consistency (Chronbach's alpha ranging from .84 to .93).

The two measures chosen for the current study and that will be discussed in further detail are the CAMM and MAAS-C. These measures were chosen because both measure trait mindfulness by asking questions that relate to experiences over time, are developmentally appropriate for middle school students, and have strong psychometric support based on current and existing research. These measures are similar in that they both measure trait mindfulness, utilize a Likert-type scale, and the questions are framed in terms of a lack of mindfulness. Once scores are reversed, higher scores indicate higher levels of mindfulness. Further, both measures ask questions related to thoughts, feelings, and behaviors; however, they vary slightly in terms of focus (i.e., the MAAS-C has a greater focus on awareness versus the CAMM's focus on non-judgmental acceptance; de Bruin, Zijlstra, van de Weijer-Bergsma, & Bögels, 2011). Despite slight differences, support for construct validity has been found ($r = .54$; $p < .001$; de Bruin et

al., 2011).

Studies investigating changes that occur following a mindfulness intervention hold value; however, a gap exists in the research in terms of measuring mindfulness as a construct itself. That is, although there are measures that were developed to assess mindfulness as a construct, interventions that are believed to enhance mindfulness tend to use pre- and post-measures of constructs other than mindfulness itself (e.g., well-being, anxiety). Assessing constructs other than mindfulness is important; however, we cannot definitively conclude that a change in mindfulness occurred when a specific measure of mindfulness is not used. Nor can we conclude that a change in mindfulness fostered other outcome measures. Therefore, there is a significant gap in the research that must be addressed. Interventions that claim to teach, foster, and enhance mindfulness must provide support that participants are, in fact, experiencing a change in their degree of mindfulness. Without this key piece of support, it cannot be concluded that mindfulness is solely responsible for other resulting changes.

Academic Achievement

An additional shortcoming identified from an extensive review of the literature in this field is the lack of investigation related to the relationship between the specific measure of mindfulness and academic achievement. Several studies have suggested that mindfulness-based interventions improve skills related to academic achievement (e.g., self-regulation, inhibitory control), but have not investigated the impact on academic achievement itself (e.g., de Bruin et al., 2011; Flook et al., 2010; Kuby, McLean, & Allen, 2015; Lawlor et al., 2014; Parker et al., 2014). For example, Parker et al. (2014) claimed that strengthened self-regulatory skills and reduction of aggression, social problems, and anxiety as a result of a mindfulness program would likely have a positive impact on students' academic performance. However, since the

researchers did not collect a direct measure of academic performance before and after the intervention, it is not certain that academic performance was directly impacted from the mindfulness intervention.

Recent research has attempted to bridge this gap. Specifically, Frank, Kohler, Peal, and Bose (2017) investigated a school-based yoga program that included mindfulness practice and academic performance measured by quarterly math and English grades. Findings did not indicate a significant change in grades post intervention; however, unexcused absences decreased significantly among students who were in the intervention group. In addition, research conducted by Bakosh, Snow, Tobias, Houlihan, and Barbosa-Leiker (2016) investigated academic scores before and after a mindfulness intervention. They found a significant improvement in reading and science grades with 54 percent of variance accounted for in reading grades and an additional five percent for science grades. However, in studies by both Bakosh et al. (2016) and Frank et al. (2017), the researchers did not take a pre- and post-measure of mindfulness, making it unknown whether a change in mindfulness as a result of the program influenced changes in academic performance.

There are studies that indicate an investigation of mindfulness as it relates to academic performance; however, these studies tend to use self-reported perceived levels of academic performance. For example, Renshaw (2017) investigated mindfulness and academic achievement in a preliminary study for a new measure of mindfulness, the *Mindful Student Questionnaire* (MSQ). However, the measure of academic achievement was calculated from students responding to a single item inquiring about their perceived grades in school. Responses were then used to estimate a grade point average. Research conducted by Shaw, Mattern, and College Board (2009) have supported this method, stating that the method was more likely to

underestimate rather than overestimate achievement. When investigating a concept such as mindfulness, perceptions of personal performance may be skewed. That is, an individual who is more or less mindful may be more or less in touch with their academic performance and may overestimate or underestimate the grades they will receive in school. Therefore, it is important to measure more concrete measures of academic performance to determine a possible relationship between levels of mindfulness and academic performance.

Further, a study conducted by Beauchemin, Hutchins, and Patterson (2008) found that mindfulness meditation improved academic performance among adolescents with learning disabilities. However, the study did not include a measure of mindfulness, and students' academic achievement was assessed using teacher report of perceived academic achievement rather than a concrete measure. Lastly, research by Bennett and Dorjee (2016) investigated the impact of a mindfulness-based course on academic attainment among students ages 16 to 18. Researchers collected academic data using General Certificate of Education exams and found that at the three month follow up, students in the intervention group demonstrated an increase in mean academic scores (6.13 points), whereas students who were in the control group experienced a decrease (10.96 points). Although researchers collected concrete and more objective scores of academic achievement, a measure of mindfulness was not collected.

Although research that links mindfulness to improvements in skills related to academic performance is valuable, neglecting to examine how mindfulness relates to academic achievement directly through quantifiable measures (e.g., grades, standardized test performance) paints an incomplete picture. Since grades are often used to determine academic achievement, research is needed to investigate a possible direct relationship between mindfulness and student grades. Without research that directly evaluates the possible relationship between these two

constructs, one can only speculate that a relationship exists. Investigating the possible relationship between mindfulness and a quantifiable measure of academic achievement would be a positive contribution to this field of study, and something that the current research intended to address.

Based upon the limited research so far, mindfulness-related skills appear to facilitate academic success. Researchers have investigated the link between self-regulation, mindfulness, and academic-related constructs. Howell and Buro (2011) found support for a relationship between mindfulness and achievement-related self-regulation (e.g., goal orientation, delay of gratification, and self-control) among undergraduate students. Specifically, these researchers evaluated aspects related to individuals' degree of mindfulness, self-regulation as it related to college achievement, and emotions surrounding achievement. The Mindful Attention Awareness Scale (Brown & Ryan, 2003), which measures how aware and attentive one is to current experiences, was administered. Additional measures were administered to assess for implicit theories, achievement goals, academic help-seeking, academic delay-of-gratification, learning strategies, self-control, procrastination, and achievement emotions. Findings indicated that dispositional, or trait mindfulness that is relatively consistent over time, was related to achievement-related self-regulation. Although academic achievement was not measured by grades, results indicated that those who were more mindful and present-focused tended to have a mastery-approach goal orientation, sought help with academic related tasks, delayed gratification, increased self-control, and decreased procrastination. Mindfulness was also found to be an indirect predictor of emotions related to achievement. Thus, these findings provide support for the connection between mindfulness, self-regulation, and academic achievement.

Further, this provides support for a relationship between mindfulness and skills that enable academic success (e.g., self-regulation, executive functioning).

More recently, Lu, Huang, and Rios (2017) investigated the relationship between mindfulness, executive functioning, and academic performance among fifth grade migrant children in China. Unlike previous research, Lu et al. (2017) investigated both mindfulness and grades using the MAAS and final exam grades in Chinese, math, and English. Additionally, researchers investigated executive functioning and how it relates to mindfulness and academic performance. Researchers found a significant positive correlation between mindfulness and executive functioning, which was positively related to academic performance. Specifically, mindfulness significantly and positively predicted Chinese grades ($B = 0.17, p < 0.05$), math grades ($B = 0.25, p < 0.01$), and English grades ($B = 0.24, p < 0.05$). Further, researchers conceptualized mindfulness into three categories of low, medium, and high based on the 33 and 66 percentile of the sample. Researchers found that higher levels of reported mindfulness were related to higher grades in Chinese, math, and English. The relationship between mindfulness and grades was consistent for medium and low levels of mindfulness as well, with group differences being statistically significant. Together, findings support a connection between mindfulness and achievement; however, additional investigation regarding the relationship between measures of mindfulness and academic performance is necessary to further bridge this gap in the current research.

Limitations in Research

In order to contribute to the empirical understanding of mindfulness, the author emphasizes the need for research to evaluate the construct of mindfulness. This can be done by administering measures of mindfulness in order to evaluate possible relationships between

mindfulness and other constructs. One area that has been identified as lacking in the current research base is that of academic outcomes. Although mindfulness-based interventions have been implemented, and outcome measures related to academic performance such as executive functioning and self-regulation have been investigated, there is very little existing research evaluating the relationship between mindfulness and objective academic outcomes among early adolescents. Howell and Buro (2011) pointed out that limited attention has been paid to mindfulness as it relates to the academic context when compared to the increase in other areas of mindfulness research. Pallozzi et al. (2016) further supported the need for research to investigate the possible relationship between mindfulness and academic achievement after an extensive review of all published trait mindfulness measures used with adolescents at the time of the study. Although a recent study by Lu et al. (2017) greatly contributed to the field of research by investigating a measure of mindfulness and academic grades among fifth grade migrant children in China, this sample may be difficult to generalize to other populations. In order to bridge this gap, future research must utilize a measure of mindfulness and a quantitative measure of academic achievement to investigate a possible relationship between the two constructs.

Present Study

The field of mindfulness has grown significantly in terms of interest, research, and practice. However, as mindfulness-related research regarding the adult population has significantly increased, there is limited mindfulness-focused research as it relates to youth. Additionally, research is needed to identify whether measures of mindfulness relate to children's academic achievement. Given that a great deal of the existing research related to mindfulness is based on intervention studies, it is important to recognize the importance of correlational data. That is, correlational data is required in order to determine potential relationships between

variables. Developing an understanding of relationships between variables is necessary, especially when evaluating mindfulness as it relates to academic achievement. Therefore, the current study evaluated scores from the CAMM, MAAS-C, and New York State standardized English language arts and mathematic academic achievement scores. Due to the research regarding cognitive development and ability to reflect on personal experiences and thoughts, participants were sixth, seventh, and eighth grade students from a public school in upstate New York.

It was predicted that a significant and positive relationship would exist between levels of mindfulness and academic achievement. Similar to findings by de Bruin et al. (2011), it was also hypothesized that the CAMM and MAAS-C would be positively correlated, demonstrating concurrent validity between both measures.

Chapter 2

Literature Review

Mindfulness

According to Kabat-Zinn (1994), mindfulness is the act of intentionally paying attention to the present moment without making evaluative judgments. Kabat-Zinn (2015) explained mindfulness as “moment-to-moment, non-judgmental awareness, cultivated by paying attention in a specific way, that is, in the present moment, and as non-reactively, as non-judgmentally, and as open-heartedly as possible” (p. 1481). Although the key principles related to mindfulness are consistent, there are slight variations in the specific ways mindfulness is conceptualized. For example, Bishop et al. (2004) suggested that the definition of mindfulness includes two parts. The first part is related to the self-regulation of attention, including maintaining attention and recognition of present moment mental events. The second part is related to an individual’s curiosity, openness, and acceptance of present moment experiences. Therefore, the practice of mindfulness encompasses several different skills.

Baer et al. (2004) evaluated what an individual does when being mindful in order to define aspects of mindfulness. They identified the act of observing one’s own thoughts to be one critical characteristic of mindfulness. Observation requires the skill of noticing and attending to factors such as thoughts, feelings, and sensations. These researchers also emphasized the importance of describing what is observed. In accordance with mindfulness practice, descriptions should be free of evaluation or judgment. In addition, acting with awareness was also noted as a central aspect of mindfulness. This skill involves providing full, undivided attention to activities. Lastly, Baer et al. (2004) identified accepting without judgment to be an important skill related to mindfulness. This requires an individual to refrain from using

evaluative labels, and to accept things for what they are. Collectively, the act of observing, describing what is observed, acting with awareness, and accepting without judgment are identified as defining aspects of mindfulness.

Although slight variations exist in how mindfulness is defined, the act of being present-centered, in the moment, and reflective in a nonjudgmental way are key aspects that characterize the concept of mindfulness. Engaging in such behaviors and thought processes are conceptualized as the practice of mindfulness. Further, aspects related to mindfulness, such as intentional focus, are also characteristic of self-regulation.

Self-regulation.

Blair and Diamond (2008) defined self-regulation as both cognitive and behavioral processes that work to maintain emotional, motivational, and cognitive arousal, resulting in positive adaptation, adjustment, social relationships, productivity, achievement, and sense of self. Blair and Diamond (2008) further explained that self-regulation is influenced by both biological and social influences. That is, children who display appropriate self-regulation are more likely to be praised for such behaviors, which in turn shapes the child's self-perception and increases his or her likelihood of continuing such behaviors. Therefore, biological factors impact an individual's ability to engage in and develop self-regulatory skills, but an individual's environment also plays a crucial role.

Mindfulness, or the act of "being attentive to and aware of what is taking place in the present" (Brown & Ryan, 2003, p. 822) is a concept that is very closely related to self-regulatory skills. That is, in order to practice mindfulness, one must engage in some form of self-regulation to intentionally focus his or her thoughts. This builds and enhances the skills of maintaining emotional, motivational, and cognitive arousal, which are identified as key components of self-

regulation (Blair & Diamond, 2008). According to Brown and Ryan (2003, p. 824), “several theories of self-regulation discuss the place of awareness and attention in the maintenance and enhancement of psychological and behavioral functioning.” However, the main factor that differentiates the constructs of self-regulation and mindfulness is the idea that “not all self-regulatory processes require conscious awareness and attention to operate smoothly, and a substantial portion of day-to-day behavior has been thought to occur automatically or mindlessly” (Brown & Ryan, 2003, p. 824). In order to practice the self-regulatory skill of mindfulness, one must purposefully and nonjudgmentally observe his or her thoughts and feelings (Brown & Ryan, 2003). Burke (2010) explained that focusing, maintaining, and switching attention are all required for the practice of mindfulness. Further, these skills are also related to the enhancement of self-regulation in children. Moore and Malinowski (2009) explained that the practice of mindfulness increases attention because when doing so an individual is actively focusing and sustaining thoughts while inhibiting those thoughts that are unwanted, thus enhancing skills that foster focus and attention. Therefore, self-regulation is a prerequisite of mindfulness, and although self-regulatory skills are necessary, they are not sufficient for mindfulness to occur. Further, they are known to develop over time.

Riggs, Black, and Ritt-Olson (2015) found a direct connection between mindfulness and executive functioning among seventh and eighth graders. They assessed trait mindfulness using the Mindful Awareness Scale-Adolescent Version (MAAS-A; Brown et al., 2011). Results found that greater trait mindfulness was significantly related to greater working memory skills ($r = .49$), inhibitory control ($r = .46$), and cognitive flexibility ($r = .31$). These findings are important because the specific functions of working memory and inhibitory control are related to the broader construct of executive functioning, which facilitates academic achievement.

Oberle et al. (2012) reported that early adolescents' self-report of mindfulness was a significant predictor of inhibitory control. Specifically, fourth and fifth grade students who reported higher levels of mindfulness also performed better on inhibitory control tasks that required self-regulation. Dispositional, or trait, mindfulness was assessed using the Mindful Attention Awareness Scale-Children (Benn, 2004 as cited in Lawlor et al., 2014; MAAS-C). Inhibitory control was measured using a computerized task that required participants to remember certain rules and apply them appropriately during different presentations of the task. Results indicated that mindfulness significantly predicted inhibitory control. That is, the more mindful one was, the more he or she responded correctly on tasks that required the practice of inhibitory control. These findings are important because they provide support for the relationship between mindfulness, self-regulation, and inhibitory control. Since inhibitory control and self-regulation have been linked to academic achievement, the relationship between inhibitory control and mindfulness indicates a possible relationship between mindfulness and academic achievement. This possible relationship is important to explore further.

Child development.

When considering mindfulness, a skill that requires cognitive thought, it is necessary to consider how such cognitive abilities develop over time. Piaget identified four stages of cognitive development: the sensorimotor stage (ages zero to two), the preoperational stage (ages two to seven), the concrete-operational stage (ages seven to 11 or 12), and the formal-operational stage (ages 11 to 12 and beyond; Shaffer, 2002). Piaget described these stages as an invariant developmental sequence. That is, stages cannot be skipped because each stage builds on the previous stage. In order to develop a better understanding of children's cognitive development and how it may relate to mindfulness, it is necessary to evaluate each stage in greater detail.

According to Shaffer (2002), Piaget proposed that during the sensorimotor stage of cognitive development, children develop an understanding for their world through behavioral schemes, which are developed through coordination of their sensory inputs and motor capabilities. This allows them to interact with, learn from, and begin to understand their environment. During this early stage of cognitive development, it is unlikely that children possess the ability to use mindfulness related skills.

The second stage of cognitive development identified by Piaget is the preoperational stage, which is characterized by children thinking symbolically about objects and events they experienced; however, Piaget believed that children at this stage were not yet capable of thinking logically (Shaffer, 2002). Whereas children toward the end of this developmental stage may be able to engage in simple mindfulness skills (e.g., taking deep breaths), it is not likely that they are able to reflect on and report their experiences related to mindfulness.

The third stage of cognitive development proposed by Piaget is the concrete-operational stage and occurs between the ages of seven to 11 (and sometimes 12). This stage consists of the development of cognitive operations and logical thinking about events and objects (Shaffer, 2002). Children in this third stage of development begin to develop perspective-taking skills. Children in this stage also begin to be able to reflect on situations and think about how certain changes could influence outcomes. Based on these skills, it is likely that a child in the concrete-operational stage of Piaget's developmental model would be able to reflect and report on questions that assess mindfulness in children.

The fourth and last stage of Piaget's cognitive development model is the formal-operational stage and occurs from age 12 and on (Shaffer, 2002). This final stage of Piaget's developmental model is characterized by the development of abstract thinking. That is,

individuals begin to think more rationally and systematically about hypothetical concepts. Hypothetico-deductive reasoning, or the ability to think hypothetically, is also believed to develop during this stage. It is likely that individuals who have reached this stage of cognitive development are able to reflect and report on questions that assess mindfulness in children.

It is important to note that healthy cognitive development does not automatically lead to being more mindful. Rather, mindfulness develops through practice. Although developmental abilities can be seen as fostering or allowing for enhancement of the skill of being mindful, mindfulness does not automatically develop in stages like cognitive development is believed to develop. When asking children to report on their mindful experiences, it is important that they have the cognitive capacity to do so. The ability to practice mindfulness skills and the ability to report on one's own mindful experiences likely requires different levels of cognitive development. That is, while a child in early stages of cognitive development may be able to engage in practices that are believed to enhance mindfulness, they may not yet have the ability to reflect on such processes. However, a child in the concrete-operational and formal-operational stage of Piaget's cognitive development theory would likely have the ability to think about and report personal experiences related to mindfulness.

Lawlor et al. (2014) explained research regarding the developmental theory as it relates to middle childhood. Middle childhood is defined as "a developmental period marked as a time when children develop a sense of competence and personal self-esteem" (p. 731). This period entails advances in understanding, meta-cognition, and self-regulation. During this time, children develop skills required to engage in self-awareness and perspective taking. Lawlor et al. (2014) pointed out that the skills of self-awareness, self-regulation, meta-cognition, and meta-awareness, or the awareness of one's self, are skills that are particularly important for children to

engage in and report on personal mindfulness. Lawlor et al. (2014) explained that although child development is a key factor related to the practice of mindfulness, research has not yet investigated trait mindfulness and when it is developed in children. In fact, results from their study of fourth through seventh grade students yielded a significant main effect for grade, $F(3, 278) = 3.31, p = .02, \eta_p^2 = .034$ with a moderate effect size. That is, a Tukey post-hoc analysis demonstrated that fifth grade students scored higher on mindfulness compared to seventh graders; thus, indicating that child development may play an important role in mindfulness. The need for research in this area has also been identified by other researchers, such as de Bruin, Zijlstra, and Bögels (2014), who looked at mindfulness among a sample of primary school children ages 10 and up (mean age of 11.1 years) and adolescents ages 13-16 (mean age of 14.8) and found that mindfulness is experienced differently among different age groups. Specifically, although both children and adolescents demonstrated “present-moment non-judgmental awareness,” children displayed “suppressing or avoiding thoughts and feelings” and adolescents displayed “distractibility or difficulty paying attention” (p. 425). Thus, researchers demonstrated that the differences in how mindfulness is experienced as related to age is important to consider and requires further investigation.

The practice of mindfulness.

The skills related to mindfulness can be practiced in various ways; however, mindfulness practices tend to have a common theme and instructions. Having participants pay attention to and observe a simple behavior, such as breathing, is a common strategy for teaching mindfulness skills (Baer, 2011; Baer et al., 2004; Segal, Williams, & Teasdale, 2002). As the individual focuses on this behavior, he or she is encouraged to note thoughts and emotions that enter his or her mind and to return focus to the original behavior. Individuals might assign a brief label to

experiences observed during this time. However, individuals should refrain from negative evaluation or making an attempt to change thoughts and feelings. For instance, an individual practicing mindfulness begins by shifting his or her attention to an activity such as breathing, walking, or eating. He or she should observe the intended act, related emotions, and bodily sensations. He or she should also make note of unrelated thoughts that may occur, make effort to not evaluate such unintended thoughts judgmentally, and make efforts to redirect attention to the intended activity. He or she may also provide brief labels for his or her observed experiences, such as *itch*, *happy*, or *soar* (Baer et al., 2004; Segal et al., 2002). Engaging in the practice of directing one's attention to present moment sensations and experiences is believed to foster and increase skills related to mindfulness and an individual's mindful state throughout his or her daily life. Although these are very broad examples of how to apply the concepts of mindfulness to practice, specific interventions have been developed using variations to the many methods of practicing and engaging in mindfulness. A select sample of such interventions will be discussed in further detail below.

Mindfulness interventions for school-age children.

Based on the current research, a great deal has focused on mindfulness as it relates to the adult population, as this was the population for whom such interventions were initially developed (Eklund, O'Malley, & Meyer, 2017). More recently, there has been a significant amount of research related to mindfulness interventions in the school setting, and evaluating the changes and outcomes that resulted from such interventions. According to researchers in the field (e.g., Dariotis, Mirabal-Beltran, Cluxton-Keller, Gould, Greenberg, & Mendelson, 2017; Klingbeil et al., 2017; Semple, Droutman, & Reid, 2017), the school setting is an ideal environment for teaching, learning, and practicing brief mindfulness techniques. Further, skills practiced directly

relate to behaviors that are expected of students in the school setting. The school is also a safe and convenient location for implementing mindfulness practices. Lastly, implementing mindfulness practice in the school setting may have a positive impact on both students and teachers. Therefore, implementing mindfulness practice in schools allows both students and teachers to learn, practice, and enhance mindfulness skills together, thus creating a greater opportunity for the skills to be generalized to the classroom. Together, this suggests that the school setting is an optimal setting to invest resources to utilize the benefits that result from teaching and practicing mindfulness.

Collectively, research in the area of mindfulness in the school setting provides substantial support for the teaching, practice, and enhancement of skills related to mindfulness for school-age children. It is important to note that this is only a subset of research on the benefits of mindfulness for children in schools. That is, research related to mindfulness interventions among school-age children continues to be published, and research that is highlighted here is only a portion of such research that exists in the field of study. Based on an extensive review of the research, the information presented is an accurate overall review of the findings related to mindfulness interventions for youth and the potential benefits of implementing mindfulness practice in the school setting.

Parker et al. (2014) evaluated the potential benefits of practicing mindfulness skills in a rural public school for 111 students in fourth and fifth grade. They developed the *Master Mind* program, which consisted of awareness of the body, feelings, thoughts, and relationships and was taught to students by trained teachers. The program was administered for 15 minutes per day for four weeks. A control group was formed by randomly assigning half of the participants to the intervention group, and half to the wait-list. It was found that mindfulness training for children

significantly strengthened self-regulatory skills among both boys and girls compared to children who had not received the training program. Self-regulatory skills, or executive functioning, was measured using the Flanker Fish task (Diamond, Barnett, Thomas, & Munro, 2007). This measure of executive functioning includes inhibitory control, cognitive flexibility, and working memory. Further, student adaptive functioning and behavioral/emotional problems in the classroom were assessed using the Children's Behavioral Checklist-Teachers Report Form (CBC-TRF; Achenbach & Rescorla, 2001). Both aggression and social problems were significantly reduced among both boys and girls, and anxiety was significantly reduced among girls. Thus, children became more aware of their thoughts and feelings, allowing them to respond thoughtfully rather than impulsively. This research supports that mindfulness positively contributed to children's cognitive, behavioral, and emotional well-being; however, it is important to consider that findings were based on teacher reports of students. Although teacher ratings are beneficial and hold value, from a research standpoint this form of data could potentially be influenced by teacher expectancies and potentially produce skewed results.

Flook et al. (2010) also evaluated possible benefits of mindfulness as related to students' enhanced behavioral regulation, metacognition, and overall global executive control, which are all related to executive functioning. Further, executive functioning is related to various aspects of cognition, emotion, behavior, and are skills that foster academic success. For this particular study, researchers investigated whether mindful awareness practices (MAPs) influenced students' executive functioning. The 30-minute program was completed twice a week for eight weeks in school by 64 children ages seven to nine. Following the program, both teachers and parents were asked to report observations related to executive functioning. Researchers assessed executive functioning using the Behavior Rating Inventory of Executive Function (BRIEF;

Gioia, Isquith, Guy, & Kenworthy, 2000, as cited in Flook et al., 2010). MAPs, a mindfulness training program tailored for children, used various activities such as short periods of meditation, laying down body scans/meditation, and games that promoted mindfulness-related skills to help students become more aware of themselves, others, and the environment. Results indicated that children who participated in MAPs experienced enhanced behavioral regulation, metacognition, and overall global executive control compared to pre-intervention measures. Further, enhancements in these skills were reported by both teachers and parents pre- and post-intervention, suggesting that children generalized and applied learned skills outside of the school setting. Having both teachers and parents reports provides the benefit of multiple reports from various settings; however, a weakness is that the participant did not have the opportunity to share their personal perspective. For example, teachers may have certain expectancies or become more aware of slight differences that may be attributed to mindfulness practice. Nonetheless, an important finding was that the MAPs program was found to be especially beneficial for students who initially had poor executive functioning skills. Researchers suggest that MAPs improve executive functioning skills that are crucial aspects of children's socio-emotional, cognitive, and academic development. Despite the lack of a control group, this research supports the use of programs that promote mindfulness skills among students within the school setting. Further research is needed to expand upon these preliminary findings.

Lechtenberg (2012) conducted a nine-week mindfulness intervention among 50 ninth grade students, ranging from 14 to 16 years of age. The intervention consisted of activities adapted from Russ Harris' *Act Made Simple*, and "...included present moment focus and awareness on the breath, physical sensations, thoughts, and environmental sensations" (p.10). This study is unique in that the researcher used the CAMM, a youth measure of mindfulness, as a

pre and post measure of the concept of mindfulness itself. Further, the majority of mindfulness intervention studies assess variables such as well-being, few studies evaluate measures of mindfulness as an independent construct. In addition, the pre and post measures of mindfulness in both the experimental and the control group sets this study apart. Lechtenberg (2012) found that although there was not a significant difference between the control group and experimental group in terms of pre-intervention levels of mindfulness, the mindfulness intervention group demonstrated a significant increase in mindfulness following the intervention as compared to the scores from the control group of students who did not receive the intervention. This finding suggests that the intervention was effective in increasing levels of mindfulness. Although this research contributes greatly to the field due to the inclusion of a measure of mindfulness for children, there remains a gap in the research related to the relationship between mindfulness in children and academic achievement.

Benefits of being mindful.

There are several benefits experienced as a result of practicing mindfulness skills and being mindful. After a review of the literature, Baer (2003) concluded that mindfulness interventions are beneficial in reducing mental health problems and enhancing psychological functioning in adults. Brown and Ryan (2003) found that the practice of self-regulatory skills related to mindfulness improved well-being. Specifically, during the validation studies of the Mindful Attention Awareness Scale (MAAS), researchers also assessed for various measures of well-being through self-report among a sample of undergraduate students. Findings supported a negative relationship between mindfulness and depression, self-consciousness, angry hostility, anxiety, and impulsivity. Further, mindfulness was positively related to self-esteem, self-

actualization, autonomy, competence, and relatedness fulfillment. Together, findings indicate that mindfulness relates to more positive psychological states.

During a validation study for the MAAS-C, Lawlor et al. (2014) found support for the relationship between mindfulness and several aspects related to well-being. These researchers administered the MAAS-C as a measure of mindfulness, along with other measures, to 286 fourth to seventh grade students, representing various socioeconomic statuses. The MAAS-C is considered a trait mindfulness measure, conceptualizing mindfulness as a relatively stable trait over time. Therefore, the measure is less sensitive to immediate changes that may occur directly after mindfulness practice, but rather measures more stable changes in thought processes and behaviors that occur in day-to-day life. That is, mindfulness is a characteristic that is stable and consistent. Results indicated that mindfulness was positively and significantly related to students' self-report of school self-concept, optimism, positive affect, perceived classroom autonomy, academic efficiency, and personal achievement goals. Further, mindfulness was significantly and negatively related to depression, anxiety, negative affect, and rumination. Although differences were not found between genders, scores indicated that younger children reported being more mindful than older children. Lawlor et al. (2014) proposed that this finding may be due to the fact that older children experience more cognitive, contextual, and social changes that place greater demands on the student and create additional opportunities for an individual to focus on the past or future rather than focusing on the present moment.

Greco et al. (2011) investigated the relationship between mindfulness and aspects related to well-being during the validation study for the Child and Adolescent Mindfulness Measure (CAMM). Researchers conducted two studies with children between the ages of 10 and 17 from public schools in Tennessee and found statistically significant results that mindfulness was

positively related to feelings about quality of life, academic competence, and social skills. In contrast, mindfulness was statistically significant and negatively related to somatic complaints, internalizing symptoms, and externalizing behavior problems.

Further, Kuby et al. (2015) reported significant correlations in the expected directions between mindfulness, as measured by the CAMM, and other constructs. That is, using results from the CAMM, they found a positive relationship between mindfulness and positive affect, and a negative relationship between mindfulness and the tendency to worry, negative affect, and emotional and behavioral difficulties. Cunha, Galhardo, and Pinto-Gouveia (2013) assessed mindfulness using the Portuguese version of the CAMM with 410 students ages 12 to 18 attending public schools in Portugal. Negative correlations were found between mindfulness and depression, anxiety, and psychological inflexibility. In contrast, positive relationships were found between mindfulness and social comparison, which was conceptualized as a positive skill to maintain.

de Bruin et al. (2014) investigated mindfulness among a sample of children and adolescents from the Netherlands using the Dutch version of the CAMM. These researchers divided the sample by age, which resulted in two groups (i.e., 275 students ages ten to 12 years old, 560 students ages 13 to 16 years old). Significant positive correlations were found between child and adolescent levels of mindfulness and measures of happiness, self-regulation, and quality of life, whereas significant negative correlations were found between mindfulness and measures of stress, rumination, self-blame, and catastrophizing. These studies suggest that there is cross-cultural and potential universal utility of the CAMM. The researchers from this study also included a variable that had not been previously researched. That is, unlike previous studies that assessed mindfulness in children and adolescents, de Bruin et al. (2014) explored

participants' previous meditation experience and knowledge as they related to CAMM scores. Although no significant relationship was found between children's previous experience and current CAMM scores, adolescents who had previous experience with meditation and/or yoga scored lower on the CAMM, indicating lower levels of mindfulness. Although this finding may seem surprising, researchers explained that it is consistent with other research in the field. It is believed that adolescents develop greater self-awareness as a result of meditation practice, thus becoming more aware of and reporting more moments in which they were not mindful. Results supported that both children and adolescents demonstrated "present-moment non-judgmental awareness." Further, children exhibited "suppressing or avoiding thoughts and feelings" and adolescents displayed "distractibility or difficulty paying attention" (p. 425).

de Bruin et al. (2011) evaluated mindfulness among 717 adolescents in the Netherlands, who ranged from 11 to 17 years old, using the Dutch version of the MAAS-A. Results indicated statistically significant negative correlations between mindfulness and measures of stress, rumination, and catastrophizing. In contrast, statistically significant positive correlations were found between mindfulness as measured by the MAAS-A and measures of happiness, self-regulation, and an additional measure of mindfulness (i.e., CAMM; $r = .54$; $p < .001$). Therefore, not only did this study further support the benefits of mindfulness as related to other constructs, but also the convergent validity between two measures that are both designed to measure trait mindfulness in adolescents.

Based on the above research, mindfulness was positively related to aspects that would serve to enhance academic outcomes and it was negatively related to those things that might impede academic achievement. That is, characteristics that were believed to foster academic success correlated positively with mindfulness and those that would hinder academic success

were negatively related. Overall, current research in the field of mindfulness provides substantial support that higher levels of mindfulness among school-age students relates to several benefits related to social, emotional, and behavioral domains. However, the field of mindfulness would benefit from further investigation into how mindfulness relates directly to academic achievement.

Academic Achievement

Academic achievement is an important topic for research because it relates to whether students are learning as expected. Academic achievement has been conceptualized and assessed in different ways. York, Gibson, and Rankin (2015) completed a review of the literature and found that terms related to academic outcomes in research can be misleading at times. Specifically, they reported that the majority of the research defines academic success as a broad term that encompasses several aspects, including persistence, career success, acquisition of skills and competencies, attainment of learning outcomes, satisfaction, and academic achievement.

Self-regulation as it relates to academic achievement.

As mentioned above, self-regulation is a concept that is closely related to mindfulness. It is also related to academic achievement. Further, methods such as mindfulness techniques that enhance self-regulation may serve to benefit children and their academic outcomes. Therefore, it is important to investigate the potential influence self-regulation may have when looking at mindfulness and academic achievement.

McClelland et al. (2007) found a positive relationship between the development of preschoolers' self-regulation skills and academic skills, specifically in vocabulary scores ($r = .35, p < .001$), and math scores ($r = .47, p < .001$). Blair and Diamond (2008) found from a review of literature that children with lower levels of self-regulation, who were in learning

environments that did not foster the development of such skills, were at-risk of academic failure. Riggs et al. (2015) found significant and positive relationships between self-reported grades and the executive function processes of inhibitory control ($r = .22, p < .05$), working memory ($r = .39, p < .001$), and cognitive flexibility ($r = .29, p < .01$) among seventh and eighth grade students. Taken together, research supports an important link between self-regulatory skills and youths' academic performance.

Collectively, research supports a connection between mindfulness and aspects of self-regulation. Further, several skills related to self-regulation are conducive to academic achievement. Therefore, it is possible that a relationship exists between mindfulness and academic achievement.

Defining academic achievement.

York et al. (2015) defined persistence as the focus and drive necessary to progress and complete an academic program of study. Career success was included for the importance of academic success and post-college success. Attainment of learning outcomes or objectives is slightly broader than acquisition of skills and competencies. Satisfaction refers to contextual elements, such as perceptions of institutional fit, climate, and motivation that create a positive learning environment and are prerequisites for academic success. Lastly, academic achievement is considered an objective measure and representative of academic performance and ability. Together, these aspects comprise academic success.

It is important to understand the factors that contribute to students' assigned grades and how reliable various measures of academic performance are. McMillan, Myran, and Workman (2002) were interested in the grading practices of teachers, and investigated this topic among over 900 third to fifth grade teachers from urban, suburban, and rural school districts.

Specifically, researchers were interested in the factors that contributed to assigned grades. Results supported that students' grades were comprised of more than only academic performance. That is, among various factors, effort, ability, improvement, and actual performance were found to contribute greatly to overall grades. Researchers further found that although all of these factors appear to influence a student's assigned grade, academic performance is the most influential factor that makes up both language arts and mathematics grades among elementary students. This study is important because it demonstrated that grades assigned to elementary students are influenced by more than students' performance alone, and that contributing factors are relatively consistent among upper elementary language arts and mathematics grading practices. Since scoring for state-wide standardized tests cannot take into account factors other than the responses to the test questions, it is likely that such scores are more consistent reports of achievement within and between school districts.

Based on findings by York et al. (2015) and McMillan et al. (2002), it is clear that teacher-assigned grades consider more than student performance on tasks alone. Rather, grades tend to take other variables into account (e.g., effort, attitude). Further, not all teachers use the same teaching and testing materials, meaning that students' grades from different teachers are derived differently. However, standardized state tests are not only the same across schools, but they are graded in a consistent, objective manner. This standard grading procedure removes the added variables that comprise teacher assigned grades. Therefore, scores from standardized state tests are more consistent within and between classrooms and school districts.

It is important to note that although there are several benefits to using standardized state test scores as an outcome measure, there are potential short comings. That is, although standardized scores allow for consistency between classroom teachers, subjects, and schools,

they are conducted in a way that leaves little room for accommodations. That is, unless a student has individualized testing accommodations, they are unable to access strategies like checking for understanding. Therefore, a student's performance may not be a full representation of their true thinking and reasoning capacity, rather a measure of what they were able to complete independently. Further, individual student testing conditions are unknown on the day of standardized state testing. Whereas a teacher may be able to observe if a student is feeling ill or tired and postpone a classroom assessment to another time, this flexibility does not exist with more standardized measures. Therefore, scores may not always represent a student's full potential. Further, state tests are conducted at the end of the school year; however, the scores are not obtainable until the summer or early fall. It is important to be aware of the potential downfalls to using standardized state test scores as an outcome measure and to take necessary precautions when drawing implications and conclusions.

Current Study

After extensive review of the current research in a large and growing field, a significant shortcoming was identified regarding the links between mindfulness among children and academic achievement. Specifically, although mindfulness interventions continue to be implemented in the school, little is known about the relationship between mindfulness and academic achievement as defined by grades or standardized testing. Therefore, there is a current need for research to focus on and explore the relationship between mindfulness and quantitative measures of academic achievement, especially among middle school students. Therefore, the current research explored whether a significant and positive relationship exists between student mindfulness and academic achievement.

Chapter 3

Method

The purpose of this study was to begin to bridge the gap in research related to mindfulness and direct, objective measures of academic achievement among early adolescents. In order to address the identified need, the current study implemented a correlational design to evaluate scores from the CAMM, MAAS-C, and New York State standardized English language arts and mathematics academic achievement scores among sixth, seventh, and eighth grade students from a public school in upstate New York.

Participants

Data was collected from 161 children in sixth, seventh, and eighth grade who attended a public suburban middle school in upstate New York (see Table 1 for demographic descriptive statistics). The middle school was part of a district that contains a high population of students from families with above average socioeconomic status. Further, participants were all students in classes that included mindfulness learning and practice within the curriculum. Students ranged in age from 10 to 14 years ($M = 12.01$ years). Females consisted of 53.4 percent of the sample. Further, the majority of the sample identified as Caucasian (76.3%). The only exclusion factor for the current study was state test participation. That is, if a student did not take the English language arts or mathematics state exam, his or her information was excluded from the related analysis. Specifically, of the 161 total students, 109 participated in the English language arts standardized state assessment and 106 participated in the mathematics standardized state assessment. Further, among the sample of 161 students, 43 did not participate in both the English language arts and mathematics assessments. Lastly, only five students opted out of participation and 11 were excluded due to lack of information or discontinued participation

throughout the study and were not included in the total sample (N = 161). Overall, this sample is believed to be representative of the district's population.

Table 1

Demographic Descriptive Statistics

Gender

N = 161

Male = 46.00%

Female = 53.40%

Other = 0.60%

Age

N = 161

10 = 1.20%

11 = 31.70%

12 = 34.2%

13 = 30.4%

14 = 2.50%

Grade

N = 161

6 = 31.70%

7 = 35.40%

8 = 32.90%

Race

N = 160

Caucasian = 76.30%

Black or African American = 3.80%

Asian = 8.80%

Native Hawaiian or Other Pacific Islander = .60%

Other = 1.9%

2 or more = 8.8%

Hispanic/Latino/Spanish Origin

N = 156

Yes = 6.40%

No = 93.60%

Parent Education	Parent 1	Parent 2
	N = 149	N = 142
Some High School	0.0%	1.40%
High school diploma	1.30%	2.10%
Some college	5.40%	4.20%
Associate degree	3.40%	2.80%
Bachelor's degree	28.2%	35.90%
Master's degree	35.6%	34.50%
Doctorate/Professional degree (JD, MD)	26.2%	19.00%

Measures

Demographic information.

Students were administered a demographic questionnaire (see Appendix A) to gather information related to sex, age, grade, race, and socioeconomic status (SES) as a way to describe the characteristics of the study sample. SES was assessed based on student report of parents' education levels.

Mindfulness.

Two measures were used as methods for assessing trait mindfulness among children in the sample. These included the Child and Adolescent Mindfulness Measure (CAMM; Greco et al., 2011; see Appendix B) and the Mindful Attention Awareness Scale for Children (MAAS-C; Benn, 2004 as cited in Lawlor et al., 2014; see Appendix C). The CAMM and MAAS-C are both trait measures of mindfulness and were used for the following reasons. First, although the MAAS and MAAS-A (differing by only one item that was removed from the adolescent version) are cited the most in existing literature regarding child and adolescent mindfulness with solid empirical support, the MAAS-C has been cited far less often. However, due to the support for the scales that the MAAS-C was developed from (i.e., MAAS, MAAS-A) and the age-appropriate wording of the MAAS-C, it is likely a promising measure. The CAMM has also been cited a great deal throughout the literature and although empirical support is slightly weaker than the MAAS and MAAS-A, it is still sound. Another benefit is that it was developed specifically for children and adolescents; therefore, the support that does exist is based on the intended population. Further, both the CAMM and MAAS-C are easily accessible to reproduce and administer.

The Child and Adolescent Mindfulness Measure (CAMM).

The Child and Adolescent Mindfulness Measure (CAMM; Greco et al., 2011; see Appendix B) was used as one measure of trait mindfulness. This is a 10-item self-report

measure. Examples of items include “I get upset with myself for feelings that don’t make sense,” “I push away thoughts that I don’t like,” and “It’s hard for me to pay attention to only one thing at a time.” Specifically, this scale assesses present-moment awareness and nonjudgmental, accepting responses to personal thoughts and feelings. This self-report measure consists of items rated on a five-point Likert scale (0 = Never True, 1 = Rarely True, 2 = Sometimes True, 3 = Often True, and 4 = Always True). Items are reverse scored and added, so overall scores can range from zero to 40, with higher scores indicating higher levels of mindfulness. Greco et al. (2011) reported that this measure has demonstrated good internal consistency (Cronbach’s alpha of .81) and is positively related to quality of life, social skills, and academic competence, supporting the scales convergent validity. Further, scores from the CAMM are negatively correlated with somatic complaints, internalizing symptoms, and externalizing behavior problems, providing support for divergent validity (Greco et al., 2011). Kuby et al. (2015) provided additional support for the CAMM’s internal consistency (Cronbach’s alpha of .84) and found no differences between gender. Further, de Bruin et al. (2011) demonstrated convergent validity through positive correlations between scores from the CAMM and MAAS-A ($r = .54; p < .001$).

The Mindful Attention Awareness Scale-Children

The Mindful Attention Awareness Scale for Children (MAAS-C; Benn, 2004 as cited in Lawlor et al., 2014; see Appendix C) was used as an additional measure of trait mindfulness. This self-report measure consists of 15 items rated on a six-point Likert scale (1 = Almost never, 2 = Not very often at all, 3 = Not very often, 4 = Somewhat often, 5 = Very Often, and 6 = Almost always). All items are reversed scored and averaged, with higher scores indicating higher mindfulness and lower scores representing mindlessness. Examples of items on this

questionnaire include “I could be feeling a certain way and not realize it until later,” “It seems that I am doing things automatically without really being aware of what I’m doing,” and “I find myself doing things without paying attention.” Brown and Ryan (2003, p. 824) explained the original MAAS to be a measure of the “frequency of mindful states over time.” Therefore, trait mindfulness refers to a quality, skill, or characteristic that is relatively stable over time. Benn (2004 as cited in Lawlor et al., 2014) modified the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) by changing the language to be more developmentally appropriate for children and simplifying the language used for the six-point Likert scale in an effort to address the problem of a lack of measurements that assess mindfulness in children. The MAAS-C has been demonstrated to be a reliable measure of mindfulness in children in grades four to seven (Cronbach’s alpha of .84) with no differences based on gender (Lawlor et al., 2014). An exploratory factor analysis provided support for the measure’s one-factor solution. Lawlor et al. (2014) found further support for the reliability and validity of the MAAS-C. Convergent validity was supported by positive and significant correlations between measures of the MAAS-C and school self-concept, optimism, positive affect, perceived classroom autonomy, academic efficacy, and personal achievement goals. Discriminant validity was supported by negative and significant correlations between measures of the MAAS-C and depression, anxiety, and negative affect.

Academic achievement.

For the purpose of this research, academic achievement was evaluated through standardized test scores on both English language arts and mathematic standardized state tests. According to the review of research by York et al. (2015), academic achievement is most often measured using grades or grade point average. Such measures represent a student’s ability to

meet an identified performance criterion. Despite the popularity of grades and grade point averages as measures of academic achievement, they are more prone to biases. Standardized test scores for English language arts and mathematics were used in order to utilize an objective measure of academic performance that could be generalizable between the different classes in which data was collected.

More specifically, academic achievement data was obtained by collecting each student's recorded English language arts and mathematic standardized state testing scaled scores and level. English language arts and mathematics was used as the outcome measures of academic achievement because the curriculum for these topics and scoring procedures for the exams are specific and consistent across school districts due to the common core curriculum requirements. Although these tests are different for each grade level, they are all based upon NYS learning standards and scored in a standardized way.

Specifically, the standardized test scores used in the current study are scored in a standardized way with anonymity. Specifically, tests are scored by licensed and trained teachers through a distributed scoring process, which means that student's tests are scored by teachers from other schools. This procedure is in line with the New York State Education Department state exam scoring policy and ensures generalization and consistency in scoring across districts in New York State. Scores obtained for each subject are include a scaled score and a level, which is determined by the scaled score and ranges from one to four (see Appendix D). Scaled scores were derived from the raw scores on both the English language arts and mathematics standardized tests from the 2018 testing year. Variations in test item content and total items existed between subject matter and grade levels. Both scaled scores and level scores were analyzed in the current study. According to NYSED, Level 1 indicates that a student who is

performing at this level is well below proficient in standards for their grade, demonstrating limited knowledge, skills, and practices that are part of the Common Core Learning Standards. Level 2 suggests partial proficiency in standards and demonstration of knowledge, skills, and practices set forth by the Common Core Learning Standards. Level 3 indicates proficiency in standards according to grade level. Lastly, Level 4 designates students who excel in standards for their grade, as determined by the Common Core Learning Standards.

Procedure

The participating district was contacted regarding participation in the study following approval from the Human Subjects Research Committee of the author's university. Middle school principals were contacted and facilitated communication with sixth, seventh, and eighth grade teachers who also helped to facilitate the current study. Administration of the study took place in groups during the school year in general education and co-taught classrooms. All participants were treated in accordance with the "Ethical Principles of Psychologists and Code of Conduct" (American Psychological Association, 2002).

Following agreement to participate and conduct the study in each classroom, the researcher distributed passive consent forms to participating classroom teachers to distribute to parent/guardians of the students (see Appendix E). Two weeks after the consent forms were distributed, the researcher visited each classroom to further explain the study, answer questions, and provide student assent forms (see Appendix F). Attached to the student assent form was a brief demographic questionnaire used to gather information about the study's sample, the CAMM, and the MAAS-C (see Appendix A, B, and C, respectively). These forms were coded numerically in order to remove identifying information and ensure confidentiality. That is, each participating student's informed assent, demographic form, CAMM questionnaire, MAAS-C

questionnaire, English language arts score, and mathematics score was labeled with the same identifying numerical code and all personal identifying information was removed. This served to protect and prevent the link of identifying information of students to their scores on mindfulness measures and standardized test scores. Further, the mindfulness measures were counterbalanced to control for order effects. Participation in the study was voluntary and required student assent and guardian consent. Students who did not participate spent the time as determined by their school/teacher.

In a group setting, each student received a research packet, including a student assent form stating that student participation was voluntary and that there were not any negative consequences for choosing not to participate in the study. This was also told to the students verbally by the researcher. The researcher also explained that the students' responses would be kept confidential, meaning that only the researcher (not teachers or parents) would see their individual responses and that it would not be linked to them once results were analyzed. Students were also provided with an opportunity to ask questions before group administration of the measures began. Additionally, the researcher read each item out loud to prevent differences in reading abilities to interfere with student responses. Students were encouraged to answer questions honestly and independently and to ask questions if unsure about what an item was asking.

The total time for students to complete the questionnaire packet in the classroom ranged between 15 to 20 minutes. Students took the standardized state tests in April and May, prior to the collection of demographic and mindfulness data, which occurred in September of the following school year. School personnel coded and recorded student state test scores to be used for data analysis.

Chapter 4

Results

A correlational design was used to investigate a possible relationship between degree of trait mindfulness and academic achievement as measured by both English language arts and mathematics scores on standardized state tests for sixth, seventh, and eighth grade students.

Additionally, Chronbach's alpha was used to determine the internal consistency of the CAMM and MAAS-C measures. Pearson correlation was used to evaluate the relationship between the CAMM and MAAS-C measures. Data was entered into and analyzed using SPSS version 23.

Descriptive Results

On average, the sampled students reported relatively high levels of mindfulness on both mindfulness measures, as shown in Table 2. Specifically, the mean score for the CAMM was 27.29 out of possible 40 (range = 6.00 – 40.00; SD = 6.79). The mean score for the MAAS-C was 4.67 out of 6 (range = 1.40 – 6.00; SD = .71). Further, the mean scaled score for the English language arts exam was 612.50 (range = 555.00 – 645.00; SD = 15.22) and the mean level score was 3.00 out of a possible four (range = 1.00 – 4.00; SD = .922). Lastly, the mean scaled score for the mathematics exam was 614.90 (range = 577.00 – 644.00; SD = 13.05) and the mean level score was 3.21 (range = 1.00 – 4.00; SD = .82).

Table 2

Descriptive Results: Mindfulness, Grade, and Subject

Mindfulness	N	Mean	SD
Total			
CAMM	157	27.29	6.79
MAAS-C	154	4.67	.71

Grade

CAMM

Sixth	49	26.67	6.15
Seventh	55	28.40	7.05
Eighth	53	26.72	7.05

MAAS-C

Sixth	50	4.62	.65
Seventh	53	4.81	.61
Eighth	51	4.57	.84

Academic Achievement

English Language Arts

Scaled Score	109	612.50	15.22
Level	109	3.00	.92

Mathematics

Scaled Score	106	614.90	13.05
Level	106	3.20	.82

Note. The CAMM uses a total score, whereas the MAAS-C uses a mean. Both measures were reverse scored, with higher scores indicating higher levels of mindfulness.

Relationship between Mindfulness and Academic Achievement

A correlational design was used to investigate a possible relationship between degree of trait mindfulness and academic achievement as measured by both English language arts and mathematics scores on standardized state tests for sixth, seventh, and eighth grade students.

More specifically, Pearson correlation was used to analyze each mindfulness measure as it related to academic achievement. Findings indicate that the CAMM was not significantly correlated with any of the academic measures (Math Level $r = -.06$, $p = .57$; Math Scaled $r = .07$, $p = .49$; ELA Level $r = .01$, $p = .92$; ELA Scaled $r = -.01$, $p = .92$). For the MAAS-C, there was a significant correlation with mathematic scaled scores (Math Scaled $r = .27$, $p < .01$) and ELA level scores (ELA Level $r = .23$, $p < .05$). However, there were nonsignificant correlations between the MAAS-C and math level scores (Math Level $r = .15$, $p = .12$), as well as the MAAS-C and ELA scaled scores (ELA Scaled $r = .15$, $p = .14$). See Table 3 for all correlational analyses.

Table 3

Correlation Between Mindfulness and Academic Achievement Measures

	Mindfulness	
	CAMM	MAAS-C
MAAS-C	.678**	
ELA SS	-.009	.146
ELA Level	.010	.225*
Math SS	.070	.269**
Math Level	-.056	.154

Note. CAMM = The Child and Adolescent Mindfulness Measure, MAAS-C = The Mindful Attention Awareness Scale-Child, ELA SS = English Language Arts Scaled Score, ELA Level = state assigned English Language Arts level based on scale score and ranges between 1-4, Math

SS = Math Scaled Score, Math Level = state assigned math level based on scale score and ranges between 1-4. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Reliability and Validity of Mindfulness Measures

Results from Chronbach's alpha determined strong internal consistency for both the CAMM ($\alpha = .82$) and MAAS-C ($\alpha = .84$). Further, Pearson correlation was used to evaluate the relationship between the CAMM and MAAS-C measures, which were significantly correlated ($r = .68, p < .01$; see Table 3). These results were in line with the hypothesis that predicted a positive correlation between mindfulness measures, demonstrating concurrent validity. However, despite the significant correlation, correlation results suggest that what the two mindfulness scales are measuring are not the exact same constructs.

Examination of Findings by Grade Level

Although unrelated to the main research hypotheses, Pearson correlation was utilized to evaluate possible relationships between mindfulness and achievement while also taking grade level into consideration. This analysis was explored in response to results from the study conducted by Lawlor et al (2014). In that study, researchers found a lower level of mindfulness among older children. Specifically, fifth grade students scored significantly higher on a mindfulness measure than seventh grade students.

The current study used analysis of variance (ANOVA) testing to analyze potential differences in mindfulness scores when dividing the sample by grade level. Specifically, a one-way ANOVA was used to investigate scores from the CAMM at each individual grade level (sixth, seventh, and eighth) and scores from the MAAS-C at each individual grade level (sixth, seventh, and eighth) in order to evaluate self-report of mindfulness as related to grade level.

Results indicated that neither mindfulness measure demonstrated significant differences in overall mindfulness between sixth, seventh, or eighth grade students (CAMM $F(2,154) = 1.128$, $p = .326$; MAAS-C $F(2,151) = 1.751$, $p = .177$), indicating no group differences among the grade levels.

Table 4

Descriptive Statistics: Academic Achievement and Mindfulness Measures by Grade Level

Academic Achievement

	ELA					Math				
	N	SS		Level		N	SS		Level	
		M	SD	M	SD		M	SD	M	SD
6	38	615.08	15.49	2.87	.99	38	614.00	15.69	3.13	.88
7	38	607.95	13.33	3.11	.86	41	614.88	13.02	3.22	.91
8	33	614.76	16.16	3.03	.92	27	616.19	8.59	3.30	.61

Mindfulness

	CAMM			MAAS-C		
	N	M	SD	N	M	SD
6	49	26.67	6.15	50	4.62	.65
7	55	28.40	7.05	53	4.81	.61
8	53	26.72	7.05	51	4.57	.84

The data was further analyzed by grade level using correlational data to assess for potential relationships. When the sample was analyzed by grade level, a significant relationship appeared between the MAAS-C and achievement among sixth grade students. Specifically, there was a positive correlation between the MAAS-C and sixth grade math achievement (scaled score $r = .37, p = <.05$; level $r = .38, p = <.05$) and between the MAAS-C and sixth grade English achievement (scaled score $r = .41, p = <.05$; level $r = .41, p = <.05$). There were not any significant findings between mindfulness and achievement in other grade levels.

Table 5

Mindfulness and Academic Achievement Correlations by Grade

	Sixth Grade		Seventh Grade		Eight Grade	
	CAMM	MAAS-C	CAMM	MAAS-C	CAMM	MAAS-C
MAAS-C	.553**		.687**		.758**	
ELA SS	.064	.411*	-.067	-.052	.031	.066
ELA Level	.030	.405*	-.035	.095	.017	.096
Math SS	.047	.365*	.146	.251	-.014	.212
Math Level	.063	.375*	-.022	.080	-.334	-.038

Note. CAMM = The Child and Adolescent Mindfulness Measure, MAAS-C = The Mindful Attention Awareness Scale-Child, ELA SS = English Language Arts Scaled Score, ELA Level = state assigned English Language Arts level based on scale score and ranges between 1-4, Math SS = Math Scaled Score, Math Level = state assigned math level based on scale score and ranges

between 1-4. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Chapter 5

Discussion

The purpose of the current study was to begin to bridge the gap in current research related to mindfulness and academic achievement among middle school students. Specifically, as schools increasingly implement mindfulness interventions, it is important to examine whether or not a relationship exists between levels of mindfulness and academic achievement, which is an important school-related outcome. The current study explored such relationships using two different validated mindfulness measures and standardized state test scores in the areas of English language arts and mathematics. Based on results from the current study, a significant and positive relationship existed between the MAAS-C and ELA level scores, as well as the MAAS-C and math scaled scores. When data was further broken down by grade level, significant and positive relationships were found between the MAAS-C and all ELA and math scores, but only among sixth grade students. Lastly, results supported internal reliability and concurrent validity for both the CAMM and MAAS-C.

Relationship between the CAMM and MAAS-C

It was hypothesized that a significant and positive relationship would exist between the CAMM and MAAS-C. This prediction was supported and provides support for concurrent validity, similar to results found by de Bruin et al. (2011). Results also supported the internal consistency of both measures, which was also in line with the original hypothesis and previous research (e.g., Greco et al., 2011; Kuby et al., 2015; Lawlor et al., 2014). However, results also demonstrated that the two measures of mindfulness do not measure mindfulness in the exact same way. Specifically, the CAMM includes items that relate to the present and past (e.g., “I think about things that have happened in the past instead of thinking about things that are

happening right now”), whereas the MAAS-C contains more items related to the present and future (e.g., “I focus so much more on a future goal I want to achieve that I don’t pay attention to what I am doing right now to reach it”). Further, the CAMM asks questions more related to an individual’s feelings, as compared to the MAAS-C. The differences between measures may relate to the fact that the MAAS-C was significantly related to academic achievement, however the CAMM was not. Thus, indicating that the MAAS-C may be a better measure to use if also measuring academic achievement.

Significant Relationships between Mindfulness and Academic Achievement

The notion that mindfulness and academic achievement are positively related was supported; however, results varied between mindfulness measures and subject area. Based on the results, there were significant correlations between the MAAS-C and academic achievement, but not with the CAMM and academic achievement. The significant and positive relationship between the MAAS-C and ELA level scores, but not scaled scores, and the MAAS-C and math scaled scores, but not level scores, was peculiar. However, after further evaluation these findings seem to have been driven by grade differences.

Mindfulness, Academic Achievement, and Grade Level

Although it was not included as part of the original hypothesis, data was further analyzed by grade level. This was done in response to findings by Lawlor et al. (2014), which found a decrease in mindfulness with age. Analyzing the data by grade level resulted in particularly interesting results. That is, when broken down by grade level, the MAAS-C was found to have a significant and positive relationship with all academic areas for sixth grade students. Specifically, a significant and positive relationship was found between the MAAS-C and both the ELA scaled and level scores, in addition to the MAAS-C and both the math scaled and level

scores. Further, this group seemed to drive the overall correlations due to the lack of significance among seventh and eighth grade students.

Additional investigation is needed to determine why there was only a significant correlation among sixth grade students. One hypothesis may be the contents of achievement tests per grade level. That is, perhaps the make up of standardized test for certain grade levels contain content that is more related to the mindfulness behaviors measured by the MAAS-C. Another consideration is the fact that students who participated in this study were in sixth, seventh, and eighth grade in the fall of 2018 when the mindfulness data was collected. However, it is important to consider that the standardized academic testing took place during the spring of 2018 when students were in fifth, sixth, and seventh grade. Therefore, it is possible that the standardized test designed for fifth graders varies in nature compared to those designed for sixth and seventh graders. It is also important to consider variations in cognitive development among middle school students and how such differences may have contributed to significant findings among sixth grade students.

When considering the significant relationship between mindfulness and academic achievement for sixth grade students, it is also important to explore potential environmental differences. Specifically, there may have been environmental differences between test settings at the elementary and middle school. For example, elementary classrooms tend to have group seating, colorful classroom climates, and built in activities to break up longer learning tasks. In contrast, middle school class rooms tend to have individual desks, different teachers for each subject, and less breaks from academics throughout the day. It is also unknown whether mindfulness practice was incorporated more in elementary school compared to middle school. For instance, fifth grade teachers may have encouraged students to engage in a mindfulness

practice to reduce stress before taking the standardized state tests. The environmental differences between elementary and middle school testing environments are unknown and potentially account for confounding variables. In addition, all middle school students who participated in the study were enrolled in classes that incorporated mindfulness teaching and practice within the curriculum. This integrated knowledge and practice may have impacted the results found among this sample. It is also possible that the significant results were found by chance, due to a small sample size, or related to the specific population from which the sample was derived. Additional investigation related to test make up would be required to further explore this hypothesis.

The significant and positive correlation between the MAAS-C and academic achievement scores among sixth grade students is particularly important, especially for future research. This positive and significant relationship may indicate that the MAAS-C potentially holds predictive power related to academic achievement among sixth grade students. If this is true, the MAAS-C could potentially be used as a screening measure, which would allow for early additional support for students who may potentially benefit. Additional research in this area is needed.

Implications

The current study has contributed to the existing field of research related to mindfulness, particularly in the areas of academic achievement among middle school students. Specifically, the current study investigated mindfulness among middle school students, a population that has extremely limited research. Further, mindfulness was measured using a measure designed to assess the concept of mindfulness itself, rather than a related concept (e.g., self-regulation, well-being). In addition, the current study provides further support for reliability and validity of two mindfulness measures for use with middle school students. Based on the findings from this

study, middle schools may consider utilizing the MAAS-C as a screening measure throughout the school year. That is, teachers could administer this short questionnaire to their class at various points throughout the year to assess levels of mindfulness. Although a cause and effect relationship cannot be concluded based on the current data, schools can use this information to make informed decisions about tier one interventions related to mindfulness. For example, if a sixth grader scores low on the MAAS-C, the data from the current study suggests that they will have lower academic achievement scores, compared to students who score higher on the MAAS-C. This information can be used to target skill areas related to the MAAS-C in efforts to enhance academic achievement scores on standardized measures.

An additional conclusion that resulted from the current study is that the CAMM and MAAS-C should not be used interchangeably. Although the current study supported the measures reliability and validity, there are also important differences between the measures, meaning that they do not both measure mindfulness in the exact same way. The ways in which these measures differ is an area that requires further exploration.

Another way that the current study contributed to the existing field of research was that standardized academic scores were used as a quantitative measure. That is, unlike previous studies that investigated mindfulness and concepts related to academic achievement (e.g., Brown & Ryan, 2003; Flook et al., 2010; Howell & Buro, 2011; Oberle et al., 2012; Parker et al., 2014; Riggs et al., 2015), or utilized self-reported grade or teacher perception (Riggs et al., 2015), the current study utilized a direct and standardized score. Therefore, this is one of the only studies to date that investigates the direct relationship between a direct measure of mindfulness and a standardized academic achievement measure that is used all throughout New York state as a method for assessing academic achievement.

Limitations and Future Research

Limitations of this study include the limited generalizability of the sample used as part of this study. Specifically, all participants were students from a middle school within a district that contains a high population of students from families with above average socioeconomic status. Further, participants were all students in classes that included mindfulness learning and practice within the curriculum. This may have skewed results in that students likely had an overall higher level of mindfulness due to previous exposure. Future research should expand on the current research by investigating mindfulness as it relates to academic achievement among students from a variety of demographic areas and of varied socioeconomic status. Further, research in this topic area should be implemented among students with a variety of mindfulness training and exposure.

Although the purpose of the current study was to further examine the specific areas of mindfulness and achievement, future research should explore other factors that influence achievement. For example, research could further explore mindfulness, achievement, and potential mediating factors, such as motivation. Further examination of the relationship between related variables, such as motivation, mindfulness, and academic achievement, would make for a positive contribution in this field of literature.

Lastly, a potential limitation of the current study involves the timing of data collection. Specifically, students participated in state testing in April and May of 2018. However, mindfulness measures were not administered until September of 2018 due to time restrictions of the participating district. Due to the fact that the CAMM and MAAS-C are measures of trait mindfulness, a characteristic that is believed to be stable over time, it is believed that the gap in time did not have a significant impact on results. However, further analysis in this area with data

collection that occurs more closely in time may be warranted and beneficial to this particular area of research.

Although the current study has contributed to an area of need in the related field, there is still a great deal of research that needs to be done. Specifically, additional exploration between the differences between the CAMM and MAAS-C, especially as they relate to academics, is warranted. The current study does not identify the exact items or cause for the significant relationship between the MAAS-C and areas of academic achievement, but not the CAMM. It is also unclear why such significant relationships existed between the MAAS-C and all academic achievement areas, but only for sixth grade students. In addition, it is unclear if the correlations between the MAAS-C and academic achievement were skewed due to the significant relationship only found among sixth grade students. Further, although this research has pointed the direction toward a relationship between mindfulness and academic achievement, more information is needed to conclude whether or not mindfulness can predict a student's academic achievement. Therefore, additional research utilizing mindfulness and academic pre- and post-measures, mindfulness interventions, and control and experimental groups are needed. With the added knowledge of potential predictive power, mindfulness interventions can be designed to target students who may academically benefit the most. Therefore, it is important for future research to implement experimental designs related to mindfulness and academic achievement.

Summary

The ability to identify qualities that relate strongly to academic performance is very powerful. Although the results from the current research varied, there were several findings that were significant and contribute to the existing field of research. That is, not only did the current study provide further support for the reliability and validity of the CAMM and MAAS-C for use

with middle school students, but it also lends insight on the relationship between a direct measure of mindfulness and academic achievement as measured by standardized grades. Specifically, the significant and positive relationship between the MAAS-C and both ELA and math scores among sixth grade students suggests that mindfulness is related to academic achievement. However, the lack of a significant relationship between the CAMM and academic achievement suggests that there is a key difference between the two mindfulness measures that should be investigated further. Lastly, the strong significance between the MAAS-C and achievement, but only among sixth grade students suggests grade may play a significant role. Again, this difference requires further analysis.

In conclusion, research in this area should continue. The ability to predict academic achievement can be very useful within the school setting. If we can use a self-reported measure of mindfulness to reliably predict student academic achievement, we could utilize this information to implement targeted interventions to students who may require additional support. The current study worked to begin to close the significant gap that exists in this field of research related to mindfulness and academic achievement in middle school students. By identifying potential relationships between mindfulness and academic achievement, efforts can be made to improve performance in achievement situations.

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Appendix A
Demographic Questionnaire

Fall 2018
ID # _____

Please read each question and write, circle, or check the best answer to each question:

1. My gender is: Male Female Other

2. My age is: 10 11 12 13 14 15

3. My grade is: 6 7 8

1. Have you ever received mindfulness training,
which could include meditation and/or yoga? Yes No Unknown

5. My race/ethnic identity is (Circle all that apply):

- | | |
|------------------------------|--|
| a. White | d. American Indian or Alaska Native |
| b. Black or African American | e. Native Hawaiian or Other Pacific Islander |
| c. Asian | f. Other (please specify): _____ |

6. Are you of Hispanic, Latino, or Spanish origin?

- a. Yes
b. No

Parent(s) Education Level:

7. Parent 1 Highest education level:

- | | |
|------------------------------------|--|
| a. Less than 8 th grade | e. Associate degree |
| b. Some high school | f. Bachelor's degree |
| c. High school diploma | g. Master's degree |
| d. Some college | h. Doctorate or other professional degree (JD, MD) |

8. Parent 2 Highest education level:

- | | |
|------------------------------------|--|
| a. Less than 8 th grade | e. Associate degree |
| b. Some high school | f. Bachelor's degree |
| c. High school diploma | g. Master's degree |
| d. Some college | h. Doctorate or other professional degree (JD, MD) |

Appendix B
Child and Adolescent Mindfulness Measure

We want to know more about what you think, how you feel, and what you do. **Read** each sentence. Then, circle the number that tells **how often** each sentence is true for you.

	Never True	Rarely True	Sometimes True	Often True	Always True
1. I get upset with myself for having feelings that don't make sense.	0	1	2	3	4
2. At school, I walk from class to class without noticing what I'm doing.	0	1	2	3	4
3. I keep myself busy so I don't notice my thoughts or feelings.	0	1	2	3	4
4. I tell myself that I shouldn't feel the way I'm feeling.	0	1	2	3	4
5. I push away thoughts that I don't like.	0	1	2	3	4
6. It's hard for me to pay attention to only one thing at a time.	0	1	2	3	4
7. I get upset with myself for having certain thoughts.	0	1	2	3	4
8. I think about things that have happened in the past instead of thinking about things that are happening right now.	0	1	2	3	4
9. I think that some of my feelings are bad and that I shouldn't have them.	0	1	2	3	4
10. I stop myself from having feelings that I don't like.	0	1	2	3	4

Scoring Instructions: Compute total score on the CAMM by reverse scoring and summing all items. Higher scores indicate higher levels of mindfulness.

Appendix C
Mindful Attention Awareness Scale-Children
Day-to-Day Experiences

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

1	2	3	4	5	6
Almost never	Not very often at all	Not very often	Somewhat often	Very often	Almost always

I could be feeling a certain way and not realize it until later.	1	2	3	4	5	6
I break or spill things because of carelessness, not paying attention, or thinking of something else.	1	2	3	4	5	6
I find it hard to stay focused on what’s happening in the present moment.	1	2	3	4	5	6
Usually I walk quickly to get where I’m going without paying attention to what I experience along the way.	1	2	3	4	5	6
Usually I do not notice if my body feels tense or uncomfortable until it gets really bad.	1	2	3	4	5	6
I forget a person’s name almost as soon as I’ve been told it for the first time.	1	2	3	4	5	6
It seems that I am doing things automatically without really being aware of what I’m doing.	1	2	3	4	5	6
I rush through activities without being really attentive to them.	1	2	3	4	5	6
I focus so much on a future goal I want to achieve that I don’t pay attention to what I am doing right now to reach it.	1	2	3	4	5	6
I do jobs, chores, or schoolwork automatically without being aware of what I'm doing.	1	2	3	4	5	6
I find myself listening to someone with one ear, doing something else at the same time.	1	2	3	4	5	6
I walk into a room, and then wonder why I went there.	1	2	3	4	5	6
I can’t stop thinking about the past or the future.	1	2	3	4	5	6
I find myself doing things without paying attention.	1	2	3	4	5	6
I snack without being aware that I’m eating.	1	2	3	4	5	6

MAAS-C Scoring

To score the scale, reverse-score and compute a mean (average) of the 15 items. Higher scores indicate higher mindfulness and lower mindlessness.

Appendix D
NYS Scale Score Ranges Associated with Each Performance Level

English Language Arts				
Grade	Level 1	Level 2	Level 3	Level 4
5	509-593	594-608	609-621	622-661
6	514-589	590-601	602-613	614-657
7	511-590	591-606	607-622	623-654

Math				
Grade	Level 1	Level 2	Level 3	Level 4
5	527-591	592-603	604-615	616-654
6	528-591	592-603	604-615	616-656
7	524-592	593-605	606-617	618-644

Note. Students were in fifth, sixth, and eighth grade at the time the NYS standardized tests were administered. Higher scaled scores and levels demonstrate better performance on the exam. Students were in sixth, seventh, and eighth grade when they completed the demographic and mindfulness questionnaires.

Appendix E
Parent Consent Form

Dear Parent or Caregiver:

This letter provides information about a research study that will be conducted in your child's school. I, Diana Gugino, am a school psychology doctoral candidate from Alfred University (AU) and I am interested in learning more about the connections between mindfulness, or the act of intentionally paying attention to the present moment without making evaluative judgments, and academic performance in middle school students. This letter provides information about the study that I will conduct to investigate this relationship.

- ✓ Why I am Requesting Your Child's Participation: Your child is being asked to participate in this project because he or she is a student in a local middle school. I am interested in better understanding how mindfulness relates to academic performance.
- ✓ Why Your Child Should Participate: Your child's participation will help to develop a better understanding of the relationship between mindfulness and academic performance, which may be helpful in future work with students. Please note neither you nor your child will be paid for your child's participation in this study.
- ✓ What Participation Requires: Children with permission to participate in the study will be asked to complete three paper-and-pencil questionnaires on one occasion this school year. These surveys will ask about your child's thoughts, behaviors, and attitudes towards life and school. Completion of surveys is expected to take your child about 15 to 20 minutes; I will administer the surveys at your child's school during regular school hours, to groups of students during a class period. In total, participation during this study will take approximately 20 minutes of time for students. Academic performance will be measured using standardized state test scores, thus will not require any additional time from students.
- ✓ Please Note: Your decision to allow your child to participate in this research study must be completely voluntary. You or your child's decision to participate, not to participate, or to withdraw participation at any point during the study will no way affect your child's student status, his or her grades, or your relationship with your child's school, AU, or any other party.
- ✓ Confidentiality of Your Child's Responses: There is minimal risk to your child for participating in this research. Your child's privacy and research records will be kept confidential to the extent of the law. Authorized research personnel, AU's Human Subjects Research Committee and its staff, and other individuals acting on behalf of AU may inspect the records from this research project, but your child's individual responses will not be shared with school system personnel or anyone other than the researcher. Your child's completed questionnaires will be assigned a code number to protect the confidentiality of his or her responses. Only the researcher and dissertation committee will have access to the locked file cabinet stored at AU that will contain all records linking code numbers to participants' names. Student scores on standardized state assessments will be gathered using codes to eliminate all identifying information. All records from the study will be destroyed

five years after the study is completed. In the unlikely event that your child experiences emotional distress as a result of completing the surveys, we will contact district mental health professionals to ensure your child's well-being.

- ✓ What I'll Do with Your Child's Responses: I plan to use the information from this study to inform educators and psychologists about the links between mindfulness and academic performance. The results of this study will be published in a dissertation and possibly other professional articles. However, the data obtained from your child will be combined with data from other people in the publication. The published results will not include your child's name or any other information that would in any way personally identify your child.
- ✓ Questions? If you have any questions about this research study, please contact Diana Gugino at dmg3@alfred.edu or Rachel Roth, Ph.D., dissertation committee chair, at (607) 871-2856 or email (roth@alfred.edu). Rachel Roth, Ph.D. may be reached via mail at 1 Saxon Drive, Alfred, NY 14802. If you have questions about your child's rights as a person who is taking part in a research study, you may contact Danielle Gagne, Ph.D., Chair of the Human Subjects Committee at AU at (607) 871-2213 or email gagne@alfred.edu. She may be reached via mail at 1 Saxon Drive, Alfred, NY 14802.
- ✓ Want Your Child to Participate? Middle school students will be invited to participate in this study. If for any reason **you do not wish** your son or daughter to participate in the survey, please sign this form and return it by (DATE). Students will also have an opportunity to decline participation at the time of the study, may skip any questions they do not wish to answer, and may stop participating in the survey at any point without penalty.

Sincerely,

Diana M. Gugino, M.A.
School Psychology Doctoral Candidate
Alfred University

Rachel A. Roth, Ph.D.
Assistant Professor of School Psychology
Alfred University

Please read the section below and check the box only if you do not want your child to partake in the survey. If you check the box "no" below, sign this form and return it to your child's school.

Thank you.



Printed name of child

Grade level of child

I have read this form and know what the survey is about.

NO, I do not give permission, my child **MAY NOT** take part in the mindfulness survey.

Signature of parent of child taking part
in the study

Printed name of parent

Date

Appendix F
Child Assent Form

Dear Student,

You are being asked to take part in a research study to determine the relationship between mindfulness and academic performance in middle school students. The goal of the study is to learn more about how mindfulness influences students in school. You are being asked to take part in this study because you are a student in a local middle school. Your parent/guardian has given permission for you to take part in this study.

To take part in this study, you will be asked to complete a couple of short surveys now. These surveys will ask you questions about your thoughts, behaviors, and attitudes toward life and school. Your answers will stay private unless you are in danger, then we will have to get help to make sure you stay safe. If you decide to take part in the study you still have the right to change your mind later. No one will think badly of you if you decide to stop.

Student Assent to Take Part in this Research Study

I understand what the person running this study is asking me to do. I have thought about this and agree to take part in this study.

Name of person agreeing to take part in the study

Date

Signature of person agreeing to take part in the study

Researchers Use Only

Name of person providing information to child

Date

Signature of person providing information to child

Biographical Statement

Diana Gugino-Sullivan is a School Psychologist at an elementary school in Upstate New York. She graduated with honors from SUNY Potsdam in 2014 with her undergraduate degree in psychology. She went on to study school psychology at Alfred University and graduated with her master's degree in 2016. She continued at Alfred University where she worked toward her doctorate degree in school psychology and pursued her research interest of mindfulness and academic achievement among school-aged children. She can be contacted via email at dmg3@alfred.edu.