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IMPACT OF A MINDFULNESS-BASED INTERVENTION ON STUDENTS IN GRADES 3–5

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IMPACT OF A MINDFULNESS-BASED INTERVENTION ON STUDENTS IN GRADES 3–5

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ABSTRACT

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The purpose of this study was to gain understanding of the impact of the Mindful Schools curriculum on students' academic performance, stress management, and academic and social self-perception. Comparisons of fall–spring academic growth measures and other data gathered over 2 years—before and after implementation of the curriculum—revealed academic, stress management, and self-perception impacts of the intervention. Student test scores from the reading (n = 322) and mathematics (n = 321) sections of the Northwest Evaluation Association were evaluated and found that the Mindfulness-Based Intervention led to significant growth from pre-intervention and post-intervention years. A repeated measures ANOVA found a significant difference in reading and mathematics scores between students of different races and students from different school buildings. The findings from this study support prior research that indicates that MBIs are a safe and effective form of Social and Emotional Learning when implemented in the school setting.

DEDICATION

I want to dedicate this work to my wife, Magnolia. Her sacrifices have made this endeavor possible for me. Without her, I would not have been able to reach this goal. I would also like to dedicate this work to my mother and father, who have supported me in every way, shape, and form since I can remember: I owe them for everything. I would like to dedicate this to my children Barrett and Soliel who I hope to inspire to reach for their dreams.

ACKNOWLEDGMENTS

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TABLE OF CONTENTS

DEDICATION……ii

ACKNOWLEDGEMENT……..iii

LIST OF TABLES……..……...vii

LIST OF FIGURES……..viii

CHAPTER 1……1

Introduction..... 1

Purpose of the Study 1

Theoretical/Conceptual Framework..... 3

Significance of the Study 15

Connection with Social Justice and/or Vincentian Mission in Education 16

Research Question 16

Definition of Terms..... 18

Summary 18

CHAPTER 2……..20

Review of Related Research 20

Theoretical Framework 20

Review of Related Literature 36

Conclusion 57

CHAPTER 3……..59

Method 59

Methods and Procedures 59

Reliability and Validity of the Research Design 60

Sample and Population 60

Treatment/Intervention 65

Procedures for Collecting Data 70

Research Ethics 70

Conclusion 70

CHAPTER 4……..71

Results 71

Introduction 71

Results/Findings 72

Conclusion 84

CHAPTER 5……..85

Discussion 85

Introduction 85

Conclusion 94

APPENDIX A: IRB Approval 95

APPENDIX B: Instruments 96

REFERENCES 98

LIST OF TABLES

Table 1 Hypotheses 17

Table 2 Descriptive Statistics for Spring 2018 and 2019 Reading Scores 62

Table 3 Descriptive Statistics for Spring 2018 and 2019 Mathematics Scores 63

Table 4 Student Population of South Shore School District Elementary Schools for Grades 3–5 64

Table 5 Components of the Implemented Curriculum 65

Table 6 A Typical Implementation Weekly Schedule, 2018–2019 67

Table 7 Normality of Distribution of Data for Stress Outcome 68

Table 8 Normality of Distribution of Data for Self-Perception Outcome 69

Table 9 Paired Sample t-test Results of Effects of MBI on Academic and Social Stress 73

Table 10 Paired Sample t-test Results of Effects of MBI on Self-Perceptions of Academic and Social Abilities 74

Table 11 Tukey Test Results for MBI Effects on NWEA Scores by Ethnicity 77

Table 12 Tukey Test Results for MBI Effects on NWEA Scores by School 79

Table 13 Reading NWEA Scores 80

Table 14 Reading NWEA Between Subjects Effects 80

Table 15 Mathematics NWEA Results 81

Table 16 Mathematics NWEA Between Subjects Effects 81

Table 17 Mathematics NWEA Data School Comparison 82

LIST OF FIGURES

Figure 1 Loop of Possible Negative and Positive Consequences for Students in Grades 3–5 14

Figure 2 Histogram of Distribution of Normality of Data for Stress Outcome 68

Figure 3 Histogram of Distribution of Normality of Data for Self-Perception Outcome 69

Figure 4 Marginal Means for Grade Level 75

Figure 5 Marginal Means for Gender 76

Figure 6 Marginal Means for Ethnicities 77

Figure 7 Marginal Means for School Building 79

Figure 8 Mathematics NWEA Data Ethnicity Comparison 82

Figure 9 Mathematics NWEA Data Spring 2008 v. Spring 2009 83

Figure 10 Mathematics NWEA Data Spring 2009 School Comparison 83

CHAPTER 1

Introduction

Public school student achievement correlates directly to student collaboration with teachers and peers (Durlak et al., 2011). It has become increasingly important for students to think critically and analytically while remaining both innovative and creative (Association for Supervision and Curriculum Development, 2007). Because schools work in a way that requires considerable cooperation, emotion can play a significant role in a student's ability to succeed (Zins et al., 2004). It has become clear that traditional measures of student success are inadequate. Definitions of student success must take into account the responsibility of schools to develop each student's physical and emotional well-being, desire to become part of a community, altruism, interest in the arts, and desire to work and become fiscally independent after graduation (Association for Supervision and Curriculum Development, 2007). Because the role of education is to develop academically, socially, and emotionally competent citizens, school administrators must find the tools and resources needed to facilitate such development.

Purpose of the Study

The purpose of this study was to examine the impact of a mindfulness-based intervention (MBI) when implemented as social and emotional learning (SEL) on student growth in reading and mathematics, student stress, and self-perception of academic and social abilities when implemented as Social and Emotional Learning.

Social and emotional learning (SEL) is the acquisition and application of skills and attitudes needed to develop positive self-identity, emotional control, and goal achievement while demonstrating empathy, construction of healthy relationships, and

responsible decision making (Collaborative for Academic, Social, and Emotional Learning, 2020). Durlak et al. (2011) conducted a meta-analysis and found that implementation of SEL programs significantly impacted developing social–emotional competencies, improved attitudes toward the self and school, increased demonstration of prosocial behavior, and improved academic testing scores. This relatively inexpensive intervention also showed significant, long-term financial benefits for school districts(Belfield et al., 2015). These findings should raise interest in school administrators and curriculum developers that desire SEL programs. Because there has been considerable variation among the approaches SEL program creators have taken (Klingbeil et al., 2017), administrators and curriculum developers must be vigilant and seek programs that adequately develop students' social and emotional needs.

Implementation of mindfulness-based curricula has surged as an approach to SEL in schools throughout the country. Mindfulness is a practice in which an individual pays attention to their experiences as they transpire in the moment (Kabat-Zinn, 2003). Mindfulness relates to the individual's ability to observe moment-to-moment experiences and emotions with acceptance and without judgment (Kabat-Zinn, 2003). Mindfulness consists of individual tools and strategies that can help bring a person's awareness back to the present moment. Connecting with the present moment allows a person to notice patterns in their thoughts, behaviors, and actions. The goal of mindfulness is to let go of the past and future and approach the present moment with an open and friendly mindset (Kabat-Zinn, 2003). Mindfulness-based curricula helps teach students how to effectively cope with stress and anxiety and self-regulate their actions and emotions.

A curriculum provides a structure within which students can learn new content (Stabback, 2016). It also determines the quality of learning for each student, which immensely impacts childhood development (Stabback, 2016). Instituting a new curriculum takes considerable time and resources. Given the high cost of training professionals and acquiring necessary resources and materials, school leaders must feel confident that their students will benefit developmentally from a new curriculum. Stabback(2016) of the United Nations Educational, Scientific and Culture Organization argued that curricula should (a) be inclusive and equitable, (b) be characterized by quality learning, (c) promote lifelong learning, and (d) be relevant to holistic development. Unfortunately, many SEL program curricula are fragmented (Zins et al., 2004).

There are many ways to implement a mindfulness-based curriculum (Klingbeil et al., 2017). In this study, the researcher analyzed the efficacy of a particular mindfulness-based curriculum, Mindful Schools, developed from Kabat-Zinn's (1982) research. The researcher investigated implementation of Mindful Schools with students in Grades 3–5. The purpose of this study was to provide school administrators and curriculum developers with an understanding of the impact of Mindful Schools on students' academic performance, stress management, and academic and social self-perception. The study's findings will help guide decision making on selection and implementation of programs that meet students' social and emotional needs.

Theoretical/Conceptual Framework

Mindfulness theory is the framework underpinning the majority of this study. Kabat-Zinn (1982),an early proponent of mindfulness theory, examined changes to brain structure and activation in response to pain and stress and developed mindful strategies to

help people reduce and manage behaviors related to coping with pain. He succeeded in this work, and along with others, extended it to other settings in which life-challenging stressors interfered with individuals' functioning, including jobs and schools.

Other theories that guided the study included:

- positive behavior support (PBS) theory, which deemphasizes traditional punishment-based behavioral management in schools and replaces it with positive approaches.
- self-regulation theory, which emphasizes the development of a child's internal locus of control, an essential skill that enables the child to succeed in social environments like schools.
- resilience theory, which explains the interactive balance between risk, protective, and vulnerability factors that enable an individual to overcome adversity.

The sections that follow briefly summarize these theories, which Chapter 2 discusses in greater detail.

Mindfulness Theory

The roots of mindfulness lie in Buddhist and other Eastern philosophies (Fulton et al., 2013). People cultivate mindfulness through meditation and other nontraditional practices that help regulate and shape attention, emotions, and behavior (Fulton et al., 2013). Mindfulness relates to the ability to remain present during moment-to-moment experiences and emotions with acceptance and without judgment (Kabat-Zinn, 1990). According to mindfulness theory, mindfulness allows a person to enter a metacognitive state of awareness that focuses on present experiences, allowing the person to reframe

perspective, reduce stress, and promote constructive feelings (Garland et al., 2015).Mindfulness-based interventions (MBIs) and mindfulness curricula intentionally teach mindfulness skills as the core therapeutic component of reducing problem behavior or improving well-being (Kabat-Zinn, 1990; Klingbeil et al., 2017).

Black et al. (2009) demonstrated mindfulness practices can decrease stress and anxiety in young people. The researchers reviewed 16 empirical studies conducted between 1982 and 2008 on the impact of sitting meditation on children ages 6–18 years and found meditation was an effective intervention for treating physiologic, psychosocial, and behavioral conditions in that age group.

Zenner et al. (2014) showed promising results of school-based mindfulness programs and MBIs for students in all grades. The researchers conducted a meta-analysis from24 studies of school-based mindfulness interventions on 1,348 students in Grades 1–12 and 876 students as controls. Student cognitive performance and resilience to stress improved, with hedge's g effect sizesof0.40 (between group) and 0.42 (within group; $p < .001$).

Schonert-Reichl et al. (2015) also conducted a school-based study of mindfulness and examined its impact on students in Grades 4 and 5 when implemented as an SEL program. The authors randomly assigned four classes of 99 students to receive either the SEL mindfulness program or a regular social responsibility program. The authors found students who received the mindfulness SEL program showed improved cognitive control and stress physiology, demonstrated more prosocial behavior, reported fewer symptoms of depression and peer-rated aggression, and received wider acceptance from their peers compared to students in the control group.

Evidence from these studies supports implementation of mindfulness in schools. A social and emotional curriculum based on mindfulness is a viable way for administrators and curriculum developers responsible for implementing or developing such curricula to develop students' social and emotional needs. In this study, the researcher's objective was to determine the impact of Mindful Schools on student self-perception and whether implementing this program increased mathematics and English language arts scores.

PBS Theory

Central to this study was the connection between MBI and PBS theories, which combine applied behavioral analysis principles with research on brain functioning (Bergen-Cico et al., 2015). PBS is a set of strategies and interventions used to reduce problem behavior and increase prosocial behavior (OSEP Center on Positive Behavioral Interventions et al., 2000). The focus of PBS is to create environments that make problem behavior less effective and desired behavior more functional (OSEP Center on Positive Behavioral Interventions et al., 2000). When implementing PBS in the classroom, teachers give students positive reinforcement for positive behavior rather than punishment for negative behavior (National Education Association, 2014). The underlying assumption is students will display positive behavior more frequently to receive more positive reinforcement.

Although PBS is essential for some students with special needs, school leaders across the country have implemented PBS schoolwide. School-wide positive behavioral support (SWPBS)and school-wide positive behavioral intervention support (SWPBIS) help schools address various school climate issues to help students manage their social

and emotional challenges. According to the National Education Association (2014), SWPBIS is a set of planned, integrated, school-wide approaches that help schools address:

- positive school climate and safety
- classroom discipline and behavior management
- student self-management through a continuum of interventions for students exhibiting social, emotional, and behavioral challenges.

Pas and Bradshaw (2012) found the quality of SWPBS implementation impacted both truancy and achievement scores on standardized tests. Using data from 421 Maryland elementary, middle, and Kindergarten–eighth grade schools, the authors compared implementation of SWPBS for 2 consecutive school years. They found higher levels of SWPBS implementation were associated with higher math scores (b = .146, p = .042), higher reading scores (b = .171, p= .006), and lower truancy (b = −.088, p = .056).

In another study, Bradshaw et al. (2015) examined the effects of SWPBIS on students with behavior problem patterns. The authors collected data from 37 schools, with 16 selected at random for control, corresponding to 12,344 elementary students. Teachers submitted baseline data on children's problem behavior, ability to focus, social–emotional level, and demonstration of prosocial behavior. These data led to placement of students into one of four categories: high-risk (6.6%), at-risk (23.3%), normative (36.5%), and socially–emotionally skilled (33.6%). Compared to the control group, high-risk and at-risk students in SWPBIS schools were significantly less likely to receive disciplinary referrals, counseling services for behavioral intervention, and referrals to

special education (Bradshaw et al., 2015). These results showed SWPBIS can adjust problem behavior for students needing the most support. By replacing problem behavior with more prosocial behavior, high-risk and at-risk students may spend less time out of class for problem behavior and more time with peers receiving instruction. These results also provided evidence that SWPBIS can help reduce referrals to special education (making it a viable method for response to intervention) and may help reduce the cost of special education services for school districts.

Like PBS, the MBI intervention implemented in this study is rooted in positive psychology and functions as a preventative measure. The goal of MBI differs from PBS, such that MBI provides students with strategies for identifying and correcting their behavior instead of relying on teacher or school staff member intervention. Mindfulness helps students acknowledge their emotions and engage with the world in a constructive manner (Burke & Hawkins, 2012). In essence, mindfulness allows a student to create a functional analysis of their behavior and strategies to cope with their emotions using prosocial behavior.

Self-Regulation Theory

Bandura's(1961) work provides a solid base for the study of self-regulation and the origins of self-regulation theory. Alongside Ross and Ross, Bandura conducted the famous Bobo doll experiments to demonstrate children can learn social behavior through observation of others' behaviors (Bandura et al., 1961). After showing 24 children a video of a role model acting aggressively toward the doll, 24 children a video of a role model demonstrating nonaggressive play, and 24 children no model, they found the

children in the aggressive-model group demonstrated aggressive behavior toward the doll, imitating what they had observed (Bandura et al., 1961).

These results led Bandura to develop social learning theory. Like the behaviorist approach, social learning theory builds on both operant and classical conditioning models and expands their scope to consider the role of environmental and cognitive factors on human learning (Mcleod, 2016). Bandura believed a child observes behaviors of the people around them. Observed behaviors become encoded in the child's brain, and the child mimics the behaviors, which leads to external reinforcement. The child registers reinforcement, both positive and negative, which determines whether the child will choose to repeat the behaviors in the future (Bandura et al., 1961).

Recognizing the limitations of social learning theory, Bandura (1986) expanded on his theory to account for human agency and the ability to self-regulate. The result was social cognitive theory, in which people acquire new behaviors through observation but decide whether to repeat those behaviors through the triadic interaction of personal factors, the behavior, and the environment or reinforcement (as reported in Brown, 2020). Social cognitive theory differs from social learning theory in that cognitive theory posits cognitive and environmental factors play equal roles in the acquisition of new behaviors (Brown, 2020).

Leventhal and Fischer (1970) focused on the interrelationship between emotions and behavior and helped develop self-regulation theory. He described self-regulation as people's ability to use resources and physical machinery to produce concrete experiences, sensations, emotions, and sensations that the biological or psychological self generates (Leventhal et al., 2003).

Leventhal (1983) examined how humans responded to fear with respect to health and disease. He challenged the impact of the fear had on disease awareness and prevention. He determined fear effectively changes people's attitudes, especially when dealing with chronic illness, but does not drive behavioral change (Leventhal et al., 1983). Leventhal et al. (1983) instead proposed the parallel response model, which provides specific actions that are more effective for inducing behavioral change in people with high and low levels of fear. However, because organisms are active decisionmakers capable of changing beliefs, emotional arousal, and accepting information, Leventhal expanded beyond the parallel processing model to develop the commonsense model of self-regulation. The commonsense model suggests health symptoms, causes, consequences, and duration develop an individual's perception of health threats, and these perceptions guide the individual's efforts to reduce those threats (Meyer et al., 1985).

Zimmerman (1989) expanded on social cognitive theory and social learning theory to create the theory of self-regulated learning. Like the triadic balance of personal, behavioral, and environmental factors in Bandura's social cognitive theory, self-regulated learning focuses on the importance of three elements: (a) self-regulation of learning strategies, (b) self-efficacy of performance skill, and (c) commitment to academic goals. Zimmerman argued these elements provide an observable and trainable approach to learning that helps analyze academic success to implement the correct interventions.

Zimmerman and Kitsantas (1997) demonstrated the way in which self-regulated learning applies to acquiring new skills. The purpose of their study was to determine the impact of goal setting and self-monitoring during self-regulated practice of motor skill

acquisition in 90 female high school students. Participants observed proper dart-throwing form and then took part in a series of self-regulated practices. Students who focused on the process during self-directed practice before shifting focus to outcomes exhibited the strongest self-efficacy, best dart-throwing skills, most positive self-reaction, and most significant interest in the game. Results supported social cognitive theory's claim that people learn behaviors through observation and level of self-regulation determines the level of success.

Growing evidence has suggested self-regulatory skills are the foundation of executive functioning skills, and mindfulness fosters the development of self-regulation skills (Oberle et al., 2012). For example, in a study of 142 students (72 in the experimental group and 70 in the control group), Bergen-Cico (2015) examined the viability and effectiveness of adding mindful yoga into the curriculum to promote self-regulation and support academic performance. The author found mindful yoga led to long-term increases in self-regulation.

Resilience Theory

Resilience is a person's capacity to recover and adapt to obstacles or adverse conditions (Bolton, 2017). Children who experience maltreatment are at risk of developing disruptive behaviors and are more likely to perform poorly in school and have poorer peer relationships (Yoon, 2018). Although many students who exhibit problem behaviors do poorly in school and social situations, those who have overcome adversity may not exhibit these same problem behaviors due to greater resiliency. Resilient individuals exhibit healthy psychological responses when confronted by adversity or challenges.

Resilience theory encompasses three specific elements that work with one another as part of a more extensive process: (a) risk factors, (b) protective factors, and (c) vulnerability factors (Bolton, 2017). Risk factors are events or circumstances that lead to adversity or conditions that reduce an individual's ability to cope with adverse conditions. Protective factors are traits, characteristics, or interventions that augment resistance. Vulnerability factors are environmental, familial, or biological traits that put an individual in an adverse state or at a disadvantage (Bolton, 2017; Smith-Osborne, 2007).

Understanding how individuals overcome challenges to develop and recover from trauma reveals adaption processes that can guide intervention efforts for others at risk (Masten & Coatsworth, 1998). For example, Werner (1989) conducted a longitudinal study of young people on the Hawaiian island of Kauai and found a subset of young people who flourished despite living in poverty. Specifically, they found resilient individuals demonstrated three protective factors: individual disposition, emotionally supportive relationships with family members, and external support systems.

Bethel et al. (2016) analyzed the effect of mindfulness practices on children with emotional, mental, or behavioral conditions. Most had been exposed to adverse childhood experiences and other chronic stressors. Using statistics from household surveys, the authors collected data from children ages2–17 years and found children without resilience who had experienced more than one adverse childhood experience were 11 times more likely to have an emotional, mental, or behavioral condition than those without adverse childhood experiences. Resilience was a protective factor for student success. Even with multiple adverse childhood experiences and emotional, mental, or

behavioral conditions, children with resilience demonstrated school engagement rates 1.85 times higher than those of other children. The authors also found resilient students were 1.32 times less likely than other students to be absent for 2 or more academic weeks (Bethel et al., 2016). These findings suggested MBI scan improve children's resilience and, therefore, improve their social, emotional, and academic outcomes.

In this study, the researcher hypothesized an MBI equips students with skills needed to better react and adjust to stimuli that arise in their lives. Individuals without the ability to self-regulate when faced with stress and anxiety remain in a negative loop, in which their reactions lead to conflict that impacts their academic performance and increases their frustration. The MBI used in this study addresses individuals' social and emotional needs and drives self-awareness of emotions as they arise and build resilience (Mindful Schools, 2021). Furthermore, the nature of the MBI develops students' self-regulatory skills necessary to overcome stressful scenarios. Application of skills acquired from the MBI provides individuals with positive self-perception and places them in a positive loop, in which self-regulation and resilience allow students to succeed (see Figure 1; Zenner et al., 2014).

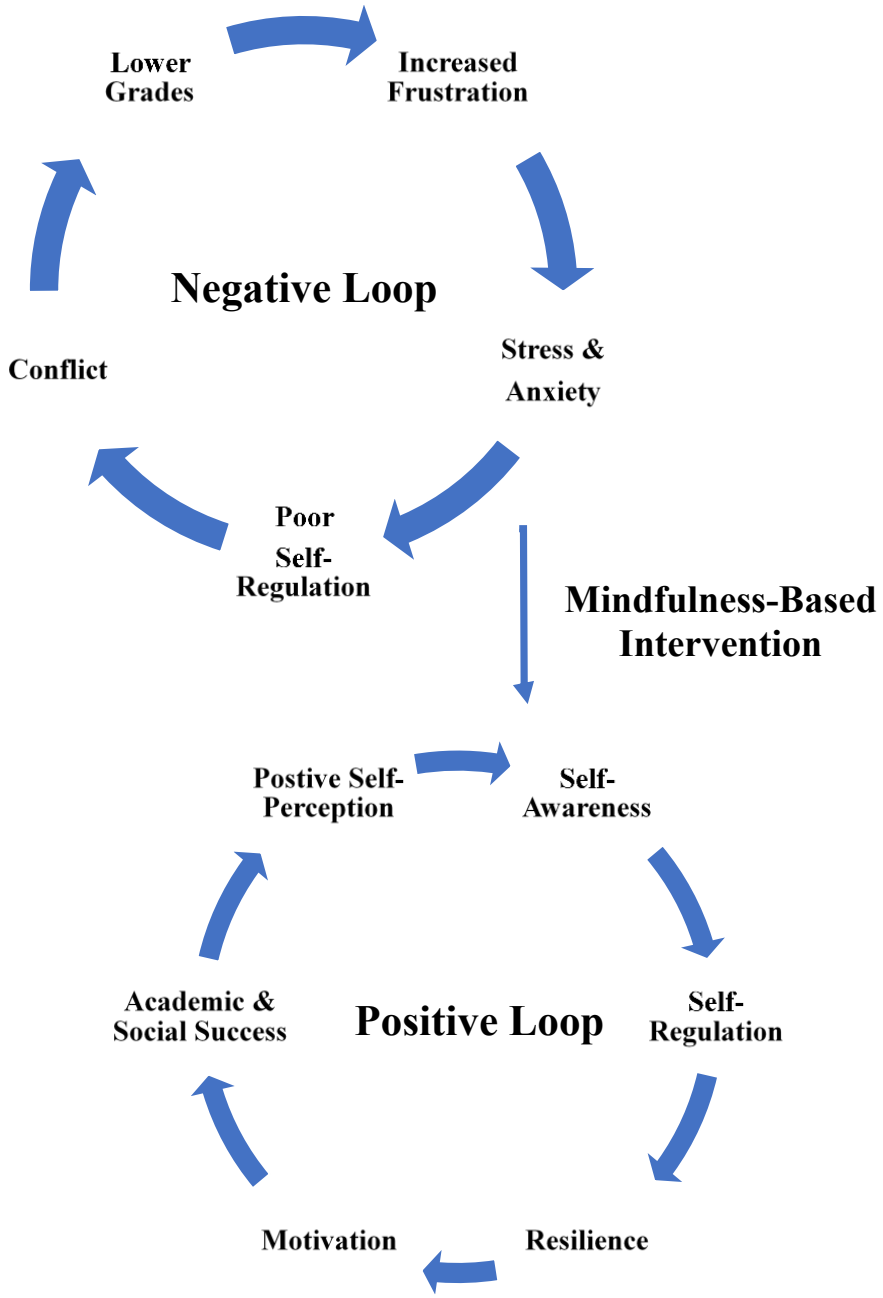
Summary

Together, the theories discussed in this section form the framework for this study. Mindfulness theory serves as the foundation structuring the intervention and skills it reinforces. PBS theory challenged traditional disciplinary practices with interventions designed to promote prosocial behavior (National Educators Association, 2014). The breakthroughs of PBS theory provided the opportunity for mindfulness theory to become a viable way to change negative student behavior. Theories of self-regulation and

resilience correspond to the elements that mindfulness theory nurtures and grows within students. Through mindfulness theory, students develop the tools and resiliency needed to self-regulate (Zenner et al., 2014), and PBS theory links these theories together.

Figure 1

Loop of Possible Negative and Positive Consequences for Students in Grades 3–5



Significance of the Study

Administrators and curriculum developers have gained understanding of the importance of SEL but have struggled with implementing sound curricula to foster SEL. The researcher's goal was to determine the efficacy of a curriculum designed around a MBI for students in Grades 3–5 and investigate SEL as it relates to MBI.

Following the advice of National Education Goals to involve students in activities that promote good health, citizenship, and personal responsibility (Office of Law Revision Counsel, 1994), the researcher examined educational approaches that promote healthy self-image, reflection, self-regulation, and empathy. SEL has helped students grow socially, emotionally, and academically (Durlak et al., 2011). By developing academically successful students who have the ability to effectively handle their emotions and show empathy to others, SEL has the potential to create well-rounded citizens capable of demonstrating good citizenship.

According to the Centers for Disease Control and Prevention (CDC,2020), approximately 4,500,000 children were diagnosed with behavior problems, 4,400,000 with anxiety, and 1,900,000 with depression. These incidence rates have increased since 2003andindicatea desperate need to help students with their social and emotional development.

Belfield et al. (2015) recommended obtaining more evidence on the benefits of SEL, and Klingbeil et al. (2017) recommended additional research into youth-based MBI, which lags behind by approximately 25 years compared to adult-based MBI research. The purpose of this study was to add to the body of research on SEL and MBI. The results of the meta-analysis Durlak et al. (2011) conducted indicated only 16% of studies

collected academic achievement data after the intervention. In this study, the researcher examined SEL and MBI and how they impacted student performance in mathematics and reading. Addressing the need other researchers have recommended, the researcher also made grade-level comparisons between classroom-based interventions(Durlak et al., 2011).

Connection with Social Justice and/or Vincentian Mission in Education

This study was closely related to St. John University's mission to address the needs of those lacking economic, physical, or social advantages. The researcher sought ways to provide social and emotional education through a curriculum that challenges traditional beliefs about intelligence and success.

Research Question

A single research question guided this study: What impact does the Mindful Schools MBI have academic performance, academic and social stress, and academic and social self-perception in students Grades 3-5?Definition of Terms

Mindfulness is the ability to remain present during moment-to-moment experiences and emotions with acceptance and without judgement (Kabat-Zinn, 1990).

Mindfulness-based interventions are treatments that involve intentional training of mindfulness skills as the core therapeutic component to reduce problem behavior or improve well-being. (Kabat-Zinn, 1990; Klingbeil et al., 2017).

Positive behavioral support is a set of strategies used to decrease problem behavior by teaching new skills and making changes in a person's environment (Association for Positive Behavior Support, 2020). presents the specific hypotheses developed from this question.

Table 1

Hypotheses

Symbol	Statement
	Hypothesis 1
$H_{1.0}$	The MBI will not improve academic performance for students in Grades 3–5.
$H_{1.1}$	The MBI will improve academic performance for students in Grades 3–5.
	Hypothesis 2
$H_{2.0}$	The MBI will not increase the capacity of students in Grades 3–5 to manage academic and social stress.
$H_{2.1}$	The MBI will increase the capacity of students in Grades 3–5 to manage academic and social stress.
	Hypothesis 3
$H_{3.0}$	The MBI will not increase self-perception of students in Grades 3–5 to perform academically and socially.
$H_{3.1}$	The MBI will increase self-perception of students in Grades 3–5 to perform academically and socially.
	Hypothesis 4
$H_{4.0}$	The MBI will not have significant differences in results based on grade level.
$H_{4.1}$	The MBI will have significant differences in results based on grade level.
	Hypothesis 5
$H_{5.0}$	The MBI will not have significant differences in results based on gender.
$H_{5.1}$	The MBI will have significant differences in results based on gender.
	Hypothesis 6
$H_{6.0}$	The MBI will not have significant differences in results based on race.
$H_{6.1}$	The MBI will have significant differences in results based on race.
	Hypothesis 7
$H_{7.0}$	The MBI will not have significant differences in results based on school.
$H_{7.1}$	The MBI will have significant differences in results based on school.

Note. MBI = mindfulness-based intervention.

Definition of Terms

Mindfulness is the ability to remain present during moment-to-moment experiences and emotions with acceptance and without judgement (Kabat-Zinn, 1990).

Mindfulness-based interventions are treatments that involve intentional training of mindfulness skills as the core therapeutic component to reduce problem behavior or improve well-being. (Kabat-Zinn, 1990; Klingbeil et al., 2017).

Positive behavioral support is a set of strategies used to decrease problem behavior by teaching new skills and making changes in a person's environment (Association for Positive Behavior Support, 2020).

Resilience is an individual's capacity for recovering from, or adapting to, obstacles or adverse conditions (Bolton, 2017).

Self-regulation is the ability to monitor and manage energy states, emotions, thoughts, and behaviors in ways that are acceptable and produce positive results such as well-being, loving relationships, and learning (Your Therapy Source, 2020).

Social and emotional learning is the process through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions (Collaborative for Academic, Social, and Emotional Learning, 2021).

Summary

This chapter provided an overview of the study, including the problem it addressed, its purpose, and its significance for SEL and mindfulness education. The chapter also provided the research question that guided the study and defined key terms

needed to understand later chapters. Chapter 2 reviews existing literature related to the research topic and question. The chapter expands on the theoretical frameworks mentioned in this chapter and discusses studies that support application of these theories to this study.

CHAPTER 2

Review of Related Research

This chapter provides in-depth discussion of the theories and research relevant to this study. The chapter expands on the theories of mindfulness, self-regulation, and resilience by reviewing original work in each of these fields that support application of these theories to this study. The chapter explains how this study relates to existing research on SEL and MBI.

Theoretical Framework

Mindfulness Theory

Based on Buddhist and Eastern philosophies, mindfulness relies on various meditative practices to help individuals unite mind and body. The goal of mindfulness is to approach each present moment with an open and friendly mindset by letting go of the past and the future (Kabat-Zinn, 1990). Connecting with the moment allows an individual to recognize cognitive and behavioral patterns. In time, this practice helps the individual regulate and shape their attention, emotions, and behavior which typically go unnoticed throughout the day. Introducing mindfulness disrupts automatic reactions and creates time and space to choose different responses. Kabat-Zinn, a pioneer of mindfulness, revolutionized mindfulness practices and was one of the first to introduce mindfulness to the medical field.

MBIs

An MBI is any treatment that involves intentional training of mindfulness skills (i.e., self-regulation of attention to immediate experience paired with an accepting attitude toward experience) as the core therapeutic component for reducing problem

behavior or improving well-being (Kabat-Zinn, 1990; Klingbeil et al., 2017). Kabat-Zinn (1990) argued there are seven attitudes of mindfulness:

- Nonjudgment requires individuals to become aware of the constant stream of judging and reacting toward inner and outer experiences.
- Patience involves acceptance of things that require time to unfold.
- The beginner's mind allows individuals to accept new possibilities and avoid frustration from prior expertise.
- Trust is an integral part of meditation through which individuals develop the confidence to believe in their intuition.
- A nonstriving individual can accept their current position rather than focusing on where they should be.
- Acceptance requires individuals to see things as they are in the present.
- Letting go helps individuals discover thoughts, feelings, and situations that their minds either want to hold onto or avoid. This attitude teaches individuals to keep all experiences on the same level.

Kabat-Zinn revolutionized mindfulness work by empirically demonstrating the physiological benefits of mindfulness when practiced for at least 8 weeks using his widely taught program of mindfulness-based stress reduction.

In his early work, Kabat-Zinn explored the impact of a 10-week mindfulness meditation stress reduction and relaxation program on 90 patients with chronic pain (Kabat-Zinn et al., 1985). Based on participant checklists and questionnaires that assessed various characteristics of pain, results showed a significant reduction in present-moment pain, mood disturbance, anxiety, and depression. Pain-related medication consumption

decreased while activity levels and self-esteem increased. Furthermore, participants maintained these improvements 15 months after training (Kabat-Zinn et al., 1985).

Scholarly interest in mindfulness has continued to grow. Researchers have consistently demonstrated many benefits of mindfulness practice, many of which apply to school. The literature review section in this chapter discusses in greater detail the applicability of MBI in school settings.

PBS Theory

PBS is the application of positive behavioral methods and mediations designed to replace adverse behavior with prosocial behavior (OSEP Center on Positive Behavioral Interventions et al., 2000). Like many theories relating to behavior, PBS has strong connections to the work of Thorndike and Skinner.

Thorndike (1938), a behavioral psychologist, studied the behaviors of animals. In one experiment, he placed a cat in a cage with a piece of food outside the cage. Thorndike observed and timed the cat as it struggled to escape the cage and retrieve the food (as cited in Mcleod, 2018). After the cat successfully retrieved the food, Thorndike placed the cat back into the cage to retrieve another piece of food. Over time, the cat discovered a lever that opened the cage and allowed for quicker retrieval of food. Thorndike found cats learned that pressing the lever led to a favorable outcome—food. His work led to the development of the law of effect, which states an individual can adjust and strengthen behavior when an aftereffect confirms the behavior (Thorndike, 1938). This law predicts an individual is more likely to repeat behavior with positive outcomes and less likely to repeat behavior with negative consequences (Mcleod, 2018).

Although elements of PBS exist in Thorndike's law of effect, Skinner's (1963) operant conditioning is the foundation of PBS. Operant conditioning expands on the law of effect with the addition of the term "reinforcement" to emphasize the role of stimuli to strengthen a response (Skinner, 1963). Skinner's (1963) operational theory explains implementing reinforcement increases the rate at which organisms respond while eliminating reinforcement decreases the response rate.

Like Thorndike, Skinner performed many of his studies on animals (as cited in Mcleod, 2018). Skinner used a box called an operant conditioning chamber, which rewarded or penalized animals for engaging in certain behaviors (Mcleod, 2018). From his research, Skinner developed the term "positive reinforcement." Through positive reinforcement, an animal will replicate a preferred behavior (Mcleod, 2018).

In one experiment, Skinner (1958) used positive reinforcement to teach a pigeon how to bowl. Designed to replicate a bowling alley, the author placed a pigeon in a box, a ball on one side of the box, and pins on the other side of the box. The pigeon received a reinforcing treat for each attempt to swipe the ball with its beak and quickly learned each attempt to swipe the ball led to a reward. Although the pigeon initially received reinforcement for any attempt to swipe the ball, Skinner later adjusted his expectations and only provided reinforcement for attempts more closely resembling proper bowling. Within minutes, the bird adjusted its behavior and pushed the ball across the box with strength and accuracy (Skinner, 1958). The study exemplified the impact of positive reinforcement on promoting desired behavior.

Changes to the Individuals with Disabilities Education Act in 1997 reinforced implementation of PBS theory in schools (as cited in Gartin & Murdick, 2001). These

changes made individualized education plan teams responsible for addressing student behaviors that negatively impact their learning ability. Team members, including general education teachers, were required to consider strategies (including positive behavioral interventions) for supporting and addressing problem behaviors (Gartin & Murdick, 2001).

New mandates also required teachers and school leaders work within a new framework for assessing behavior based on functional behavior analysis (Gartin & Murdick, 2001). The changes required members of individualized education plan teams to conduct functional behavior analysis or explain the reasons for problem behaviors and demonstrate how to assess, understand, and work with students to improve problem behaviors (Gartin & Murdick, 2001). Team members could then begin to understand when and why behaviors occurred and how to prevent their occurrence. Rather than selecting an intervention when problem behaviors arose, those implementing PBS constructed a set of procedures at the outset that changed the environment to reduce triggers and improved instructions to ensure more consistent, appropriate behaviors (Braddock, 1999).

The introduction of functional behavior analysis flipped traditional consequence-driven modes of behavior on their heads and brought in the new PBS strategy (Gartin & Murdick, 2001). Although PBS may only be mandated for a few students with special needs, school leaders across the country have implemented PBS across their schools. SWPBS is a team-based framework in which teachers enforce behavior expected from students across all environments to prevent problem behavior developing while

reinforcing and promoting prosocial behavior (OSEP Center on Positive Behavioral Interventions et al., 2000).

Like PBS, mindfulness theory is a preventive measure. Mindfulness helps students acknowledge their emotions and engage constructively with the world (Burke & Hawkins, 2012). In essence, mindfulness allows students to functionally analyze their own behaviors and strategize ways to cope with their emotions using prosocial behavior. The literature review section in this chapter includes a discussion of PBS and SWPBS and their impact on students.

Self-Regulation Theory

Self-regulation theory is another vital element of this study's theoretical framework. Bandura was a critical figure in the development of self-regulation theory. Bandura et al. (1961) studied aggression transmission through imitation using a sample of 36 boys and 36 girls ages 37–69 months. The researchers created eight experimental groups, each with six participants, and a control group of 24 participants. Experimental groups were then divided in half: one half viewed models demonstrating aggressive behavior and the other half viewed models demonstrating nonaggressive behavior. The researchers hypothesized participants would imitate the behavior they viewed. Results supported the researchers' hypothesis that subjects in the aggressive group would imitate aggressive behavior, exhibiting more physical and verbal aggression than subjects in the nonaggressive and control groups. However, results also showed approximately one third of participants in the aggressive group demonstrated nonaggressive responses they observed from the model. Overall, the researchers demonstrated children learn behavior through observation and without reinforcement. These findings led to inclusion of

imitation in social learning theory. Bandura (1963) agreed operant conditioning could shape behavior but challenged the idea that operant conditioning is responsible for all behavioral acquisition.

To support his claim, Bandura (1963) tested social learning theory by combining operant conditioning with imitation. The purpose of the experiment was to demonstrate social modeling and reinforcement can alter a child's moral judgment. Bandura (1963) used baseline data to place children into subgroups based on moral judgment orientation. One group of children observed adult models who demonstrated behaviors opposite to the children's orientations and received reinforcement for adopting the models' behaviors. The second group observed models without receiving reinforcement, and the third group observed no models but received reinforcement when they made moral judgments that countered their orientations. After the intervention, Bandura (1963) used stories similar to the baseline tests to detect any changes in moral judgment. He hypothesized the group who observed models and received reinforcement would show the greatest change in behavior. Contrary to expectations, both groups who observed models exhibited similar levels of behavioral change regardless of reinforcement but exhibited greater levels of behavioral change than the model-free group (Bandura, 1963). These results supported Bandura's (1963) belief that individuals acquire behavior through imitation and reinforcement strengthens that behavior.

Bandura (1986) challenged the idea that only external forces determine behavior through a view of social learning theory that acknowledged people control their behavior. Controlling thought processes, actions, and motivations is a human characteristic through which people make personal and circumstantial changes (Bandura, 1989). This emphasis

on self-control led to the development of social cognitive theory. Social cognitive theory posits human agency follows an emergent interactive model, or the notion that people influence their motivations and actions within a triadic reciprocal causation system influenced by cognitive, personal, and environmental factors (Bandura, 1989). Social cognitive theory suggests forethought structures purposeful human behavior. Anticipating future events allows people to plan by setting goals and planning courses of action to reach those goals. Self-regulation plays a role in an individual's adherence to and alteration of those courses of action (Bandura, 1989). It is through self-regulation that human agency develops and regulates behavior.

Bandura (1991) conducted an in-depth examination of the levels and stages of self-regulation and how each determines individuals' motivations and actions. Bandura (1991) asserted self-regulation is a composite of three subfunctions: self-monitoring behavioral cause and effect, judgment of behavior with respect to personal standards, and self-reaction.

Self-monitoring is the process by which an individual examines their performance. Self-monitoring provides the individual with the necessary information to set realistic goals and standards (Bandura, 1991). Self-monitoring requires the individual to reflect on their thoughts, behaviors, and emotions to identify patterns to enact meaningful change. Judgment of behavior establishes personal standards that guide action. An individual can best determine the effectiveness of a behavior when they have an objective standard for comparison. Most goal setting derives from social norms and expectations, but the achievements of competitors will also help the development of goals. Self-reaction helps an individual determine how satisfied they are with an action. If

the action does not meet the established standard, the individual tries again until they reach the standard. When the individual achieves the desired standard, he or she is either satisfied or establishes new standards to reach (Bandura, 1991).

Leventhal also contributed to the development of self-regulation theory. Leventhal examined behavior in the medical field and described self-regulation as a system. In his early work, Leventhal studied the impact of the health belief and fear-driven models of communication on patient behavior (Leventhal., 1983). According to the health belief model, an individual's perception of their vulnerability to disease, the severity of the disease, whether the benefits of change outweigh the costs, and appearance of symptoms determine whether they change their behavior. Leventhal and colleagues determined the health belief model incited more fear and provoked less meaningful behavior change. The authors also analyzed the fear-driven model, which suggests fear-stimulating health communications are the best way to change thoughts and behaviors because individuals alter their behaviors and beliefs to mitigate fear and reduce health risks. The fear-driven model led to changes in patient beliefs about health risks but provided only minor behavioral changes. The inadequacy of these models led Leventhal to develop a new model, the dual process model, that combined the health belief and fear-driven models.

The dual process model, or parallel response model, suggests cognitive and emotional reactions cause fear arousal, so it is necessary to address both to stimulate desire to change (Leventhal, 1983). The cognitive process involves generating a depiction of the health threat and developing action plans to cope with that threat. The emotional process involves stimulating fear, disgust, depression, and anger through graphic images

or provocative slogans. To test this efficacy of this approach, Leventhal et al. (1983) drew on the findings of three experiments, two related to tetanus vaccinations and one related to smoking. The researchers compared fear level and action plan to attitude, intention, and behavior. They divided subjects into four groups, each of which received a different level of fear messaging and instructions for a specific action. High-fear messages produced more short-term changes in attitude and intent to change behavior than low-fear messages, but both messages led to long-term change when accompanied by an action plan (Leventhal, 1983).

Meyer et al. (1985) tested the commonsense model of self-regulation, an extension of the parallel process model. The commonsense model suggests individual understanding of health threats guides their steps to reduce exposure to those threats. Researchers made three hypotheses:(a) patients with hypertension would develop representations of the health threat and experience symptoms of that threat, (b) those representations would be acute and short term, and (c) those representations would serve as a guide for the actions participants would take to treat the health threat.

The sample of 230 patients made up four groups: patients with normal blood pressure, first-time hypertension patients, long-term hypertension patients, and patients who previously opted out of treatment. The researchers interviewed patients with open-ended questions to assess their views of hypertension and its treatment. Patients who believed varying blood pressure levels would lead to hypertension signs followed the recommended blood pressure monitoring guidelines more closely, supporting the link between the commonsense model of self-regulation and subsequent action.

Leventhal's work with both parallel process and commonsense models allowed theorists and researchers to understand the development of human self-regulation regarding health. He described self-regulation as a system's ability to use provided resources to achieve goals (Leventhal et al., 2003). The commonsense model of self-regulation describes health threats as self-regulated (Leventhal et al., 2003).

Zimmerman (1989) examined how social cognitive theory and self-regulation contribute to academic learning. Zimmerman's self-regulated learning built upon Bandura's triadic reciprocity of personal, behavioral, and environmental factors. Beyond the traditional characteristics these factors encapsulated, self-regulated learning treats self-efficacy as an essential part of personal influence. An individual's perception of their ability to succeed depends on their knowledge, metacognitive processes, ability to set goals, and underlying emotions or feelings. Behavioral influences include self-observation, self-judgment, and self-reaction, and environmental influences include physical context and social experience. Social experience corresponds to the impact of modeling on self-regulation, verbal persuasion, and reward systems; physical context corresponds to the task and setting.

Zimmerman (1989) argued the level of a student's self-regulation depends on their level of involvement in the learning process. Self-regulated learning incorporates three essential elements: self-regulated learning strategies, self-efficacy of performance skills, and commitment to academic goals. Self-regulation learning strategies are purposeful steps taken to acquire new information or skill agency. Self-efficacy is a student's perception of their ability to organize and implement the actions needed to

acquire a particular skill. Academic goals are the short- and long-term achievements by which students can measure their progress (Zimmerman, 1989).

Zimmerman (1989) described three advantages to the social–cognitive approach of self-regulated learning:

1. Self-regulated learning encompasses two processes critical to self-regulated learning: self-efficacy and implementation of strategies.
2. The social–cognitive approach differentiates between impact of self-regulatory and behavioral influences.
3. The social–cognitive approach links self-regulatory processes to social learning and can explain how they influence each other.

Zimmerman and Kitsantas (1997) conducted a study that supported self-regulated learning theory. The purpose of the study was to determine the impact of goal setting and self-monitoring on self-regulated practice of dart-throwing skills. The sample included 90 female high school students from four different gym classes ranging in age from 14 to 16 years (M = 15.4). The researchers assigned participants randomly to one of eight experimental groups, and the ninth group served as a practice-only control. Experimental conditions included (a) outcome goals with no self-recording, (b) outcome goals with self-recording, (c) process goals with no self-recording, (d) process goals with self-recording, (e) transformed goals with no self-recording, (f) transformed goals with self-recording, (g) shifting goals with no self-recording, and(h) shifting goals with self-recording. The researchers hypothesized students who shifted goals from developing proper processes (i.e., form) to developing good outcomes would outperform those with

process goals in dart-throwing skills, self-reaction, self-efficacy, and overall interest in the game.

Each group received 10-min demonstrations of proper dart-throwing form in separate rooms, after which students practiced dart throwing for 20 min (Zimmerman &Kitsantas, 1997). Students in the outcome-goal groups received instruction in obtaining the highest possible score. Those assigned to self-record logged their scores after each throw. Students in the process-goal groups focused on proper form. Those assigned to self-record wrote down correctly enacted steps after each throw. Students in the shifted-goal groups began with the goal of perfect form then switched to attaining the highest possible score. Those assigned to self-record wrote down the steps they performed correctly then wrote down the scores they attained. The control group was instructed to participate in 20 min of unstructured dart-throwing practice. All groups then completed an evaluation of dart-throwing ability, self-efficacy, self-reaction, interest in darts, and personal attributes (Zimmerman &Kitsantas, 1997). The researchers conducted factorial analysis of variance of the data using the four goal-setting strategies and the two self-recording levels and made post hoc comparisons using Tukey's test. Finally, t-tests were used to compare goal groups to control groups (Zimmerman &Kitsantas, 1997).

Findings showed during self-directed practice, students who focused on process goals but then shifted to outcome goals outperformed all other groups in dart-throwing proficiency, self-efficacy, positive self-reaction, and interest in the game (Zimmerman &Kitsantas, 1997). Students who recorded themselves during goal-oriented practice also enhanced their self-regulatory beliefs, self-efficacy, self-reaction, and interest in the game. Overall, these findings indicate a need for social guidance (i.e., modeling) during

the initial phases of learning to prepare students to self-regulate when practicing independently (Zimmerman &Kitsantas, 1997).

Self-regulation theory has grown to include the work of many theorists. Bandura laid the crucial foundation. Leventhal demonstrated application of self-regulation to help prevent the dangers of life-threatening illness. Zimmerman expanded the work of Bandura in academic settings to help describe how students learn best.

Resilience Theory

Resilience theory is the final component of this study's theoretical framework. Resilience is an individual's capacity to recover from or adapt to obstacles or adverse conditions (Bolton, 2017). Resilience theory encompasses three specific elements that work with one another as part of a more extensive process: (a) risk factors, (b) protective factors, and (c) vulnerability factors (Bolton, 2017). Risk factors are adverse conditions, challenges, or conditions of vulnerability individuals face (Smith-Osborne, 2007). Protective factors are traits, characteristics, and interventions that alleviate the impact of risk factors (Smith-Osborne, 2007). Vulnerability factors are genetic or environmental predispositions that interfere with an individual's ability to cope with risk factors (Smith-Osborne, 2007).

Werner sought to determine why some children growing up in at-risk environments develop healthy and resilient personalities (Werner, 1989). Werner's groundbreaking longitudinal work in the Hawaiian island of Kauai sparked the interest of several researchers and theorists (as cited in Bolton, 2017). This study was one of the most extensive examinations of the determining factors of resiliency and included a cohort of 698 infants born in 1955, beginning in the prenatal period (Werner, 1989). This

multidisciplinary study incorporated nurses, physicians, pediatricians, psychologists, teachers, and participants to explore the impact of psychological and biological risk factors and traumatic life events on the development of protective factors from early childhood to young adulthood. Although most participants were raised in supportive environments free of traumatic or stressful life events, one third of participants were raised in adverse environments. Circumstances at birth and post-birth experiences produced moderate-to-severe stress and trauma, such as poverty, alcoholism, and mental illness, placing participants at-risk. Two thirds of these at-risk children either developed severe learning or behavioral problems by10 years of age or experienced delinquency problems consistent with mental health issues or teenage pregnancy.

More interesting was the at-risk participants who developed into proficient, poised, and compassionate young adults (Werner, 1989). These participants received greater positive attention from family members as infants, demonstrated more communication, locomotion, and self-holding skills as toddlers, showed better reading and reasoning skills and developed many interests and hobbies by elementary school, and developed greater positive self-concept by graduation (Werner, 1989). Furthermore, these students had friends who provided emotional support and participated with them in extracurricular activities. At the 30-year follow-up, many of these participants had completed their education, were goal-oriented, and were working in a satisfying job.

Three types of protective factors were responsible for individuals' resilience: individual dispositions, emotionally supportive relationships with family members, and external support systems (Werner, 1989). Resilience served as a balance between risk factors, vulnerability factors, and protective factors.

Rutter's (1987) theoretical work also supported resilience theory. Rutter conducted longitudinal studies of children from the Isle of Wight and inner-city London and demonstrated protective measures allowed children to overcome adverse environmental conditions (as cited in Bolton, 2017). Rutter also sought to understand the mechanisms of vulnerability and protective factors in response to risk factors.

Analyzing psychosocial resilience, Rutter (1987) hypothesized vulnerability and protective factors have a catalytic relationship directly impacting each other. Rutter claimed vulnerabilities and protective factors are only apparent at the onset of risk because individuals cope more effectively in some scenarios than others. He sought to determine why specific scenarios elicited protective responses while other scenarios elicited vulnerabilities. Rutter empirically examined various interaction effects: sex, temperament, parent–child relationship, spousal support, planning, school experience, early parent loss, and life turning points. Rutter identified four predictors of protective response arousal: reduction of impact, reduction of chain reaction, establishment and maintenance of self-esteem and self-efficacy, and opening of opportunities (Rutter, 1987). Rutter concluded resilience is a person's learned ability to cope with stressful and unfortunate scenarios. He also emphasized the need to educate people on how to operate their protective mechanisms during turning points in life (Rutter, 1987).

Summary

The theoretical framework of this study incorporates elements of mindfulness theory, PBS theory, self-regulation theory, and resilience theory. When practiced regularly, mindfulness can regulate stress and anxiety, behavior, and focus to ultimately benefit student success. PBS theory, developed from the work of Thorndike (1938) and

Skinner (1963), allows educators to take the individualized approach of PBS and apply it in a school-wide setting, including via MBIs. Self-regulation theory, developed from Bandura's (1991) and Leventhal's (1983) work, combines the skills MBI teaches students that allow them to observe and control patterns of thoughts, behaviors, and actions. Resilience theory, originating from the work of Werner (1989) and Rutter (1987), explains adjustment to unfortunate circumstances through development of protective mechanisms that arise when risk factors attack areas of vulnerability. MBI helps give students the defensive tools needed to overcome those circumstances. The next section reviews research relevant to applying these theories to academic settings.

Review of Related Literature

This section is an in-depth examination of existing research related to the research topic and hypotheses that examines the role of SEL in education and its importance in school curricula. The review begins with work on the validity of mindfulness and MBIs among youth and in schools. The review continues with work relating to PBS and SWPBS and their role in curbing negative behaviors through preventative measures. The review concludes with work on the immediate and long-term importance of self-regulation and resilience for school-aged children and the facilitation of mindfulness and MBIs.

SEL

Fundamentals of SEL

Schools are social places where students learn collaboratively with teachers and peers (Zins et al., 2004). SEL is the process through which individuals develop and apply the knowledge, attitudes, and skills necessary to comprehend and control emotions,

establish and reach positive goals, cultivate empathy for others, build and maintain positive relationships, and practice positive decision making (Collaborative for Academic, Social, and Emotional Learning, 2021). Acquiring strong SEL skills can help students feel motivated, believe in themselves, communicate well with other, set goals and standards for themselves, and overcome obstacles to achieve those goals (Zins et al., 2004).

Many of these skills and characteristics are critical attributes of the theories discussed in the theoretical framework section. SEL is therefore the overarching umbrella under which this study fits. In this study, the researcher sought to determine whether a properly organized and implemented SEL curriculum can impact academic performance and student self-perception. The next section reviews research supporting the implementation of SEL in the school setting.

Meta-Analyses on SEL

Durlak et al. (2011) conducted the first important meta-analysis on school-based SEL programs. Their first hypothesis was school-based SEL interventions would have significant and positive effects on participants' scholastic and social competence and attitudinal and behavioral outcomes (Durlak et al., 2011). The second hypothesis posited regular staff members could use and administer SEL programs in academic settings while children attend school. They distinguished between SEL interventions that outside personnel administers and SEL interventions that school staff members administer (Durlak et al., 2011). The third hypothesis was programs that focused interventions both inside and outside the classroom would have a greater impact than those focused inside the classroom alone. The fourth hypothesis predicted the use of recommended processes

for skill development and program implementation would positively impact program implementation (Durlak et al., 2011). The fifth and final hypothesis was programs that experience difficulty with implementation would be less successful than those that do not (Durlak et al., 2011).

Durlak et al. (2011)compiled information from 213 school-based SEL programs that included 270,034 students from Kindergarten through high school. Using Hedge's *g* to compare groups, the authors found students who participated in SEL had significantly higher levels of social and emotional skills ($g = 0.57$, $p \leq .05$), attitude ($g = 0.23$, $p \leq .05$), positive social behavior ($g = 0.24$, $p \leq .05$), conduct problems ($g = 0.22$, $p \leq .05$), emotional distress ($g = 0.24$, $p \leq .05$), and academic performance ($g = 0.27$, $p \leq .05$) compared to students who did not participate in SEL. Students who participated in SEL programs demonstrated overall increases in aptitude, attitude, and positive social behaviors and decreases in the number of behavioral issues and sense of emotional distress (Durlak et al., 2011). In particular, students who participated in SEL programs demonstrated an 11% gain in academic performance (Durlak et al., 2011). These findings support school-based SEL programs and their impact on targeted social and emotional competencies and self-perception, attitudes about others, and feelings about school (Durlak & Mahoney, 2019).

Durlak et al. (2011) also found that teacher-implemented SEL programs were more effective than SEL programs that people who were not school professionals administered, indicating SEL is most effective as part of daily classroom routines. As expected, programs that implemented best practices and experienced no issues with implementation were more effective than other programs (Durlak et al., 2011). The

authors did not find that programs focused inside and outside the classroom were more effective than programs focused on the classroom alone. Durlak et al. (2011) argued this may have been because those programs experienced additional complications and complexities with the implementation and procedure.

Expanding on Durlak et al. (2011), Taylor et al. (2017) conducted another meta-analysis to determine the follow-up effects of school-based SEL interventions on positive youth development. First, they hypothesized participants in SEL programs would show more favorable social, emotional, and well-being outcomes than controls at follow-up. Second, they predicted SEL programs would provide positive effects regardless of race and socioeconomic status. Third, they predicted participation in SEL programs would lead to positive long-term outcomes. The researchers examined 82 school-based SEL interventions with 97,406 students in Kindergarten through 12th grade. Most interventions were class-based and lasted 30-45 minutes. Follow-up data collection occurred 6 months to 18 years after intervention.

Taylor et al. (2017) reported significant positive impacts on SEL skills, attitude, positive social behavior, academic performance, conduct, emotional distress, and drug use for participants in SEL programs. The authors used Hedge's *g* to calculate mean effect sizes for each category. Effect sizes rangedfrom0.13 to 0.33(Taylor et al., 2017). SEL interventions positively impacted student outcomes but also protected participants of all demographics against conduct problems, emotional distress, and drug use (Taylor et al., 2017). The authors also concluded participants demonstrated higher levels of well-being than others at follow-up. A focused examination of 936-week follow-ups indicated

improved social relationships, increased high school graduation and college attendance rates, and reduced arrests and clinical disorders.

The results of these meta-analyses validated the implementation of SEL programs in schools. Though the researchers who conducted these studies did not examine the impact of specific SEL approaches, the purpose of the following study was to fill that gap by examining the impact of a particular MBI on the academic performance and self-perception of elementary students.

Mindfulness Based Interventions

Researchers have determined the efficacy of mindfulness-style meditation practices on adults (Black et al., 2009). However, few researchers have determined the impact of such practices on young people (Black et al., 2009). Black et al. (2009) conducted one of the earliest systematic reviews of empirical studies on mediation interventions among young people. Using various databases, the authors obtained data from 16 studies conducted in school, clinical, and community settings between 1982 and 2009. The sample included a total of 680 students ages6–18 years. Eleven studies were randomized controlled trials and five studies used pretest/posttest designs with no control. Interventions included mindfulness meditation, transcendental meditation, mindfulness-based stress reduction, and mindfulness-based cognitive therapy (Black et al., 2009).

Black et al. (2009) concluded sitting meditation provided participants with physiological, psychological, and behavioral benefits. Median Cohen's d effect sizes ranged from 0.16 to 0.29 for physiological outcomes and 0.27 to 0.70 for psychosocial and behavioral outcomes. The authors found reductions in anxiety, decreased rates of rule

infractions and suspensions, and improvements in absenteeism and self-esteem. This meta-analysis provided promising evidence but was limited by the small sample size.

Zenner et al. (2014) completed a comprehensive systematic review of 24 studies exploring the impact of school-based mindfulness interventions on psychological outcomes. The study included a sample of 1,348 students from Grades 1–12 (i.e., 876 in the control group and 472 in the treatment group). The authors measured efficacy of MBI via data on cognitive performance, emotional problems, stress and coping, resilience, and third-person ratings collected through testing and self-reported questionnaires.

Zenner et al. (2014) reported the effect size, *g*, was 0.40 for between groups and0.41 for within groups ($p < .001$). Effect sizes indicated statistical significance for performance ($g = 0.80$), stress ($g = 0.39$), and resilience ($g = 0.36$), but the authors did not find statistical significance for emotional problems ($g = 0.19$) or third-person ratings ($g = 0.25$). The authors concluded mindfulness programs might be valuable strategies for improving students' cognitive performance, learning skills, and resilience to stress. They also claimed their results were sufficient to justify allocating resources to implementation of MBIs among young people.

Zoogman et al. (2014) completed the first meta-analysis of youth-based mindfulness interventions, compiling 20 peer-reviewed articles involving participants ages18 years or younger who received mindfulness interventions between2004 and 2011. The authors sought to determine (a) the overall size of the effect of mindfulness interventions on young people, (b) the most effective method for delivering MBI, and (c) which outcomes (e.g., psychological, attention, social function) mindfulness most strongly impacts. The study's purpose was to identify which outcomes and

subpopulations MBI most impacted (Zoogman et al., 2014). The authors primarily used Becker's (1988)primarily used delta (δ)for aggregating effect size and compilation analysis.

Zoogman et al. (2014) found a small-to-moderate effect size (δ =0.23, $p < .001$) for young people in intervention groups compared to controls over a range of specific subsamples, demonstrating those in the intervention groups consistently outperformed active controls. The effect size for clinical samples ($\delta = 0.50$) was greater than nonclinical samples ($\delta = 0.20$, $p = .24$), suggesting MBI is more beneficial for young people in clinical settings. The authors also reported MBI was more effective for treating psychological symptoms ($\delta = 0.37$) than other dependent variables ($\delta = 0.21$, $p = .24$). Zoogman et al. (2014) concluded MBI is safe and effective for pursuing several social and emotional goals in a variety of settings, including schools. This conclusion supports the aim of this study, which was to determine the impact of MBI on SEL. The results of this study add to the body of research on implementation of the Mindful Schools curriculum in elementary schools.

Klingbeil et al. (2017) expanded on the work of Zoogman et al. (2014) and Zenner et al. (2014) and conducted another important study on MBIs among young people. They conducted a comprehensive meta-analysis of studies on group-designed MBIs with young people in school and non-school settings, clinical and nonclinical samples. The authors conducted a thorough search for group-designed MBIs using various databases and quantitatively analyzed data from 76 studies involving 6,121 participants. They determined although the effects of MBIs in studies with pretest/posttest and control designs were small, effects were greater at later follow-up

than immediately after treatment. This suggested the impact of MBIs may take time to develop. The authors found setting and number of implementations had no significant impact on outcomes. They concluded their data supported the use of MBI as part of a larger SEL program to help develop various SEL skills.

MBIs and Attention

Napoli et al. (2005) sought to determine whether MBI impacted students' attention outcomes in Grades 1–3. The authors hypothesized mindfulness training helps children manage their stress more efficiently, enabling them to increase their focus. Their sample included 194 students from nine different elementary schools, with 97 in the experimental group and 97 in the control group. The 24-week program ran bimonthly for 12 months from September 2000 through May 2001. The program included various mindfulness methods, including breathwork, body scan, movement, and sensorimotor awareness activities. The authors collected data from the ADD-H Comprehensive Teacher Rating Scale (Actress) to assess attention, hyperactivity, social skills, and oppositional behavior, the Test Anxiety Scale was used to assess testing anxiety, and the Test of Everyday Attention for Children (TEA-Ch) was used to measure visual and sustained attention (Napoli et al., 2005).

Napoli et al. (2005) conducted paired *t*-tests using pretest and posttest data. Results were statistically significant for the TEA-Ch Selective Attention Subscale ($t = 7.94$, $p < .001$), the Actress Attention Subscale ($t = 8.21$, $p = .001$), the Actress Social Skills Subscale ($t = 7.19$, $p = .001$), and the Test Anxiety Scale ($t = 1.34$, $p = .007$). Students in the treatment group showed improvements in selective attention and

reductions of both test anxiety and attention-deficit/hyperactivity disorder behaviors compared to students in the control group (Napoli et al., 2005).

MBIs and Executive Functioning

Flook et al. (2009) examined school-based MBI and its impact on executive functioning. They authors conducted a randomized controlled study of 64 students across diverse ethnicities ages7–9 years in Grades 2 and 3. They examined the impact of a mindful awareness practices program implemented 2 times per week over 8weeks for 30 min (a total of 16 sessions). Parent and teacher questionnaires assessed children's executive functioning immediately before and after the program. The authors used the Behavior Rating of Executive Functioning scale comprised of three subscales: the metacognition index, the behavioral regulation index, and the global executive composite score. They hypothesized training in mindful awareness practices would significantly impact subjects with poor baseline executive functioning skills.

Flook et al. (2009) conducted multivariate analyses of covariance using pretest and posttest scores from each subscale. Findings from both teacher reports ($\Lambda = .796$, F [3, 55] = 4.70, $p = .005$) and parent reports ($\Lambda = .838$, F [3, 55] = 3.54, $p = .020$) showed students with lower initial levels of executive functioning in the training group had improved executive functioning. Based on these results, the authors concluded participation in the mindful awareness practices program had improved overall executive functioning, and the introduction of such programs in a general education setting would benefit children with executive functioning difficulties.

MBIs Implemented for SEL

Schonert-Reichl et al. (2015) sought to understand how SEL programs that include mindfulness and caring for others could affect cognitive and social behavior and outcomes by assessing executive function, stress, well-being, peer acceptance, and math grades. The authors randomly assigned four fourth- and fifth-grade classes to receive either SEL with a mindfulness program or a typical social responsibility program (as a control). The authors hypothesized the SEL program would improve executive functioning skills, stress levels, well-being, peer acceptance, and math grades compared to the control group.

Schonert-Reichl et al. (2015) found, compared to students in the control group, students who received SEL incorporating mindfulness demonstrated more cognitive control and quicker executive functioning skills. Although test responses were not significantly more accurate for students in the experimental group than the control group, their response times were quicker, $F(1, 92) = 4.32$, $p = .04$, $d = -.21$, and they were also better able to inhibit distraction, $F(1, 92) = 5.54$, $p = .02$, $d = -.31$. Analysis of covariance of stress response measured by student cortisol levels revealed a leveling off of cortisol levels in the afternoon, indicating students were less stressed then, but these results were not statistically significant, $M = 0.032$, $SD = 0.07$, $F(3, 94) = 5.90$, $p = .02$, $d = .51$.

Schonert-Reichl et al. (2015) examined emotional intelligence using multivariate analysis of covariance of child self-report measures. The dependent variables were the differences between posttest and pretest measures of empathy, perspective taking, optimism, emotional control, self-concept, mindfulness, and depression, and the independent variable was intervention status, controlling for age, gender, and English as a

second language. The authors found a significant main effect of group, $F(7, 88) = 2.14$, $p = .04$. Analysis of covariance revealed improvement from pretest to posttest in empathy, $F(1, 97) = 4.42$, $p = .03$, $d = .42$,perspective taking, $F(1, 97) = 4.17$, $p = .03$, $d = .40$, optimism, $F(1, 97) = 5.40$, $p = .02$, $d = .48$, emotional control, $F(1, 97) = 8.78$, $p = .004$, $d = .59$, self-concept, $F(1, 97) = 5.60$, $p = .02$, $d = .50$, and mindfulness, $F(1, 97) = 7.94$, $p = .006$, $d = .55$. Analysis also revealed significant decline in symptoms of depression, $F(1, 97) = 4.14$, $p = .04$, $d = -.45$. Peer nominations elicited peer perception of prosocial behavior in the areas of sharing, trustworthiness, perspective taking, and helpfulness. Multivariate analysis of covariance indicated significant increases in peer nominations across all measures, $F(7, 88) = 4.36$, $p = .001$.

Additionally, Schonert-Reichl et al. (2015) performed analysis of covariance of math grades while controlling for age, gender, and English as a second language. They found higher math grades in the experimental group ($M = 6.12$, $SD = 2.17$) compared to the control group ($M = 5.25$, $SD = 2.46$, $t(87) = 1.76$, $p = .7$, $d = .38$. These results indicated MBI-based SEL programs positively impact many areas, including academic achievement. The authors reported their analyses were conducted at the student level though randomization occurred at the class level. In this study, the researchers examined differences in many areas based on grade, gender, school building, and race.

The evidence discussed in this section indicated MBI is effective at various levels of education among young people. In this study, the researcher addressed the limitations imposed by small samples on the studies discussed in this section. The aim of this study was to provide evidence regarding MBI when implemented as SEL for young people.

PBS

The theoretical framework section discusses empirical support for the use of PBS to reduce the frequency of unwanted behaviors by promoting desired behaviors. Because the purpose of this study was to determine the efficacy of PBS implementations across grade levels in multiple schools, this section begins with examination of evidence supporting SWPBS or SWPBIS.

SWPBS

Mendez et al. (2008) examined the efficacy of a 1-year SWPBS program on rural elementary students in North Texas. The school served 652 students in Kindergarten through third grade, of whom 77.5% were White, 19.6% were Hispanic, and 39.9% were economically disadvantaged. The school's staff included three administrators, 45 teachers, and 15 educational aides. The student–teacher ratio was 15:1. The researchers introduced and developed SWPBS the year before implementation. After introducing building administrators to the idea and securing support for training, the authors offered a turnkey approach to training staff members in each building. Six teachers attended professional training on PBS and later conducted a half-day retreat for lead teachers, counselors, and principals to discuss SWPBS approaches and form an implementation committee. Members of this committee introduced SWPBS to staff members during a half-day training and to students at an assembly held at the beginning of the subsequent year. Committee members also monitored the program's progress and made changes as needed.

The authors used disciplinary office referrals from the year of and the year before implementation to determine the outcome of the SWPBS program (Mendez et al., 2008).

They found 130 fewer referrals after program implementation, an 18.3% reduction. SWPBS was most effective for 36.6% of students with between one and four referrals the year before implementation. The number of referrals decreased by 18.8% for students with10 or more referrals in the year before implementation. There was a 19.6% decrease in referrals for boys and a 13.2% decrease in referrals for girls. The percentage of students who passed the Texas assessment of academic skills was higher in the implementation year. Mendez et al. (2008)used the same approach and compared data from two consecutive school years. Another similarity was the use of academic data to determine efficacy of the intervention. In this study, the researcher examined the impact the intervention on reading and math growth.

Curtis et al. (2010) presented a case study of the impact of SWPBS from 2002 to 2006 on a Kindergarten–fifth-grade elementary school in rural North Carolina. Of the 523 students, 421 were White, 34 were Hispanic, 12 were Black, 14 were Asian, five were American Indian or Alaskan Native, and 32 did not specify their race or ethnicity. The authors reported results of a 4-year implementation of SWPBS. Training and preparation for SWPBS began in the 2002–2003 school year under the leadership of a specially trained team consisting of teachers, counselors, administrators, and a social worker. During the latter half of the preparation year, the team took charge of designing and implementing the SWPBS. The team decided on five positive behavioral statements that would earn students reward tickets from a school staff member. Students placed the labeled tickets in a special box and tickets were drawn weekly for prizes.

Data from 2002–2003 served as a baseline and Curtis et al. (2010)collected and analyzed data related to (a) behavioral referrals to the principal, (b) extended school-day

timeouts, (c) out-of-school suspensions, and (d) lost instructional days. The authors reported a 47.8% decrease in behavior referrals, a 1.7% decrease in extended timeouts, a 67% decrease in out-of-school suspensions, and a 56.5% decrease in lost instructional time between the baseline and the 2006–2007 school year. The differences were statistically significant ($p < .001$) for behavioral referrals, out-of-school suspensions, and lost instructional time. The authors concluded their results provided evidence to support the claim that SWPBS can reduce behavioral problems and loss of instructional days (Curtis et al., 2010).

SWPBS and SEL

Albrecht and Brunner (2019) investigated the impact of a SWPBIS and SEL curriculum on learning time in a Kindergarten–fifth-grade school in Kansas. The authors analyzed data from disciplinary referrals. The sample consisted of all 325 students (90% White, 8.4% Hispanic or Latino, 0.4% Black, 0.4% Asian, and 0.4% American Indian) who attended the school fulltime. Of the student population, 71.7% received free or reduced-price lunch, qualifying the school as low socioeconomic status (Albrecht & Brunner, 2019).

At the start of the 2016–2017 school year, the Kansas Department of Education Technical Assistance System Network (TASN) provided a one-day professional development seminar to introduce PBIS concepts to staff members (Albrecht & Brunner, 2019). The staff members decided on three positively phrased slogans on behavioral expectations and posted them in seven locations throughout the school building, buses, and playground. Staff members introduced the intervention to students by demonstrating behavioral expectations at each of the seven locations and explaining the school-based

incentives designed to reinforce desirable behavior, including a ticket system through which students received tickets they could use to purchase items at the school store. The SWPBS intervention extended through the last quarter of the 2016–2017 school year. Staff members reviewed behavioral expectations with students in August 2017 before full-year implementation and repeated the review in December 2017 and again in March 2018 for reinforcement purposes (Albrecht & Brunner, 2019).

In August 2017, the TASN trained staff members to implement the classroom SEL curriculum (Albrecht & Brunner, 2019). The second step SEL curriculum included weekly 30-min lessons. Over the 2017–2018 school year, the TASN provided staff members with 2.5 days of additional training on the impact of adverse childhood experiences on brain function, child development, behavior, and learning (Albrecht & Brunner, 2019).

The authors compared referral data across the 2015–2016 (baseline), 2016–2017 (9-week SWPBS intervention), and 2017–2018 (full-year SWPBS and SEL implementation) school years (Albrecht & Brunner, 2019). The numbers of in-school and out-of-school suspensions decreased. Total referrals decreased from 172 in the 2015–2016 school year to 142 in the 2017–2018 school year, which suggests PBIS and SEL were effective at improving student behavior (Albrecht & Brunner, 2019).

PBIS and School Organizational Health

School climate has been shown to impact academic success (Back et al., 2016). When implementing anew intervention or initiative, administrators must consider its impact on school climate. Bradshaw et al. (2008) investigated the impact of SWPBIS on

specific aspects of organizational health, including resource influence, staff affiliation, academic emphasis, collegial leadership, and institutional integrity.

The authors studied 37 rural and suburban public elementary schools in Maryland (Bradshaw et al., 2008). They used school demographics—such as the percentage of students receiving free or reduced-price lunch, school enrollment, and suspension rates—to match schools in the study. The authors randomly selected 21 schools to receive the PBIS intervention and the remaining16 schools refrained from implementing PBIS to act as controls. Bradshaw et al. (2008) collected data from staff using the Organizational Health Inventory for elementary schools (OHI; Hoy & Feldman, 1987), a 37-item measure with items on a 4-point scale that average five subscale scores of healthy school functioning to determine a school's overall health or OHI score. The authors collected data from the baseline year and three subsequent years (Bradshaw et al., 2008).

The 2,507 staff members consisted of general education teachers (55.33%) and support staff (44.67%),91.35% women, 86.48% White, and 11.21% Black respondents(Bradshaw et al., 2008). Of the 2,507 staff members, 31.31% were ages20–29 years, 23.77% were ages30–39 years, 24.53% were ages 40–49 years, 18.63% were ages 50–59 years, and 2.75% were 60 years of age or older. The response rate varied between 80% and 86% across the 4-year study. Multivariate analysis of variance revealed no significant differences in baseline OHI between the PBIS schools and control schools, $\Lambda = 0.674, F(9, 19) = 1.022, p = .46$.However, the PBIS intervention significantly and positively affected the growth of organizational health ($p < .05$). PBIS significantly impacted resource influent and staff affiliation ($p < .05$) and only marginally significantly impacted academic emphasis ($p = .07$). Effect sizes were significant for OHI ($g = 0.29$),

resource influence (g = 0.34), staff affiliation (g = 0.26), and academic emphasis (g =0.24). These results indicated PBIS training made the school environment more friendly, positive, and collaborative (Bradshaw et al., 2008).

The evidence discussed in this section suggests PBS programs improve student behavior and teacher attitude, which in turn improve school climate and the learning environment for students. Administrators or school leaders must consider this evidence when deciding whether to implement SWPBS programs. Evidence from this study demonstrated the efficacy of MBI as PBS across grade levels.

Self-Regulation

Fundamentals of Self-Regulation

Self-regulation theory has evolved to incorporate a variety of academic and nonacademic disciplines. Ponitz et al. (2009) sought to determine whether behavioral self-regulation predicts achievement outcomes for Kindergarten students. The purpose of this quantitative study was to determine whether student behavioral regulation at the beginning of Kindergarten predicted achievement in mathematics, literacy, vocabulary, and teacher-rated classroom function in end-of-year evaluations. The authors studied 343 students from schools in Michigan and Oregon. They measured behavior regulation using the head toes knees shoulders task, a structured observation of a student's ability to (a)focus on instructions, (b) use working memory to execute rules while processing commands, and (c) regulate actions to respond correctly (Ponitz et al., 2009). The authors measured student achievement using Likert-scale teacher ratings of classroom functioning and scores from standardized testing results in mathematics, literacy, and expressing vocabulary. Strong behavioral regulation in the fall predicted high teacher

ratings in the spring ($p < .01$). The authors found a significant correlation between behavioral regulation and academic scores in mathematics only. These results support the need for development of self-regulation in school curricula.

Self-Regulation and Mindfulness

Because many definitions of mindfulness include regulation of thoughts to focus on the present moment, the development of self-regulation is consistent with the core values of MBIs. To demonstrate this, Oberle et al. (2012) conducted a quantitative study on the relationship between self-reported mindfulness measures and executive control of inhibitions. Their study included 99 students from four fourth- and fifth-grade classrooms (56 boys and 43 girls). The authors collected data using and attention and awareness scale during a 45-min class period. Executive functioning data was collected via a computerized assessment in a computer lab outside the classroom. The authors found a statistically significant positive correlation between self-reported mindfulness and the number of correct responses on the executive functioning assessment. The findings suggested a need for programs and interventions that enhance self-regulation and promote positive youth development (Oberle et al., 2012). The findings also supported the value of MBIs for students in Grades 4–5.

Bergen-Cico et al. (2015) conducted a similar study and examined the practicability and value of infusing mindful yoga into curricula on the development of self-regulation in young adolescents. Their sample included 144 sixth-grade students in the greater Boston area. The author randomly assigned 72 students to receive mindful yoga as part of their English language arts curriculum and the other 72 students to serve as controls. The teacher who led the yoga intervention was certified in public school

education and yoga instruction and had completed a 30-hr children's yoga program. The intervention took place at the beginning of class 3 times weekly. In each session, students completed a 2-min yoga practice followed by a 2-min mindful meditation practice. The author collected baseline data before implementation in September, follow-up data in January, and final data in June at completion of the program. They assessed self-regulation using a 36-item Likert-scale-based self-report questionnaire designed to measure short-term, long-term, and overall self-regulation skills. The author used independent samples t-tests to determine baseline differences. They used repeated-measure analysis of variance to measure differences between the intervention and control groups and within each group over time. The author measured feasibility of the yoga intervention through teacher feedback on (a) effectiveness of implementation, (b) time consumption, (c) student receptiveness, and (d) parental feedback.

The students who participated in the curriculum showed significant increases in global and long-term self-regulation compared to those in the control group (Bergen-Cico et al., 2015). Bergen-Cico et al. (2015) did not find any significant changes in short-term self-regulation; however, they argued that was a result of daily variations in emotional stress in young adolescents. The teacher in charge of implementing the yoga intervention reported the time commitment needed was minimal and the mindfulness practice helped students transition into class and improve their performance. Overall, parents approved of the MBI (Bergen-Cico et al., 2015).

Alphonso et al. (2019) also examined the impact of MBIs on student self-regulatory skills. The purpose of their study was to determine the effect of two mindfulness curricula, MindUP and Exercises of Practical Life, on the self-regulatory

skills of elementary students. Their study included 38 students across three classrooms. The authors collected qualitative and quantitative data from parental assessments before and after intervention, notes and tally sheets from daily observations, and a student behavioral self-assessment tool. The study took place in three different environments implementing the MBIs daily over a 4–6-week period. Findings showed a connection between MBI implementation and student ability to self-regulate. These results indicated school-based MBIs were effective in developing student self-regulation.

The research discussed in this section indicated the impact of self-regulatory behavior on student outcomes and the ability of MBIs to improve student self-regulation. Furthermore, the researchers' findings emphasize the need for MBI integration in schools. The findings suggest school-based MBI is practical and easy to integrate into classroom curricula in various ways (Bergen-Cico et al., 2015).

Resilience

Resilient individuals are those who overcome adverse conditions to meet or exceed others' expectations. Researchers used some of the nation's toughest neighborhoods and underfunded schools to understand why some students demonstrate greater resilience than others.

Fundamentals of Resilience

Shumow et al. (1999) sought to determine how neighborhood risk impacted academic performance and identify sources of resiliency available to students. They studied 168 students over 3 years from third to fifth grade. The authors characterized neighborhoods by income, educational level, proportion of female-headed households, and violent crime rates. They found a negative relationship between children's fifth grade

academic performance and neighborhood risk. The authors also found students with better impulse control had better academic self-perception and performance (Shumow et al., 1999). Students who could self-regulate and maintain positive self-concept were resilient enough to overcome the risks of their environment.

Gardner et al. (2008) conducted a longitudinal study of self-regulation and resilience. The purpose of their study was to determine whether self-regulation served as a resiliency factor to help older adolescents resist influences of antisocial behavior. The authors collected data from adolescent, peer, and teacher reports of self-regulation and peer deviance. They obtained and analyzed 803 reports from 17-year-old adolescents and802 reports from 19-year-old adolescents. The racial and ethnic makeup of the adolescent sample was44.4% White, 30.9% Black, 5.7% Hispanic, 3.3% Asian, 2.3% Native American, and 1.6% Pacific Islander. Self-regulation of attention and behavior served as a protective factor against antisocial behavior and a source of resilience for students against peer deviance (Gardner et al., 2008).

The research discussed in this section suggests a need to develop self-regulatory skills in children before adolescence. The more control younger students have over their attention and behavior, the sounder their decision making in adolescence. The next section elaborates how MBIs may foster development of self-regulation and thus resilience.

Resilience and MBIs

Chapter 1 discusses the findings of Bethel et al. (2016), which suggest that mindfulness-based methods improve children's resilience, subsequently enhancing social, emotional, and academic outcomes.

Coholic et al. (2012) studied the impact of MBI on student resilience by examining the effect of an art-based mindfulness program on the resilience and self-esteem of 21 children ages 8–14 years. The authors implemented the holistic arts-based program, a 12-week program designed to develop at-risk students' resilience. The goal of the program is to educate children to understand their emotions and develop their strengths. The authors measured resiliency using a self-report Likert-scale questionnaire designed to evaluate participants' self-concept and resilience. A mixed-design multivariate analysis of variance based on scores from 21 participants indicated the program effectively lowered student emotional reactivity and increased student resilience (Coholic et al., 2012). This finding illustrates the impact of MBI on student resilience.

Conclusion

The evidence discussed in this chapter indicated how this study fits into the framework of existing research. The work discussed also suggest areas in need of further research, and the present research aims to fill these research gaps.

The chapter examined the overall impact of SEL. Based on a large body of research, Durlak et al. (2011) concluded SEL is essential for developing students socially and academically. al. (2011) also found SEL was most effective when classroom teachers in school implemented the program. However, few researchers have studied SEL in connection with academic achievement (Durlak et al., 2011). The researcher intended to use this study to fill that gap by examining the impact of SEL and MBI on academic growth across 2 academic years.

The findings examined in this chapter suggest MBIs are effective for treating physiological, psychosocial, and behavioral conditions (Black et al., 2009),improve

cognitive performance and resilience to stress (Zenner et al., 2014), and are safe to implement in school (Zoogman et al., 2014). Limitations of existing research include a need to further understand the effects of mindfulness on large samples of young people. The researcher addressed those limitations in this study by sampling 777 students across three elementary grades.

This chapter also developed the importance of self-regulation for resilience and how MBI improves development. Researchers have shown students who participate in MBI develop better long-term self-regulatory skills than those who do not (Bergen-Cico et al., 2015) and self-reported mindfulness abilities significantly improved student executive functioning (Oberle et al., 2012). Similarly, Bethel et al. (2016) concluded MBI effectively improved student resiliency and thus social, emotional, and academic performance. Other limitations discussed included the need to examine the impact of MBI across a variety of classroom environments. The researcher addressed this point in this study by compiling evidence from four different elementary schools.

CHAPTER 3

Method

The purpose of this nonexperimental, ex post facto study was to examine the impact of the Mindful Schools curriculum on attendance, academic performance, social and academic stress, and self-perception in students in Grades 3–5. This chapter describes the methods used to conduct the study and the validity and reliability of the design and instruments.

Methods and Procedures

Research Question

A single research question guided this study: What impact does the Mindful Schools MBI have on students in Grades 3–5, as measured by attendance, academic performance, academic and social stress, and self-perception?

Research Design and Data Analysis

The study design was nonexperimental and ex post facto. Students from four elementary schools in South Shore school district took part in implementation of a 12–15 session mindfulness curriculum. The school district's mindfulness coach delivered each 20 min weekly session.

Mindful Schools, a California-based nonprofit organization, designed the mindfulness curriculum and the district's mindfulness coach implemented it. The mindfulness coach received extensive mindfulness training on how to educate teachers about proper techniques for implementing Mindful Schools. The district's mindfulness coach was the sole provider of mindfulness training to the four elementary schools.

To test Hypotheses 1, 4, 5, 6, and 7, the researcher used mixed-model analysis of variance to make between-group comparisons (grade, gender, ethnicity, and school building)of academic performance and grades from the implementation timeframe with those from a similar timeframe.

To test Hypotheses 2 and 3,the researcher used paired samples *t*-tests to compare results of participant surveys administered before and after treatment and determine the impact of the treatment on student perceptions of academic and social stress and performance.

Reliability and Validity of the Research Design

To ensure statistical validity, the researcher collected data from a sample large enough to produce the effects of interest with a power of .90. The researcher checked homogeneity of compared groups using Levene's test of equality of variances.

Mindful Schools trained and certified the district's mindfulness coach to properly implement the curriculum and was the only implementor of the intervention. The coach also distributed and collected pre- and postintervention participant surveys. The coach distributed postintervention surveys at a time intended to prevent student recall of preintervention surveys. Students completed surveys in a familiar setting to eliminate distractions that could alter the survey results.

Sample and Population

Sample

Participants were students in Grades 3–5 enrolled in a South Shore school district, which serves a suburban area in New York. South Shore school district had four elementary schools, each with three sections in each grade for Grades 3–5 fora total of 12

sections throughout the district and 776 students across the three grades. The district required all students participate in the weekly 20-min MBI lesson. The sample selected for this study represented a diverse ethnic range of students, illustrates a summary of descriptive statistics for reading scores and Table 3 summarizes descriptive statistics for math scores across sample demographics. A test of sphericity conducted for spring 2018 and spring 2019 for both reading and mathematics subtests was nonsignificant. Additionally, Table 4 illustrates descriptive statistics summarizing demographic characteristics of the sample.

Table 2

Descriptive Statistics for Spring 2018 and 2019 Reading Scores

Spring 2018			
School	*M*	*SD*	*N*
1	205.3	16.2	106
2	203	17.5	106
3	203.7	15.9	91
4	205.6	16.2	74
Total	204.3	16.5	377
Grade			
4	200.5	16.0	142
5	206.6	16.4	235
Total	204.3	16.5	377
Gender			
male	202.0	16.8	183
female	206.4	16.1	191
Total	204.3	16.5	374
Ethnicity			
White	207.1	14.9	220
Black	196.0	17.7	37
Hispanic	200.2	17.8	103
Asian	211.4	14.9	16
Total	204.3	16.5	376
Spring 2019			
School			
1	211.1	16.1	106
2	213.6	14.1	106
3	212.8	13.9	91
4	211.0	14.2	74
Total	212.2	14.6	377
Grade			
4	208.9	15.0	142
5	214.2	14.0	235
Total	212.2	14.6	377
Gender			
male	210.7	14.9	183
female	213.7	14.3	191
Total	212.2	14.7	374
Ethnicity			
White	215.2	12.8	220
Black	205.4	17.6	37
Hispanic	207.7	15.0	103
Asian	216.4	16.3	16
Total	212.2	14.6	376

Table 3

Descriptive Statistics for Spring 2018 and 2019 Mathematics Scores

	Spring 2018		
School	*M*	*SD*	*N*
1	209.92	15.464	106
2	207.53	17.268	106
3	207.86	14.207	91
4	206.89	16.869	75
Total	208.15	15.969	378
Grade			
4	202.35	13.349	142
5	211.65	16.418	236
Total	208.15	15.969	378
Gender			
male	208.21	16.353	184
female	208.17	15.705	191
Total	208.19	16.005	375
Ethnicity			
White	210.58	14.604	220
Black	199.32	16.027	38
Hispanic	204.97	17.409	103
Asian	216.69	12.934	16
Total	208.17	15.987	377
	Spring 2019		
School			
1	218.29	16.845	106
2	221.38	16.984	106
3	219.38	14.839	91
4	217.95	15.65	75
Total	219.35	16.183	378
Grade			
4	214.29	14.077	142
5	222.4	16.626	236
Total	219.35	16.183	378
Gender			
male	219.86	16.007	184
female	218.93	16.475	191
Total	219.39	16.232	375
Ethnicity			
White	222.2	14.541	220
Black	209.18	15.376	38
Hispanic	215.86	17.573	103
Asian	227.19	16.714	16
Total	219.37	16.201	377

Table 4

Student Population of South Shore School District Elementary Schools for Grades 3–5

Category	*n*	%
Grade		
3	260	34
4	259	33
5	257	33
Gender		
Male	400	52
Female	376	48
Race		
White	425	55
Black	80	10
Hispanic	221	28
Asian/Pacific Islander	36	4
Multiracial	14	2
Disabilities		
General education	673	87
Student with disability	103	13
Former student with disability	10	1
Economic status		
Economically disadvantaged	284	37
Homeless	8	1
Primary language		
English language learner	48	6
Former English language learner	31	4
Not English language learner	728	94

Population

Descriptive statistics of South Shore school district with respect to race, socioeconomic status, and gender were comparable to those of neighboring districts and districts in other suburban parts of New York. The researcher did not exclude any potential participants.

Treatment/Intervention

The MBI implemented in the study was a research-backed adaptable curriculum for Kindergarten through 12th grade designed by the nonprofit organization Mindful Schools (Mindful Schools, 2021). Established in 2007, this organization has promoted mindfulness as a vital skill for teachers and students to adapt to the complexities of life in the 21st century (Mindful Schools, 2021). The curriculum rests on the assumption that when educators integrate mindfulness into their classrooms, students experience benefits across many areas. The Mindful Schools curriculum includes guided lessons and audio that allows learning to occur through observation, mirroring, and modeling (Mindful Schools, 2021). Table 5 summarizes the curriculum.

Table 5

Components of the Implemented Curriculum

Week	Topic
1	Mindful bodies and listening
2	Mindfulness breathing—finding your base
3	Heartfulness—sending kind thoughts
4	Body awareness
5	Mindfulness of breathing—staying with your base
6	Heartfulness—generosity
7	Thoughts
8	Mindful seeing
9	Heartfulness—kind and caring on the playground
10	Emotions—creating space or show me, tell me
11	Slow motions
12	Gratitude
13	Walking
14	Mindful test taking
15	Ending review 2 + 2

Implementation of this intervention took place in each of South Shore school district's four elementary schools. Lessons took place weekly, each lasting 20 min. To

ensure continuity of implementation, only one individual served as the mindfulness coach and implemented the curriculum across all sections and classes.

The mindfulness coach used a "push-in" implementation style for mindfulness lessons. In a push-in approach, specialists come into general education classrooms to provide support services (Morin, 2020). The mindfulness coach attended one elementary school Monday through Thursday to provide lessons to all students in Grades 3–5. On Fridays, the coach split time between the school districts' self-contained special education classrooms, located in two of the four schools. The self-contained classrooms provided students in need of specialized support beyond the scope of general education classrooms with the necessary space (Chen, 2009). Implementation times varied from week to week based on teacher preference. Table 6 provides an example of the weekly implementation schedule.

Table 6

A Typical Implementation Weekly Schedule, 2018–2019

Period (time)	Monday School 1	Tuesday School 2	Wednesday School 3	Thursday School 4	Friday Schools 1 & 2
1 (9:20–10:02)	9:20–9:40 Grade 4 Section 1 9:42-10:02 Grade 4 Section 2	9:20–9:40 Grade 4 Section 4 9:42–10:02 Grade 3 Section 4	9:20–9:40 Grade 4 Section 7 9:42–10:02 Grade 5 Section 7	9:20–9:40 Grade 3 Section 10 9:42–10:02 Grade 3 Section 11	9:20–9:40 (Day 4) School 1 SE Section 1 9:30–10:00 (Day 1) School 1 SE Section 2
2 (10:04–10:46)	10:04–10:24 Makeup/consult 10:26-10:46 Makeup/Consult	10:04–10:24 Makeup/consult 10:26–10:46 Grade 5 Section 4	10:04–10:24 Grade 3 Section 7 10:26–10:46 (Days 1, 2, & 5) Grade 3 Section 8	10:04–10:24 Grade 5 Section 10 10:26–10:46 Makeup/consult	Travel to School 2
3 (10:48–11:30)	10:48–11:08 Grade 4 Section 3 11:10–11:30 Grade 5 Section 1	10:48–11:08 Grade 3 Section 5 11:10–11:30 Grade 3 Section 6	10:48–11:08 Grade 3 Section 9 11:10–11:30 Rm makeup/consult	10:48–11:08 Grade 5 Section 11 11:10–11:30 Makeup/consult	10:50–11:20 School 2 SE Section 1
4 (11:32–12:14)	Prep	Prep	11:32–11:52 Grade 4 Section 8 11:54–12:14 Rm makeup/consult	11:32–11:52 Grade 4 Section 10 11:54–12:14 Grade 4 Section 11	11:32–11:52 School 2 SE Section 2 11:54–12:14 School 2 SE Section 3
5 (12:16–1:06)	12:16–12:36 Grade 5 Section 2 12:38–12:58 Grade 5 Section 3	12:16–12:36 Grade 4 Section 5 12:38–12:58 Makeup/consult	12:18–12:38 Grade 4 Section 9 12:40–1:00 Grade 5 Section 8	12:18–12:38 Grade 4 Section 12 12:40–1:00 Grade 5 Section 12	Travel to School 1
6 (1:08–2:00)	Lunch	Lunch	Lunch	Lunch	Lunch
7 (2:00–2:34)	2:00–2:20 Grade 3 Section 1 2:22–2:42 Grade 3 Section 2	2:00–2:20 Grade 4 Section 6 2:22–2:42 Grade 5 Section 4	2:00–2:20 Grade 5 Section 9 2:22–2:42 (Days 3 & 4) Grade 3 Section 8	Prep	2:00–2:20 (Days 2, 3, 5, & 6) School 1 SE Section 2 2:22–2:42 (Days 1–3, 5, & 6) School 1 SE Section 1
8 (2:36–3:15)	2:45–3:05 Grade 3 Section 3	2:45–3:05 Grade 5 Section 6	Prep	2:36–2:56 Grade 3 Section 12	Prep

Note. Rm = Remedial; SE = special education

Pre- and Post-Data

Students completed continuous measures on their self-perception and capacity to manage academic and social stress both pre- and post-intervention to determine the effect of MBI on these outcomes. All outliers in the data were removed and differences between pretest and posttest scores were analyzed to determine if data were normality distributed, including an assessment of skewness and kurtosis. Table 7 and Figure 1 shows normality

of distribution of data for academic and social stress, and Table 8 and Figure 2 shows normality of distribution of data for self-perceptions.

Table 7

Normality of Distribution of Data for Stress Outcome

Valid N	503
Missing	0
M	0.09
Median	0
SD	3.01
Variance	9.04
Skewness	-0.02
SE of Skewness	0.11
Kurtosis	-0.02
SE of Kurtosis	0.22
Percentiles	
25th	-2
50th	0
75th	2

Figure 2

Histogram of Distribution of Normality of Data for Stress Outcome

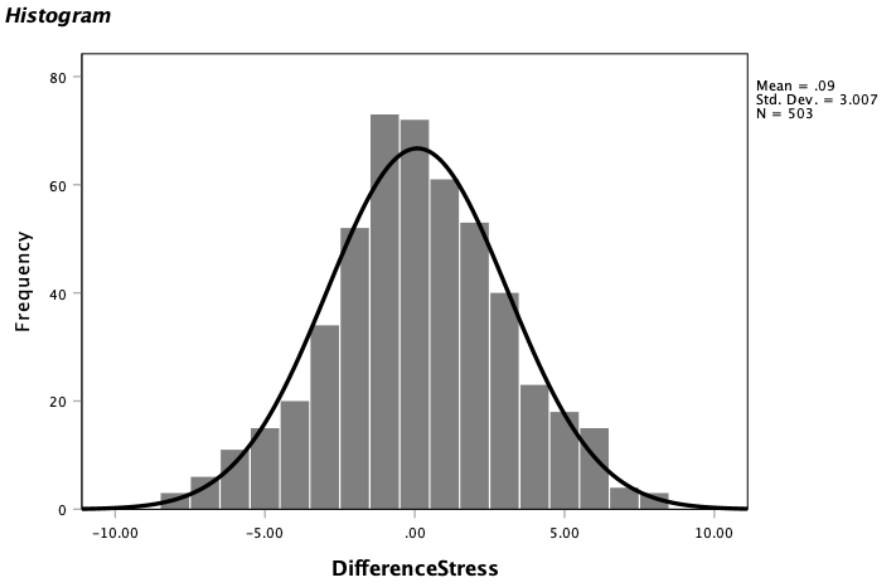


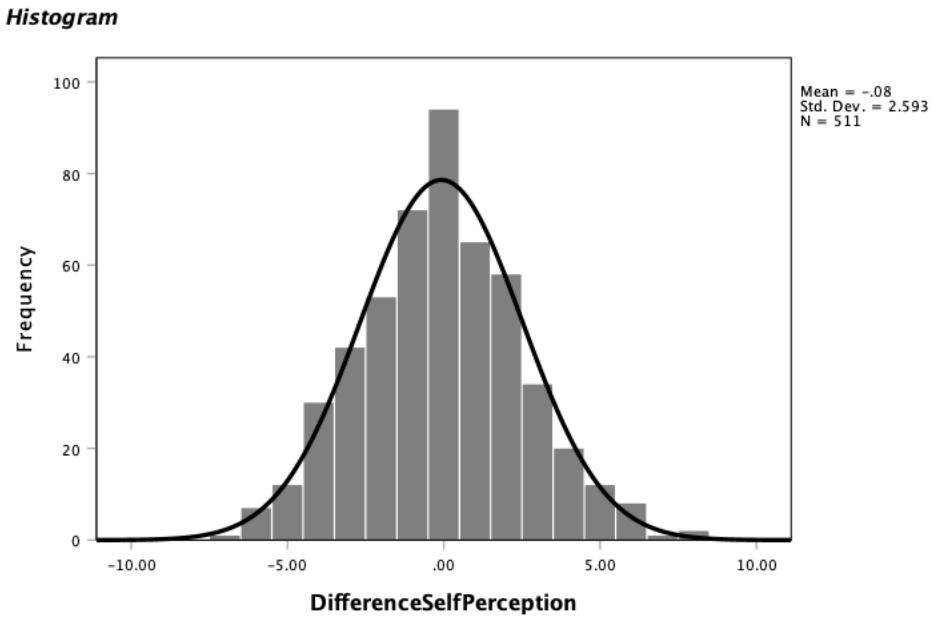
Table 8

Normality of Distribution of Data for Self-Perception Outcome

Valid *N*	511
Missing	0
M	-0.08
Median	0.11
SD	0
Variance	2.59
Skewness	6.72
SE of Skewness	0.14
Kurtosis	0.11
SE of Kurtosis	-0.01
Percentiles	0.216
25th	15
50th	-2
75th	0
	2

Figure 3

Histogram of Distribution of Normality of Data for Self-Perception Outcome



Procedures for Collecting Data

Student Behavioral Outcome Data: Perceived Academic and Social Stress and Self-Perceived Capabilities

The second source of data was a self-evaluation Likert-scale-based questionnaire. Participants completed the questionnaire prior to implementation of the intervention. Completion was mandatory. These data served as baseline data for students on academic and social stress and self-perception. The researcher provided the same questionnaires to participants after the intervention. The mindfulness coach distributed and collected both pre- and postintervention questionnaires.

Research Ethics

The researcher prioritized participant confidentiality and maintained it throughout the study. The researcher took all steps required by the institutional review board to ensure the study met all ethical requirements.

Conclusion

The next chapter includes analysis of the research data to determine the extent in which the Mindful Schools curriculum affected third through fifth grade students' academic and social stress and self-perceptions. The researcher anticipated the Mindful Schools MBI would significantly improve grades, stress, and self-perceived capabilities.

CHAPTER 4

Results

Introduction

The goal of the research was to examine the impact of MBI on student growth in reading and mathematics, student stress, and self-perception of academic and social abilities. The researcher compared test scores between students who took the Northwest Evaluation Assessment (NWEA) reading (n = 321) and mathematics (n = 322) subtests in the spring of 2018 and 2019. The researcher also compiled results of preintervention and postintervention self-evaluation questionnaires on stress (n= 503) and self-perceptions (n = 511). The following hypotheses were tested:

$H1_0$: The MBI will not improve academic performance for students in Grades 3–5.

$H1_a$: The MBI will improve academic performance for students in Grades 3–5.

$H2_0$: The MBI will not increase the capacity of students in Grades 3–5 to manage academic and social stress.

$H2_a$: The MBI will increase the capacity of students in Grades 3–5 to manage academic and social stress.

$H3_0$: The MBI will not increase self-perceptions of students in Grades 3–5 in their abilities to perform academically and socially.

$H3_a$: The MBI will increase self-perceptions of students in Grades 3–5 in their abilities to perform academically and socially.

$H4_0$: The effect of MBI on academic performance will not significantly differ by grade level.

$H4_a$: The effect of MBI on academic performance will significantly differ by grade level.

$H5_0$: The effect of MBI on academic performance will not significantly differ by gender.

$H5_a$: The effect of MBI on academic performance will significantly differ by gender.

$H6_0$: The effect of MBI on academic performance will not significantly differ by race.

$H6_a$: The effect of MBI on academic performance will significantly differ by race.

$H7_0$: The effect of MBI on academic performance will not significantly differ by school.

$H7_a$: The effect of MBI on academic performance will significantly differ by school.

Results/Findings

Hypothesis 1

Hypothesis 1 was tested to determine the impact of MBI on academic performance in mathematics and reading. A repeated measures ANOVA showed the mean NWEA test score for reading differed significantly between the2 years ($F(1,321) = 84.83$, $p<0.001$).Within groups comparison showed that all groups made significant improvements in the area of reading from Spring 2018 to Spring 2019 ($F(1, 321) = 84.83$, $p = 0.00$). A repeated measures ANOVA showed the mean NWEA test score for mathematics also significantly differed between the 2 years ($F(1,322) = 173.86$, $p< .001$). Within groups comparison demonstrated that all groups made significant improvements in the mathematics from Spring 2018 to Spring 2019 ($F(1, 322) = 173.86$, $p=0.00$). This data suggested the rejection of the null hypotheses and concluded the MBI improved academic performance for students in Grades 3-5.

Hypothesis 2

Hypothesis 2 predicted the MBI would increase the capacity of students in Grades 3-5 to manage academic and social stress. A paired-samples *t*-test was conducted to compare pre-and post-MBI questionnaire scores on student academic and social stress. There was not a statistical significance in Pre-MBI scores for stress (M = 11.45, SD = 2.24) and post-MBI stress scores (M=11.54, SD=2.33; $t(502)$= -0.67, p=0.51). These results shown in Table 9 justify the acceptance of the null hypothesis that the MBI did not increase the capacity of students in Grades 3-5 to manage academic and social stress.

Table 9

Paired Sample t-test Results of Effects of MBI on Academic and Social Stress

Paired Samples Statistics						
	M	*SD*	*SE*	*r*		
Pre-MBI Stress	11.45	2.24	0.10	0.13**		
Post-MBI Stress	11.54	2.33	0.10			
Paired Samples Test						
	M	*SD*	*SE*	95% CI	*t*	*df*
Pre-and Post-MBI Stress	-0.09	3.01	0.13	(-.035, 0.17)	-0.67	502

Note. **p< .001, N= 503.

Hypothesis 3

Hypothesis 3 predicted the MBI would increase students' self-perceptions of their ability to perform academically and socially. A paired-sample *t*-test was conducted to compare pre-and post-MBI questionnaire scores on student self-perceptions of ability to perform academically and socially. Pre-MBI scores of self-perceptions (M = 14.14, SD = 1.86) were not significantly different from post-MBI self-perception scores (M = 14.22, SD = 1.96; $t(510)$ = -0.67, p= 0.51). These results illustrated in Table 10 justify the

acceptance of the null hypothesis that the MBI did not increase self-perception of students in Grades 3-5 to perform academically and socially.

Table 10

Paired Sample t-test Results of Effects of MBI on Self-Perceptions of Academic and Social Abilities

Paired Samples Statistics						
	M	*SD*	*SE*	*r*		
Pre-MBI Self-Perceptions	14.14	1.86	0.08	0.08†		
Post-MBI Self-Perceptions	14.22	1.96	0.09			
Paired Samples Test						
	M	*SD*	*SE*	95% CI	*T*	*df*
Pre-and Post-MBI Stress	-0.08	2.59	0.11	(-.30, 0.15)	-0.67	510

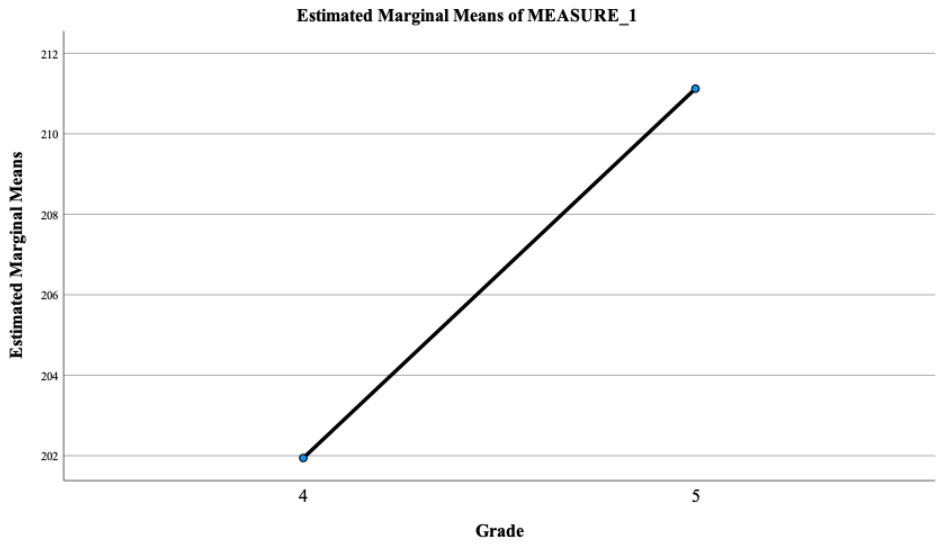
Note. †$p \leq .10$, $N = 511$.

Hypothesis 4

Hypothesis 4 sought to determine whether there was significant difference between grades. A repeated measures ANOVA showed mean NWEA reading test scores did not significantly differ between the 4th and 5thgrade levels($F(1,321) = 0.48$, $p = 0.48$). A repeated measures ANOVA showed mean NWEA mathematics test scores did not significantly differ between the two grades ($F(1, 322) = 0.13$, $p = 0.72$). Therefore, data suggest the acceptance of the null hypothesis, such that the effect of the MBI on reading scores did not differ significantly by grade level. Marginal means for grade level are shown in Figure 4.

Figure 4

Marginal Means for Grade Level

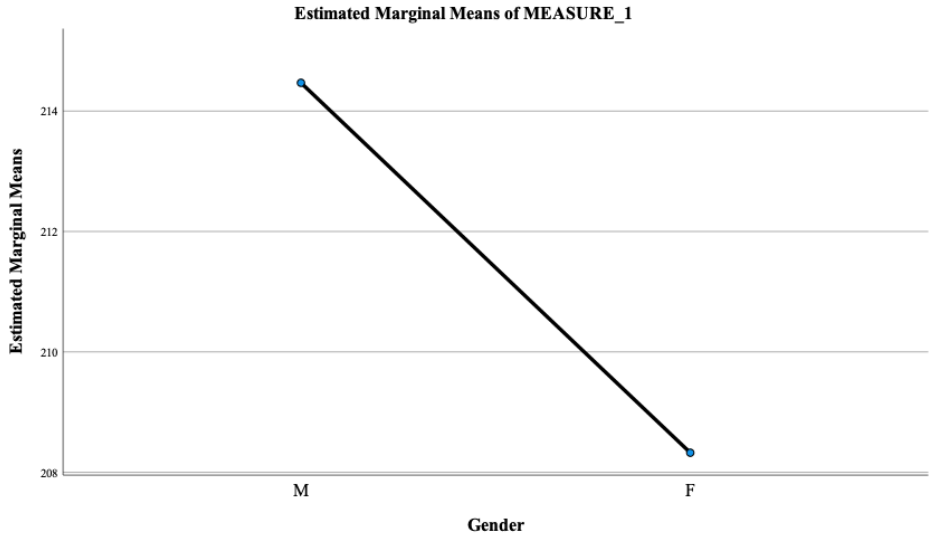


Hypothesis 5

Hypothesis 5 sought to determine whether there were differences in NWEA results based on gender. A repeated measures ANOVA showed the mean NWEA reading test scores did not significantly differ between male and female students ($F(1, 321) = 2.34$, $p = 0.13$]. A repeated measures ANOVA also showed the mean NWEA mathematics test score did not significantly differ between male and female students ($F(1, 322) = 1.55$, $p = 0.21$). Thus, the data suggest the acceptance of the null hypothesis, such that the effect of the MBI on NWEA test scores did not significantly differ by gender. Figure 5 illustrates the marginal means for gender.

Figure 5

Marginal Means for Gender



Hypothesis 6

Hypothesis 6 sought to differences in NWEA scores based on race. A repeated measures ANOVA showed the mean NWEA reading test scores significantly differed by ethnicity ($F(3, 321) = 7.90$, $p < .001$]. Specifically, a post-hoc Tukey test, shown in Table 11, demonstrated significant differences between White and Black students ($p < .001$) and White and Hispanic students ($p < .001$). Similarly, this test showed a significant difference between Asian and Black students ($p = .01$) and Asian and Hispanic students ($p = .03$). A repeated measures ANOVA showed the mean NWEA mathematics test scores also significantly differed by ethnicity ($F(3, 322) = 8.63$, $p < .001$). A post-hoc Tukey test demonstrated significant differences between White and Black students ($p < .001$), White and Hispanic students ($p < .001$), Asian and Black students ($p < .001$), and Asian and Hispanic students ($p = .01$)These findings suggest the rejection of the null

hypothesis, such that the effects of the MBI on NWEA test scores significantly differed by ethnicity. Marginal means for sample ethnicity is shown in Figure 6.

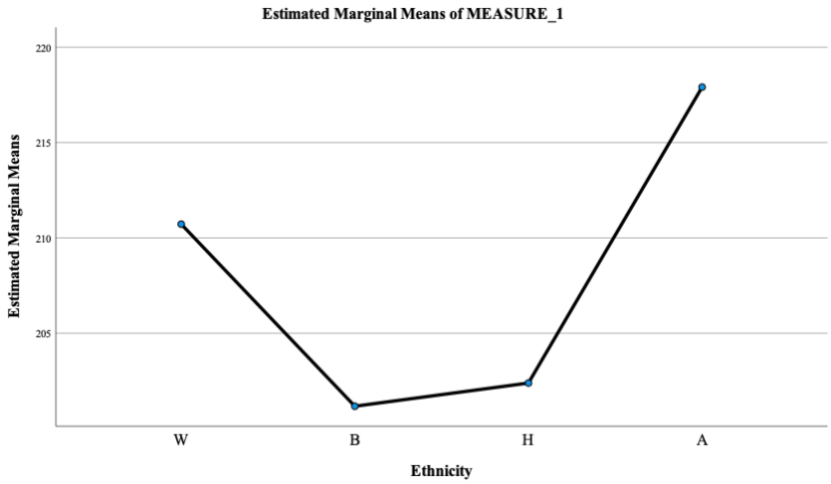
Table 11

Tukey Test Results for MBI Effects on NWEA Scores by Ethnicity

					95% CI	
Target Ethnicity	Ethnicity Comparisons	*M* Difference	*SE*	*p*	LL	UL
White	Black	10.52	2.38	<.001	4.36	16.67
	Hispanic	7.29	1.60	< .001	3.15	11.43
	Asian	-2.70	3.47	.87	-11.66	6.27
Black	White	-10.52	2.38	<.001	-16.67	-4.36
	Hispanic	-3.23	2.57	.59	-9.86	3.41
	Asian	-13.22	4.01	.01	-23.57	-2.86
Hispanic	White	-7.29	1.60	<.001	-11.43	-3.15
	Black	3.23	2.57	.59	-3.41	9.86
	Asian	-9.99	3.60	.03	-19.29	-.69
Asian	White	2.70	3.47	.87	-6.27	11.66
	Black	13.22	4.01	.01	2.86	23.57
	Hispanic	9.99	3.60	.03	.69	19.29

Figure 6

Marginal Means for Ethnicities



Hypothesis 7

Hypothesis 7 sought to determine whether the effects of MBI on NWEA standardized examined differed by school building. A repeated measures ANOVA showed the mean NWEA reading test scores did not significantly differ by school building ($F(3, 321) = 0.09$, $p = 0.97$). A within subjects comparison however, showed that there were significant difference between schools from Spring 2018 and Spring 2019 in reading ($F(3,321) = 4.78$, $p = 0.00$) A repeated measures ANOVA showed the mean NWEA mathematics test scores also did not significantly differ by school building ($F(3, 321) = 0.54$, $p = 0.66$). A within subjects comparison however, showed that there were significant difference between schools from Spring 2018 and Spring 2019 in math ($F(3,322) = 5.62$, $p = 0.00$).The result of this days suggests the rejection of the null hypothesis, as these results demonstrated the MBI did impact NWEA test scores differently based on school building. Results are shown in Table 12 and Figure 7.

Table 12

Tukey Test Results for MBI Effects on NWEA Scores by School

					95% CI	
Target School	School Comparisons	*M* Difference	*SE*	*p*	LL	UL
1	2	0	1.85	1.0	-4.76	4.77
	3	.01	1.92	1.0	-4.94	4.95
	4	-.28	2.06	.99	-5.58	5.03
2	1	0	1.85	1.0	-4.77	4.76
	3	.01	1.92	1.0	-4.95	4.96
	4	-.28	2.06	.99	-5.60	5.04
3	1	-.01	1.92	1.0	-11.43	-3.15
	2	-.01	1.92	1.0	-3.41	9.86
	4	-.28	2.12	.99	-19.29	-.69
4	1	.28	2.06	.99	-6.27	11.66
	2	.28	2.06	.99	2.86	23.57
	3	.28	2.12	.99	.69	19.29

Figure 7

Marginal Means for School Building

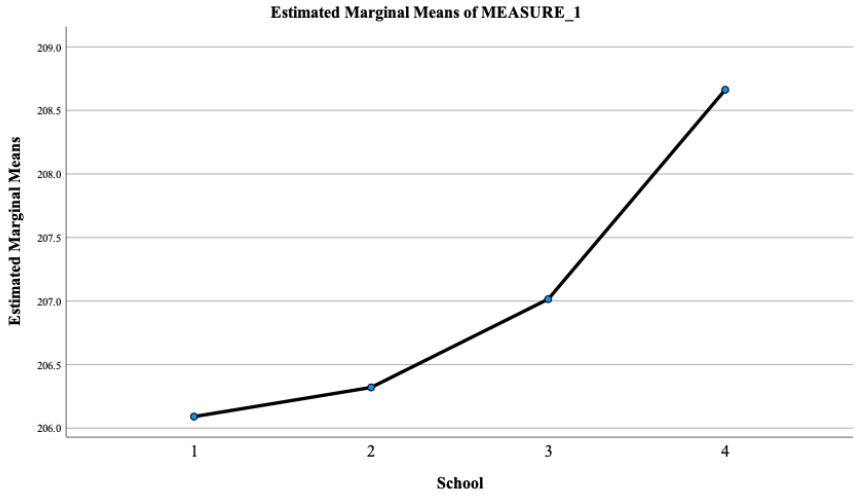


Table 13

Reading NWEA Scores

Tests of Within-Subjects Effects						
Measure:MEASURE_1			*MS*	*F*	*p*	Partial η^2
Source	Type III *SS*	*df*	3651.99	84.83	0.00	0.21
factor1	3651.99	1	3651.99	84.83	0.00	0.21
factor1 * Ethnicity	130.55	3	43.52	1.01	0.39	0.01
factor1 * School	617.61	3	205.87	4.78	0.00	0.04
factor1 * Gender	100.86	1	100.86	2.34	0.13	0.01
factor1 * Grade	20.78	1	20.78	0.48	0.49	0.00
Error(factor1)	13819.92	321	43.05			

Note. Sphericity was assumed for all analyses and Factor 1 was linear for all analyses.

Table 14

Reading NWEA Between Subjects Effects

Tests of Between-Subjects Effects						
Measure: MEASURE_1						
Source	Type III *SS*	*df*	*MS*	*F*	*p*	Partial η^2
Intercept	9214690.26	1	9214690.26	25653.262	<.001	0.99
Ethnicity	8510.43	3	2836.81	7.90	<.001	0.07
School	94.43	3	31.48	0.09	0.97	0.00
Gender	528.13	1	528.13	1.47	0.23	0.01
Grade	3118.85	1	3118.85	8.68	0.00	0.03
Error	115303.68	321	359.20			

Table 15

Mathematics NWEA Results

Tests of Within-Subjects Effects						
Measure: MEASURE_1						
Source	Type III *SS*	*df*	*MS*	*F*	*p*	Partial η^2
factor1	7428.05	1.00	7428.05	173.86	0.00	0.35
factor1 * School	720.74	3.00	240.25	5.62	0.00	0.05
factor1 * Grade	5.50	1.00	5.50	0.13	0.72	0.00
factor1 * Gender	66.35	1.00	66.35	1.55	0.21	0.01
factor1 * Ethnicity	12.96	3.00	4.32	0.10	0.96	0.00
Error(factor1)	13757.03	322	42.72			

Note. Sphericity was assumed in all analyses and Factor 1 was linear for all analyses.

Table 16

Mathematics NWEA Between Subjects Effects

Test of Between-Subjects Effects						
Measure: MEASURE_1						
Source	Type III *SS*	*df*	*MS*	*F*	*p*	Partial η^2
Intercept	9685594.73	1	9685594.73	25568.515	.00	0.99
School	609.74	3	203.25	0.54	0.66	0.01
Grade	6036.07	1	6036.07	15.93	<.001	0.05
Gender	1292.06	1	1292.06	3.41	0.07	0.01
Ethnicity	9808.94	3	3269.65	8.63	<.001	0.07
Error	121976.62	322	378.81			

Table 17

Mathematics NWEA Data School Comparison

Multiple Comparisons						
Measure: MEASURE_1						
Tukey HSD						
Target School	Comparison Schools	*M* Difference	*SE*	*p*	95% CI	
					LL	UL
1	2	-0.3	1.90	1.00	-5.19	4.6
	3	0.49	1.97	1.00	-4.59	5.57
	4	1.4	2.10	0.91	-4.03	6.83
2	1	0.3	1.90	1.00	-4.6	5.19
	3	0.78	1.97	0.98	-4.31	5.87
	4	1.7	2.11	0.85	-3.74	7.13
3	1	-0.49	1.97	1.00	-5.57	4.59
	2	-0.78	1.97	0.98	-5.87	4.31
	4	0.91	2.17	0.98	-4.69	6.52
4	1	-1.4	2.10	0.91	-6.83	4.03
	2	-1.7	2.11	0.85	-7.13	3.74
	3	-0.91	2.17	0.98	-6.52	4.69

Note. MSE = 189.41.

Figure 8

Mathematics NWEA Data Ethnicity Comparison

Multiple Comparisons

Measure: MEASURE_1
Tukey HSD

(I) Ethnicity	(J) Ethnicity	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
W	B	12.23*	2.420	<.001	5.98	18.48
	H	6.07*	1.647	.002	1.81	10.32
	A	-5.45	3.565	.421	-14.66	3.75
B	W	-12.23*	2.420	<.001	-18.48	-5.98
	H	-6.17	2.612	.087	-12.91	.58
	A	-17.69*	4.101	<.001	-28.28	-7.10
H	W	-6.07*	1.647	.002	-10.32	-1.81
	B	6.17	2.612	.087	-.58	12.91
	A	-11.52*	3.698	.011	-21.07	-1.97
A	W	5.45	3.565	.421	-3.75	14.66
	B	17.69*	4.101	<.001	7.10	28.28
	H	11.52*	3.698	.011	1.97	21.07

Based on observed means.
The error term is Mean Square(Error) = 189.405.

*. The mean difference is significant at the .05 level.

Figure 9

Mathematics NWEA Data Spring 2008 v. Spring 2009

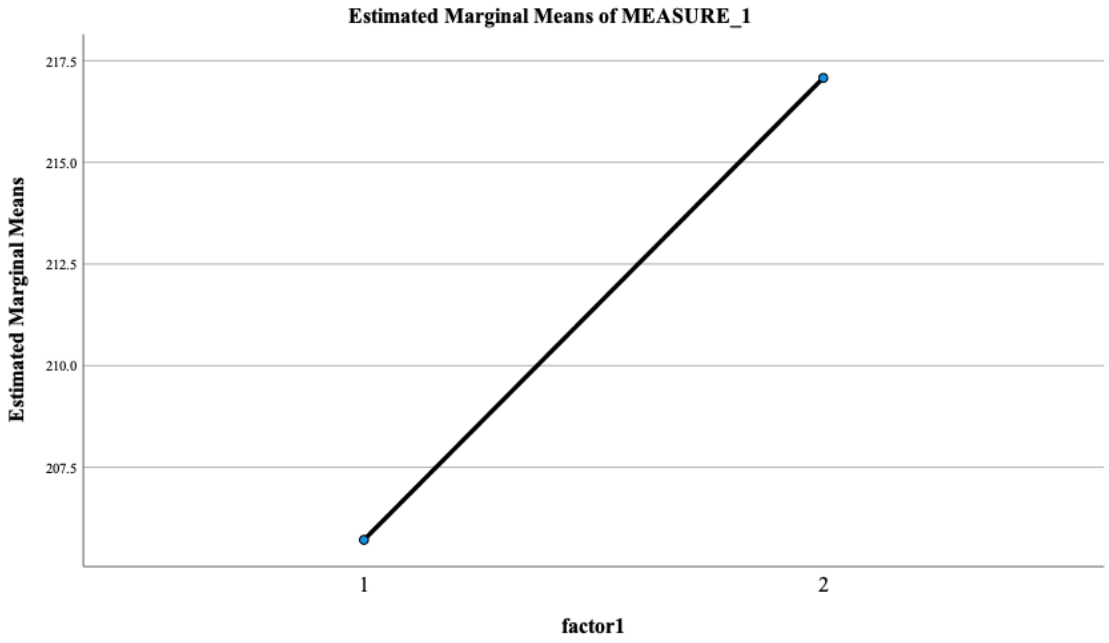
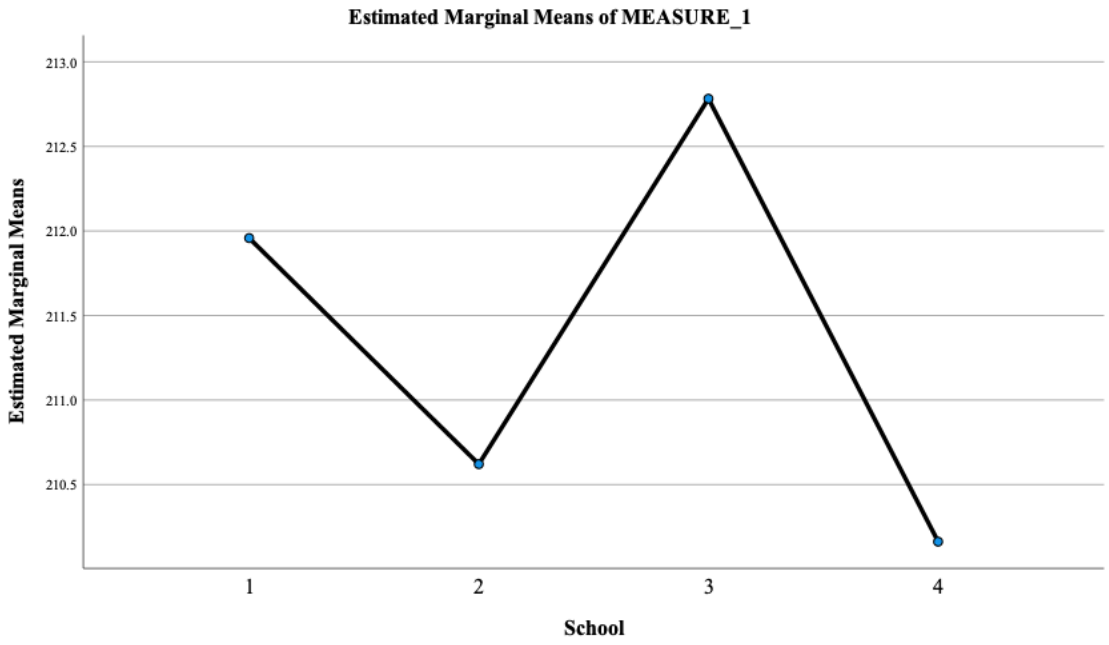


Figure 10

Mathematics NWEA Data Spring 2009 School Comparison



Conclusion

Student NWEA test scores in reading and mathematics were collected from Spring 2018 and Spring 2019 to determine if the MBI implemented in the 2019 school year impacted academic performance. A repeated measures ANOVA was conducted to determine if significant gains occurred between the two school years and whether significant differences existed between grade level, genders, race, and school buildings. From these analyses, the researcher can conclude that the MBI led to significant academic performance growth between Spring 2018 and Spring 2019 and illustrated significant differences in academic growth between races and school buildings.

Likert-scale student questionnaires used at pre-and post-intervention helped determine if the MBI impacted student academic and social stress and self-perception. Analysis done by a paired sample t-test concluded that there was no significant difference in stress and self-perception from pre-intervention questionnaires to post-intervention.

CHAPTER 5

Discussion

Introduction

In this study, a district mindfulness coach administered weekly a mindfulness-based curriculum, or MBI, to a group of students Grades 3-5 in the classroom setting. To test the impact of the MBI on student test score in reading and mathematics, *ex post facto* data was collected during the year prior to and year of implementation. *Ex post facto* student questionnaire data were also used to examine the MBI's impact on student academic and social stress and self-perception.

This chapter reviews the data reviewed in Chapter 4 and connects it to prior research on MBI and SEL. These results may facilitate recommendations for administrators and curriculum developers interested in implementing a mindfulness curriculum in their district. This chapter also reviews limitations of the current study and recommendations for future research.

Implications of Findings

Addressing Hypothesis 1, this study's findings indicated the MBI impacted student performance on the NWEA assessments in both reading and mathematics. These results suggested MBI provides students with effective emotion regulation abilities to cope with stressful testing environments and the ability to remain calm and think clearly through each question and answer. These results also demonstrated time taken to promote the social and emotional well-being of children through a MBI may result in increased academic performance

As students return to full-time in person instruction, there needs be an effort to address social and emotional well-being of the students. The evidence from this study demonstrated that the small amount of time needed to help familiarize students with mindfulness practices will help student's self-regulation and resilience and improve academic performance.

The findings of this study also showed the effect of MBI on NWEA test scores on showed no significant differences between grade levels, gender. This suggested MBI may significantly impact students regardless of age and gender. However, the research found significant differences in NWEA performance by student race, potentially suggesting the MBI was not culturally sensitive enough to impact all races included in the study or was more culturally sensitive to some races than others. Similarly, the results demonstrated significant differences between school buildings which shows that setting impacts the effectiveness of MBIs.

Due to the impact MBI have on academic performance, educators should examine ways to help make mindfulness practices more culturally responsive. Educators should prioritize community outreach in the black and Hispanic communities to help create mindfulness practices meaningful for all students regardless of race and ethnicity. Stigma attached to mindfulness might be a reason some students were not impacted by the intervention. Teachers and administrators should work to create their own meaning of mindfulness in order to authentically teach the practices.

Findings from the pre-and post-MBI questionnaires demonstrated no significant effect on academic and social stress management and self-perception. These results

support the need to conduct more longitudinal studies to better understand the impact of MBI on these academic and social domains.

Relationship to Prior Research

Results from this study demonstrate that a social and emotional education plays a role in students' academic performance. This evidence in consistent with the meta-analysis results Durlak et al. (2011) reported. A significant difference in year-to-year test scores between the pre-MBI year to the year of MBI implementation shows how social and emotional education plays a role in increased academic performance. Traditional standardized tests are typically long and require a lot of focus and resilience. The results demonstrate that the MBI was able to help students self-regulate their focus to the questions on the test and equipped them with the resilience to push forward without giving up.

Another area discussed in this chapter is the degree of mindfulness training required to make a difference for students, and findings parallel results from Bergen-Cico et al.(2015). Specifically, results from teacher reports showed only a small amount of mindfulness sessions were required to make an impact on children. Considering the MBI curriculum was implemented on a weekly basis and significantly and positively impacted academic growth, this study's findings are consistent with the findings of Bergen-Cico et al. (2015).These results show teachers, curriculum developers, and administrators addressing their students' social and emotional needs do not require a significant amount of time and helps student academic growth.

Similar to the Klingbeil et al. (2017) meta-analysis findings of small effect sizes of mindfulness-based interventions, results from the pre-and post- portion of this study

did not demonstrate any statistical significance. Klingbeil et al. (2017) also concluded school-based MBI implemented by school personnel were as impactful as Implemented in a clinical setting. Results from this study supports those findings as school personnel were able to effectively implement the curriculum in a school setting and make a meaningful impact on student academic growth.

However, the findings of this study show a significant difference between ethnicities when examining the NWEA data. The results showed a significant difference between Asian and White students when compared to Black and Hispanic students. Meta-analyses and research studies reviewed in this paper did not examine the impact MBIs had on ethnicity. This new finding is an area that should be explored and should be considered an area of future research.

Relationship to Theory

Mindfulness theory played a significant role in the development of the theoretical framework laid out in previous chapters. Mindfulness theory laid the foundation for the intervention implemented in this study. After analyzing the data, it is evident that MBIs effectively improve academic performance for students in Grades 3-5. These results are promising for mindfulness theory as the implementation of moment-to-moment awareness led to significant academic growth.

Another theory that helped contribute to the design of the theoretical framework was the Positive Behavioral Support theory. The findings of this study draw parallels to the work of Thorndike (1938) and Skinner (1963). In all scenarios, evidence shows that behavior is learned and can be modified. In this study, students engaged in mindfulness

strategies. These strategies showed to be effective at improving academic performance during a stressful high stakes testing environment.

Self-Regulation Theory and Resilience Theory, both part of the design of this study's theoretical framework, were evident in the ability to perform during long and arduous testing. Bandura (1989) understood that humans took part in managing their actions. The findings from this study support the Self-Regulation Theory. Students taught behavioral and emotional regulation strategies through mindfulness could employ those strategies in both reading and mathematics. Additionally, students demonstrated their resilience to overcome adverse conditions during the testing periods and show academic growth.

Limitations of the Study

One limitation of the current study is findings examined data collected only across 2 years. Therefore, findings from this study may be limited in their ability to delineate the long-term impact mindfulness-based interventions have on student academic performance. Another limitation is the study sample only included elementary school students Grades 3-5.Thus, findings on the effects of MBI in the limited sample demographic may not generalize to other age groups.

One threat to statistical conclusion validity of the study is potential confounding factors in the experimental setting. Intervention implementation occurred in different elementary school buildings throughout the district. As a result, characteristics across buildings and classrooms may have been inconsistent, and some environments better suited for implementing mindfulness-based interventions than others. Additionally, implementation schedule varied throughout the week and may have impeded the impact

of the intervention due to intervention timing as a potential confounding factor. For example, implementation may have occurred when school hallways were busy or when student engagement was low.

Another threat to statistical conclusion validity was the reliability of treatment implementation. The researcher attempted to control this by using only one individual for intervention implementation across all schools and for all students to standardize the procedure. Though intervention followed a structured curriculum, lessons were unscripted; as such, slight variation in the delivery of the intervention may have occurred and affected the results.

Two potential threats to this study's internal statistical validity were maturation (i.e., the impact of passing time on outcomes) and experience (i.e., the contribution of passing time to students' familiarity with standardized testing). Students' test scores were compared between two time periods that allowed for growth and maturity to naturally occur. Students' ability to understand standardized testing expectations and properly adjust to those expectations could have impacted standardized test scores. For example, test day procedures may overwhelm a third-grade student and contribute to underperformance on an exam. However, the student may feel more comfortable with the procedures the following year and allow the student to think more clearly, ultimately improving their performance.

Another potential limitation of this study was mortality. Data collection in this study required students to either complete a pre- and postintervention questionnaire or be present for 2 consecutive years for reading and mathematics NWEA exams. Students who did not register a pre or a posttest or missed an exam during 1 of the 2 years were

excluded from the study. Students who were absent for data collection day impacted the overall results by being unable to be tallied. To accurately measure academic performance, students had to complete the NWEA for 2 consecutive years. Thus, only students in third and fourth grades in 2018 and fourth and fifth grades in 2019 could be included in the study.

One possible threat to external validity in this study was the interaction between setting and treatment. The MBI was implemented to students in the classroom. As a result, specific classroom factors may have benefitted some students but hindered others. Furthermore, classroom-implemented MBI may restrict some students' ability to generalize the strategies taught to other settings. This could impact students' abilities to implement strategies during testing periods, which may have impacted NWEA results.

Recommendations for Future Practice

Programs that teach SEL have tremendously improved students' social and emotional competencies and their perception of themselves, peers, and the school environment (al., 2015). Similarly, MBIs have been found to positively impact academic performance and social, behavioral, and physical health (Klingbeil et al., 2017). Thus, evidence from past research and this study suggest there is a sound basis for the implementation of MBI in the school setting as a means of SEL. With minimal time needed for effective implementation, this method provides students social, emotional, and academic benefits without loss of instructional time.

The findings of this study support the evidence that MBI positively impacts academic performance and social and emotional well-being. This evidence impacts school leaders who desire to educate students beyond the content-specific curriculum and

state testing confines. While MBI may be outside of the realm of traditional educational content, the results of this study confirm that students that learn mindfulness strategies perform better on academic measures used for student evaluation. School leaders should know that this program can provide students with strategies for managing emotions while helping to improve their ability to grow academically.

The results of this study showed a significant difference between white and black and white and Hispanic students. Similarly, there was a significant difference between Asian and black and Asian and Hispanic students. Educators who which to pursue implementing MBIs in the classroom should reach out to members of the black and Hispanic communities to develop ways for the practice to be more culturally sensitive. Recommendations also include training staff in MBIs to the point where they can differentiate practices for students with various needs.

The results demonstrate that the Mindful Schools curriculum implemented as the MBI positively impacted student academic growth. The findings support the implementation of this program to elementary school students Grades 3-5. A curriculum developer in charge of providing a sound, evidence-based mindfulness curriculum provides the support necessary to justify the use of this program in elementary schools.

For teachers who are considering implementing mindfulness-based practices within their classroom, the results of this study provide evidence to support such implementation. For elementary school teachers, providing an MBI for one period a week for students grades 3-5 will improve academic performance on end-of-the-year assessments in reading and mathematics.

Recommendations for Future Research

This study examined the impact of MBIs on elementary school students Grades 3-5. This *ex post facto* study compiled survey and academic data over a 2-year period. Future research may consider conducting longitudinal studies to determine how MBI continues to impact student outcomes as they age into adolescence. Bergen-Cico et al. (2015) found long-term effects of MBI on children's self-regulation abilities. Further research should examine whether those trends continue throughout more advanced developmental stages and determine whether long-term implementation impacts academic performance. Similarly, Klingbeil et al. (2017) determined MBI significantly impacted at follow-up than post-intervention. Future research in the field of MBI should examine the long-term implications of MBI intervention on youth samples.

Another recommendation would be to examine the effects of MBI on younger elementary school and high school students. Using a larger population of students would allow researchers to compare across grade levels to determine when MBI implementation is most effective. With a more diverse grade-level sample, researchers may better understand how social factors impact student self-perception as student socialization matures during young adolescence and throughout the teen years.

A third recommendation should examine MBI as it pertains to race and academic performance. This study concluded that there was a significant difference between different races when examining academic performance. Further research is needed to determine whether different mindfulness methods are more effective with students of various races.

Conclusion

The use of MBIs and different styles and methods of MBI implementation in the academic setting has grown. Administrators and curriculum developers must consider the outcomes they desire for students before implementing a school-wide mindfulness curriculum. Results of this study support the use of MBI in the school setting when implemented as part of a SEL curriculum.

APPENDIX A:

IRB Approval

Dear Cornelius Campbell:

The St John's University Institutional Review Board has rendered the decision below for *EFFICACY OF MINDFULNESS-BASED INTERVENTIONS ON STUDENT PERFORMANCE GRADES 3-5.* .

Decision: Exempt
Conditionally approved pending receipt of letter of approval to conduct research as the school.

PLEASE NOTE: If you have collected any data prior to this approval date, the data must be discarded.

Selected Category: Category 1. Research, conducted in established or commonly accepted educational settings, that specifically involves normal educational practices that are not likely to adversely impact students' opportunity to learn required educational content or the assessment of educators who provide instruction. This includes most research on regular and special education instructional strategies, and research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.
Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording).
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

Sincerely,

Raymond DiGiuseppe, PhD, ABPP
Chair, Institutional Review Board
Professor of Psychology

APPENIDX B:

Instruments

Grades 3-5: Mindfulness Pre-Survey

School: _____ Grade: _____ Classroom Teacher: _____

Directions: Please circle one response on each line.

	1	2	3	4
1. I worry about taking tests.	Never	Sometimes	Usually	Always
2. I worry about doing well in school.	Never	Sometimes	Usually	Always
3. I worry about having someone to socialize with at school.	Never	Sometimes	Usually	Always
4. I feel embarrassed when I make mistakes at school.	Never	Sometimes	Usually	Always
5. I often argue with other kids.	Never	Sometimes	Usually	Always
6. It's hard for me to pay attention.	Never	Sometimes	Usually	Always
7. I am good at reading.	Never	Sometimes	Usually	Always
8. I am good at math.	Never	Sometimes	Usually	Always
9. I get along with other kids easily.	Never	Sometimes	Usually	Always
10. Other kids want me to be their friend.	Never	Sometimes	Usually	Always

Grades 3-5: Mindfulness Post-Survey

School: _____ Grade: _____ Classroom Teacher: _____

Directions: Please circle one response on each line.

	1	2	3	4
1. I worry about taking tests.	Never	Sometimes	Usually	Always
2. I worry about doing well in school.	Never	Sometimes	Usually	Always
3. I worry about having someone to socialize with at school.	Never	Sometimes	Usually	Always
4. I feel embarrassed when I make mistakes at school.	Never	Sometimes	Usually	Always
5. I often argue with other kids.	Never	Sometimes	Usually	Always
6. It's hard for me to pay attention.	Never	Sometimes	Usually	Always
7. I am good at reading.	Never	Sometimes	Usually	Always
8. I am good at math.	Never	Sometimes	Usually	Always
9. I get along with other kids easily.	Never	Sometimes	Usually	Always
10. Other kids want me to be their friend.	Never	Sometimes	Usually	Always

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Vita`

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