Summer 2015

Impacts of mindfulness on disruptive behaviors associated with characteristics of ADHD

Joseph L. Sims
James Madison University

Impacts of Mindfulness on Disruptive Behaviors Associated with Characteristics of ADHD

Joseph L. Sims, M.A.

A thesis submitted to the Graduate Faculty of

JAMES MADISON UNIVERSITY

In

Partial Fulfillments of the Requirements

for the degree of

Education Specialists

Graduate Psychology

August 2015

Acknowledgements

I would like to give thanks to the members of my graduate committee, Dr. Tammy Gilligan, Dr. Patricia Warner, and Dr. Michele Kielty. I appreciate the time you have dedicated, guidance you have offered, and support you have given in my interest and work.

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Abstract

The prevalence of ADHD has drastically increased over the last decade, and children with this disorder often receive attention from their teachers for their disruptive behaviors (Visser, Danielson, Bitsko, Holbrook, Kogan, Ghandour,... & Blumberg, 2014). Students with ADHD often struggle with controlling their impulses that lead to these disruptions in the classroom. If not addressed, the classroom learning environment is likely to be negatively impacted (Lambert, Cartledge, Heward, & Lo, 2006). Introducing students with ADHD to the practice of mindfulness may help to create a space, or a delay in responding, between thoughts and actions which may, in turn, reduce the amount of disruptive behaviors teachers must manage in the classroom. The following literature will describe mindfulness and its implementation in the K-12 setting; and then, describe ADHD symptoms and how mindfulness is used to address these symptoms.

I. Introduction

What is Mindfulness?

Mindfulness is paying attention to the present moment and accepting whatever comes of it without being judgmental (Kabot-Zinn, 1990). Originally used as an ancient personal practice in Eastern Buddhist tradition, mindfulness has been adapted for the use in secular disciplines (Meiklejohn, Phillips, Freedman, Griffin, Biegel, Roach,… & Saltzman, 2012). Renshaw (2012) suggests a cognitive-behavioral model to define mindfulness with three interrelated dimensions of attentive awareness, receptive attitude, and intentionality. Attentive awareness refers to developing focused, sustained awareness of stimuli in the here-and-now. Receptive attitude means approaching awareness with curiosity, openness, acceptance, and love. Intentionality is deliberately cultivating attentive awareness and receptive attitudes with proper motives and persistence.

Mindfulness can be practiced either formally or informally. When integrated into daily activities such as eating and walking, mindfulness is considered informal. An example would be body scanning, which is focusing on bodily awareness and physical sensations (Smalley & Winston, 2010). Frauman (2012) provides another example of informal practice when he developed a model incorporating mindfulness with an outdoor educational program to facilitate increased learning, overall satisfaction, and responsible environmental behavior. He challenged his students to think mindfully by posing statements as, “There is no one way to build a fire.” Frauman would then instruct his student to be creative in building their fires. When one intentionally attends to thoughts, feelings, body sensations, and sensory experiences, mindfulness is considered formal (Meiklejohn et al., 2012). Formal practices of mindfulness are introduced with more

structure, for example practicing yoga and sitting meditations (Schure, Christopher, & Christopher, 2008). Mindfulness interventions such as, mindfulness-based stress reduction and mindfulness-based cognitive therapy are often used because they both can be practiced formally and informally (Renshaw, 2012).

When practicing mindfulness, it is common to find yourself drifting into thoughts of the past or future while trying to attend to the present moment. Meiklejohn et al., (2012) suggests focusing on your natural breath to serve as an anchor when this drift happens. It is not intended to completely eliminate thoughts and feelings that may arise, but to develop a clearer awareness of moment to moment experiences. By paying attention to one's breath in the present-moment, one is able to slow down their heart rate and sharpen their focus to control conscious thoughts (The MindUP Curriculum, 2011, pg 43).

Mindfulness in Clinical and Non-Clinical settings

As mindfulness became more popular and accessible throughout the years, numerous research studies have been conducted and have shown benefits in clinical settings with the adult population. Geschwind, Peeters, Drukke, van Os, & Wichers (2011) examined the benefits of mindfulness-based cognitive therapy with adults from multiple out-patient care facilities who were experiencing depression. Following the eight-weeks of intervention, statistically significant improvements were found in participants' positive emotions and appreciation for daily activities. Kabat-Zinn, Lipworth, & Burney (1985) examined the effects of mindfulness meditation on chronic pain in adult patients at the University of Massachusetts Medical Center. Participants

were referred from separate clinics in the hospital (i.e., Pain, Orthopedic, Neurology, and Adult Primary Care) and were experiencing pain in their back, legs, arms, shoulders, face, and head. Following a 10-week mindfulness program, there were statistically significant reductions in present-moment pain, negative body image, inhibition of activity by pain, anxiety, and depression among participants in the treatment group compared to the control group. These studies, as well as others (e.g., Speca, Carlson, Goodey, & Angen (2000) & Evans, Ferrando, Findler, Stowell, Smart, & Haglin (2008)), highlight the effectiveness of mindfulness with adults when used in clinical settings for a variety of psychological and physical concerns.

Research examining the impact of mindfulness with children and adolescents in the clinical setting has recently been expanded. Biegel, Brown, Shapiro, & Schubert (2009) designed a randomized clinical trial to assess the effects of a mindfulness-based stress reduction program with adolescents at an out-patient facility who were mainly experiencing mood and anxiety disorders. Participants were randomly selected to a treatment group that received mindfulness training or a control group. Following an eight-week mindfulness program, stress, self-reported anxiety, depression, and somatization symptoms were significantly reduced in the treatment group compared to the control group. Bootzin and Stevens (2005) introduced mindfulness-based stress reduction to adolescents from an out-patient substance abuse program who were experiencing sleep problems. After the six-sessions of mindfulness interventions, participants who completed four or more sessions experienced improvements in their sleep, worry, and mental health distress. Semple, Lee, Rosa, & Miller (2010) examined mindfulness-based cognitive therapy with a group of 9-13 year old children. This

program was adapted from mindfulness-based cognitive therapy, which is commonly used with adults, and implemented to increase social-emotional resiliency through mindful attention. Following the 12-week program, children in the treatment group displayed significantly less attention problem compared to the control group. Although not significant, children who received the intervention saw reductions in anxiety symptoms and behavior problems as well.

Even though there is substantially less research, the implementation of mindfulness in non-clinical settings (e.g., summer camps, home, and schools) has been examined as well (Black &Fernando, 2013; Gillard, Roark, Nyaga, & Bialeschki, 2011; Meiklejohn et al., 2012; Singh, N., Singh, A., Lancioni, Singh, J., Winton, & Adkins, 2010). Lau and Hue (2011) examined mindfulness with students from two secondary schools who presented with depressive symptoms and were experiencing low academic performance. Following a six-week mindfulness program, significant decreases in symptoms of depression were observed in the intervention group compared to the control group. There were also enhancements in personal growth within students' well-being. Hanstede, Gidron, & Nyklícek (2008) examined the preliminary trial of a mindfulness-based intervention with a group of students recruited from a university setting. Students presented with a minimal amount of obsessive-compulsive disorder symptoms and did not have a prior diagnosis. Following the mindfulness-based intervention, there were strong decreases in the amount of obsessive-compulsive behaviors and "letting go" of bothering thoughts and feelings.

Mindfulness Programs in K-12 School

Mindfulness is typically introduced and integrated into the school setting indirectly, directly, or as a combination of the two. When mindfulness is integrated indirectly in schools, teachers practice mindfulness so their attitudes and behaviors influence the classroom and student behaviors (Roeser, Skinner, Beers, & Jennings, 2012; Jennings, & Greenberg, 2009). Various programs have been created to help teachers develop a personal use of mindfulness such as, the Mindfulness-Based Wellness Education program which was created to address teacher stress and burnout. Poulin, Mackenzie, Soloway, & Karayolas (2008) found that after the eight-week program, teachers experienced increased mindfulness and self-efficacy that in turn, improved their self-care and relationships with students and others. Also, the Cultivating Awareness and Resilience in Education program was created to improve teachers' support to students, well-being, and relationships with students through mindfulness training (Jennings, Snowberg, Coccia, & Greenberg, 2011). Two pilot studies were conducted with different sets of participants. After completing the 30-hour program, it was found that teachers had reduced stress associated with time demands and increased mindfulness awareness to better manage their classrooms.

When integrated directly into schools, mindfulness is introduced to students so they are able to relate to internal and external experiences in ways that are objectively responsive instead of subjectively reactive (Meiklejohn et al., 2012). Various mindfulness programs have been developed and implemented to achieve this goal and promote the well-being of students. Napoli, Krech, & Holley (2005) evaluated the Attention Academy Program with 228 elementary students. This program was created to improve students'

quality of life through the practice of mindfulness. Program goals intended for students to increase their attention to present moment experiences, approach each experience without judgment or criticism, and to have a sense of curiosity when approaching these experiences. Participating students received 24-weeks of mindfulness training that included activities of breathing, moving, and sensory stimulation. After completing the program, there were statistically significant increases in students' selective attention, decreases in test anxiety, fewer problems noted by teachers, and a reduction in ADHD behaviors when compared to the control group. Another program that was developed for adolescents to support emotion regulation skills through mindfulness is Learning to BREATHE (Broderick & Metz, 2009). Learning to BREATHE is a six-session program that was piloted with a treatment and control groups at a high school. The goals of this program are for students, in a group setting, to understand their thoughts and feelings and to use mindfulness to manage negative emotions. After completing the program, students in the treatment group reported increases in emotional regulation, relaxation, self-acceptance, and a reduction in negative affect compared to the control group.

Mindful Schools (2012) is a curriculum that has extensive research with the most noticeable being the largest randomized-controlled study to date with Oakland Public Schools. This 15 lesson curriculum was implemented, in a real-world environment, to 915 students and 47 teachers in three elementary schools. Students participated in activities such as mindful breathing, listening, empathy and test-taking. Teachers participated in a scaled-down version of the fundamental course in efforts to help develop a personal mindfulness practice in their busy schedules. After the curriculum had been

implemented in its entirety, statistically significant improvements were reported by teacher rating scales for students' behaviors of paying attention and social compliance.

When implementing mindfulness programs and interventions (e.g., Mindful Schools (2012) and mindfulness-bases cognitive therapy) in schools, Renshaw (2012) suggests doing so using a Response to Intervention framework. Within the 3-tier model, these programs and interventions implemented in Tier 1 are administered school-wide by teaching skills to all students. Mindfulness-based interventions implemented within Tier 2 aim to promote the well-being of a specific population with more intensive practice and guidance. Tier 3 interventions are provided to an even more specific population of students who failed to respond to Tier 2 interventions. Students needing remediation at Tier 2 and Tier 3 levels have distress that is likely to be channeled outward emotionally, socially, and/or behaviorally. When examining mindfulness with children in school, research is growing but is still general with fewer specific studies.

ADHD and Mindfulness

The diagnosis of ADHD in 4-17 year-old student has increased from 7.8% in 2003 to 11% in 2011 (Visser et al., 2013). Often, behaviors channeled outwardly in the classroom are disruptive behaviors coming from students with ADHD (Burley & Waller, 2005; Stone, Brown, & Hinshaw, 2010). To understand how this disorder impacts students and the classroom environment, a clear definition is necessary.

ADHD is a disorder described by a persistent pattern of inattention and/or hyperactivity-impulsivity behaviors that interfere with one's functioning or development across multiple settings. Observed behaviors of ADHD are more severe than what's

typically seen for someone with comparable development (American Psychiatric Association, 2000). Problematic behaviors associated with ADHD begin to emerge in early childhood. Although not entirely observable in the preschool and kindergarten years, elementary teachers begin to notice differences between students presenting with ADHD symptoms and their normal developing peers (Lee, 2008). Diagnosis is determined after using a multi-method approach of analyzing teacher and parent rating scales (e.g., Behavior Assessment Scale for Children) in conjunction with behavioral observations from practitioners (McConaughy, 2010). Due to the importance of such rating scales, numerous measures have been developed and tested to assess and identify children with the aforementioned symptoms of ADHD (Vaughn, Riccio, Hynd, & Hall, 1997). As a chronic disorder, it causes problems in academics, behaviors, and peer relationships of children while in school and throughout their life (DuPaul & Stoner, 2003).

There is a small amount of literature examining the relationship between mindfulness and ADHD. Zylowska, Ackerman, Yang, Futrell, Horton, Hale,… & Smalley (2008) examined the feasibility of a mindfulness program with adults and adolescents who had a primary diagnosis of ADHD. Thirty-two participants were recruited through a clinical and research program to take part in an eight-week program that was adapted to ADHD. The program used feasibility assessments of attendance and weekly review forms, as well as, pre and post self-report measures of ADHD. Twenty-five participants completed the program. These participants received the intervention well, evidenced by a high overall program adherence rate. Significant reductions in ADHD symptoms and improved cognitive abilities, related to inhibition and self-

regulation, were also reported by the participants. Findings from this study show mindfulness programs to be a feasible intervention when addressing ADHD.

Singh et al., 2010 examined how mindfulness training affects children with ADHD and their compliance to instruction. Two mothers received 12-sessions of mindfulness training which was followed by 12-sessions given to each of their sons. Both boys were on medication before the training began to manage their ADHD symptoms. During the mindfulness training, both of the boys' physicians took the initiative to taper and discontinue their medication due to mothers' perceptions of improvements in behaviors. Increases in the boys' compliance to their mothers' requests were observed after the mothers received the training. Even greater increases of compliance to requests were observed after the boys received the mindfulness training as well.

Impulsivity and hyperactivity are core characteristics of ADHD and are commonly associated with disruptions in the classroom by students inappropriately calling out, becoming angry and aggressive when frustrated, and excessively fidgeting. Impulsive behaviors associated with ADHD are described as impairment in delayed responding that warrant remediation to create a space between thoughts and behaviors (DuPaul, Arbolino, & Booster, 2009).

Although studies using mindfulness with children that have ADHD are limited, there are even fewer that examine the impact of mindfulness on impulsivity in children with this disorder. Kratter & Hogan (1982) introduced mindfulness to a group of 24 male students, age 7-12, who met several criteria for being diagnosed with ADHD. Students were referred by school psychologists and special education teachers and placed in one of three groups of mindfulness meditation, relaxation training, or a waitlist control. After

meeting with an instructor for 20-minute sessions twice a week, the students in the mindfulness meditation and relaxation groups experienced significant decreases in impulsivity compared to the control group, which did not see any changes in impulsivity. Students were also able to problem solve better by reviewing a situation more carefully before responding. This study provides preliminary evidence for the use of mindfulness in helping children with ADHD control their impulses and exhibit less disruptive behaviors in the classroom.

Current Study

A mindfulness curriculum was introduced to elementary students who are displaying disruptive behaviors in the classroom. The primary research question addressed is what impact does mindfulness training have on the disruptive classroom behaviors, impulsivity, and mindfulness awareness of students presenting with ADHD?

II. Methods

Participants

Five 5th grade students in an urban elementary school in South Carolina were selected to receive mindfulness activities. Fifth grade teachers at the elementary school referred students who met specific criteria for disruptive behaviors in their class. Once teachers had the opportunity to refer students, a meeting was held between the primary investigator, the school principal, and assistant principal to help determine which students exhibited disruptive behaviors and would potentially benefit most from participation in a mindfulness group. Five students were asked to participate in the mindfulness training through parental consent and student assent. After consents were obtained from each of the five students, one student transferred to another school and was no long able to participate.

Research Design

This research followed a case-study design in hopes of providing a more in-depth look at the research question for each participating student. The following design consisted of quantitative and qualitative measures to see what unfolds when a small group of students are introduced to mindfulness activities.

Quantitative Measures

Children's Mindfulness in the Classroom Questionnaire (CMCQ)

This questionnaire was modified from the Children's Mindfulness at School Questionnaire (Renshaw, 2014) to measure mindfulness awareness

directly in the classroom (Appendix B). This instrument was used as a pre and post intervention measure of students' mindfulness of classroom-based behaviors. The CMCQ, a 15-item scale, is a self-report measure designed to assess the three constructs of mindfulness including attentive awareness, receptive attitude, and intentionality. Items are answered on a 4-point scale (1 = Never, 2 = Sometimes, 3 = Often, and 4 = Always). Preliminary pilot testing of the original instrument has yielded favorable psychometric properties (Renshaw, 2014).

The Behavior Rating Inventory of Executive Function (BRIEF)

Select questions of The Behavior Rating Inventory of Executive Function (BRIEF) were completed by the 5th teachers of the student participants before mindfulness activities began as a pre-test measure and following mindfulness activities as a post-test measure (*Appendix A*). The BRIEF is an 89-item rating scale that is useful in evaluating executive function of children with developmental disorders and neurological conditions (i.e., ADHD). Responses can be recorded using three descriptive options (N = Never, S = Sometimes, and O = Often). For the purpose of the current study, only the 10-items measured by the inhibit construct of the BRIEF were used. The internal consistency has an alpha of .80 - .98 and the test-retest reliability has an alpha of .82.

Qualitative Measures

Classroom Observation

The primary researcher conducted classroom observations of each participant. Each observation lasted for approximately 15 minutes and notes were taken using the Student Behavioral Observation Recording Sheet (*Appendix D*).

This form has three areas to document individual behaviors, interactions with the teacher, and interactions with peers.

Teacher Interview

The researcher met with each participant's teacher before and again after the program was implemented to record their personal observations and gain insight on their student's behaviors. The interview was informally structured and lasted approximately 10 minutes. Notes were taken related to problem/disruptive behaviors, positive behaviors, and what behaviors the teacher would like to see from the student. Additionally, teachers reported the level of impulsivity the student displayed (scale 1-10) and if they observed the student to use mindfulness techniques (*Appendix C*).

Procedures

Parental consent and student assent were obtained before students were allowed to participate in mindfulness activities. The group of students met for 30 minute sessions, once a week during "Time with Text". Zelazo and Lyons (2012) suggest that mindfulness be implemented to students with an appropriate developmental perspective. Being mindful of this suggestion, the original 15-lessons of the MindUP Curriculum (2011) was modified to address students with ADHD characteristics more appropriately. The six mindfulness lessons that were implemented to participating students are described below.

Lesson 1: How our Brain Works

Three important parts of the brain were highlighted and students completed a fill-in-the blank worksheet of the brain to enhance their learning of brain structures.

- Prefrontal cortex- uses information to help us plan and think clearly. The information used to plan and think comes from the amygdala.
- Amygdala- Almond shaped structure that takes in information and sends it to the prefrontal cortex, but only able to do so when calm.
- Hippocampus- Brain structure that holds our memories in order to make sense of the information received from the amygdala.

Lesson 2: Mindful Awareness

- Students practiced attending to the here-and-now in a nonjudgmental way by paying close attention to their present experiences and their role in it. Terms of mindful and unmindful were used to describe thoughts and actions in each of the students' own lives.

Lesson 3: Focused Awareness

- Students became mindful of their natural breath and where in their bodies they felt their breath. This was an important lesson for students to develop an awareness of their breath because it was used as an "anchor" throughout other lessons.

Lesson 4: Mindful Listening

- Students practiced being mindful of sound. Once a mindful body was obtained, students were attentive to the sounds in the environment. This activity helped students determine which sounds to focus their attention on and how students hear and respond to the words of others.

Lesson 5: Mindful Seeing

- Students practiced mindful seeing to better observe themselves, other people, and their surroundings. Students were presented with various objects that they would normally see in the classroom or at school. After close inspection, students were able to describe the objects with noticeable distinguishing detail.

Lesson 6: Mindful Movement

- Students practiced walking and moving around in their environment. Students were attentive to various things in the environment and were mindful of how their body feels when active or at rest. Students also learned simple self-regulation skills by controlling their breathing and heart rate

III. Case Analysis

Each student's teacher completed select items on the *BRIEF.* The maximum score that can be obtained for the Inhibit scale is 20, which indicates the student "Often" exhibits each behavior. Higher scores on this measure suggest that the student is displaying more impulsive behaviors.

Each student completed the CMCQ, a self-report measure. The highest rating for this measure is 60, which indicates that the student "Always" thinks, feels, or does the specific behavior in the classroom. Higher scores on this measure suggest that the student is more aware of their behaviors.

Each student was observed by the primary investigator in the classroom setting prior to the mindfulness activities. Observation notes were taken using the Student Behavioral Observation Recording Sheet. The purpose of these observations was to supplement teacher interview notes with each student's individual behaviors. In addition to individual behaviors, the primary investigator made observational notes regarding the student's interaction with their teachers and peers.

The following table reports scores for each student pre and post intervention. A case description for each participant follows:

Table 1

Pre/Post scores for the Children's Mindfulness in the Classroom Questionnaire		
	Pre	**Post**
Participant 1: Allie	42	50
Participant 2: Bart	48	41
Participant 3: Cane	39	42
Participant 4: Daisy	43	42

*Higher ratings indicate a higher sense of awareness in the classroom.

Table 2

Pre/Post Scores for the Behavioral Rating Inventory of Executive Functioning		
	Pre	**Post**
Participant 1: Allie	16	10
Participant 2: Bart	17	18
Participant 3: Cane	17	16
Participant 4: Daisy	11	15

**Higher ratings indicate a higher level of impulsivity.

Allie

Allie is a female student who has difficulties following directions and accepting that things will not always go her way. When Allie displays disruptive behaviors in the classroom, her teacher usually compromises and gives in to some demands to deescalate the situation. Although Allie is often disruptive in the classroom, she can be helpful and tends to be motivated by her own interests. Allie also demonstrates qualities of a leader and works well within group settings. During Allie's observation, she worked on completing a morning assignment at her desk. When her teacher asked students in the class questions, Allie provided responses that were on-topic; however, she called out without raising her hand. She also left her desk multiple times without permission to throw paper towels in the trashcan.

Prior to Allie participating in the mindfulness activities, Allie received a score of 16 on the Inhibit scale from her teacher. Allie's rating on the CMCQ totaled to 42. Allie attended each of the six mindfulness sessions and was an active participant. She put forth effort to practice the mindfulness techniques, but she would often become annoyed with another group member.

Following the six mindfulness sessions, Allie received a total Inhibit scale score of 10 from her teacher. These findings indicated that Allie was viewed by her teachers as less impulsive in the classroom setting. She was less likely to do things without thinking, get out of her seat without permission, and get into trouble if left unsupervised. Ratings indicated that Allie was more likely to think of consequences before she acted. After the

six sessions, Allie's rating on the CMCQ totaled to 50, suggesting that she was more aware in the classroom. Allie noticed more of how other people reacted to what she did. She was also more likely to stay calm and think positive thoughts, even in difficult situations. Allie's teacher reported that Allie is more willing to listen. She is able to refocus more often and is less argumentative.

Bart

Bart is a male student who has great difficulties with self-regulation and staying on-task. Although he wants to please his teacher and works hard with one-on-one attention, Bart is often disruptive in the classroom when he plays with objects in his desk and refuses to follow directions. Due to his disruptive behaviors, Bart misses directions, and his teacher will have to explain them multiple times. He does not appear motivated and lacks responsibility. Bart's teacher feels that he is very conscientious of these behaviors because he tends to be manipulative. During Bart's observations, he was returning to the classroom from the bathroom. A peer reported to the teacher that Bart was in the bathroom sleeping on the floor. As Bart entered the classroom, he was rather lethargic. Once he settled in at his desk, Bart, completed work on his iPad. When his teacher reviewed the assignment, Bart raised his hand to answer, but called out his answer before the teacher called on anyone. Several times during the observation, Bart left his seat without permission to look at the assignment board and to throw objects in the trash. Bart's teacher asked him to return to his seat multiple times throughout the observational period. She also asked Bart to sit up on the carpet during group activity because he was lying down, which would have likely caused the teacher to trip over him.

Prior to Bart participating in the mindfulness activities, Bart received a total Inhibit scale score of 17 from his teacher. Bart's rating on the CMCQ totaled to 48. Bart attended each of the six mindfulness sessions, but would frequently say he did not want to be in the group because he was "too smart". Bart was very disruptive in the group and often angered other group members with his impulsive and noncompliant behaviors.

Following the six mindfulness sessions, Bart received a total Inhibit scale score of 18 from his teacher. This finding indicated that Bart was perceived by his teacher as more impulsive in the classroom setting than before the start of the sessions. Bart's teacher reported that he did not use any mindfulness techniques in class, and he continued to do things without thinking and often got into trouble with adults. Bart's rating on the CMCQ totaled to 41, suggesting that he was less aware in the classroom setting. Bart was less likely to notice when his feelings changed from good to bad or how other people reacted to what he was doing. Though Bart's overall CMCQ ratings totaled to be less after the mindfulness activities, specific ratings indicated that he was more likely to have a good attitude when he was feeling bad.

Cane

Cane is a male student who often requires redirecting when he gets out of his seat and is conversing with his peers. Cane also has a negative attitude when he is asked to follow directions. He is described by his teacher to be mean to other students and lacks the awareness to know what appropriate behaviors should look like. Cane works well in groups and is helpful. Though he can be helpful, Cane will offer to help his teacher or others during inappropriate times and cause disruptions. During the observation of Cane,

he sat at his desk quietly, but was focused on a task unrelated to his assignment. Once Cane returned his focus to the teacher, he was an active participant in the lesson. Cane raised his hand to answer a question, and responded correctly when he was called on. He stood up at his desk briefly to stretch, and then sat back down before drawing attention to himself.

Prior to Cane participating in the mindfulness activities, Cane received a total Inhibit scale score of 17 from his teacher. Cane's rating on the CMCQ totaled to 39. Cane attended each of the six mindfulness sessions and was an active participant. He offered insightful remarks and practiced the mindfulness techniques that he learned on multiple occasions when he became frustrated with another group member.

Following the six mindfulness sessions, Cane received a total Inhibit scale score of 16 from his teacher. These finding indicated that Cane was viewed as slightly less impulsive in the classroom setting. He was less likely to interrupt others when they were speaking. Cane's rating on the CMCQ totaled to 42, suggesting that he was more aware in the classroom following completion of the mindfulness sessions. Cane was more likely to have a good attitude and be friendly to others when he was feeling bad in class. Cane also tried to do his best more frequently when things became difficult for him.

Daisy

Daisy is a female student who has difficulties accepting that everything will not go her way. When she is asked to complete a non-preferred task, Daisy will become defiant and display disruptive behaviors. Daisy's behaviors are most likely due to her frustrations and unwillingness to make corrections on assignments. During an

observation of Daisy, she worked independently on an iPad at a table in the back of the classroom. Daisy whispered to a peer, but did not draw attention to herself. When the teacher asked students in the classroom to line up at the door to transition to related arts, Daisy followed directions without complaining.

Prior to Daisy participating in the mindfulness activities, Daisy received a total Inhibit scale score of 11 from her teacher. Daisy's rating on the CMCQ totaled to 43. Daisy attended each of the six mindfulness sessions and put forth effort to try the mindfulness techniques. She was social with the other female student in the group and generally followed directions. Daisy would easily become frustrated by another group member when he spoke to her.

Following the six mindfulness sessions, Daisy received a total Inhibit scale score of 15 from her teacher. These findings indicated that Daisy was perceived by the teacher as more impulsive in the classroom setting than before the start of the sessions. She needed to be told "no" or "stop that" more frequently, and Daisy was more likely to interrupt others. Specific ratings indicated that Daisy was more likely to get into trouble if she was left unsupervised, and she was not as likely to consider consequences to her actions. Daisy's teacher reported that Daisy did not use any mindfulness techniques in the classroom setting, and she continued to be noncompliant. Daisy's rating on the CMCQ totaled to 42, suggesting that she was less aware in the classroom. Daisy was less likely to notice the things that happened around her. Though Daisy's overall CMCQ ratings totaled to be less, she indicated that when she was feeling bad, she was more likely to think good thoughts.

IV. Discussion

Classroom behaviors, impulsivity, and mindfulness awareness of four 5th grade students presenting with characteristics of ADHD were examined before and after introducing them to a structured mindfulness curriculum delivered in a small group session format. Cases analysis revealed that each participant was impacted by their involvement in the mindfulness activities. The mindfulness group was successful in exposing participating students to mindfulness techniques.

The school principal and fifth grade teachers were optimistic that the small group would be a success. Other school staff members (i.e. the school counselor and special education teachers) became aware of the mindfulness group through "word-of-mouth" and showed a general interest in the benefits of mindfulness. Initially, there was some confusion by a student's parent that thought the mindfulness group was a tutoring group to help improve academic grades. After the goals of the mindfulness group were reviewed, the parent fully understood the possible benefits their child may receive from participating. Other students' parents received the mindfulness group well. They expressed concerns of their child's problematic behaviors and were interested in the outcome of the mindfulness group.

Students in the mindfulness group expressed a range of feelings about their initial desire to participate in the group. One student expressed that he was too smart to be in the group. The primary investigator explained that anyone could practice mindfulness. Another student thought that she was being punished for her classroom behaviors. For

this student, the primary investigator assured her that she was not in any trouble, but that the mindfulness group would hopefully give her skills to keep her out of trouble in the future. The other two students were excited to be taken out of their classrooms and looked forward to meeting weekly for the mindfulness group.

The mindfulness curriculum that was presented to the school principal appeared to be feasible for all grades within the school due to the high number of disciplinary referrals. Fifth grade students were targeted because they had the most challenging behavior in school, and the school principal felt that mindfulness would benefit these students the most as they transitioned to middle school. Having principal acceptance of this curriculum was important and should be elicited for future interventions.

The mindfulness curriculum also appeared feasible for this Title I elementary school because it did not require materials that were difficult to obtain. During the mindfulness sessions, a dry erase board was used that was already inside of the room. Other objects that were used to practice mindfulness (i.e. a tuning fork or a plastic bottle with glitter (used to demonstrate important brain functions) could be found in recycling bins that were conveniently located around the school or in related arts classrooms.

After completing the mindfulness curriculum, two students were perceived to become more impulsive by classroom teachers over the duration of the group sessions, while two students were perceived to become less impulsive. Improvements in these students' behaviors are consistent with prior research findings that teachers observed improvements in their student's behaviors (i.e. increased attention and self-control) after receiving mindfulness training (Black, D. S., & Fernando, R., 2013). In the current

study, students who were perceived to become less impulsive indicated a greater awareness on self-rating scales, whereas the students perceived to be more impulsive indicated less awareness on self-rating scales.

Classroom observations helped determine similarities between students' behaviors and information obtained through teacher interviews. Students who were perceived to be less impulsive after receiving mindfulness training displayed behaviors consistent with teacher reports. Though the behaviors these students displayed during the observation were similar, they would be considered mild. The students were impulsive in some of their behaviors, but their behaviors did not draw attention away from the teacher or the flow of instruction. The disruptive behaviors included leaving their desk to put materials away, standing to stretch during instruction, and calling out suggestions without raising a hand.

The students who were perceived to become more impulsive after receiving mindfulness training had either an extreme amount of disruptive behaviors or hardly any at all during their observations. The student's behaviors that were extreme aligned closely with the description provided by the teacher. This student's behaviors were disruptive and required multiple redirecting prompts. The other student's classroom had a substitute teacher during the observation. Instruction from the teacher was minimal, and students in classroom spent the time completing activities on their iPads. The student had no disruptions during this observation and was well behaved. Though there was a substitute teacher, this student's behaviors were inconsistent with information obtained from the teacher.

Based on teacher report, student and teacher ratings, and observations, it appears that the students who were perceived to become less impulsive and more aware approached mindfulness with a more receptive attitude. Renshaw (2012) discussed one of the three dimensions of mindfulness to be a receptive attitude. Students who were positively impacted by mindfulness appeared to demonstrate this dimension, more so, than the other two students. Students who were perceived to become more impulsive and less aware approached the mindfulness group with skepticism.

Also, students who were perceived to become less impulsive after the mindfulness sessions displayed a mild level of disruptive behaviors throughout the school day. It is likely that these students were impacted positively by the mindfulness group because their behaviors were not extreme and could be molded easier. The students who were perceived to become more impulsive and less aware were likely impacted negatively by the mindfulness group due to their display of more severe or inconsistent behaviors.

Barriers

A barrier that the primary investigator was challenged with was dealing with the extreme behaviors of one student. These behaviors often caused other students to become annoyed, resulting in verbal disputes. Eventually, students were able to use breathing techniques instead of responding impulsively, and they were able to refrain from verbal confrontations.

The primary investigator expressed to the group that the same rules followed throughout the school day needed to be followed during group sessions. This presented as

a barrier to the primary investigator, not knowing specific school rules and how students are held accountable when rules are broken. It would have been beneficial to establish a set of rules that included general school rules, specific group rules, and a reward/consequences system.

Another barrier that was faced by the primary investigator was transitioning from students' classrooms to a designated location for the group session. Although all of the fifth grade classrooms were on the same hallway, each participating student was met by the primary investigator at their individual classrooms. Once all students were out of their classrooms, the group had to travel down a set of stairs and through a main hallway leading to an isolated conference room inside the library. Though the primary investigator attempted to be systematic during transitions, one student insisted on either walking at a significantly slower pace or running ahead of other group members. As a student at this particular school, expectations of how to walk and behave in a line are reviewed and rehearsed beginning the first day of school. It is likely that the students did not feel as though the mindfulness group was as structured as their general classrooms due to the limited amount of time they spent with the group. Also, students with ADHD tend to thrive with repetition. Since the mindfulness sessions occurred once a week, practicing the transition routine presented difficulties.

A final barrier that was faced by the primary investigator was making the best use of supplemental worksheets included with the MindUp Curriculum. As a part of the first session, students filled in key words (i.e. amygdala, hippocampus, and prefrontal cortex) on an empty diagram of the brain. The group discussed the importance of each area and students reviewed the material to demonstrate their knowledge. Some students were able

to complete this worksheet and recall facts with no difficulties, while other students struggled to copy text from the board to complete their worksheets. It appeared that these students did not fully grasp the material. During another lesson, worksheets were used as part of the session again. Due to the difficulties the primary investigator observed during the previous lesson, demands of filling in the worksheet were loosened, and the primary investigator focused more on the students' understanding of the content. The worksheets were intended to supplement class discussion, but the utility of the worksheets to the students was minimal.

Limitations of current study

Though the primary investigator practices mindfulness techniques regularly and is an advocate of this practice, the researcher had no experience implementing these mindfulness techniques to elementary age students. It is possible that understanding how students, especially presenting with ADHD, receive mindfulness would have allowed for better judgment and planning of session activities.

The observations conducted on each student by the primary investigator captured a limited amount of behaviors and likely did not capture the students' typical behaviors that are displayed throughout the school day. Also, students were aware of the primary investigator's presence, which likely encouraged the students to do a better job of following their classroom rules.

The *Children's Mindfulness in the Classroom Questionnaire (CMCQ)* is an adapted measure from Renshaw (2014). Though preliminary pilot testing of the original

instrument yielded favorable psychometric properties, it lacks extensive data identifying it as a statistically sound instrument to measure a student's mindfulness awareness. However, a strength of this measure is the amount of time it took students to complete. The short prompts made it easy for the fifth grade students to clearly understand what was being asked of them. The primary investigator provided answers to any questions that were asked. There were no indications that students did not understand any material on the forms.

Introducing the sessions as they were ordered in the MindUp Curriculum presented as a weakness of the current study's curriculum design. Though the first 2 lessons were foundational lessons, it was difficult to transfer the information to other lessons. Lessons three through six were well received by the students because they were interactive. Students were able to channel their high energy levels into a task that required focus, while being mindful of their experiences.

Another apparent weakness of the curriculum used in this study was the limited intensity or frequency of the interventions (e.g., one session a week for six weeks). Prior studies using mindfulness with children who have ADHD that saw benefits, implemented strategies as often as twice a week (Kratter & Hogan, 1982) or for up to eight-sessions (Zylowska, Ackerman, Yang, Futrell, Horton, Hale,… & Smalley, 2008). It is likely that specific populations such as students with ADHD may require a more intensive and pervasive schedule of intervention. Determining the essential treatment schedule for ADHD populations will be important in future research.

Implications for School Psychologists

It is intended that the case studies presented here will add to the growing research of the benefits mindfulness has on elementary students and offer a possible way to introduce students to mindfulness. More specifically, how mindfulness impacts behaviors associated with ADHD can be highlighted.

The following suggestions are offered as other school psychologists offer mindfulness based interventions to students with ADHD characteristics:

School psychologists interested in presenting mindfulness to a similar group of students should consider the severity of disruptive behaviors each student in the group is presenting with. Informal interviews with students may help to determine the level of ADHD characteristics a student is displaying. These interviews would also help the school psychologist determine if there are additional concerns (i.e. anxiety or cognitive impairments) worth considering that would impact the student's ability to function appropriately within a group setting.

School psychologists might consider increasing the size of the group or present mindful activities to an entire class. Increasing the size of the group would provide the opportunity for students without disruptive classroom behaviors to participate so that they may serve as models and demonstrate appropriate behaviors. Providing sessions to entire classrooms would allow students to be in their natural environment to support the use of techniques outside of the sessions, models of peers, and integrating mindfulness into the academic curriculum. Providing sessions to the entire class may also influence teachers to practice mindfulness and reap benefits, as well.

School psychologists may consider provide mindfulness training to teachers and parents. As evidenced by Singh and colleague's (2010) research, children are more likely see increased benefits of mindfulness if they are exposed to mindfulness as a combination of direct and indirect approaches. This would allow students to work directly with the group facilitator, and for the students to be exposed to mindfulness through their teachers and parents.

The time of day that students might respond best to mindfulness activities is also worth considering. Although mindfulness is rewarding in itself, having students meet earlier in the day may decrease the amount of distractibility a student displays before group sessions.

Although a school psychologist may reach more students with a group design, consideration should be given to introducing techniques individually for some students. Students with ADHD are more likely to respond better with one-on-one attention. This one-on-one attention would also allow for a more individualized approach to understanding the student you are working with better.

School psychologists may consider having mindfulness sessions twice a week when introducing mindfulness to students with ADHD characteristics. Also, including a mindfulness activity along with the foundational sessions may be beneficial so that students have the opportunity to apply what they are learning more immediately.

It is recommended that school psychologists or group facilitators, who will present mindfulness techniques, be an active participant themselves. The personal use of mindfulness provides an essential perspective that can be shared with students.

It would be recommended that a behavioral chart be used to document students' disruption in the classroom throughout the implementation of the mindfulness curriculum. This would allow for more data to be gathered helping to identify any changes in behaviors that students display.

With the prevalence of ADHD continuing to increase, (Visser, Danielson, Bitsko, Holbrook, Kogan, Ghandour,... & Blumberg, 2014) classroom teachers are left to manage the disruptive behavior that are likely to come from these students. Managing these behaviors takes away from the instruction that teachers are able to provide. Mindfulness has shown to benefit students with characteristics of ADHD in reducing levels of impulsivity. Future research could analyze students' willingness to participate in mindfulness activities to determine if initial perspectives of mindfulness impact overall outcome of mindfulness.

This study demonstrated that mindfulness interventions may likely be beneficial for students who struggle to control their impulses and display disruptive behaviors in the classroom. School psychologist may consider offering this sort of intervention as part of a problem-solving strategy for classroom management. Also, this intervention may be offered to improve students' behavioral functioning.

Appendix A

Selected Items that are marked on the BRIEF

9. Needs to be told “no” or “stop that”

38. Does not think before doing

42. Interrupts others

43. Is impulsive

45. Gets out of seat at the wrong times

47. Gets out of control more than friends

57. Acts too wild or “out of control”

58. Has trouble putting the brakes on his/her actions

59. Gets in trouble if not supervised by an adult

69. Does not think of consequences before acting

Appendix B

What Do You Do in Class?
Children's Mindfulness in Class Questionnaire (CMCQ)

Name: _____

Student ID #: _____ Teacher: _____ Date: _____

Here are sentences about what you think, feel, and do at school. Please circle the answers that are true for you. Only circle one answer for each sentence.

	Never	Some-times	Often	Always
1. When I am in class, I notice . . .				
. . . when my feelings change from good to bad.	**1**	**2**	**3**	**4**
. . . how other people feel and act.	**1**	**2**	**3**	**4**
. . . the many things that happen around me.	**1**	**2**	**3**	**4**
. . . when my thoughts come and go.	**1**	**2**	**3**	**4**
. . . how other people react to what I do.	**1**	**2**	**3**	**4**
2. When I am feeling bad in class, I still . . .				
. . . have a good attitude.	**1**	**2**	**3**	**4**
. . . am kind to myself.	**1**	**2**	**3**	**4**
. . . think nice thoughts.	**1**	**2**	**3**	**4**
. . . stay calm.	**1**	**2**	**3**	**4**
. . . am friendly to others.	**1**	**2**	**3**	**4**
3. When I am doing something hard in class, I try to . . .				
. . . work and work to get it right.	**1**	**2**	**3**	**4**
. . . do the best I can.	**1**	**2**	**3**	**4**
. . . focus on doing a good job.	**1**	**2**	**3**	**4**
. . . keep going until I finish.	**1**	**2**	**3**	**4**
. . . do everything I can to do well.	**1**	**2**	**3**	**4**

Appendix C

Teacher Interview Form

1. What problem/disruptive behavior have you had to address with student in the classroom?

2. What positive behavior have you observed from the student in the classroom?

3. Based on present behaviors, what would you like to see differently from the student in the classroom?

4. Have you observed the student to use any mindfulness techniques? If yes, briefly describe.

5. What would you rate the student's level of impulsivity? (1 = rarely impulsive, 5 = moderately impulsive, 10 = extremely impulsive)

Appendix D

Student Behavioral Observation Recording Sheet

Student Individual Behaviors

Notes:

Student/Teacher Interactions

Notes:

Student/Peer Interactions

Notes:

Appendix E

Parent/Guardian Informed Consent

Identification of Investigators & Purpose of Study

Your child is being asked to participate in a research study conducted by Joseph Sims from James Madison University. The purpose of this study is to examine the impact mindfulness has on disruptive behaviors associated with characteristics of ADHD. Mindfulness is a practice of increased awareness. An example of mindfulness would be deep breathing and focused attention. This study will contribute to the researcher's completion of his master's thesis.

Research Procedures

Should you decide to allow your child to participate in this research study, you will be asked to sign this consent form once all your questions have been answered to your satisfaction. This study consists of six mindfulness activities that will be administered to a group of participants at Welcome Elementary School. The six lessons are briefly described below:

- How our Brain Works- Three important parts of the brain and how they function
- Mindful Awareness- Attending to the here and now experiences
- Focused Awareness- Quieting the mind and control breathing
- Mindful Listening- Mindfully taking in sounds in the environment
- Mindful Seeing- Mindfully taking in what is seen in the environment
- Mindful Movement- Paying attention to the body moves in an environment

Participants will be asked to provide answers to a series of questions related to mindfulness awareness before these lessons and after these lessons.

Time Required

Participation in this study will require 10 minutes to complete the written questions given out before the first session and after the 6^{th} session. Each session will last approximately 20 minutes over a 6-week period.

Risks

The investigator does not perceive more than minimal risks from your child's involvement in this study (that is, no risks beyond the risks associated with everyday life).

Benefits

Potential benefits from participation in this study include helping to identify the perceived benefits of using a mindfulness curriculum in the school system.

Confidentiality

The results of this research will be presented at James Madison University as part of Joseph Sims master's thesis. The results of this project will be coded in such a way that the respondent's identity will not be attached to the final form of this study. The

researcher retains the right to use and publish non-identifiable data. While individual responses are confidential, aggregate data will be presented representing averages or generalizations about the responses as a whole. All data will be stored in a secure location accessible only to the researcher. Upon completion of the study, all information that matches up individual respondents with their answers will be destroyed.

Participation & Withdrawal

Your child's participation is entirely voluntary. He/she is free to choose not to participate. Should you and your child choose to participate, he/she can withdraw at any time without consequences of any kind.

Questions about the Study

If you have questions or concerns during the time of your child's participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

Joseph Sims, M.A.
Graduate Psychology Department
James Madison University
simsjx@dukes.jmu.edu

Tammy Gilligan, Ph.D.
Graduate Psychology Department
James Madison University
gilligtd@jmu.edu

Questions about Your Rights as a Research Subject

Dr. David Cockley
Chair, Institutional Review Board
James Madison University
(540) 568-2834
cocklede@jmu.edu

Giving of Consent

I have read this consent form and I understand what is being requested of my child as a participant in this study. I freely consent for my child to participate. I have been given satisfactory answers to my questions. The investigator provided me with a copy of this form. I certify that I am at least 18 years of age.

_____
Name of Child (Printed)

_____
Name of Parent/Guardian (Printed)

_____ _____
Name of Parent/Guardian (Signed) Date

_____ _____
Name of Researcher (Signed) Date

Appendix F

CHILD ASSENT FORM (Ages 7-12)

IRB # **15-0031**

IMPACT OF MINDFULNESS ON STUDENTS

We are asking you to be in in this study because your school psychologist is working with a group of students who have a hard time controlling their classroom behaviors. We want to know how these lessons on mindfulness connect to your behavior in the classroom. Mindfulness is a practice of paying attention and being aware of where you are and what is happening at any time. An example of mindfulness is deep breathing.

Joseph Sims will bring the lesson to your group for six sessions. Each lesson will last about 15-20 minutes. Before the first lesson, and after the last lesson, you will be asked to complete a set of questions. These questions will be in paper and pen form. You will not put your name on your paper so that others will not know your answers. Answering these questions will take about 10 minutes of your time.

There are no risks for answering these questions on your paper. Some benefits may include helping others know if these lessons are useful for elementary students that have a difficult time controlling their behaviors in the classrooms like yours.

Your parents will also be asked to give their permission for you to take part in this study. Your parents must also say yes to you answering these questions.

You do not have to be in this study if you do not want to. If you decide to participate in the study, you can stop the practice of mindfulness at any time.

If you have any questions at any time, please ask the researchers.

IF YOU PRINT YOUR NAME ON THIS FORM IT MEANS THAT YOU HAVE DECIDED TO PARTICIPATE AND HAVE READ EVERYTHING THAT IS ON THIS FORM. YOU AND YOUR PARENTS WILL BE GIVEN A COPY OF THIS FORM TO KEEP.

_____ _____

Name of Child (printed) Date

_____ _____

Signature of Investigator Date

Joseph Sims, M.A.

simsjx@dukes.jmu.edu

Appendix G

Teacher Consent to Participate in Research

Identification of Investigators & Purpose of Study

You are being asked to participate in a research study conducted by Joseph Sims from James Madison University. The purpose of this study is to examine the impact mindfulness has on disruptive behaviors associated with characteristics of ADHD. Mindfulness is a practice of increased awareness. An example of mindfulness would be deep breathing and focused attention. This study will contribute to the researcher's completion of his master's thesis.

Research Procedures

Should you decide to participate in this research study, you will be asked to sign this consent form once all your questions have been answered to your satisfaction. This study consists of six mindfulness activities that will be administered to a group of participants at Welcome Elementary School. The six lessons are briefly described below:

- How our Brain Works- Three important parts of the brain and how they function
- Mindful Awareness- Attending to the here and now experiences
- Focused Awareness- Quieting the mind and control breathing
- Mindful Listening- Mindfully taking in sounds in the environment
- Mindful Seeing- Mindfully taking in what is seen in the environment
- Mindful Movement- Paying attention to the body moves in an environment

Teachers will be asked to fill out selected items on the Behavior Rating Inventory of Executive Function (*BRIEF)* and discuss students' behaviors in an interview with the researcher before and after the program.

Time Required

Participation in this study will require three minutes of your time to complete the BRIEF and 10 minutes to interview with the researcher. Because the BRIEF and interview will be given before and after the mindfulness program, your total time participating would not exceed 30 minutes.

Risks

The investigator does not perceive more than minimal risks from your involvement in this study (that is, no risks beyond the risks associated with everyday life).

Benefits

Potential benefits from participation in this study include helping to identify the perceived benefits of using a mindfulness curriculum in the school system.

Confidentiality

The results of this research will be presented at James Madison University as part of Joseph Sims master's thesis. Teachers' names will be identified using pseudonyms to maintain confidentiality. The researcher retains the right to use and publish non-identifiable data. While individual responses are confidential, aggregate data will be

presented representing averages or generalizations about the responses as a whole. All data will be stored in a secure location accessible only to the researcher. Upon completion of the study, all information gathered from teacher will be destroyed.

Participation & Withdrawal

Your participation is entirely voluntary. You are free to choose not to participate. Should you choose to participate, you can withdraw at any time without consequences of any kind.

Questions about the Study

If you have questions or concerns during the time of your participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

Joseph Sims, M.A.
Graduate Psychology Department
James Madison University
simsjx@dukes.jmu.edu

Tammy Gilligan, Ph.D.
Graduate Psychology Department
James Madison University
gilligtd@jmu.edu
(540) 568-6564

Questions about Your Rights as a Research Subject

Dr. David Cockley
Chair, Institutional Review Board
James Madison University
(540) 568-2834
cocklede@jmu.edu

Giving of Consent

I have read this consent form and I understand what is being requested of me as a participant in this study. I freely consent to participate. I have been given satisfactory answers to my questions. The investigator provided me with a copy of this form. I certify that I am at least 18 years of age.

_____
Name of Participant (Printed)

_____ _____
Name of Participant (Signed) Date

_____ _____
Name of Researcher (Signed) Date

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