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# The impact of school-based mindfulness programs on the externalizing behavior of students

Madison Ruhlmann
*University of Northern Iowa*

# THE IMPACT OF SCHOOL-BASED MINDFULNESS PROGRAMS ON THE EXTERNALIZING BEHAVIOR OF STUDENTS

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Madison Ruhlmann

University of Northern Iowa

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IMPACT OF MINDFULNESS PROGRAMS ON EXTERNALIZING BEHAVIOR

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Date Dr. Elizabeth Lefler, Honors Thesis Advisor

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Date Dr. Jessica Moon, Director, University Honors Program

**Abstract**

Interventions involving mindfulness in schools are becoming increasingly commonplace. Mindfulness is a way of directing attention towards the present moment without passing judgement, and has been adapted as a psychological treatment over the past forty years. The goal of this review is to summarize how schools have used interventions featuring mindfulness; and particularly the impact on externalizing behavior in the classroom. Online database search techniques were utilized in the collection and analysis of these studies. The findings of this review show that mindfulness interventions may be valuable in the reduction of externalizing behavior in the classroom, but the current research has methodological flaws. Further randomized-controlled trials using a double-blind data collection technique are recommended.

# The Impact of School-Based Mindfulness Programs on the Externalizing Behavior of Students

Modern public schools should strive to find new ways to accommodate a wide range of psychological and behavioral disorders in the pursuit of an appropriate education for all students. One specific category of disorders is referred to as externalizing behavior problems, and by definition these disorders are very noticeable and disruptive in a classroom. Externalizing behavior disorders are characterized by disruptive, hyperactive, and/or aggressive behaviors. Attention-Deficit Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD), and Conduct Disorder (CD) are all disorders that fall into the externalizing behavior spectrum (King et al., 2018). These disorders are considered a risk factor for later antisocial behavior, as well as for higher rates of incarceration and arrest (Liu, 2004). Additionally, children on the externalizing behavior spectrum have been shown to have poorer social relationships, more violent tendencies, and lower academic achievement than their peers (Burke et al., 2014). As a result, children with these issues often cause disruption in the classroom; this may lead to a classroom environment where success is harder to obtain for the child exhibiting the disruptive behavior as well as for the other children. Furthermore, disruptive behavior levels in classrooms may affect teacher retention and job satisfaction, as disruptive behavior has been shown to increase the emotional distress of teachers, and teachers show a reduced ability to manage the classroom when dealing with high levels of this problematic behavior (Black & Fernando, 2014). Externalizing behavior problems in schools, therefore, deserve increased awareness and further research.

The main factors that comprise externalizing behavior disorders are aggression, delinquency, and hyperactivity (Liu, 2004). Aggression can be defined as behaviors that harm or threaten others, such as violence. Delinquency includes antisocial acts such as lying, stealing,

and spending time with delinquent peers. Hyperactivity is characterized by excessive motor activity and restlessness. It is important to note that not all children with externalizing behavior disorders possess all three of these factors. In fact, children with ADHD may not possess any of these traits; namely when they have the inattentive presentation of ADHD. ADHD is made up of two domains of symptomatology: inattention and hyperactivity-impulsivity. There are three presentations of this disorder, which are predominantly hyperactive-impulsive, predominantly inattentive, and the combined presentation (American Psychiatric Association, 2013). Children with the combined or hyperactive-impulsive presentation are much more likely to be disruptive than children with inattentive presentation, though they are less aggressive and delinquent than children with conduct problems such as ODD and CD (Barkley, 2018). In sum, whether or not to consider inattention a disruptive behavior problem is controversial. For the purpose of this review, inattention is not considered a disruptive behavior problem because it usually does not disrupt the classroom.

One important factor related to externalizing behavior disorders is poor self-regulation. Self-regulation is one's ability to alter one's own actions, cognitions, and emotions to meet the demands of the situations they encounter in their lives (Baumeister & Vohs, 2007). Human behavior is purposive and motivated by forethought, therefore, the basis for all purposeful action is self-regulation of behavior, thoughts, and emotions (Bandura, 1991). Dysregulation, on the other hand, is the inability to use healthy and/or adaptive strategies to manage and diffuse negative emotions and actions. Improving self-regulation skills requires learning about and managing the relationship between thoughts, feelings, and behaviors; this is the basis of many psychological treatments such as cognitive-behavioral therapy (Rolston & Lloyd-Richardson, 2017). Emotional dysregulation has been shown to be common in ADHD, and is a major

contributor to impairment (Shaw, 2014). It also is potentially a major contributor to the develoment of conduct problems, as emotional regulation skills are being studied as a moderator of an adolescent's potential to develop ODD and/or CD. Neurobiological research on these disorders has indicated emotional dysregulation combined with trait impulsivity could be their developmental basis (Beauchaine, 2012). Aggressive tendencies have also been linked to emotional dysregulation (Garofalo et al., 2018). Therefore, many treatments for these externalizing behavior problems include self-regulation components.

### *Externalizing Behavior Disorders*

ADHD is one of the most widely known externalizing behavior disorders due to the fact that it is the most common, with a prevalence of approximately 5% in children (Barkley, 2018). ADHD has a high comorbidity rate with the other two externalizing behavior disorders, ODD and CD. Children with ADHD are as much as ten times more likely to develop ODD or CD as compared to their non-ADHD peers (King et al., 2018). However, it should be noted that many children with ADHD do not develop conduct problems. ODD is a disorder characterized by disobedience and hostility to rules and authority. It has a prevalence rate of approx 3% (Canino et al., 2010). CD is a disorder related to ODD, but CD is characterized by more serious symptoms, such as aggression, destruction of property, and theft. CD has a prevalence rate of approx 2-3% (Canino et al., 2010). Individuals with CD are more likely than those wtih ODD to exhibit antisocial behavior is so severe that it may lead to legal and other serious consequences (APA, 2013). Like most other disorders, ODD and CD exist on a spectrum from less severe to more severe. This category of behaviors and the related disorders are typical to encounter in the

school setting. Students with these disorders tend to face impairment in the social and academic environment of the classroom.

Academic impairment is common in children with externalizing behavior disorders. Children with ADHD may display significant deficits in multiple academic areas such as reading and math, and many children with ADHD, ODD, and CD even have a comorbid specific learning disorder (SLD; Barkley, 2018). These children are also said to show poorer executive functioning skills which include things like organization, time management, and self-motivation. In adolescence, children with ADHD show higher rates of grade retention and dropping out (Sibley et al., 2014). Conduct problems such as ODD and CD lead to more failure and dropping out, as well as more suspensions and expulsions (National Academies of Sciences, Engineering, and Medicine, 2015). Children with these disorders are much less likely to attend higher education than their peers (Barkley, 2018). Classroom behavior and social skills are also areas of concern for these children. Children with ADHD are shown to have higher rates of off-task behavior as well as lower levels of academic engagement (Junod et al., 2006). When considering the social aspects of school, those diagnosed with ADHD face higher levels of peer rejection, have fewer close friendships, and tend to have more deviant peer groups (Sadler et al., 2011). Those diagnosed with ODD and CD also tend to have more deviant peers as well as high incidence of school behavior problems (Kolko et al., 2008). In fact, untreated hyperactivity, oppositionality, and conduct problems - by definition - make it very difficult for a student to succeed in an academic setting.

One treatment option for the most common externalizing behavior disorder, ADHD, is medication. Stimulants are often prescribed to improve frontal lobe functioning and control over impulsivity (Barkley, 2018). Stimulants are thought to have an effect on ODD symptoms as well

due to the high comorbidity of ADHD and ODD, and risperidone has been shown to lessen symptoms in cases of ODD and CD with severe aggression (Turgay, 2009). The other evidence-based treatment route for these disorders is behavioral treatment. Common behavioral treatments for ADHD include things like token economies and parent training (Barkley, 2018). Treatments for ODD and CD include more community-based treatments, such as multisystemic therapy (Turgay, 2009). When it comes to decreasing disruptive behavior in the classroom, behavioral interventions are the most evidence-based option. Most school-based behavioral programs are delivered by teachers, administrators, and school counselors through lessons, school changes, cognitive and behavioral interventions, and increased communication with parents (Han & Weiss, 2005). A new trend in these programs is mindfulness interventions, which use calming or relaxation techniques.

### *Mindfulness Treatments*

Calming or relaxation interventions are not a new concept in terms of cognitive-behavioral interventions in schools (Volpe, 1975). Many children go through training in progressive relaxation or deep breathing at some point in their schooling. Progressive relaxation is the sequential tensing and relaxing of muscles, and deep breathing is slow breathing from the diaphragm that helps the flow of oxygen and carbon dioxide in the body (Johnson et al., 2009). Relaxation training methods have been shown to be helpful in reducing hyperactivity and disruptive behavior, especially in children with emotional or learning disorders (Matthews, 1986). This shows they may be helpful in reducing classroom behavior problems.

A recent trend in this category of interventions has been moving towards more cognitive techniques, such as mindfulness and meditation. A common definition for mindfulness practice

is intentionally paying sustained attention to the experience of the present moment without judgement (Black & Fernando, 2014). Mindfulness is a type of meditation, which is a concept that encompasses many things such as reaching spiritual enlightenment, controlling the mind, and regulating the self. Meditation has been around since as early as 1100 B.C. as part of the spiritual practice of Hinduism and since then, it has become part of many traditions. Some specific aspects of meditation, such as mindfulness, have been adapted in Western culture for psychological well-being (Bushak, 2016). Recently, mindfulness has been adapted as part of many individual psychological treatments as well as group interventions.

Mindfulness was first introduced as part of a clinical treatment by John Kabat-Zinn in 1982 (Zenner et al., 2014). His treatment was focused on reducing stress and was called the Mindfulness-Based Stress Reduction (MBSR) program. The program included weekly sessions of psychoeducation and mindfulness practices as well as instructions for at-home practice. From this program, an individual treatment for depression relapse was developed called Mindfulness-Based Cognitive Therapy (MBCT). Since then, mindfulness has been used as a part of many individual and group therapies as well as school and community programs.

This review will focus on mindfulness-based programs and their impact on externalizing behavior problems in schools. There will also be a discussion of self-regulation as it relates to mindfulness and externalizing behavior disorders. Children and adolescents will be discussed separately due to the different nature of the interventions for each population. Only studies that include a mindfulness practice component will be included while studies that include a yoga component will be excluded to narrow our findings.

## Self-Regulation

In order to understand why mindfulness-based interventions may be potentially valuable as a treatment for externalizing behavior in the school setting, one must understand how self-regulation is linked to both externalizing behavior disorders and mindfulness. As will be explained in more depth below, individuals with externalizing behavior disorders are often deficient in the self-regulatory skills they need to inhibit their impulses, aggression, and other negative behaviors (Lonigan et al., 2017). Further, one type of treatment shown to be effective in improving self-regulation is mindfulness-based treatment. The author of the current review will argue that mindfulness training improves the self-regulation of students with externalizing behavior disorders and therefore decreases their symptoms in the school setting.

Deficient self-regulatory skills are a significant component of externalizing behavior disorders. ADHD is a prime example of this because it has been thought of as a disorder involving deficient self-regulation since research on the topic emerged in the late 1970s (Garbarino & Thompson, 1978). Self-regulatory skills are especially important for goal-directed behavior, which is often a challenge for individuals with ADHD. Deficiency in self-regulatory skills such as inhibition, self-awareness, self-motivation, and rule-following are common for those diagnosed with this disorder (Barkley, 2011). Lack of sufficient self-regulatory skills in individuals with ADHD can lead to behavioral dysregulation, which may present as disruptive behavior in the classroom (Shiels & Hawk, 2010). Some individuals may struggle specifically with emotional dysregulation, in which strong emotions cannot be well-regulated and lead to behavior that is not adaptive or appropriate. Emotional dysregulation is emerging in the field of ADHD research as an important aspect that contributes to impairment (Biederman et al., 2012; Shaw, 2014). In fact, recent research shows that there might be evidence for an irritable subtype of ADHD defined by poor emotion regulation (Karalunas et al., 2019).

As for ODD and CD, there is less research on the impact of self-regulation, but the studies that have been done show that deficiencies in this area are significant contributors to these disorders (Loeber et al., 2009). Children with ODD have been found to have great emotional regulation difficulties compared to controls without conduct problems and show the greatest deficit with regulation of negative emotions (Jiang et al., 2016). Poor emotional regulation in CD is common and contributes to symptoms such as impulsivity, aggression, and antisocial behavior (Frick, 2006). Emotional dysregulation as a child has been shown to be a risk factor for developing conduct problems later in adolescence (Masi et al., 2015). One of the most interesting links found between self-regulation and ODD/CD is support found for a specific neurodevelopmental pathway to these disorders. This theorized pathway states that the combination of trait impulsivity and poor emotional regulation leads to the development of conduct problems (Beauchaine, 2012).

Externalizing behavior disorders are defined by their *external* symptoms, but external behavior follows as response to internal cognitions or emotions. There is a great deal of evidence for the role of emotion dysregulation as a key contributor to each externalizing behavior disorder, which can lead to aggression or delinquency (Frick, 2006). Behavior dysregulation is also a component and may present itself as impulsive symptoms. Taking all of this into account, it is easy to see how self-regulation deficits contribute to the symptoms of externalizing behavior disorders. Poor regulation skills can lead to behavior issues inside and outside of the classroom.

### *Self-Regulation and Mindfulness*

The concept of mindfulness has religious roots (Brown et al., 2007), but is on the rise as a secular psychological treatment. These special circumstances prompt a discussion of why

mindfulness is effective at treating different mental health disorders, and which mechanisms are utilized by mindfulness treatment. For the purposes of this review, this discussion will be limited to the use of mindfulness to treat externalizing behavior disorders.

As stated previously, the author of this review holds the theory that improved self-regulation is the mechanism by which mindfulness-based interventions decrease the symptoms of externalizing behavior disorders. A key self-regulatory skill that is relevant to mindfulness is self-awareness. Mindfulness increases one's attention to the self as well as the surrounding environment, and this awareness is necessary to regulate one's behaviors (Evans et al., 2009). The extent to which an individual is self-aware is also the extent which they may regulate their behaviors. Therefore, increasing one's self-awareness will increase their ability to regulate their behaviors. This self-awareness includes emotional self-awareness, which is being aware of one's internal experiences without becoming overwhelmed or acting impulsively. Studies on mindfulness training show that participants experience less internal conflict, less resistance to emotion, and less use of unhealthy coping strategies than they did before participating in the training (Friese & Hoffman, 2016).

Because emotional dysregulation has been indicated as a factor in externalizing behavior disorders, mindfulness training could be beneficial to helping those individuals learn to manage strong emotions without displaying  disruptive behavior. Increasing awareness has also been shown to reduce impulsivity, which is a core component of externalizing behavior disorders (Peters et al., 2011). One theory behind this effect is that mindfulness creates a "mental gap" between perceptions of a stimulus and a response, which allows the individual to disengage from their automatic response before performing a maladaptive behavior. An example of this may be that if a young student using mindfulness skills feels the impulse to kick someone's chair, their

increased attention to their own thoughts slows down the process of impulsivity and prevents the child from kicking the chair before they consider the consequences. The simple nature of the practice of mindfulness may be beneficial as well because it encourages the individual to slow down and focus on the task at hand rather than using abstract self-relevant thoughts that deplete the mental energy needed for effective self-regulation (Brown et al., 2007).

As discussed earlier, difficulties in emotional and behavioral self-regulation have been found to contribute to externalizing behavior. Mindfulness, on the other hand, has been shown to increase self-regulatory capacities. It is important to consider this link as mindfulness programs in the school setting are reviewed in the following sections.

## School-Based Mindfulness Programs

For the purpose of this review, children and adolescents will be considered separately. This choice was made for two reasons. The first reason children and adolescents must be considered individually is these populations have different capabilities and school settings, and therefore their interventions may differ in content and format. The other factor that went into this decision is the differing prevalence of externalizing behavior disorders between children and adolescents. Adolescents have a higher rate of CD, so they may have a different, more severe set of externalizing behaviors that are being addressed (Nock et al., 2007).

Both types of studies will be evaluated for how well they fit the model of a randomized controlled trial (RCT). RCTs must be randomized, meaning the participants are placed into the treatment/experimental group totally at random (MacGill, 2018) There must also be a control group. A control group receives either no intervention at all or a placebo intervention. A placebo intervention is one that acts as a substitute for the experimental treatment, but does not provide

any of the supposed benefits (MacGill, 2018). Control and experimental group assignments must be random. Finally, it is best if RCTs are blind, meaning the raters of outcome variables (i.e., DVs) do not know whether the patient was in the treatment group or the control group. Studies conducted as RCTs are the most reliable because they reduce the chance of confounding factors impacting the results (MacGill, 2018).

The following studies were collected through the use of online searches in credible databases such as PsychINFO and Google Scholar. These databases were accessed through the Rod Library website. Initial searches included entering terms related to my topic in isolation and together, such as “externalizing behavior disorders” and “school-based mindfulness”, to find the most relevant results. Each article was read in detail and summarized in an annotated bibliography, as well as other relevant articles identified in the reference section of each study. The annotated bibliography was then used to identify trends in this area of research and the articles that best represent these trends were chosen to be analyzed in this review.

## Children

### *Study 1*

The first study that will be examined by this review is an evaluation of the impact of an audio-guided mindful awareness program on quarterly grades, classroom behavior, and teaching operations in third grade classrooms (Bakosh et al., 2016). Eight teachers volunteered their classroom for this study. This mindfulness program was delivered over an eight week period to the four classrooms randomly chosen as the experimental group and featured daily ten minute recordings that were based on the MBSR treatment originally developed by John Kabat-Zinn (1990). The four control classrooms ran as usual. The intervention group was 54% male and the

control group was 52% male. The recordings used by the intervention group taught several things to the third-graders, including the core values of mindfulness such as self-awareness, self-control, and kindness. They also included periods for breathing exercises, silence, and a two minute journaling practice after each recording (Bakosh et al., 2016).

Classroom behavior was evaluated using teacher logs of behavior events. A behavior event was defined as a principal visit, a call home, a suspension, or receiving a "red card". "Red cards" were given to indicate consistent classroom disruption without indicating specific participants or behaviors (Bakosh et al., 2016). These events were recorded daily throughout the study by teachers.

Results indicated that classrooms receiving the mindfulness program had a 50% drop in behavior events over the eight weeks of the study. The average daily number of behavior events in these classrooms fell from four in the first week to fewer than two in the last week. Interestly, behavior events in the control classroom rose 15% during the eight weeks (Bakosh et al., 2016). When assessing the students' quarterly grades, post-intervention grades were most highly correlated with the student's pre-intervention grades, but students in the intervention group showed significant improvement in math and reading compared to the progress of the control group. This program also was convenient for the teachers and had little to no impact on daily teaching operations (Bakosh et al., 2016).

This study, while promising, did not meet all requirements of a strong RCT. The most important flaw is that it was not completely randomized. The classrooms involved in the study were voluntarily selected by the teachers after learning about the study. This can confound the results because teachers who volunteered for this study may run their classrooms differently than

teachers who did not volunteer. These volunteering teachers also act as the reporters of the data in this study, which can lead to possibly biased data collection (i.e., ratings were not blind).

***Study 2***

The second relevant study involving children that was reviewed assessed the impact of a five week mindfulness program on the classroom behavior of primarily low-income and ethnic minority elementary school students (Black & Fernando, 2014). This program, named Mindful Schools, featured fifteen minute sessions of mindfulness training delivered by trained mindfulness teachers in the classroom three times weekly, plus two minute mindfulness exercises delivered on off-days by teachers. The lessons encouraged the students to use the mindfulness exercises and skills outside the classroom as well (Black & Fernando, 2014).

Only one school was assessed in this study because the school solicited the program. Seventeen classrooms produced classroom behavior data from 409 students. All classrooms received the program and there was no control group in this study. The classrooms ranged from kindergarten to sixth grade, but every class received the same program regardless of age level (Black & Fernando, 2014). Classroom behavioral data were collected by teachers using *The Student Behavior Rubric* (Kinder Associates LLC, 2007). This rubric assesses student attention, self-control, participation, and caring and respect for others. Items in these four categories were rated on a Likert-type scale. Teachers filled out these scales directly before beginning the program, directly after finishing the program, and seven weeks after finishing the program (Black and Fernando, 2014).

From pre-test to post-test, students showed significant improvements in all four categories of classroom behavior assessed by the study (Black & Fernando, 2014). These

improvements also were maintained when they were assessed seven weeks after the program ended. Some groups received additional sessions during the seven weeks which lead to improvement of classroom behavior measures rather than just maintenance (Black & Fernando, 2014).

This study was limited due to lack of randomization and lack of a control group. The intervention was self-selected, meaning the school sought it out, which can cause selection effects that change the results. Since the school self-selected, there was no control group because all classrooms wanted to receive the intervention. This means there is no group to compare the intervention group to and changes must be measured on the differences between the pre-test and post-test of students receiving the intervention. This is further complicated by the fact that data were reported by teachers, who may report biased information or see differences that are not there.

***Study 3***

The third relevant study involving children that was reviewed was a 24-week study of the impact of a mindfulness program on ADHD symptoms in first through third grade students (Napoli et al., 2005). The mindfulness program is called the Attention Academy and is delivered in twelve bimonthly 45-minute sessions by mindfulness trainers outside of the classroom. The program teaches how to pay attention to the present experience and non-judgement (Napoli et al., 2005).

Two local elementary schools were chosen to participate and, out of those schools, nine classrooms were randomly chosen for the study. Out of the 254 students in these classrooms, 228 students were given parent permission to participate, and those students were then randomly

assigned to the experimental or control group, creating an experimental group of 114 children and a control group of 114 children (Napoli et al., 2005). The percentage of female participants in the study was 47%. The control group participated in reading and quiet activities rather than receiving the intervention at the designated time. ADHD symptoms in students were measured using the *ADD-H Comprehensive Teacher Rating Scale* (*ACTeRS*; Ullman et al., 1984) and the *Test of Everyday Attention for Children* (*TEA-Ch*). Teachers and students completed these measures at the beginning and end of the program (Napoli et al., 2005). The number of subjects who actually completed both rounds of testing was 194.

Comparison of pre-test and post-test results of all students showed a significant reduction of ADHD behaviors in the classroom as well as greater selective attention ability (Napoli et al., 2005). This is a promising result for the prospect of treating the most common externalizing behavior disorder, ADHD, in the classroom. Though the intervention was for the whole class, ADHD behaviors were rated due to the prevalence of ADHD and its individual symptoms in the classroom.

This study was a stronger RCT than the previous studies that have been reviewed. Participants were chosen randomly to participate, and then also assigned randomly to either the experimental or control group. This is a good practice of randomization and helps reduce the influence of selection effects. This study also had a control group that was valuable to use for comparison, ensuring that the results were not simply due to the passage of time. The measurements used in this study included teacher-report and student self-report. Self-report can sometimes be limited in its ability to provide information by the difficulty of self-reflection for children, but can still provide valuable data. The most valuable data comes from the report of the teachers, which can be biased, but since the intervention was delivered outside the classroom and

teachers had students in both groups, they were blind to what group the students were in. This means the teacher report is not influenced by the knowledge of whether or not the students are receiving the intervention and will be less biased.

### *Study 4*

The last study involving children that will be covered in this review used the MindUP program. This program is based in the classroom and includes a curriculum of twelve lessons to be delivered over twelve weeks by teachers (Schonert-Reichl et al., 2015). The lessons lasted about fifty minutes and focused mostly on the teaching of mindfulness practice, but also included training over skills like self-regulation and kindness as they relate to mindfulness.

Four elementary schools were selected by researchers for this study out of a large urban school district due to their similar demographics and sizes. Fourth and fifth grade teachers were asked to consent to receiving the program at each school, and one consenting classroom was randomly chosen at every school (Schonert-Reichl et al., 2015). Once the four classrooms were chosen, a coin flip was done to decide which two classrooms would be the intervention group and which two would be the control group (i.e., randomization). The total number of students evaluated in both groups was ninety-nine. The control group received a standard social responsibility program instead of the intervention. This program was considered “business-as-usual” because these types of programs were common in this school district (Schonert-Reichl et al., 2015). The measures of this study included salivary cortisol levels, math achievement data collected by the teacher, executive functioning computer task performance, and peer-report of sociality and acceptance. More specifically, peers were asked to report prosocial behaviors such as sharing and helping as well as antisocial behavior such as rule-breaking and fighting

(Schonert-Reichl et al., 2015). Students also filled out self-report inventories concerning things such as empathy and emotional control. Students were measured directly before and directly after the program by trained research assistants who were blind to their experimental condition (Schonert-Reichl et al., 2015).

The most important result of these measures is that in comparison to the control condition, students in the intervention condition showed a significant decrease in peer-rated antisocial behavior and an increase in all categories of peer-rated prosocial behavior, as well as peer acceptance (Schonert-Reichl et al., 2015). Students also self-reported greater empathy, perspective-taking, and emotional control, which are all important skills of self-regulation.

This is a good example of an RCT. This study was completely randomized, meaning classrooms and experimental conditions were assigned randomly by researchers. This eliminates self-selection effects. This study also used only one classroom in each school to decrease diffusion effects of contact between the subject groups (Schonert-Reichl et al., 2015). This study also included a control condition which received a substitute program that lacks the mindfulness component, so the results will be more likely the effects of mindfulness. Reporter bias was reduced by having researchers blind to the experimental condition collect the data. The most important results for this review are the results of the peer-report measures because they measure antisocial and prosocial behavior. Though peer-report may not sound like the most reliable way to assess student behaviors, it has been used as a valid measure in multiple studies (Schonert-Reichl et al., 2015; Schonert-Reichl et al., 2012; Wentzel et al., 2004).

***Summary***

Overall, these studies show that mindfulness programs in schools seem to decrease externalizing behavior problems of elementary school students. This topic needs stronger RCTs,

however, to be more certain about efficacy. Some studies showed lack of objective reporters because many used teacher-report measures when the teacher was not blind to condition. There is also the influence of self-selection effects in many of them. Further studies should use more random assignment and objective measurement. However, one strong RCT did demonstrate effects in peer-rated antisocial behavior outcome variables that is promising.

## Adolescents

### *Study 1*

The first relevant study involving adolescent behavior assessed how a mindfulness program impacted the school climate of an alternative high school (Wisner, 2014). Alternative high schools are common institutions throughout the United States, and are meant to help at-risk high school students have a greater chance of academic success. Most of the students at these schools are at risk for dropping out or failing. Many students are referred for behavioral problems such as fighting and disruptive verbal behavior as well, and some may be referred for both reasons (National Center for Education Statistics, 1999). Due to this, there is a higher prevalence of students with behavior problems in alternative high schools than typical high schools. School climate is an important topic for schools like this due to this fact. Students with behavior issues and aggression can create a hostile school environment, so school climate is a relevant measure of student behavior.

The program used in this study taught mindfulness meditation specifically (Wisner, 2014). The program was delivered over eight weeks by a licensed social worker twice weekly in thirty minute sessions. The sessions focused on the practice of meditation and got more intensive on the practice as the program progressed. Thirty-five students participated in the study (out of

the thirty-six students who attended the school; Wisner, 2014). The number of males in the group was nineteen and there were sixteen females. There was no control group. School climate was assessed through pre-test and post-test student reports as well as student concept-mapping.

Students rated the school climate as more peaceful and calm after receiving the intervention (Wisner, 2014). They also found higher levels of student engagement. Students had rated improved student climate as the most important possible effect of the intervention and it was also the most significant difference (Wisner, 2014). This is an important finding because student perceptions of school are important in how effective their learning is.

This study has limitations in that it is not randomized or controlled. The school was intentionally selected due to it's specialization and therefore school selection was not random. There also was no random selection of participants because almost all students at the school took part in the program. Since all participants were given the intervention, there was no control group with which to compare the results of the intervention, meaning the results could be attributed to something other than the mindfulness training. Lastly, this study only used self-report measures which can be skewed compared to objective measures, and are not blind. A replication of this study with a control group and more reliable measures would be a valuable resource.

***Study 2***

The next relevant study concerning adolescents was a small study over the impact of mindfulness programs on conduct disorder in schools. As discussed earlier, conduct disorder is the most serious of the externalizing behavior disorders. It can often cause severe impairment in school and contribute to the risk of dropping out. In this study, three adolescents with conduct

disorder participated in the mindfulness program called Meditation of the Soles of the Feet (Singh et al., 2007). This program teaches the practice of shifting attention from high-energy emotional events to a neutral part of the body, such as the soles of the feet. This program is specifically used to treat aggression because the method works well for avoiding impulsive behavior based on emotion (Singh et al., 2007).

The three students who took part in the study were chosen to do so due to their diagnosis of conduct disorder and their high risk of not reaching graduation. Noncompliance was eliminated by making the program mandatory for the students if they wished to graduate (Singh et al., 2007). The students were in seventh grade when this study began and only one of the participants was female. The students met with a therapist trained in mindfulness for fifteen minutes each three times a week for four weeks. This part of the study is when the program was taught. For the next twenty-five weeks after the study, the students were instructed to keep up with their mindfulness practice and met with the therapist for fifteen minutes once a month (Singh et al., 2007).

Logs were kept for each student recording expulsions as well as threats of expulsion and these logs were assessed one year after the study began. This data showed that these events did not decrease much over the first four weeks of the study, but decreased significantly over the twenty-five week maintenance phase (Singh et al., 2007). Furthermore, each student kept their behavior at an acceptable level in order to make it to middle school graduation.

This study could be improved if it included a control group. For this particular study, it would be difficult to use random assignment due to the fact that only participants with conduct disorder were included. If there was a larger sample size, it would be more feasible to randomly assign the participants to intervention and control groups to use for comparison. On the other

hand, this study shows strength as an RCT when you consider the assessment measures. The measures are of quantitative objective behavior events and therefore reduce the level of possible bias in data collection.

***Study 3***

The next relevant study that was reviewed assessed how mindfulness programs impact the aggressiveness and impulsivity of adolescents in the classroom (Franco et al., 2016). Aggression and impulsivity are two main components of externalizing behavior disorders as discussed earlier. The program used in this study features weekly mindfulness lessons during counseling hour as well as fifteen minute daily practice with an audio recording (Franco et al., 2016).

There were thirteen individuals in the experimental group of this study and fourteen individuals in the control group (Franco et al., 2016). These twenty-seven students were chosen because they had been sent to the counseling room for misbehavior five or more times during the first term of the year. The percentage of male participants was 59%. Data were collected using self-report inventories of aggression and impulsivity that were completed by the participants directly before and directly after receiving the program (Franco et al., 2016).

Compared to the control group, students in the experimental group saw a reduction of all dimensions of aggression and impulsivity. Some of the biggest reductions included a 24% reduction in verbal aggression and a 10% reduction in non-planned impulsivity (Franco et al., 2016). This shows that the mindfulness program had a significant effect in decreasing aggression and impulsivity.

This study is a better example than the two previous concerning adolescents of an RCT. The study was not randomized because students who had behavioral problems were selected, which may cause selection effects, but does target the population emphasized in this review. There was a control group and assignment to the control group was randomized, which gives a valuable data set for which to compare the intervention group with. This study could be improved by the use of objective measures of behavior rather than just self-report measures. It would also benefit from a larger sample size to obtain more accurate results.

### *Summary*

Overall, there is less research over mindfulness programs and how they impact behavior problems in adolescence. This may be due to the fact that adolescent behaviors are harder to measure and analyze since they often move classrooms throughout the day and are generally given more behavioral freedom. From the studies we have reviewed, it seems that mindfulness programs may have the potential to reduce behavior problems in adolescents who are particularly behaviorally challenged, such as those who have a history of behavior problems or a diagnosis of CD. There is limited research on how mindfulness affects the behavior of students with mild behavior problems or the general population of the school. Further studies with adolescents should look into how mindfulness impacts the general population and their behavior in schools, as well as performing larger studies with a control group for comparison.

## Conclusion and Research Implications

Self-regulation plays a significant role in the symptoms of externalizing behavior disorders (Barkley, 2011; Loeber et al., 2009). Self-regulatory skills tend to be underdeveloped

in students with externalizing behavior disorders, and lead to behaviors such as aggression and impulsivity (Frick, 2006). Research has shown that mindfulness is one method to improve self-regulatory skills as well as reduce aggression and impulsivity (Friese & Hoffman, 2016). The current review assessed whether these specific benefits of mindfulness translate into reduced externalizing behavior symptoms in the classroom. As mindfulness interventions are relatively new in the field of social and emotional learning, research in this area can and should be improved.

Mindfulness interventions for elementary students have demonstrated the potential to reduce externalizing behavior symptoms. Teachers consistently reported less disruptive behavior and fewer ADHD symptoms in the classroom after the children received mindfulness training (Black & Fernando, 2014; Napoli et al., 2005). Peers reported fewer antisocial behaviors and greater peer acceptance (Schonert-Reichl et al., 2015). This is promising because teachers and peers have great insight into the everyday behavior of other students, especially in a typical elementary classroom where the students stay in one class for the majority of the day. However, limitations to the studies - including a lack of blind outcome assessment and randomization in most - keep them from being considered a first-line, evidence-based treatment. More research is certainly warranted.

Mindfulness interventions for adolescents have an even more limited research base as compared to the research with children. Most studies done with this population only include students with a diagnosis of an externalizing behavior disorder or a history of behavior problems in school. This may be due to the less consistent structure of secondary schools, as well as the reduced feasibility of performing a general population study in a high school or middle school. From the available studies, it can be concluded that mindfulness interventions show potential as

a valuable option for students with behavior problems. Some identified benefits include improved school climate and reduced level of expulsion and threat of expulsion. Mindfulness has also been shown to reduce aggression and impulsivity in adolescents as well. However, as with the studies of children, most studies in this group were not fully controlled nor randomized.

These promising results have indicated that this is an avenue that should be explored further. Mindfulness interventions can be a valuable resource for schools working to mitigate behavior issues. Further studies of school-based mindfulness programs should aim to better fit the model of an RCT. Many studies, particularly those done with elementary school students, lacked blind data collection. This means the data were reported by students, teachers, or peers who were aware of the subjects' experimental condition. Other studies, particularly those with adolescents, tended to lack a control group for comparison. Future studies should focus more on the general population of students and use random assignment to choose participants as well as assign them to control and experimental groups. They should also use a blind model, which means data is collected by someone who does not know the experimental condition of the participant. More RCTs in this area will allow for mindfulness to be known, used, and respected as a useful intervention.

The future of mindfulness programs in schools will see the evolution of these programs to fit the academic setting and the needs of the students. Interventions that seem to show promise for improving externalizing behavior symptoms in the classroom have a focus on reducing impulsivity and regulating the self. Behavioral and emotional regulation both play a role in the detrimental aspects of externalizing behavior disorders and future interventions with the goal of reducing symptoms should keep this critical point in mind. Mindfulness has the ability to

improve self-regulation and potentially the quality of each student's education and school experience.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*. American Psychiatric Pub.

Bakosh, L. S., Snow, R. M., Tobias, J. M., Houlihan, J. L., & Barbosa-Leiker, C. (2016). Maximizing mindful learning: Mindful awareness intervention improves elementary school students' quarterly grades. *Mindfulness, 7*(1), 59-67.

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational behavior and human decision processes, 50*(2), 248-287.

Barkley, R. A. (2018). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and Treatment*.

Barkley, R. A. (2011). The important role of executive functioning and self-regulation in ADHD. *J Child Neuropsy, 113*(21), 41-56.

Baumeister, R. F., & Vohs, K. D. (2007). Self-Regulation, ego depletion, and motivation. *Social and personality psychology compass, 1*(1), 115-128.

Beauchaine, T. P. (2012). Physiological markers of emotion and behavior dysregulation in externalizing psychopathology. *Monographs of the Society for Research in Child Development, 77*(2), 79-86.

Biederman, J., Spencer, T. J., Petty, C., Hyder, L. L., O'Connor, K. B., Surman, C. B., & Faraone, S. V. (2012). Longitudinal course of deficient emotional self-regulation CBCL profile in youth with ADHD: prospective controlled study. *Neuropsychiatric disease and treatment, 8*, 267.

Black, D. S., & Fernando, R. (2014). Mindfulness training and classroom behavior among lower-income and ethnic minority elementary school children. *Journal of child and*

*family studies*, *23*(7), 1242-1246.

Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological inquiry*, *18*(4), 211-237.

Burke, J. D., Rowe, R., & Boylan, K. (2014). Functional outcomes of child and adolescent oppositional defiant disorder symptoms in young adult men. *Journal of child psychology and psychiatry, and allied disciplines*, *55*(3), 264–272. doi:10.1111/jcpp.12150

Bushak, L. (2016, March 10). *Mindfulness Vs Meditation: The Difference Between These Two Pathways To Well-Being And Peace Of Mind.* Retrieved from https://www.medicaldaily.com/mindfulness-meditation-differences-377346

Canino, G., Polanczyk, G., Bauermeister, J. J., Rohde, L. A., & Frick, P. J. (2010). Does the prevalence of CD and ODD vary across cultures?. *Social psychiatry and psychiatric epidemiology*, *45*(7), 695-704.

Chambless, D. L., & Hollon, S. D. (1998). Defining empirically supported therapies. *Journal of consulting and clinical psychology*, *66*(1), 7.

Evans, D. R., Baer, R. A., & Segerstrom, S. C. (2009). The effects of mindfulness and self-consciousness on persistence. *Personality and Individual Differences*, *47*(4), 379-382.

Flook, L., Smalley, S. L., Kitil, M. J., Galla, B. M., Kaiser-Greenland, S., Locke, J., ... & Kasari, C. (2010). Effects of mindful awareness practices on executive functions in elementary school children. *Journal of applied school psychology*.

Franco, C., Amutio, A., López-González, L., Oriol, X., & Martínez-Taboada, C. (2016). Effect of

a mindfulness training program on the impulsivity and aggression levels of adolescents with behavioral problems in the classroom. *Frontiers in psychology*, *7*, 1385.

Frick, P. J. (2006). Developmental pathways to conduct disorder. *Child and Adolescent Psychiatric Clinics*, *15*(2), 311-331.

Friese, M., & Hofmann, W. (2016). State mindfulness, self-regulation, and emotional experience in everyday life. *Motivation Science*, *2*(1), 1.

Garbarino, J., & Thompson, B. (1978). Child Attachment and Family Environment Differences Of Adolescent Children with ADHD and/or Conduct Disorder. *Psychiatry*, *27*, 336-341.

Garofalo, C., Velotti, P., & Zavattini, G. C. (2018). Emotion regulation and aggression: The incremental contribution of alexithymia, impulsivity, and emotion dysregulation facets. *Psychology of Violence*, *8*(4), 470.

Han, S. S., & Weiss, B. (2005). Sustainability of teacher implementation of school-based mental health programs. *Journal of abnormal child psychology*, *33*(6), 665-679.

Jiang, W., Li, Y., Du, Y., & Fan, J. (2016). Emotional regulation and executive function deficits in unmedicated Chinese children with oppositional defiant disorder. *Psychiatry investigation*, *13*(3), 277.

Johnson, C. M., Larson, H. A., Conn, S. R., Estes, L. A., & Ghibellini, A. B. (2009, March). The impact of relaxation techniques on third grade students' self-perceived levels of test anxiety. Paper based on a program presented at the American Counseling Association Annual Conference and Exposition, Charlotte, NC.

Junod, R. E. V., DuPaul, G. J., Jitendra, A. K., Volpe, R. J., & Cleary, K. S. (2006). Classroom observations of students with and without ADHD: Differences across types of engagement. *Journal of School Psychology*, *44*(2), 87-104.

Kabat-Zinn, J. (1990). Mindfulness Based Stress Reduction. Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness.

Karalunas, S. L., Gustafsson, H. C., Fair, D., Musser, E. D., & Nigg, J. T. (2019). Do we need an irritable subtype of ADHD? Replication and extension of a promising temperament profile approach to ADHD subtyping. *Psychological assessment*, *31*(2), 236.

Kinder Associates, LLC. (2007). Unpublished measurement scale. Available at http://www.mindfulyoga.com.

King KM, Luk JW, Witkiewitz K, et al. Externalizing Behavior Across Childhood as Reported by Parents and Teachers: A Partial Measurement Invariance Model. *Assessment*. 2018;25(6):744–758. doi:10.1177/1073191116660381

Kolko, D. J., Dorn, L. D., Bukstein, O., & Burke, J. D. (2008). Clinically referred ODD children with or without CD and healthy controls: Comparisons across contextual domains. *Journal of Child and Family Studies*, *17*(5), 714-734.

Liu J. (2004). Childhood externalizing behavior: theory and implications. *Journal of child and adolescent psychiatric nursing : official publication of the Association of Child and Adolescent Psychiatric Nurses, Inc*, *17*(3), 93–103.

Loeber, R., Burke, J., & Pardini, D. A. (2009). Perspectives on oppositional defiant disorder, conduct disorder, and psychopathic features. *Journal of Child Psychology and Psychiatry*, *50*(1-2), 133-142.

Lonigan, C. J., Spiegel, J. A., Goodrich, J. M., Morris, B. M., Osborne, C. M., Lerner, M. D., & Phillips, B. M. (2017). Does preschool self-regulation predict later behavior problems in general or specific problem behaviors?. Journal of abnormal child psychology, 45(8), 1491-1502.

MacGill, M. (2018). Randomized controlled trials: Overview, benefits, and limitations. Retrieved from https://www.medicalnewstoday.com/articles/280574

Masi, G., Muratori, P., Manfredi, A., Pisano, S., & Milone, A. (2015). Child behaviour checklist emotional dysregulation profiles in youth with disruptive behaviour disorders: clinical correlates and treatment implications. *Psychiatry research*, *225*(1-2), 191-196.

Matthews, D. B. (1986). discipline: can it be improved with relaxation training?. *Elementary School Guidance & Counseling*, *20*(3), 194-200.

Napoli, M., Krech, P. R., & Holley, L. C. (2005). Mindfulness training for elementary school students: The attention academy. *Journal of applied school psychology*, *21*(1), 99-125.

National Academies of Sciences, Engineering, and Medicine. (2015). *Mental disorders and disabilities among low-income children*. National Academies Press.

National Center for Education Statistics. (1999). *Education statistics quarterly*. Washington, DC: National Center for Education Statistics, Office of Educational Research and Improvement, U.S. Dept. of Education.

Nock, M. K., Kazdin, A. E., Hiripi, E., & Kessler, R. C. (2007). Lifetime prevalence, correlates, and persistence of oppositional defiant disorder: results from the National Comorbidity Survey Replication. *Journal of Child Psychology and Psychiatry*, *48*(7), 703-713.

Peters, J. R., Erisman, S. M., Upton, B. T., Baer, R. A., & Roemer, L. (2011). A preliminary investigation of the relationships between dispositional mindfulness and impulsivity. *Mindfulness*, *2*(4), 228-235.

Rolston, A., & Lloyd-Richardson, E. (2017). What is emotion regulation and how do we do it. *Cornell Research Program on Self-Injury and Recovery.[on-line].[cit. 2017-22-09] Available at: http://www. selfinjury. bctr. Cornell.*

*edu/perch/resources/what-is-emotion-regulationsinfo-brief. Pdf*.

Sadler, J. M., Evans, S. W., Schultz, B. K., & Zoromski, A. K. (2011). Potential mechanisms of action in the treatment of social impairment and disorganization in adolescents with ADHD. *School Mental Health*, *3*(3), 156-168.

Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F., &

Diamond, A. (2015). Enhancing cognitive and social–emotional development through a simple-to-administer mindfulness-based school program for elementary school children: A randomized controlled trial. *Developmental psychology*, *51*(1), 52.

Schonert-Reichl, K. A., Smith, V., Zaidman-Zait, A., & Hertzman, C. (2012). Promoting children's prosocial behaviors in school: Impact of the "Roots of Empathy" program on the social and emotional competence of school-aged children. *School Mental Health*, *4*(1), 1-21.

Shaw, P., Stringaris, A., Nigg, J., & Leibenluft, E. (2014). Emotion dysregulation in attention deficit hyperactivity disorder. *American Journal of Psychiatry*, *171*(3), 276-293.

Shiels, K., & Hawk Jr, L. W. (2010). Self-regulation in ADHD: The role of error processing. *Clinical psychology review*, *30*(8), 951-961.

Sibley, M. H., Altszuler, A. R., Morrow, A. S., & Merrill, B. M. (2014). Mapping the academic problem behaviors of adolescents with ADHD. *School Psychology Quarterly*, *29*(4), 422.

Singh, N. N., Lancioni, G. E., Singh Joy, S. D., Winton, A. S., Sabaawi, M., Wahler, R. G., & Singh, J. (2007). Adolescents with conduct disorder can be mindful of their aggressive behavior. *Journal of Emotional and Behavioral Disorders*, *15*(1), 56-63.

Teens, S. (2010). Assessing the efficacy of an adapted in-class mindfulness-based training

program for school-age children: A pilot study.

Turgay, A. (2009). Psychopharmacological treatment of oppositional defiant disorder. *CNS Drugs*, *23*(1), 1-17.

Ullmann, R. K., Sleator, E. K., & Sprague, R. L. (1984). A new rating scale for diagnosis and monitoring of ADD children. *Psychopharmacology Bulletin*.

Volpe, R. (1975). Feedback facilitated relaxation training in school counseling. *Canadian Journal of Counselling and Psychotherapy*, *9*(3-4).

Wentzel, K. R., Barry, C. M., & Caldwell, K. A. (2004). Friendships in middle school: Influences

on motivation and school adjustment. *Journal of educational psychology*, *96*(2), 195.

Wisner, B. L. (2014). An exploratory study of mindfulness meditation for alternative school students: perceived benefits for improving school climate and student functioning. *Mindfulness*, *5*(6), 626-638.

Zenner, C., Herrnleben-Kurz, S., & Walach, H. (2014). Mindfulness-based interventions in schools—a systematic review and meta-analysis. *Frontiers in psychology*, *5*, 603.