

Mindfulness Training for Elementary School Students: The Attention Academy

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ABSTRACT. Mindfulness is the cognitive propensity to be aware of what is happening in the moment without judgment or attachment to any particular outcome. This concept flies in the face of modern, Western philosophical outcomes-based thinking about events and activities. This article presents results of a formative evaluation of whether participation in a mindfulness training program affected first, second, and third grade students' outcomes on measures of attention. The training was designed and intended to help students learn to focus and pay attention. The 24-week training employed a series of exercises including breathwork, bodyscan, movement, and sensorimotor awareness activities. Results from three attentional measures administered to the students show significant differences between those who did and did not participate in mindfulness practice training. Results are discussed and recommendations are made for future work in this developing field of interest. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <<http://www.HaworthPress.com>> © 2005 by The Haworth Press, Inc. All rights reserved.]*

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Journal of Applied School Psychology, Vol. 21(1) 2005
Available online at <http://www.haworthpress.com/web/JAPPS>
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Digital Object Identifier: 10.1300/J008v21n01_05

KEYWORDS. Stress, attention, wellness, curriculum, mindfulness

Children today are experiencing stress resulting in anger and violent behavior, conduct disorders, and various types of anxiety, including competition and test anxiety, in ways like never before (Feindler, 1995; Ommundsen & Vaglum, 1991; Prins & Hanewald, 1999). The literature indicates that anxiety can negatively impact students' school performance, disrupt their thinking, and interfere with their learning (Ialongo, Edelson, Werthamer-Larson, Crockett, & Kellam, 1994; Shapiro, Schwartz, & Bonner, 1998). Life skills training programs have directly and indirectly affected children's functioning and psychological well-being in school (Stipek, de la Sota, & Weishaupt, 1999). LeCroy and Rose (1986) discuss how schools can play a larger role in meeting the needs of children and can influence children's behavior and emotional development. Teachers are now expected to be aware of the emotional challenges children face and are required to have the methods to deal with them. The increase in diagnoses of Attention Deficit and Hyperactive Disorder (ADHD), stress disorders, depression, and anxiety among students place more demands upon teacher's knowledge and skills.

The purpose of this article is to present results of a formative evaluation of whether participation in a mindfulness training program affected students' outcomes on measures of attention. This article discusses the incidence of life-stressors and their influence on the ability to maintain attention as experienced by children. It is hypothesized that even with the increase in stress and overload of incoming information, children and teachers can still benefit from mindfulness training by dealing with stress more effectively and increasing their ability to focus. This article reports on the design, implementation, and formative evaluation of a mindfulness-based training program at the elementary school level.

THEORETICAL BACKGROUND

For the purposes of this discussion, our definition of mindfulness is derived from the literature as a function of an individual's conscious, purposeful choice and ability to be fully aware in the present moment (Hanh, 1976; Nyanaponika Thera, 1972). By "fully aware," we mean that mindful-awareness corresponds with all types of sensation awareness: Visual, auditory, gustatory, tactile, cognitive, consciousness, and emotional human sensory features. By being fully aware, one is not dis-

tracted by any intrusive thought brought about by the experience of any internally or externally generated stimulus.

The primary element of mindfulness practice is a focus on the breath. Other key elements are the ability to tune into events occurring within the body and mind, and the act of being a witness to one's own personal experience. Breathing has been reported to regulate the autonomic nervous system, focus the mind and increase self-awareness. Rhythmic breathing not only affects the autonomic nervous system, but also focuses the mind and increases levels of self-awareness (Davidson et al., 2003; Salmon, Santorelli, & Kabat-Zinn, 1998).

Mindfulness and Children

If students can learn to be “fully-present,” they can increase the quality of their learning performance by being more focused, and become better able to deal with stressful situations (Langer, 1993). When a student is mindful, he or she becomes able to approach learning situations from a novel perspective while drawing upon previously learned material (Langer, Hatem, Joss, & Howell, 1989).

In a study of mindfulness practice in the classroom, Richart and Perkins (2000) state:

For generations, educational philosophers, policy-makers and practitioners have decried the mindlessness of schools and their tendency to stifle creativity, curiosity, and enthusiasm while nurturing passivity and superficial learning (p. 28). . . . Let us look at an example of a math lesson from a traditional didactic instructional classroom and a mindful “constructivist” classroom where students had more freedom to explore answers on their own. Second grade students were given the following problem: *There are 26 sheep and 10 goats on a ship. How old is the captain?* 88% of the students from the traditional classroom settings answered “36.” Not one student commented that the question did not make sense although they averaged in the 85th percentile on standardized tests. In contrast nearly a third of the students in the more mindful “constructivist” classroom questioned the sense of the problem. (p. 29)

When we are mindful, we can both implicitly and explicitly (1) view a situation from several perspectives, (2) see information presented in the situation as novel (3) attend to the context in which we are perceiving the information, and eventually (4) create new categories through

which this information may be understood (Kabat-Zinn, 1990). In their discussion of the construction of a psychometric instrument for measuring individual propensity toward mindfulness as a personality trait, Bodner and Langer (2001) noted:

The same behaviors resulting from habits, mindsets, and other routines may be enacted when in a mindful state; however, these routines are now available for revision if the situation warrants. Thus, mindfulness can be defined as a personality trait where one has the propensity to be open to novelty, attentive to distinctions, sensitive to context, aware of multiple perspectives and oriented in the present. (p. 1)

Mindfulness can further be conceptualized as a cognitive state, or a process, where mindfulness trait components are more readily employed on certain occasions and under certain conditions (Mischel, 1968; Zuckerman, 1976). Having the individual propensity and opportunity to continually process information from various perspectives can add to one's knowledge base and increase levels of creativity. Schools that employ mindfulness-based training generally view students and teachers as partners in the learning experience. When students use mindfulness in their learning processes, they utilize creativity, experience cognitive flexibility, and are able to better use information to enhance memory for instructional retention. As a result, individuals tend to feel more in control of their lives (Langer, Hatem, Joss, & Howell, 1989; Thornton & McEntee, 1995).

Historically, children have been taught to memorize course content and view what is being offered in the classroom from the teacher's perspective. As much as we like to see things from a different perspective, we also become trapped in habits of seeing things in the same way over and over, screening out much of our personal experience. This screening out process dramatically limits the integration of new material with the old. Children need to make sense of what they learn instead of solely memorizing facts. When we nurture our sensitivity to experience, we enhance the integration of creativity and flexibility, or right brain activity, in tandem with sequential ordering and analytic ability, or left-brain activity. When students are taught from within a mindfulness framework, the teacher also benefits from becoming receptive to the students' many perceptual frameworks for instructional material (Adams, 2002). An individual's evolving capacity to see the world from another perspective is an important milestone in cognitive development (Langer &

Moldoveneu, 2000). Steins and Wicklund (1996) highlight an example of the need for openness to others' perspectives:

If we assumed that people behaving differently from us are not inferior, but rather are viewing the same stimulus differently, we could take advantage of the different perspective that they offer. When we use a single metric for excellence, it becomes hard to seek or take the advice of someone implicitly, if not explicitly, deemed deficient. It is ironic that we can have an option of some or some group being inadequate to solve a problem for which we don't know the answer to ourselves (I don't know, but I'm sure you can't know). (p. 132)

As opposed to solely memorizing a plethora of facts, children can be taught in a fashion where they may experience surprise and delight, enlivening the learning experience. In a study of teachers who practiced mindfulness in the classroom, Napoli (2004) found that teachers who developed a mindfulness practice were able to create positive changes both in and out of the classroom. Students who practiced mindful breathing in those teachers' classrooms reported benefits as well. They were better able to focus and relax, reduce anxiety before taking a test, make better decisions when in conflict, and were more easily able to redirect their attention when off-task.

Increasing our children's capacity to pay attention is the goal of mindfulness training; yet, there are other residual benefits that have been found. The handful of programs that have been implemented incorporating mindfulness with children have shown success in reducing anxiety and disruptive behavior, and improved concentration and self-control in children (Feindler, Marriott, & Iwata, 1984; Fluellen, 1996; Ryan, 2000).

Stress and Children

Individuals develop patterns of stress response from birth through continued interaction with the environment. Young (1995) acknowledges that educators today recognize that students are suffering from stress in very different ways than a decade ago. Children's perceptions of life events have a direct influence on the learning process and academic performance (Langer & Imber, 1979). Physiologist Walter Cannon (1939) alluded to the acute stress, or "fight or flee (flight)" response in terms of the autonomic emergency response to an individual sensing

danger. The hormone epinephrine (adrenaline) floods through every tissue in the body, which is fundamentally critical in an emergency situation and prepares an individual to fight or flee (Dreher, 1996). When the emergency response process is occurring, learners tend to utilize more of the midbrain, which is responsible for controlling sensory processes. During periods in which the midbrain is primarily engaged, higher-ordered cognitive processes are generally inactive (Badre & Wagner, 2002). Generally, during these stressful occurrences, meaningful learning is infrequent. Too often teachers and children activate this emergency response for non-emergency situations, such as being late for an appointment, preparing for a test, or misplacing a book. If these stress hormones are continually released, the body remains in a physical state of overdrive, which may eventually result in a depleted immune system and a cycle of exacerbated stress.

The literature indicates that children are under a great deal of external pressure both at home and in school, resulting in many of the same physiological symptoms of distress as adults (Miller & McCormick, 1991). While much of the research on children and stress was conducted two decades ago, available research indicates that environmental stress negatively affects children. For example, in a study that followed seven- and eight-year-olds for two to four years, researchers found that increases in stressful life events were related to decreases in ratings of academic performance, though unrelated to ratings of social behaviors (Kiselica, Baker, Thomas, & Reedy, 1994). With the increase of external social problems, stress-related health problems such as asthma, stomach disorders and headaches are increasing in children. Schools are now compelled to address this widespread problem. Teaching techniques to children for dealing with stress may be particularly important in schools surrounded by environmental stressors such as violent neighborhoods, unsafe or dilapidated housing, and worries related to obtaining adequate resources to meet basic needs. Stress-reduction skills also are critical for children who experience stressors related to classism, racism and religious oppression. Not only do we see these problems concentrated in the inner city, but on Native American reservations and in mainstream communities, too (Krech, 2002).

Childhood stress is a precursor for stress as adults because we carry the patterns we learn as children into adulthood. Incorporating tools for stress reduction and relaxation is essential and needs to be an integral part of the effective education of teachers and children. A common approach to stress reduction is to elicit what Herbert Benson (1975) termed the "relaxation response." The relaxation response involves

bodily changes when one experiences deep muscle relaxation. This response is a naturally occurring measure against *overstress* bringing the body back to a healthier balance. Focusing on the breath is a simple and effective way to achieve concentration, awareness and relaxation.

Research indicates that incorporating stress reduction programs into the school curriculum is associated with improvement of academic performance, self-esteem, mood, concentration and behavior problems (Ballinger & Heine, 1991; Dendato & Diener, 1986; Kiselica, Baker, Thomas & Reedy, 1994; Napoli, 2002; Shillingford & Shillingford-Mackin, 1991). For example, one study found that progressive relaxation training significantly lowered trait anxiety levels and improved the mood states of junior high school students (Cheung, 1999). In another study, relaxation/cognitive therapy was found to be effective in reducing anxiety among test-anxious students, though test scores did not improve significantly (Dendato & Diener, 1986). Another study of third-, fourth-, and fifth-grade students found that children who participated in mindfulness training reported positive changes in behavior, mood, and attitude after being taught to pay attention to their breath (Napoli, 2002). Children in this study also reported feeling more relaxed, experiencing reduced tension and anxiety.

Attention and Children

Attention is the foundation of most cognitive and neuropsychological functions in our lifestyle (Cooley & Morris, 1990), where multitasking has become the norm. Children also are multitasking as they face information overload due to watching hours of television, surfing the Internet, and playing video games—often simultaneously.

Multiple studies increase our understanding of the factors involved in children's ability to direct their attention. Not surprisingly, developmental research indicates that children's attention to specific information depends upon the importance they place on the information and that children in later states of development are better able to logically control their selective attention (Wright & Vliestra, 1975). Other studies have found that children were more likely to stay "on task" in the presence of their teacher (Raessi & Baer, 1984) and with activities that were self-controlled (Larson & Kleiber, 1993).

Little is known about interventions that may increase children's abilities to selectively focus attention. Semrud-Clikeman et al. (1999) studied ADHD children for eighteen weeks using attention and problem solving training. The intervention group showed improved performance

on visual and auditory tasks on re-test and the control group showed no improvement.

In order for children to learn in the classroom, they must be able to focus their attention. Mindfulness—one technique for focusing our attention—allows us to perceive multiple perspectives on a situation, recognize the novelty of current information, become aware of the context of the information, and better understand the information through the creation of new categories (Kabat-Zinn, 1990). Such outcomes undoubtedly would allow students to increase their learning. Indeed, studies show that learner-centered classrooms that use mindfulness as a core ingredient in the student's learning experience lead to students who are able to transfer material learned to new and novel situations, are more creative, and think independently (Richart & Perkins, 2000; Thornton & McEntee, 1993; Wong, 1994). Mindfulness training thus is one strategy that has the potential to assist students to alleviate the negative effects of environmental stressors by focusing their attention on the moment so that they can fully focus on classroom activities. If students develop their attention skills, teaching and learning can become more meaningful.

Bringing mindfulness into the classroom can increase students' ability to maintain their attention, which evidence suggests will lead to decreased stress and increased learning. This study thus examines whether students' participation in a mindfulness-training program increased their ability to maintain their attention.

ATTENTION ACADEMY PROGRAM DESCRIPTION

The mission of the Attention Academy Program (AAP) was to help students improve their quality of life through practicing mindfulness. The goals of the program were to help students learn to (1) increase their attention to the present experience, (2) approach each experience without judgment, and (3) view each experience as novel and new with a "beginner's eye." As described below (see Method), the classes met for 45 minutes bimonthly during students' regular physical education class period. The facilitators, Trainer A, female, and Trainer B, male, have been professionally trained as mindfulness training instructors. Trainer A was trained in the Center for Mindfulness Program in the Southwestern U.S. She has been teaching mindfulness to school-age children since 1997. She has developed curriculum for undergraduate students that include a mindfulness practice, and has written two workbooks and re-

corded one CD on the practice of mindfulness for adults and children. In addition, Trainer A has presented research and program development on mindfulness both nationally and internationally at conferences and workshops. Trainer B was trained as a Mindfulness Practice® facilitator at the Center for Mindfulness, in Massachusetts. He has been teaching mindfulness practice for twenty years in corporate, education and health nationally. Appendix A provides information about the exercises utilized in the classes.

METHOD

Sample Recruitment and Study Participants

The trainers and research assistants visited a total of nine classrooms within two elementary schools in a U.S. Southwestern city to conduct introductory information sessions. School administrators and the trainers had a pre-existing professional relationship and a positive rapport based on previous collaborative projects within the school district. The 254 first, second, and third grade students and the eleven teachers were addressed as groups in their intact classroom settings. The students were administered parental consents both in English and Spanish prior to conducting the initial survey. Explanatory letters and permission slips were given to over 300 students in the nine first, second, and third grade classrooms, and a total of 228 parental permission slips were returned for specific student inclusion in the training. Of those children, 120 were males and 108 were females. Students then were chosen at random to be placed in the experimental group (those who received AAP training) ($N = 114$), or control group (those who received no AAP training) ($N = 114$). Completion of the program required that each of the students attend a total of 12 AAP training/control group sessions. Thirty-four students missed more than one training/control group session and so are excluded from this analysis. A total of 194 students completed the program ($N_{experimental} = 97$, $N_{control} = 97$) and are included in the data set.

The 12 each bi-monthly AAP training sessions were held over a period of 24 weeks from September 2000 through May 2001. The trainings for the experimental group were conducted in a separate classroom from the room where the control group participated in reading or other quiet activities. Preparing the room for the AAP training involved moving desks and chairs to the side, and opening a large

space in the middle where students could place a mat or blanket and sit on the floor. Exercises such as paying attention to the breath, movement activities and sensory stimulating activities were used to facilitate “being in the moment” (see Appendix A). The sequential structure of the classes was: breathing exercises, a body-scan visualization application, a body movement-based task, and a post-session de-briefing or sharing of instructor feedback with the class.

Design and Procedure

Prior to and at the end of the 24-week AAP, each child either completed or was measured with four established measures: The ADD-H Comprehensive Teacher Rating Scale (ACTeRS) (Ullmann, Sleator & Sprague, 1997), the Test of Everyday Attention for Children (TEA-Ch), which utilizes 5 subtests measuring sustained and selective attention (Manly, Nimmo-Smith, Watson, Anderson, Turner, & Robertson, 2001), and the Test Anxiety Scale (TAS) (Sarason, 1978). Difference scores between pre-test and post-test measures were computed and standardized for use in analysis.

Instruments

ADD-H Comprehensive Teacher Rating Scale (ACTeRS). The ACTeRS is a screening instrument developed by researchers at the University of Illinois Institute for Child Behavior and Development, and standardized on approximately 4,000 teacher ratings of children in kindergarten through eighth grade. The ACTeRS utilizes a teacher rating form with 24 items and 4 subscales: Attention, Hyperactivity, Social Skills, and Oppositional Behavior. The chief goals of the ACTeRS are (1) assessment of classroom behaviors, (2) diagnosis of ADHD, and (3) evaluation of an individual student’s behavior before and after an intervention. We utilized the ACTeRS with the first and third goals in mind, as these make it an appropriate measure for non-ADHD populations (Ullmann, Sleator, & Sprague, 1984).

Test Anxiety Scale (TAS). The second scale was adapted from the Test Anxiety Scale (Sarason, 1978), which contains 14 items that measure general debilitating test anxiety. The original TAS asks students to respond in a true-false format. The modified version used in this study asks students to respond to a 4-point Likert-type format, ranging from strongly disagree to strongly agree. The instrument has four subscales: (1) self-evaluation, (2) worry, (3) physiological reactions, and (4) con-

cerns about time limits or constraints. The test-retest reliability of this instrument is .86.

Test of Everyday Attention for Children (TEA-Ch). Two major subtests of the TEA-Ch including 5-sub tests included within are described below.

Selective (visual) attention measures:

1. *Sky Search*. This subtest challenges students to scan a visual field filled with various shapes of spacecrafts. Students then are asked to find all the pairs where the two spaceships are the same. The presence of many distractors makes the search slow and a serial process. An item total score is generated by subtracting the age-scaled accuracy score from the age-scaled time-per-target score, based on number of correct pairs of targets identified and the time it takes to perform the task. The published reliability for this subscale = .90.
2. *Map Mission*. The test authors were concerned that the task may be more sensitive to differences in children's motor skills than their attention, and therefore developed a motor-control version of the task. Here all the distracting spaceships are removed. Children don't need to search as every pair they can see are targets, so this is really a test of how quickly they can move their hands around the sheet. We again calculate a time-per-target score. By subtracting this 'motor' time from the time-per-target on the first task we get a better estimate of the attentional component to the task. The published test-retest reliability for this subscale = .88.

Sustained attention measures:

3. *Score!* This is a child's version of a well-validated measure of sustained attention, consisting of a 10-item tone-counting measure. Children have to keep a count of the number of "scoring" sounds they hear on a tape, as if they were keeping the score on a computer game. It is therefore a good test of the child's ability to *self-sustain* his or her attention. Students silently count the number of tones heard on a tape and total them at the end of the task. The published test-retest reliability for this subscale = .64.
4. *Walk, Don't Walk*. This subtest requires periodic and unpredictable holding of an expected task. The students are given a sheet showing "paths" each made of 14 squares. They are asked to listen to a tape that will play one sound (a "go" tone) if the move to the next square should be made and another sound (a "no-go" tone).