

## **Erratum**

The following acknowledgment should have been included in the article “Mindfulness Training for Elementary School Students: The Attention Academy,” by Maria Napoli, Paul Rock Krech, and Lynn C. Holley, which published in the *Journal of Applied School Psychology*, 21(1), pp. 99–125:

Special thanks to Paul Sugar who was instrumental in leading the training program, developing curriculum, and facilitating the classes for this project. Thanks to the Arizona State University College of Public Programs for supporting the development and implementation of the program through the Dean’s Incentive Grant.

# 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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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).

The students are then instructed to listen to the entire tone before they make their marks. The “go” tones were presented in rhythmic fashion, whereas the “no-go” tones occurred unpredictably, for a total score of 20. The published test-retest reliability for this subscale = .73.

5. *Code Transmission*. The Code Transmission subtest is designed to be a vigilance task in which students monitor a stream of continuous information for the occurrence of a rare target. In this case, the children monitor a series of monotonous visual digits (i.e., 1, 1, 1 . . . ) and for the occurrence of a particular target sequence (2, 2). Following a practice sequence to see if the students understand the directions, different targets ( $n = 40$ ) were presented over the duration of the task. The published test-retest reliability for this subtest = .82.

### ***Procedure***

All students were seen for one session during which the ACTeRS, TAS, and TEA-Ch attention subtests were completed. The total duration of testing was approximately 1 hour, although this would vary with the amount of demonstration and practice required by each child. The remaining students were then retested using the TAS and TEA-Ch attention subtests at 24 weeks. Teachers completed the ACTeRS prior to the training and following the training. A total of 194 pairs of data sets were utilized at the end of the study, with 97 respondents in each of the control and experimental groups. We used SPSS-Compare Means to analyze the data set for each group on pairs of pre-test and post-test difference scores.

## ***RESULTS***

Paired  $t$ -tests were conducted for each group on the pre-test/post-test measures and showed statistically significant results for TEA-Ch selective attention subscale ( $t_{\text{diff}} = 7.94, p < .001$ ), the ACTeRS Attention Subscale ( $t_{\text{diff}} = -8.21, p = .001$ ), the ACTeRS Social Skills Subscale ( $t_{\text{diff}} = -7.19, p = .001$ ), and the Test Anxiety Scale ( $t_{\text{diff}} = -1.34, p = .007$ ) (see Table 1 for information about correlation between difference measures). The TEA-Ch Sustained Attention subscale showed a non-significant difference between groups pre- and post-test and non-significant pre-post differences.

TABLE 1. Correlations Between Difference Measures

Difference Measure	ACTeRS Attention	ACTeRS Social Skills	Test Anxiety Scale	TEA-Ch Selective
ACTeRS Social Skill	.948*			
Test Anxiety Scale	-.479*	-.445*		
TEA-Ch Selective	.712*	.708*	-.412*	
TEA-Ch Sustained	.514*	.463*	-.314*	.389*

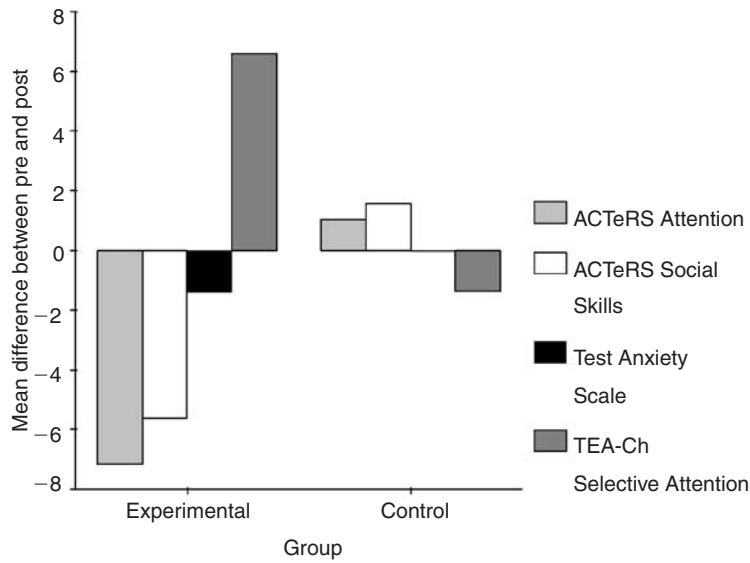
\*Significant at  $p < .001$   
 $N = 194$

This finding indicates that there were statistically significant changes of score differences between control and experimental groups in the negative direction for ACTeRS subscale scores, indicating fewer problems noted by teachers. Likewise, we see a decrease in test anxiety scores, and an increase in selective attention scores. As seen in Figure 1, the experimental group performed better than did the control group post-intervention. Table 2 presents the mean differences, standard error of differences,  $t$  and  $p$  values, and Cohen's  $d$  effect size for these analyses.

### *Limitations of the Study*

It was indeed difficult to find instruments that were appropriate measures of classroom attention traits that were suitable for non-ADHD children, but the ACTeRS and the TEA-Ch were appropriate for the purpose. We would suggest the use of smaller numbers of pre and post children (e.g.,  $N = 10$ , for both control and experimental groups) as well as adding gender and ethnic differences to obtain more interestingly explorable data. The literature on the ACTeRS, TEA-Ch and TAS scales indicated that they would be appropriate for our purposes. We also believe that the use of an *a priori* pre-test covariance structure to statistically control for naturally occurring group differences would be appropriate. By utilization of this method, a pretest would be employed followed by random assignment to treatment groups based on the results of the pretest; this procedure might lead to a higher degree of power of the test. Since this article is based on a formative evaluation of

FIGURE 1. Bar chart of significant mean differences for group change scores pre- and post-test.



Note: Lower scores on ACTeRS subscales indicates fewer problems noted by teachers, and less reported test-anxiety. Higher scores on TEA-Ch selective attention scores indicates an increase in ability to selectively pay attention.

TABLE 2. Paired t-Test for Pre- and Post-Test Difference Measures Between Groups

Measure	Mean Difference	S.E. Difference	<i>t</i>	<i>p</i>	Cohen's <i>d</i> Effect Size
ACTeRS Attention	-8.21	2.41	-3.41	.001	0.49
ACTeRS Social Skills	-7.19	2.18	-3.30	.001	0.47
Test Anxiety Scale	-1.34	0.50	-2.71	.007	0.39
TEA-Ch Selective:	7.94	1.90	4.17	< .001	0.60
TEA-Ch Sustained	2.07	2.21	0.94	.350	n/a

Equal variances assumed

\*Significant at  $p < .001$

$N = 194$

a program, however, we believe the methods used are appropriate for the scope of the project.

### ***DISCUSSION AND IMPLICATIONS***

The data from this experiment provided initial support for the prediction made, based on previous supporting literature, that a difference for group performance would be evident through the practice of mindfulness practice training. The results showed a statistically significant difference between experimental and control groups as assessed by the measures. It appears that an increase in selective attention or the ability to choose what to pay attention to, and a reduction of both test anxiety and teachers' ratings of students' ADHD behaviors provided the greatest variance in terms of performance improvement. The ability to hold attention, or measures of sustained attention did not make as great a contribution to overall score variance as did the other three attentional measures. Some threats to validity exist for our sample under these particular conditions. It was indeed difficult to find scales that were appropriate measures of classroom attention traits that were appropriate for non-ADHD children.

Hanh (1976) suggests, "If in one class, one student lives in mindfulness, the entire class is influenced." Incorporating mindfulness training into the physical education curriculum as health education is an ideal way to begin teaching children at an early age how to deal with stress and anxiety and focus and pay attention. Shillingford and Shillingford-Mackin (1991) state that "in many schools, gym is a time during which the overworked classroom teacher may have 30 minutes to prepare for the rest of the day or simply to have a brief rest. However, a teaming of the classroom teacher and physical education teacher may do a great deal toward the development of a child's self-image" (p. 465).

Because techniques such as attention to breathing are compatible with all religious traditions (Canda & Furman, 1999), they hold promise for helping children who are diverse in ethnicity, social class, and religion to develop important skills. Such skills might be particularly useful in schools with Indigenous children and youth. While First Nations Peoples are extremely diverse culturally (Weaver, 1998; Yellow Bird, 2001), spiritual approaches to healing are prevalent. As described by Yellow Bird (2001), "In the past and present times, Indigenous Peoples have used spirituality to overcome despair and cope with the oppression brought on by forces outside their cultures" (p. 66).



Some traditional cultural qualities that appear to be prevalent among many First Nations suggest that certain stress-reduction techniques are particularly compatible with these cultures. In particular, the prevalent Indigenous quality of being in the present time (Slattery, 2004) is congruent with mindfulness. The quality which Lakota writer Brave Heart (2001) calls "silence and observance" (p. 164) also is highly consistent with attention techniques. Although no research has been conducted comparing such Indigenous qualities with the goals or techniques of mindfulness, similarities suggest that these practices may be mutually reinforcing. Implementing mindfulness training for Indigenous children appears to be culturally congruent. This congruence may result in children's cultural qualities being supported and encouraged. This encouragement may assist them in feeling valued in a school environment that may in other ways feel unsupportive or hostile toward their communities and cultures. This sense of support, combined with increased academic success that may result from mindfulness, may lead to a stronger attachment to school. If effective, such techniques may be one component of efforts to reduce the rate of youth who leave school before graduation.

Findings from this study also have implications for future research. First, future studies may consider ways of addressing the limitations of the current study (described above). Second, studies need to examine whether similar programs also are effective with younger and older youth. Third, future studies could explore whether including parents and other family members in mindfulness programs might assist families in dealing with environmental stress, thus creating more nurturing environments for youth.

With increases in stress, depression, and anxiety that often are caused by forces beyond children's control, it is vital that children learn techniques for reducing feelings of stress. Creating wellness through a mindfulness program as part of the school can become an integral part of school life. The consistent reinforcement of using the mindfulness activities in each class will have long lasting effects and can filter through the children's school experience and personal lives.

Students in elementary school generally do not have curriculum content related to health. Unfortunately, most of this information is left for middle and high school. Integrating a mindfulness practice training program into the physical education curriculum can be an excellent model to offer students life skills to deal with stress and increase attention skills in the classroom. In addition, if a mindfulness practice program were implemented in the physical education curriculum, all students

would receive the tools since all students receive physical education. The time allotted for mindfulness practice would depend upon the school.

The training for the physical education teachers can assist them in managing the classroom and increasing their ability to focus. Napoli (2004) found that teachers who received mindfulness practice training were able to add depth to existing curriculum by focusing on key ideas, were better able to prioritize and prepare class material and were better able to focus in implementing instruction.

Teachers can apply the mindfulness practice training toward continuing education and faculty development credits which are often needed toward raises and promotions. Parents and school administrators can also have the mindfulness training. If these teachers, parents and school personnel practice mindfulness they can transfer these tools to the children which can be instrumental in reducing behavior problems, test-anxiety, performance anxiety, improving self confidence by reducing feelings of helplessness, and improving self image by experiencing a sense of competence in problem solving.

Children today must make decisions that previous generations never considered, many of them life threatening. Shillingford and Shillingford-Mackin (1991) discuss how a wellness-training program can help develop a positive self-image, one of the best preventative tools a child can possess. Including mindfulness training in the school curriculum will in the long run save time for teachers. When children are able to deal with situations more effectively teachers may have fewer interruptions during the day and more tools to deal with situations that do arise.

Creating wellness through a mindfulness program as part of the school can become an integral part of school life. A Midwestern school has developed a wellness program that focuses on the importance of improving the entire school environment as a significant way to enhance students' wellness and safety. Gallagher and Satter (1998) state that "when students, faculty, and community members nourish relationships, caring communities develop" (p. 11).

### ***Implementing a Mindfulness Program in Primary and Secondary School Settings***

The activities of the AAP are geared toward physical, sensory, social and cognitive areas, offering a comprehensive experience for students. Teachers, social workers, psychologists, nurses and other service profes-

sionals can be trained to facilitate a mindfulness practice program such as the Attention Academy Program described in this paper. In addition to students, all school personnel can be trained to develop a mindfulness practice. Training can be accessed in several ways: (1) participation in the eight-week mindfulness stress reduction program developed by Jon Kabat-Zinn, which has trainers nationwide; (2) self-education about mindfulness practice through readings (see Recommended Resources); and (3) participation in workshops that offer mindfulness training (see Recommended Resources).

Based on the experience of the AAP, the physical education curriculum appears to be an ideal place for implementing such a program. Although students and teachers can greatly benefit from ongoing mindfulness activities in the primary classroom, teachers have a great deal of required curriculum to cover during the academic year. In addition, there are too many classes in one school to reach all of the children in the primary classroom. Housing the AAP in the physical education curriculum appears to be cost effective since all students take physical education. Further, because there are fewer physical education teachers, all students can be reached through fewer trained staff. Other staff such as the school social worker, psychologist, nurse, or other educator or health professional also might be logical choices for the program facilitator position. Other school personnel and parents can benefit from developing a mindfulness practice by participating in workshops facilitated by school personnel. This will not only offer tools for the parents, but will reinforce what their students are learning.

Wherever the program is implemented, the facilitator should keep in mind that repetition of the practice is key to actually developing mindfulness. A consistent series of 8-10 classes is needed for a basic development of the practice. The more students practice, the more integrated mindfulness will be in their lives.

In conclusion, we offer four guidelines for AAP facilitators. The facilitator needs to (1) take a mindfulness training workshop and or read about mindfulness (see Recommended Resources for Facilitators, below), (2) make a commitment to practice mindfulness in her/his daily life, (3) create a program of activities that fits within a time schedule that is workable (see Appendix A for suggestions), and (4) keep the concept of mindfulness simple: *paying attention to what's happening now without judgment.*

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**RECOMMENDED RESOURCES FOR FACILITATORS**

## Books and CDs:

- *Tools for Balanced Living Workbook and CD: A Mindfulness Practice* by Maria Napoli. (2002) Scholarly Press, Tempe Arizona.
- *Mindfulness Practice Workbook for Children: A Guide for Teachers, Parents and Those Who Love Children* by Maria Napoli (2004) Scholarly Press, Tempe, Arizona.
- *The Miracle of Mindfulness* by Thich Nat Hanh. (1987) Boston, MA: Beacon Press.
- *Full Catastrophe Living*, Jon Kabat-Zinn (1991) Delecorte Press, Boston.

## Facilities that offer mindfulness workshops:

- Stress Reduction Clinic, University of Massachusetts Medical Center, Boston, MA
- Scottsdale Institute for Health and Medicine, Inc. Scottsdale, AZ.
- Kraal Center for Yoga and Health, Lenox, MA
- Omega Center, Rhinebeck, NY
- Check internet for other training opportunities in your area

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APPENDIX A  
*Attention Academy Program Considerations and Activities*

**Time Considerations**

AAP mindfulness practice class activities can be offered daily, weekly or biweekly. The classes can be offered for a full class period of 40 minutes, or for a 30-, 20-, or 10-minute portion of the class. The key is continuous practice and repetition both in the classroom and in the student's personal life. Depending on the time available for the class, the following time allocations might be followed.

Exercises	Minutes of Each Class			
	3	6	9	10
<i>Mindfulness reminder and smile</i>	3	6	9	10
<i>Breathing</i>	1	2	3	5
<i>Physical Activity</i>	3	6	9	15
<i>Sensory Activity</i>	3	6	9	10
Total Minutes for Class	10	20	30	40

**Essentials of Curriculum**

Each activity is geared toward directing students to focus on what they are *aware of in the experience*. The facilitator is continually reminding the students to pay attention to their breath, their thoughts, or some other element(s) of their current experience. Following are some essential elements of each class session:

- Each class begins with a discussion of mindfulness.
- Students practice a breathing exercise (e.g., count breaths, three part breath)
- Students practice a physical exercise (e.g., stretching, dancing, walking)
- Students practice a sensory activity (e.g., noticing smells, sounds)

**Sample Activities**

**MINDFULNESS DISCUSSION**

*How did you use mindfulness this week?*

*What are words to describe mindfulness?*

*What are you aware of today?*

**BREATHING EXERCISES**

*Three part breath*

1. Get comfortable, sit with your back straight and chest lifted or lie down on your back.
2. Slowly take the breath in through your nose.
3. Notice how the breath moves from the lungs from your tummy, ribs, chest and shoulders. Notice your belly filling up like a balloon.
4. When you exhale, let the breath ooze out of your lungs slowly, like a balloon losing its air, until they are empty.



## APPENDIX A (continued)

**BREATHING EXERCISES***Ocean breath (Ujai)*

1. Get comfortable, sit with your back straight and chest lifted or lie down on your back.
2. Slowly take the breath in through your nose.
3. Let the breath out keeping your mouth closed making the ahhhhh sound (feel the back of your throat pushing while making the ocean sound).
4. Try taking in longer breaths and longer exhalations as long as you're comfortable.
5. Listen to your personal ocean, imagine your own boat, and let the waves sweep you away.

*Counting breaths*

1. For one minute, count how many breaths you take. One breath equals an inhalation plus an exhalation. Go around circle and say how many breaths each person took.
2. For one minute listen to all sounds outside of yourself that you hear and write them down. Go around circle and share.
3. For one minute, listen to all the sounds you hear inside yourself, such as stomach growling, swallowing, etc. Write down each sound you hear. Go around circle and share.
4. Count your breaths again for 60 seconds. Has it changed from the first time we did the exercise?

**PHYSICAL ACTIVITIES***Yoga stretches/positions* (see Appendix B for selected examples)*Body Scan*

Guide students to pay attention to each body part while staying with the breath: feet, ankles, calves, shins, knees, thighs, hips, belly, neck, back, arms, and throat. Instruct students to notice what's happening as student moves their attention along the body.

*Movement Activities* (see Appendix B for selected examples)**SENSORY ACTIVITIES***Aromatherapy*

Make groups of 4 to 6 students. Each makes three columns on a piece of paper. Label the first column "thoughts," the second column "body" and the third column "feelings/emotions." Pass around different scents and, after smelling each, write down what the smell made you think of in the first column, how the smell made your body feel in the second column, and in the third column what feelings or emotions the smell may have triggered. Share with one another your responses.

*Listening to sounds*

For 2 minutes, pay attention to sounds you hear.

*Stand outside classroom—smell, feel, touch, taste the air**Listen to the sounds of your breath**Bring in various types of fabric; feel and see the differences**Bring in various types of food; smell, touch, taste, and see the differences**Bring in various types of plants; smell, touch, hear, and see the differences*

**THOUGHTS AND COMMUNICATION***Thought awareness activity*

Leader reads a question to students and they write their response. Then go around circle and share responses after each question. Examples of questions are (1) Sometimes I like to think and sometimes I don't like to think. What do I think about most often? (2) In school we learn to think. My favorite subject to think about is what? Why? (3) I am allowed to have my own thoughts. Sometimes what I think is different from what my friends and family think. What is an example of this?

*Communication and listening exercise*

(1) Take about 1-2 minutes to tell a partner what you liked about Mindfulness Class, did not like about it, what you would have liked to have done, etc. Partner listens very carefully while the first person talks. (2) Partner repeats back to first person what she/he said (2 minutes). (3) Switch roles.

*Guided imagery*

Students are guided into an experience and are asked to focus and pay attention to their experience, breathing, body, senses, thoughts, etc.

**Sample Lesson Plan: Session 4<sup>1</sup>**

Purpose: Using Movement Mindfully

Focus: Paying attention to how our bodies feel and how we feel emotionally

1. Mindfulness

Ask students what they have been aware of today

2. Smile Exercise

3. Paying Attention to Your Breathing

Lie on floor on your back in a circle with feet toward center of circle. Put hands on belly. Breathe for one minute.

4. Body Scan (see above description)

5. Physical Exercises (repeated from previous classes) (see description in Appendix B)

6. Listening and Movement Exercise with Music (see description in Appendix B)

7. Smiling Circle Exercise

Sit in a big circle. Breathe in and out. With each breath, smile a little bit. Smile a little more with each breath until your smile gets as big as possible. Make eye contact and smile at each person in the circle.

<sup>1</sup>All of the above activities can be modified according to the facilitator's interest, experience, and creativity. The key focus of all activities is *paying attention to the experience without judging what's happening*.

## APPENDIX B Descriptions of Selected Physical Activities

### Yoga Stretches/Positions

#### *Standing Postures*

Palm Tree – Stand with your feet together, arms at your sides. Lift your right arm above your head. Rise up on your toes while stretching your left arm down. Repeat with left arm up.

Seed to Tree – Come into a squat position. Curl into a tight ball, like a seed. Take a deep breath, begin making tiny movements as you unfold from the seed into a full grown tree.

#### *Standing or Sitting Positions*

Shoulder Circles – Slowly roll the right shoulder clockwise, squeezing it toward the ear, then down, forward, and up. Repeat several times. Reverse direction of circle and then repeat on opposite side. Finally, rotate both shoulders at the same time, then repeat in opposite direction.

Neck Stretches – Press head away from shoulders, gently tilting head backward so chin aims at ceiling. Then bring chin forward, pressing against the chest. Feel the back of the neck open and stretch. Bring head to center, tilting it to the left, lowering the ear to the left shoulder. Turn head slightly to the side and slowly roll it back to center and then repeat on the right side. Feel the neck extend as you lean to each side.

#### *Sitting Positions*

Toe Hug – Sit down, bring your legs together and stretch them straight out in front of you. Stretch your toes toward your head with both hands.

Cat – Stand on “all fours” like a cat and lower your head, stretching your back up. Breathe slowly through your mouth and on the exhale, raise your head and curve the back the opposite way. Look up and repeat several times.

#### *Lying Down Positions*

Bike Ride – Lie down on your back with your legs lifted off the floor. Rotate your legs in a circular motion as if you are riding a bicycle. Now add your hands – have fun and add a bit of laughter, too. 😊

Knee Press – While on your back, bend your right knee toward your chest and wrap your arms around it as you bring it to your forehead. Press for 3 seconds and repeat with alternate leg. Try pressing both knees now!

Bow - Lie on your stomach. Bend your legs and lift your feet off the floor. Reach behind and grab your feet or ankles with your hands. Pull your legs in close to you. Look up. Then pull on your feet and try to lift your knees off the floor and stretch your body like a bow. Slowly come down toward the floor, unfolding your legs.

#### *Hara Breaths*

The Hara – To fully experience the posture, start each Hara exercise slowly, deepen breath, let out any natural sounds, stay relaxed and loose, slowly picking up the pace. On the exhale, let the sound of **HA** become increasingly strong. The **HA** sound is a forceful exhaling release. Allow yourself to let the sound go free if it happens. Hara postures are energizing and invigorating!

Brushing Floor – Stand with feet comfortably apart, swinging arms forward and back. Keep knees slightly bent, press feet into ground, exhale HA as you bend forward brushing floor with fingertips. Inhale, return to standing as you swing arms up over head and repeat. Lightly bounce the knees and ankles as your arms swing down and again as the arms swing up.

### **Movement Activities (Qi-gong)**

Listening and Movement with Music – Play a song for approximately 30 seconds. Just listen to the music. How do you feel now? Play the same song again, and this time move to the music however your body wants to move. How do you feel now? Repeat using different types of music. Notice how you feel differently when different types of music are playing.

Partner Exercises – (1) Stand facing partner. One person bends her/his arms at the elbows and puts her/his hands palms facing up out in front. The other person raises her/his hands to shoulder height with palms facing out and then, moving entire upper body, swings arms downward and slaps the palms of the partner's hands and then continues the movement, following through after slapping hands, including bending the knees. Each person stays in the same position for about 30 seconds, repeating several times. Then switch positions and repeat for about 30 seconds. (2) Stand back to back. Each raises hands to shoulder height, palms facing out. Both drop arms and clap with partner. Do not look at partner. Continue trying to tune into partner and to time the hand clapping together. (3) Stand back to back. Each raises hands to shoulder height with palms facing out. Both turn to your right, keeping your feet planted. Twist around to the right until you clap hands. Then repeat, both turning to the left until you clap hands.

Corkscrew Exercise – Put right foot in front with knee bent slightly. Place left hand behind your back. Bend right elbow and put right hand palm up in front of you. Now slowly turn your right hand in toward your body. Continue turning your hand in this direction and gradually raise your arm up over your head at the same time, leaning back slightly. Pretend you have a plate on your head and do not want to drop it. Repeat exercise with the left hand.

Foot Massage – With feet planted on the floor, slowly sway from side to side, keeping your balance. Now slowly sway from front to back, still keeping feet planted and keeping your balance. Now gently massage feet by slowly moving body around in a circle while still keeping feet planted. Then move in a circle in the other direction.

Walking Exercise – (1) Everybody take 4 steps slowly in a direction of your choice, then change directions and take 4 steps in a different direction. Continue walking in this manner. Do not make eye contact with anyone, but be aware of your position and do not run into others. (2) Now clench jaw and make fists and continue walking in this manner as in step 1. (3) Relax face and arms. Now walk slowly, taking 3 steps in a direction before changing directions. (4) Same as 3, but a little faster. (5) Now take two steps and then switch directions. (6) Same as 5, but a little faster. (7) Now take 3 steps in a direction before changing and make eye contact with as many people as possible. (8) Very, very, very slowly, this time move backwards with eyes closed, taking 3 steps before changing directions. (9) Everyone spread out, leaving middle of room empty. Now again very, very, very slowly, everyone with eyes closed move toward the middle of the room and stop when you think you are there or when you are against someone else and can no longer move.

Windmill Partner Exercise – Stand back-to-back with a partner, holding hands. Together, lift arms up on one side and over to the other, then follow with other arms. Bend toward the floor, one arm followed by the other like a windmill.

Butterfly Exercise – Sit on floor. Place soles of feet together and bring them toward your body. Place soles of feet together and bring them toward your body. Flap bent legs ("butterfly wings"). Lean forward and see if you can put your elbows on the floor.

Shake Your Sillies Out – Have students focus on one body part at a time, beginning with their heads, and shake each part until they get to the feet. When they focus on the feet, have them shake each foot and then slowly stomp and rapidly pick up the pace, noticing the breath and how the body feels (i.e., temperature changing, heart beating faster, etc.).