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MINDFULNESS GOES TO SCHOOL: THINGS LEARNED (SO FAR) FROM RESEARCH AND REAL-WORLD EXPERIENCES

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Abstract

Mindfulness-based curricula are being implemented in K-12 schools across the nation. Many of these programs, although well-considered and implemented, have little or no research support for their effectiveness. Recognizing the paucity of published research in this area, a sampling of school-based programs currently being implemented in the schools is reviewed. The programs reviewed are *Inner Explorer, Master Mind* and *Moment Program, Mindfulness and Mind-Body Skills for Children, Mindful Schools, Resilient Kids, Still Quiet Place, Stress Reduction and Mindfulness Curriculum* and *Mindful Moment*, and *Wellness and Resilience Program*. We offer a summary of research support for each program and discussion of unpublished, mostly qualitative indicators of feasibility, acceptability, efficacy, and effectiveness. Strengths and limitations of each program are described, along with suggestions for bolstering informative and useful research. We encourage researchers, educators, and mindfulness practitioners to work collaboratively to conduct rigorous program evaluations.

Rising expectations of students in K-12 schools increase demands on their attention and executive functioning, but students are rarely taught *how* to pay attention. The high prevalence of childhood affective disorders (approximately 20%) may contribute to deteriorating class climates (Broderick & Metz, 2009) and increasing teacher stress (Roeser, Skinner, Beers, & Jennings, 2012). Relationships between cognitive and affective self-regulation and academic outcomes has been supported by research in neuroscience and educational psychology (Buckner, Mezzacappa, & Beardslee, 2009; Greenberg et al., 2003; Tang, Yang, Leve, Harold, 2012). Prophylactic school-wide interventions aimed at improving social-emotional resiliencies and decreasing emotional and behavioral problems are urgently needed (Semple & Burke, 2012).

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School-based universal preventative programs aimed at helping students achieve greater social, emotional, and academic success have been established. Social-Emotional Learning (SEL) and Positive Interventions and Support (PBIS) programs are two examples of these. SEL programs foster the acknowledgement and management of emotions through skills intended to develop healthy relationships, confront difficult situations, and bolster motivation to achieve academic success (Schonert-Reichl and Hymel, 2007). PBIS is a comprehensive three-tier program consisting of primary (school-wide), secondary (classroom level), and tertiary (individual) interventions. PBIS interventions are aimed at reducing or preventing school-wide problem behaviors, with individualized interventions for students who do not respond to the broader prevention and reduction strategies (Sugai and Horner, 2006). SEL and PBIS programs, however, differ from those of mindfulness-based programs in an important and fundamental way. SEL and PBIS programs teach skills "from the outside in." That is, students learn through psychoeducation, behavioral skills, and a positive school environment to self-manage their emotions to reduce risky behaviors and improve academic performance. Alternatively, mindfulness-based approaches teach students "from the inside out" to cultivate self-management of attention and increase self-awareness by focusing on intrapsychic experiences such as thoughts, emotional states, the breath, and other bodily sensations (Semple, Lee, Rosa, & Miller, 2010). The ultimate aim of most school-based mindfulness programs is to increase awareness of the influence of thoughts and emotions on speech and behaviors, and thereby enhance the likelihood of making more skillful or appropriate choices (Semple & Lee, 2011).

Mindfulness has been defined as a nonjudgmental, non-elaborative awareness of the present moment, an awareness that allows for acknowledgement and acceptance of feelings, thoughts and sensations as they arise (Bishop, 2004). Holzel and colleagues (2011) suggested that the benefits of mindfulness could be attributed to two distinct but interrelated components. The first is a regulation of attention focused on immediate experience, while the second involves "approaching one's experiences with an orientation of curiosity, openness, and acceptance, regardless of their valence and desirability" (p. 538).

A Garrison Institute report (2004) suggested that many schools adopt mindfulness approaches because the techniques are easy to learn and may help students become more responsive, calm, and focused while experiencing less stress and distractions. This report suggested that mindful classrooms might create more positive learning environments in which students are "primed" to pay attention, and consequently, are better prepared to learn. At the time, however, only a few small studies had evaluated school-based mindfulness programs. During the past few years, dissemination of mindfulness-based programs into K-12 schools has been remarkably rapid. We cannot even estimate how many schools are using any of the wide range of practices loosely described as "mindfulness" or how many children might be influenced by these practices. A cursory Google search yielded more than 4.3 million results for "mindfulness and schools." This included approximately 20,000 media reports—almost half of which have appeared in the past 12 months.

Mindfulness programs for adults have been shown to produce neurological, physiological, cognitive, affective, and behavioral benefits (see Hofmann, Sawyer, Witt, & Oh, 2010; Ivanovski & Malhi, 2007). Mindfulness may indeed produce a host of short- and long-term

positive outcomes for children and adolescents as well. At present, however, the evidence base for this is limited and inconclusive. After reviewing child and adolescent mindfulness research, Greenberg and Harris (2012) concluded that, “the enthusiasm for promoting such practices outweighs the current evidence supporting them” (p. 161). The first published meta-analysis on the effects of mindfulness training in youth (Zoogman et al., 2014) found mindfulness to be generally helpful and superior to a variety of control conditions. This meta-analysis included 20 studies with sample sizes ranging from 4 to 246 participants. Thirteen of these studies were randomized controlled trials (RCT). Several recent studies have reported reductions in stress and improvements in well-being (Lee, Semple, Rosa, & Miller, 2008; van de Weijer-Bergsma et al., 2012) and reductions in depressive symptoms (Raes et al., 2013) immediately after the intervention and at the 6-month follow-ups. Not all studies, however, have demonstrated the superiority of mindfulness over other approaches. Britton and her colleagues (2014) conducted a RCT that compared mindfulness meditation with an active control intervention to improve mental health for middle-school students and found that although both interventions produced benefits, no significant between-group differences were found. The authors suggested that many novel activities might produce comparable benefits. Although mindfulness training for children and adolescents seems to be a promising approach, significantly more research is needed to examine its effectiveness with different populations and in different settings, its mechanisms of change, the specific components needed for successful school-based implementation, and possible concerns or contraindications for its use.

In this article, we offer brief descriptions and critical analyses of ten mindfulness-based programs that have successfully been implemented in school settings, but have not yet been rigorously researched. We review the empirical support, and identify strengths and limitations of each program. Our aim was to sample the wide variety of mindfulness-based programs that are being brought into the schools—particularly as there is little or no published research available for many programs—and to highlight some of the strengths and limitations of different approaches. This article is not intended to present a comprehensive review, but rather to offer a practical overview of some school-based mindfulness programs that are currently being used in the schools. For other comprehensive reviews, see Albrecht et al., 2012; Meiklejohn et al., 2012; and Rempel, 2012).

Method

This article reviews ten mindfulness-based programs being implemented in K-12 schools. Electronic searches of the internet, PubMed, PsycInfo, and ERIC databases were conducted to identify relevant programs. Inclusion criteria for programs were (1) programs that defined mindfulness as a primary focus of the program, (2) had been in use for more than one year and were ongoing, (3) had been conducted in more than one school, (4) were intended for conventional classrooms, (5) appeared to be replicable, and (6) had little or no published research support. Programs focused primarily on yoga, creativity, or other approaches were excluded from consideration. Programs focused on clinical, psychiatric, or special education needs were not considered. Programs were selected, in part, to illustrate the variety and diversity of approaches being used. With no hierarchical intent, selected programs are presented in alphabetical order with related programs presented together. The programs

reviewed are *Inner Explorer, Master Mind* and *Moment Program, Mindfulness and Mind-Body Skills for Children, Mindful Schools, Resilient Kids, Still Quiet Place, Stress Reduction and Mindfulness Curriculum* and *Mindful Moment*, and *Wellness and Resilience Program*.

Two authors (VD and BAR) conducted semi-structured interviews with at least one of founders or developers of each program. All available program materials were reviewed. Data from both internal (unpublished) program sources and published sources were critically evaluated. In discussing research support for these programs, we offer the caveat that some of these data are anecdotal, were provided by the program developers, or have not been peer-reviewed. Questions that guided data collection included:

1. What research support is available for these programs?
2. What are the central components of each program?
3. How feasible are these programs to implement in school settings?
4. Which program components may be the essential contributors to the positive outcomes reported by students, teachers, and parents? Which components may be less essential?
5. What frequency, intensity, and duration of mindfulness training are necessary in order to achieve desired aims?
6. What degree of teacher training and/or personal commitment is required to implement these programs?
7. What do all these programs have in common and how do they differ?
8. How sustainable are these programs for the long-term?
9. What potential negative effects of mindfulness with youth are being considered or evaluated?
10. What protections should be considered when working with potentially vulnerable child or adolescent populations?

We briefly describe the development of each program, its aims, structure, and description. The existing research is critically examined, including descriptive and qualitative indicators of feasibility, acceptability, efficacy, and effectiveness, followed by strengths and limitations of each program. Table 1 provides a summary of the key elements of each program reviewed. We discuss the overall strengths and limitations of these programmatic evaluations, and suggest ways to facilitate rigorous, “school-friendly” research.

Results

Inner Explorer

Development—*Inner Explorer* (IE) was developed in 2007 by Janice Houlihan and Laura Bakosh to teach mindfulness to children in classrooms. Houlihan and Bakosh were trained in Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 1994) and Relaxation Response (Herbert & Klipper, 1992) and adapted these practices for students in classroom settings.

Like MBSR, IE emphasizes the importance of daily practice, however, is markedly different in that students practice by listening to brief, audio-recorded exercises.

Structure, aims, and description—IE offers three age-adapted curricula: preschool-to-kindergarten, elementary, and middle school. A fourth program for high school students is under development, along with corresponding "at-home" programs that are compatible with the school-based curricula. IE programs are designed to help children understand and become more aware of their, "inner worlds of senses, thoughts, and emotions" (Inner Explorer, 2011). Its primary goals are to strengthen self-awareness and promote self-management of emotions.

IE is notable because all lessons are delivered via MP3 audio instruction, during which teachers and students participate together. The preschool program consists of 50 five-minute segments. Elementary and middle school programs consist of 90 ten-minute segments. Segments are played once daily throughout an 18-week semester. Each segment lasts only 5 to 10 minutes, therefore, few changes are necessary to integrate IE into most classroom schedules. The first week offers basic information about mindfulness and its applications. During subsequent segments, students are guided through mindfulness or relaxation activities (e.g., breath meditation, body scan, and progressive muscle relaxation). For elementary and middle school students, each segment ends with a few minutes of personal journaling. Teacher training to implement IE is minimal—mainly consisting of a manual and four 15-minute audio recordings that introduce mindfulness concepts, practices, and relevant research.

Program evaluation—IE has expanded rapidly since its inception, which is one indication of its viability. At present, about 250 schools across 10 states are using these programs. Although IE appears to be thriving, research support for the program consists of only two studies.

Bakosh (2013) compared IE to wait-listed controls using a partially-randomized research design (volunteer teachers; stratified by grade level). Two elementary schools participated (18 classrooms with 383 students). Ten weeks of IE was hypothesized to improve student grades, increase teacher mindfulness, and reduce perceived teacher stress, while having little or no adverse impact on teaching operations. Data were collected on feasibility and fidelity of implementation, grade point averages (GPA) across six academic subjects, and teacher-rated mindfulness, perceived stress, and influence on teaching operations.

Since the schools used markedly different grading systems, academic performance was analyzed by school. In one school, GPA in the IE classrooms improved significantly as compared to the control classrooms ($p < .001$) with a large effect size ($d = .96$). At this school, significant improvements were found in math, science, and social studies. At the second school, changes in GPA were not significant. Of six academic subjects, significant improvements were found only for math. IE teachers at both schools self-reported greater mindfulness and less perceived stress. Qualitative analyses found little adverse impact on the classroom curriculum.

Limitations of this study include not having an active control group and that the teachers were self-selected. It seems reasonable to assume that increased teacher mindfulness and reduced perceived stress might mediate student academic outcomes, but the sample of 18 classrooms was too small to conduct a mediation analysis.

A second, non-randomized, controlled study evaluated IE (Bakosh, Snow, Tobias, Houlihan, & Barbosa-Leiker, 2014). Eight 3rd grade classrooms at two public elementary schools (N = 191) responded to emailed invitations. Classrooms of the first two teachers from each school to respond were assigned to receive IE, while the others served as no-intervention controls. Both schools were defined low income (i.e., most students qualified for free or reduced fee lunches). IE teachers received brief training. The eight-week program included daily 10-minute audio-recorded mindfulness exercises followed by a drawing or writing activity. It was hypothesized that IE would improve student grades and classroom behaviors, with no adverse impact on classroom operations. Controlling for pre-intervention grades, being in an IE classroom predicted significant differences in reading and science grades. Marked reductions in behavioral events (e.g., principal visits, calls home, suspensions, and classroom disruptions) were recorded for the IE groups, whereas control group incidents increased. No adverse impact on classroom operations was identified. Lack of randomization and bias associated with teacher-reported outcomes are limitations of this study.

Strengths and limitations—Although IE was based on MBSR, it has been radically restructured and condensed. The mode of delivery, brief duration, and absence of interactive teacher-student guidance make IE sufficiently different from MBSR as to preclude making comparisons between them. Yet, these changes have made IE a low-cost, easy-to-implement program. IE does not require extensively trained facilitators and minimizes disruption of normal classroom activities. There is little preparation and minimal time investment required. The IE research methodology was not sufficiently rigorous to produce definitive conclusions about the effectiveness of this intervention on academic performance. For example, when teachers and students are trained together, potential IE-mediated changes in the quality of the instruction are conflated with changes in student mindfulness. Research to identify specific mechanisms by which IE may influence academic performance is needed.

Master Mind and Moment Program

Development—Unlike other programs we describe, *Master Mind* and the *Moment Program* were developed by research scientists. A behavioral sciences research corporation, innovation Research and Training, Inc. (iRT), conducts translational research, then develops, evaluates, and disseminates programs with the aim of “enhancing the mental health, health, and quality of life of children, adolescents, families, communities, and organizations” (iRT, 2014). We selected iRT as an example of a program developed for commercial dissemination. The following review does not constitute any endorsement of iRT products.

The lead developer of *Master Mind* (MM) was Alison Parker, an MBSR-trained practitioner and developmental psychologist with expertise in child and adolescent social-emotional development. She evaluates the effectiveness of mindfulness programs to improve affective self-regulation and decision-making capabilities in children and adolescents. In 2009, Parker

and her colleagues developed MM, a classroom curriculum for students in grades four and five. One year later, the *Moment Program* (MP) was developed for middle school students in grades six and seven. Another curriculum is under development for high school students.

Structure, aims, and description—MM is a mindfulness education and substance abuse prevention program, while MP focuses on promotion of healthy peer relationships and academic performance. MM and MP are taught by classroom teachers as part of an integrated curriculum. Teachers receive one day of face-to-face training. The iRT curricula provide detailed lesson plans with instructions, student workbooks, and multimedia software (Parker & Kupersmidt, 2014). The software includes instructions for conducting each lesson, audio recordings of guided mindfulness practices, and videos that demonstrate mindful movement practices. The goals and objectives of each lesson are aligned with Common Core standards for K-12 schools (National Governors Association, 2010).

MM and MP use age-appropriate language, slogans, and short titles for activities and skills, concrete examples, and child-friendly metaphors for abstract concepts (Parker & Kupersmidt, 2014). MM uses animal cartoon characters and stickers to make the material more engaging to young children. Peer-led and interactive activities may increase the efficiency of learning (Botvin et al., 2006), so these components were included in both programs. Both consist of 15-minute lessons delivered once daily for four weeks. The material is organized into subtopics: (1) awareness of the body, (2) awareness of feelings, (3) awareness of thoughts, and (4) relationships with self and others. Both programs consist of five core activities: mindful breathing meditations; “mindful journeys” (e.g., activities such as body scan and mindful eating); mindful movement exercises; everyday applications of mindfulness; and daily home practices. Some activities were adapted from MBSR with age-appropriate modifications. Daily lessons include an explanation of the main concept, a mindfulness practice, and discussion. At the end of each week, which corresponds to the end of each subtopic, attention is given to “real world” applications of mindfulness—hypothetical and actual situations in which students might apply the skills learned that week.

Program evaluation—Although relatively new, MM and MP have undergone several randomized controlled evaluations. These were conducted in rural schools in the Southeastern United States with predominantly Caucasian students. Therefore, further evaluation in other environments (e.g., urban, inner city) with a broader range of ethnicities is suggested.

Evaluation of MM: The aims of this study were to assess feasibility and acceptability, evaluate the effects of MM on executive functioning (EF), behavior, and emotion regulation, and ascertain if program participation would reduce student intentions to use substances. Two elementary schools ($N = 111$ students in grades four and five) were randomly assigned to receive MM ($n = 71$) or serve as wait-listed controls ($n = 40$). Data were collected pre- and post-intervention (Parker et al., 2014). MM teachers were interviewed and students completed program evaluations. Teachers rated the program content, materials, ease of implementation, and enjoyment of teaching. EF was assessed using a computerized Flanker Fish Task (Diamond et al., 2007). Student behaviors were teacher-rated using the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001). Students completed a

questionnaire about their intentions to smoke or use alcohol in the future. Data were evaluated using separate hierarchical linear models for each measure, controlling for age, gender, and baseline scores. Teachers supported the feasibility and acceptability of MM and endorsed their intent to continue its use. Most students reported liking the program. EF scores were significantly higher for the MM group compared to the control group. Teacher-reported CBCL scores showed reductions in social and aggression problems, with girls showing less anxiety. No significant differences were found in intention to use substances. Based on these findings, iRT received additional funding to modify MM and conduct a second RCT with 40 classrooms.

Evaluation of MP: The aims of this study were to assess feasibility and acceptability, and evaluate effects on EF, academic performance, behaviors, and emotion regulation (Parker, Kupersmidt, & Willoughby, in preparation). Study design and methods were similar to the previous study. Classrooms at two middle schools ($N = 118$ students from grades six and seven) were randomly selected to receive MP ($n = 72$) or wait-listed as controls ($n = 46$). Feasibility and acceptability were similar to MM. Academic performance was mediated by gender: girls in the MP group were rated higher than were girls in the control group. Significant reductions in aggression and social problems, and improvements in behavior regulation and metacognition were reported for the MP group. No significant improvements were found for EF. Measuring outcomes using mainly teacher-report rather than objective measures is a limitation of both studies.

Strengths and limitations—Strengths of these programs include their demonstrated feasibility and acceptability, along with preliminary data showing improvements on some outcome measures. Ease of implementation and relatively low cost increase the likelihood that these programs will be further disseminated. Extensive instructional materials are available and the programs are implemented by classroom teachers with minimal training. The 15-minute lessons should not be difficult for most teachers to integrate into their curricula, and it may be helpful that lessons are aligned with Common Core standards. Most teachers will have a relatively superficial understanding of mindfulness concepts, however, and have little or no mindfulness experience to support the lessons. This seems likely to alter the quality of instruction in ways not yet understood. Limited data suggest that a teacher's ability to effectively facilitate mindfulness in others may be closely related to his or her personal experiences of mindfulness (Segal, Williams, & Teasdale, 2013).

Mindfulness and Mind-Body Skills for Children

Development—*Mindfulness and Mind-Body Skills for Children* (MMBS) was developed in 1999 at the Israel Center for Mind-Body Medicine in response to one school principal's request for a long-term intervention to improve school climate, decrease emotional reactivity, and improve student well-being. MMBS was developed by Nimrod Sheinman, a naturopathic physician specializing in mind-body medicine, yoga, and mindfulness, and Simi Levy, an experienced mindfulness instructor. Following a positive reception by teachers and students at one school, the program was implemented in several other primary schools across Israel. In one south Tel-Aviv school, MMBS has been running continuously for over a

decade. Since 2010, MMBS has been based at the Israel Center for Mindfulness in Education (ICME) and supported by the Israeli Ministry of Education.

Structure, aims, and description—MMBS was developed for students ages 6 to 13 and integrated into a "whole-school" curriculum that is offered to teachers and students across all elementary grade levels. Its main goals are to enhance self-awareness, improve self-efficacy and resilience, develop social-emotional skills, prevent risky behaviors, and improve learning potential. As participant-observers, teachers attend the 45-minute, once weekly classes with their students. In addition, teachers participate in monthly trainings to discuss experiences and receive additional instruction about bringing MMBS into classrooms. MMBS was later adapted for younger children (ages 3 to 5). A training program teaches preschool teachers to implement MMBS in the classroom. The main difference between this and the original program is that the younger children are taught mindfulness by classroom teachers rather than by external instructors.

Its two-year minimum duration makes MMBS a longer program than most. Classes are taught by ICME-trained instructors. MMBS activities focus on developing awareness of breath and body sensations, sounds, movement, thoughts, and emotions. Yoga, a "loving kindness" practice, and guided imagery further cultivate mindfulness. "Mindful circles" create opportunities for children to share their experiences. Classes are conducted in a dedicated room furnished with yoga mats, a CD player, and a gong. Informal practices include use of mindful language and integration of mindful awareness into daily classroom activities. Teachers bring MMBS skills into the classroom by incorporating "mindful moments" into their lessons. Workshops for parents and other school staff extend the culture of mindfulness to the entire school community. Mindfulness-focused activities may also be conducted before exams or during other school events.

Program evaluation—Following the initial one-year pilot, the feasibility and acceptability of MMBS were assessed (Sheinman et al., 2011). Thirty teachers and 235 students (ages 6 to 13) at Golomb School participated. Teachers and older students (8–13 years) completed an open-ended program evaluation questionnaire. Students were asked about their experiences and insights, understanding of the curriculum, application of skills, and changes in classroom climate, peer-relationships, affective self-regulation, and ability to focus. Teachers were asked about personal experience of the classes, observed student behavioral changes, and overall usefulness of the curriculum. Students endorsed learning the mindfulness skills, applying them, and enjoying the program. Qualitative analyses suggested that MMBS improved coping skills and contributed to enhanced self-image, self-awareness, emotional intelligence, openness for learning, and friendliness.

Tel-Hai primary school: Tel-Hai was an early adopter of MMBS and has used the program for 13 years. Thus, recent graduates have participated in MMBS throughout their primary education. MMBS has been integrated into the Tel-Hai school culture and curriculum. Although no program evaluations have been conducted, anecdotally, faculty and staff credit MMBS for the significant changes that have occurred since the program was implemented. In 2002, Tel-Hai was an under-performing school—academic performance was well below national averages, and the school was experiencing high levels of violence. Academic

performance improved in succeeding years, with GEMS[1] increases seen across all metrics (Hebrew language, math, science, and English). By 2009, Tel-Hai ranked third nationally in academic performance and in school climate, achieving GEMS scores well above national averages. During the 2008–2009 school year, fifth grade Tel-Hai students averaged 92% in English and 78% in math—well above the average 72% in English and 61% in math (Sheinman, 2014). The school principal describes the climate of the school as being supportive and cohesive, with violence almost nonexistent (Limone, 2011).

Ongoing research: A controlled study is underway to evaluate how well students learn and utilize MMBS skills. Participants include students ages 9 to 12 from four schools (N = 1,000). Approximately 25% have prolonged experience with MMBS (Tel-Hai students, with 3 to 6 years of training); 50% have one year experience with MMBS (two schools were evaluated after one year); and 25% have no MMBS experience. Those participating in MMBS completed open-ended questionnaires to assess their understanding of the program purpose, goals, and skills learned. All students completed a 10-item questionnaire to assess applications of mindfulness-based skills to resilience and constructive problem resolution (e.g., "What do you do when you can't focus or concentrate in critical situation?"). Data were collected at the end of the 2013–2014 academic year and are now being analyzed. Initial results suggest that MMBS-trained students tend to use mindfulness skills consistently, especially after prolonged training (i.e., Tel Hai students).

Strengths and limitations—MMBS engages an entire school community in mindfulness practices. This provides students, teachers, staff, and parents with common experiences and a shared vocabulary. The extended duration of the program lets students develop mindful habits gradually, with ongoing, repetitious practice. Teachers gain experience to integrate the language and skills into their classrooms. The need for trained external instructors improves the quality of training, but also contributes to the higher-cost of implementation, which may jeopardize long term-sustainability. Sustainability may be enhanced by strengthening the teacher-training component, perhaps with the aim of eventually eliminating the need for external instructors. MMBS appears to be helpful to students. However, the program would benefit greatly from controlled research to identify specific skills learned and assess academic performance at the student level.

Mindful Schools

Development—In 2007, Laurie Grossman, Megan Cowan, and Richard Shankman established the Community Partnership for Mindfulness in Education, which was later renamed *Mindful Schools* (MS). Although not MBSR-trained, their backgrounds were similar. Consequently, MS has similarities to that model. Initially, MS brought their own trained mindfulness facilitators into K-12 classrooms, but now concentrates on first helping educators develop their own mindfulness practices, and then training them to teach mindfulness to their students. MS is a widely disseminated program. Program staff have

[1]Growth and Effectiveness Measures for Schools (GEMS) is a mandatory Israel national testing program to measure academic achievement and school climate.

indicated that more than 7,000 adults have taken a MS course, and that the program has reached more than 200,000 youth worldwide.

Structure, aims, and description—A central aim of MS is to "bring mindfulness to youth to build attention, self-regulation, and empathy" (Mindful Schools, 2015a). The developers believe that in order to teach mindfulness, instructors must first learn mindfulness by developing their own experiential practice. Consequently, three levels of training are offered. The first is a six-week, online "fundamentals" course to provide educators with basic information about mindfulness, while supporting development of a personal meditation practice. Goals include developing a daily sitting practice, working skillfully with thoughts and emotions, and cultivating positive mind states. The second course teaches facilitation of the MS curriculum. Participants learn about the role of mindfulness in communication and student interactions. The facilitation course is offered as a six-week online program or as an in-person weekend intensive. Specific youth-appropriate mindfulness practices, information about the basic neurobiology of attention and emotion, and accurate communication of research findings are included. Interestingly, educators also learn skills to communicate mindfulness that are meant to gain "buy-in" from administrators and agencies—which may contribute to the remarkably rapid dissemination of MS. The third course is a year-long program of certification as an MS facilitator. The certification program is intensive—including ten months of weekly online training, webinars, weekly coaching sessions, peer-group meetings, and two week-long residential retreats.

MS teaches students mindful breathing and body exercises, mindfulness in different sensory modes (e.g., listening or eating), and mindfulness of thoughts and emotions. Two age-adapted curricula have been developed. The K-5 curriculum (ages 5–12) includes 30 modules; the grade 6–12 curriculum (ages 12–17) includes 25 modules. Teacher manuals, student workbooks, and program evaluation materials are available. Lessons are taught in 15-minute increments, 2 to 3 times per week. The duration of each activity varies with age, environment, and experience with mindfulness practices. Each lesson begins and ends by ringing a bell or gong. Discussions about ways that students might incorporate mindfulness into their daily lives are part of each lesson. Student workbooks are available to support an optional 5-minute journaling period at the end of each lesson.

Program evaluation—Despite having limited research support, MS continues its rapid expansion. This is a strong "real-world" indication of its acceptability. In collaboration with the University of California at Davis, one controlled trial has been conducted, randomized at the classroom level (Fernando, 2013[2]). Participants were 47 teachers and 915 students from three public elementary schools (K-5). Each school was located in a relatively high crime district with mostly minority, low-income students (91% qualified for free or reduced fee school lunches). Data were collected during the 2011–2012 academic year. The study was designed in two phases—the first to evaluate the efficacy of the program, the second to assess its sustainability. The first phase consisted of 15 student lessons, each lasting 15 minutes. These were taught by trained facilitators brought into the classrooms 2 to 3 times

[2]These data were presented at a professional conference, but have not yet undergone scientific peer-review. A research manuscript is in preparation (Smith et al., 2012).

weekly for six weeks. The second phase consisted of six 1-hour teacher-training sessions plus six weekly "booster" sessions taught by trained facilitators in the classroom. Data were collected pre- and post-intervention and three months later. Teacher self-reported mindfulness, well-being, and self-efficacy were assessed. Student measures included mindfulness, attention, and the Kinder Associates Student Behavioral Rubric (KASBR; Kinder, Kinder, & Kinder, 2005), a teacher-rated scale that consists of four metrics: mental (paying attention), emotional (self-calming, self-control), physical (self-care, participation) and social (showing care for others). Qualitative data found 92% of teachers endorsed gaining personal benefits and 84% of students endorsed an intention to use mindfulness techniques in the future (Mindful Schools, 2015b). Statistically significant pre-post improvements on the KASBR attention and physical metrics were found, with the social metric showing significant improvements at the 3-month follow-up. Gender was a significant covariate—with larger effects for found for boys than for girls. MS teachers reported significantly increased mindfulness as compared to the control teachers, with scores increasing further at the 3-month follow-up. Small effect sizes across all measures, however, led researchers to conclude that the amount of training given was insufficient to make meaningful improvements in teaching efficacy. Additional training may be necessary before teachers can apply mindfulness skills to effective classroom management.

A major limitation of this study is that the primary outcome measure, the KASBR, is an unvalidated scale that purports to assess four broad constructs using a single item for each metric. Other validated scales exist that might have provided more robust and interpretable data. In addition, teachers participated in the intervention, and then rated perceived changes in their own students. Expectancy effects severely limit any conclusions that might be drawn from that data. An open trial pilot study of MS with 17 teachers and 409 children reported comparable outcomes, but also noted these important methodological caveats (Black & Fernando, 2014).

Strengths and limitations—Although most MS teacher trainings are conducted online, training materials are thorough and expert trainers provide readily accessible support. With no oversight or monitoring for fidelity of implementation, individual educators may be implementing MS in idiosyncratic ways. As mindfulness practitioners ourselves, we consider one strength of this program to be that it includes activities designed to promote gratitude, generosity, compassion, and other wholesome emotions. Although MS has expanded steadily, the investments required to implement and maintain this program are high—teachers are asked to invest substantial time and commitment toward cultivating a personal mindfulness practice. Although scholarships are available, some educators may be unable to manage the costs of training. We suggest two recommendations for future planning; both related to the expansive reach of this program. First, the large number of students participating in MS support the conduct of sorely needed, large-scale, randomized trials that could provide a strong evidence-base for the generalized effectiveness of mindfulness training in schools. We encourage Mindful Schools to collaborate with academic researchers to conduct methodologically sound studies that yield robust and meaningful data. This might include assessing the effectiveness of web-based training using clearly defined and measurable metrics and ascertaining the fidelity of program

implementation. Second, subjecting their research data to scientific scrutiny by publishing their findings in peer-reviewed journals would be of tremendous value to the entire mindfulness research community.

Resilient Kids

Development—*Resilient Kids* (RK) was developed by Vanessa Weiner in 2009, initially as an afterschool program before being adapted as a classroom curriculum. Weiner is certified as a yoga instructor and has facilitated several other child mindfulness programs. In 2012, Weiner established a non-profit organization and began piloting the RK curriculum in one classroom. According to Weiner, RK is now taught in 71 classrooms at 12 schools across Rhode Island.

Structure, aims, and description—RK was initially conducted with students in elementary classrooms, but now serves K-12 students. The aims of RK are ambitious—to teach students self-regulation and balance (emotional equanimity); improve their self-confidence; develop the ability to focus and transition between tasks; build stronger and healthier school communities; and reduce behavioral problems, violence, and bullying. The program addresses five core competencies described by the Collaborative for Academic, Social, and Emotional Learning (CASEL, 2013). These competencies are self-awareness, self-management, social awareness, responsible decision-making, and relationship skills. RK is delivered in the classroom by trained instructors who are required to undergo program-specific training and maintain a personal mindfulness practice.

RK is taught throughout the academic year (32 weeks from September to June). A written curriculum provides structure and guidance. Typically offered in two weekly 30-minute classes, some high schools have combined this into weekly one-hour classes or opted for three 20-minute classes. RK includes yoga, breath work, mindfulness practices, discussions, journaling, storytelling, games, and drawing activities. Each class includes a movement activity, breath meditation, and discussion, with half the time devoted to experiential practices. Classroom teachers attend an introductory workshop (1 to 4 hours, as determined by each school). Teachers are present during the classes and encouraged to participate.

Program evaluation—RK has undergone one internal program evaluation, although these data have not been peer-reviewed or published. Quantitatively, schools track behavioral referrals, incidents of violence, and bullying. Some schools reported 30 to 50% reductions in behavioral referrals, with students self-reporting reductions in stress. One school reported an 83% decrease in incidents of violence. Qualitatively, students and teachers have reported improvements in student self-confidence and emotional self-regulation, as well as improved community climate in schools. Anecdotally, teachers have commented on students being better able to focus and transition between tasks. Some teachers noted that RK might increase effective instruction time by reducing behavioral disturbances. Two studies are underway during the 2014–2015 academic year. One school is tracking the number of visits to the school nurse to assess this potential health benefit. A controlled trial is underway in a second school in which half the classrooms were randomized to implement RK while half serve as wait-listed controls.

Strengths and limitations—Opportunities to practice consistently throughout a full academic year may support a more readily sustainable practice. The availability of a written curriculum increases standardization of implementation and research fidelity. Many have suggested that a deeper understanding of the concepts and practices gained through personal experience creates a better experience for students, and may produce effects that are more robust. This widespread belief, however, has yet to be evaluated in controlled research. Instructors having personal practices may demonstrate better teaching skills, but this requirement is also likely to hinder expansion of the program. The need for continued funding to support external instructors is another impediment to the long-term sustainability of the program. Resilient Kids would benefit from rigorous controlled studies that directly assess its ability to improve social-emotional competencies and academic outcomes. Given that the program is designed to respond to CASEL standards, the use of the CASEL evaluation guidelines would be appropriate.

Still Quiet Place

Development—Amy Saltzman received MBSR training and has maintained a personal mindfulness practice since 1993. In 2003, Saltzman created *Still Quiet Place* (SQP), which she taught to children's groups in northern California. In 2004, Saltzman began teaching SQP in schools. She now trains educators to teach the SQP curriculum—in person and through online webinars. Having an online educator training option has facilitated the expansion of SQP across the United States and internationally.

Structure, aims, and description—Like several other programs described here, SQP was modeled after MBSR. To make the program more accessible and engaging for children, Saltzman modified the language, shortened the practices, and created the concept of a "still quiet place" as being "a place of peace and happiness that is alive inside of each person" (Saltzman, 2014a). The aim of SQP is to "immunize" youth against the stresses of modern life by teaching skills that improve affective and behavioral self-regulation and general well-being (Saltzman, 2014b). It was designed for children and adolescents ages 5 to 18, with the language, level of abstraction, teaching illustrations, and length of practices adapted for different age groups. For example, the duration of breathing practices is about one minute per year (e.g., 10 minutes for a 10 year-old child).

SQP is taught by trained instructors. Saltzman believes that the instructor's personal practice is essential to the teaching of mindfulness. Educators and allied professionals can choose an in-person training or a 10-week internet-based practicum. Participants learn to teach the SQP curriculum through reading assignments, watching videos of SQP classes, conducting guided practices with feedback, and discussing the challenges of teaching mindfulness to children in a school environment. Research on teaching mindfulness to children is reviewed. Program materials include the SQP manual and age-appropriate CD/MP3s of guided practices—one each for younger children and adolescents.

SQP consists of eight weekly classes, each lasting for one school period (30–60 minutes). Students learn breathing and feeling practices, a body-scan activity, thought-watching practices, mindful eating, walking meditation, and a "love and kindness" practice. Classes

also include practices to enhance awareness of present-moment activities. The first four classes focus on development of skills; the last four on the everyday application of those skills. According to Saltzman, students learn to respond to events with kindness and wisdom rather than with mindless reactivity. Each student receives a CD or MP3 of guided meditations, with which they are encouraged to practice at home.

Program evaluation—No research on the school-based SQP program has been conducted. One non-randomized, controlled study of a family-based intervention has been done, which included both MBSR for adults and SQP for children (Goldin, Saltzman, & Gross, 2006; Saltzman & Goldin, 2008). Primary aims were to examine the feasibility and helpfulness of teaching mindfulness to families. A self-selected community sample of 24 families with children in grades four through six participated. Eight similar families served as wait-listed controls. Children and parents attended the eight-week group training. Outcomes measures included components of attention, mindfulness, self-compassion, anxiety, and depression. Program participants showed significantly less emotional reactivity than controls. Interestingly, the amount of formal home practice (e.g., a scheduled breath practice) mediated improvements in cognitive control, while the amount of informal practice (e.g., practice of mindfulness in daily activities) was related to reductions in depressive symptoms. Parents reported significant reductions in mood and anxiety symptoms, and improvement in parenting self-efficacy. Child participants tended to be more compassionate and less self-judgmental than the controls. These data, along with a 17% attrition rate, suggest that the combined MBSR-SQP program was feasible and may have produced meaningful results. Limitations of this study include the small sample and non-randomized controls.

Strengths and limitations—MBSR has been evaluated in dozens of studies. SQP is closely aligned with this model, which may be one of its strengths. SQP offers a written curriculum, CD/MP3 support materials, and online instructor training. It is relatively easy to implement and, beyond the need for a trained instructor, requires few other resources. That SQP has not yet been evaluated as a stand-alone program is an important limitation. Similar to other programs that encourage instructors to have an established practice, this requirement can be both a strength and a limitation. On one hand, it increases the likelihood that the instructor has a clear experiential understanding of the material. On the other hand, it increases costs and likely constrains program dissemination.

Stress Reduction and Mindfulness Curriculum and Mindful Moment

Development—In 2001, Brothers Ali and Atman Smith, and Andres Gonzalez founded the Holistic Life Foundation (HLF) with the aim of improving the well-being of youth in an economically disadvantaged neighborhood of Baltimore that suffered from high rates of violence, crime, and substance use. HLF initially taught yoga and mindfulness to at-risk children in a community-based afterschool program. One cohort of 20 5th grade children attended the program four days a week for four years. A second cohort of 20 was then started that continued four more years. In 2010, the community program became a school-based afterschool program. About 40 K-5 students were enrolled annually until 2014, when the program expanded to accommodate 90 students each year. Thirteen Baltimore schools

now use HLF programs. Workshops are also offered for educators interested in teaching yoga and mindfulness.

Structure, aims, and description—Two distinct programs emerged from the original afterschool program: the *Stress Reduction and Mindfulness Curriculum* (SRMC) and *Mindful Moment* (MM). Both aim to improve affective self-regulation, social-emotional wellness, anger management and problem resolution, and interpersonal relationships. SRMC is taught during the school day (using available resource [non-academic] periods), while MM has been integrated into a "whole school" curriculum. Both include yoga, breathing exercises, meditation, centering, and other mindfulness practices.

Stress Reduction and Mindfulness Curriculum (SRMC): SRMC is taught in 45-minute classes four times weekly for 12 weeks or twice weekly for 24 weeks. Most classes start with a brief centering exercise, followed by yoga or t'ai-chi. The facilitator leads a group discussion, and then ends with a mindfulness meditation. Some classes include chair-based yoga poses that can be used in the classroom. SRMC is manualized and taught by HLF-trained instructors.

Mindful Moment (MM): Mindful Moment (MM) was developed in 2014 and is now being offered school-wide at two schools: a 1,000-student high school and a 200-student elementary school. Twice daily, 15-minutes classes teach meditation, mindfulness practices, and yoga exercises. HLF-trained instructors conduct classes for three weeks to educate students and teachers about MM. After that, audio recordings are played over the public-address system. A designated "mindfulness room" at each school containing meditation cushions, yoga mats, soft music, incense, candles, and tea provides a calm, quiet space for students and teachers. HLF instructors staff the room daily to assist students with their practices. Students may request a "mindfulness break" when he or she has difficulty staying on-task or needs emotional self-soothing. Mindfulness breaks may also be assigned by teachers to manage emotional and behavioral issues—replacing the previous school policy of disciplining students with "detention."

Program evaluation—HLF informally evaluated the initial 20-student cohort after two months of program participation, and found improved school attendance and academic performance, with fewer problem behaviors (Holistic Life Foundation, 2014).

Evaluation of SRMC: HLF collaborated with Johns Hopkins and Pennsylvania State Universities to evaluate SRMC in a randomized controlled trial (Mendelson et al., 2010). Four schools participated ($N = 97$ 4th and 5th grade students). Two schools ($n = 51$) were randomized to SRMC while the other two ($n = 46$) served as wait-listed controls. The 12-week program was taught four days each week during a resource period. Data were collected at baseline and following the program. Aims were to ascertain feasibility, acceptability, and effectiveness. Measures included the Involuntary Engagement Coping Scale of the Response to Stress Questionnaire (RSQ; Connor-Smith et al., 2000); the Short Mood and Feelings Questionnaire—Child Version (SMFQ-C; Angold et al., 1995); the Emotion Profile Inventory (EPI; Benn, 2003); and People in My Life (PIML; Cook et al., 1995). Feasibility was ascertained from recruitment and retention rates and qualitative feedback from students

and teachers. Separate general linear models for each measure controlled for age, gender, and baseline scores. Compared to controls, SRMC participants reported significant improvements on the RSQ and its three subscales (Rumination, Intrusive Thoughts, and Emotional Arousal). No other significant changes were found. Implementing SRMC in urban public schools was feasible and may improve stress reactivity by reducing rumination, intrusive thoughts, and emotional arousal.

The same research team is conducting a three-year, federally funded study in six Baltimore public schools to examine SRMC with 5th and 6th grade students. Measures include student questionnaires, neurocognitive tests, and teacher-reported student behaviors. Data were collected before and after the program, and 6- and 12-months later. Data analyses are underway. A preliminary report has identified three components essential to implementing SRMC: teacher involvement, administration support, and student engagement (Mendelson et al., 2013).

Evaluation of MM: Being a newer program, there is no existing research on MM. HLF is now collaborating with the Institute for Integrative Health and the University of Maryland to conduct a program evaluation.

Strengths and limitations—Strengths of SRMC include its demonstrated feasibility and acceptability. Another strength may be that SRMC combines yoga and mindfulness, which may synergize potential benefits from both. The manualized curriculum supports program expansion. Costs of using HLF-trained instructors can be moderated by the instructor training that is now available. Schools can implement these programs with less cost after teachers receive instructor training.

School-wide participation and daily implementation of MM may positively influence the school culture, thereby affecting many other outcomes. Offering a “mindful break” in response to behavioral issues, rather than putting students in detention, may itself be a significant environmental change. For many schools, the initial cost of establishing, maintaining, and staffing a “mindfulness room” may be an obstacle to implementation. The use of audio recordings rather than personal instruction offer a cost-benefit, however, the effectiveness of this has not yet been demonstrated. Given their theoretical similarities and applied differences, conducting a study to compare the relative effectiveness of SRMC and MM would increase our understanding of which components may offer the most benefits.

Wellness and Resilience Program

Development—In 2004, Marilyn Webb Neagly, an educational consultant, author, and community activist began development of the *Wellness and Resilience Program* (WRP). It has a theoretical orientation similar to MBSR, but was also influenced by the *Inner Resilience* program (Lantieri & Goleman, 2008). WRP has been used in the South Burlington (Vermont) School District since 2008. WRP staff train all adult school personnel, including teachers, administrators, and staff in mindfulness techniques. Teachers subsequently train students in the classroom. Ongoing educational workshops for K-12 teachers aim to increase the sustainability of this program.

Structure, aims, and description—WRP is a wellness course for teachers, administrators, and staff working in PreK-12 education. Its aims are to cultivate personal contemplative practices that may reduce the sometimes stressful demands of these jobs, and to teach children about their "inner experiences" through art and nature, while learning mindfulness meditation for relaxation. Learning to conduct WRP begins with a one- or two-day intensive retreat. WRP trainers provide information about mindfulness, and then teach specific skills and techniques to teach mindfulness to students. Didactic training, role-play, small-group experiences, and personal practice are included. Perhaps somewhat tangential to mindfulness *per se*, attention is given to regaining participants' enthusiasm for teaching by exploring their original motivations for choosing an academic career. Following the weekend retreat, monthly 90-minute trainings support ongoing practice and frame mindfulness as personal and professional development. Trained WRP "mindfulness coaches" provide modeling and clear examples to school personnel throughout the academic year. Summer retreats further promote personal development of mindfulness. Weekly contemplative classes (e.g., mindfulness meditation, yoga, t'ai chi, and qìgōng are available to school personnel. School personnel are encouraged to maintain a daily practice, and use mindful speech and behaviors when interacting with students, parents, and other staff.

WRP teaches a variety of mind-body practices aimed at promoting calm and focused awareness. Guided meditations develop focused breathing techniques. Body scans, progressive muscle relaxation, music, and tactile perceptual activities, (e.g., touching a feather) are included. Other activities include squeezing toys to relieve stress, mandala coloring, and the use of "snow globes" or "breathing buddies" (a soft toy placed on the belly of a prone child) to still the mind and focus attention on the breath or belly movements. "Peace corners" or "time-ins" allow students to practice breathing techniques and calm agitated or distraught students.

Classroom implementation of WRP is determined by each teacher's familiarity and comfort presenting the concepts and basic instructions. Some teachers may choose to take a few moments of daily quiet time for relaxation and self-reflection. Others will implement structured or lengthier activities on a consistent schedule. Brief "mindful moments" may be inserted throughout the day, along with discussions about practicing kindness or applying social-emotional skills with mindful awareness.

Program evaluation—Although Neagly believes that WRP is effective and sustainable, its research support is limited. The influence of WRP on stress, well-being, and mindfulness practices of school personnel has been evaluated in only one unpublished study (MacNeil, Gray & Quintiliani, 2011). Sixty-one faculty and staff from five schools participated. An uncontrolled, mixed-methods, pre-post design was used. Assessments of stress and mindful awareness were collected using the Mindfulness Applications Survey (MASQ; Quintiliani, 2010), the Perceived Stress Scale (PSS; Cohen et al., 2008), and the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). Significant reductions were reported on the PSS (t [1, 60] = −8.05, $p < .05$, $d = 0.54$), with increases on the MAAS (t [1, 60] = −7.98, $p < .05$, $d = 0.64$) and MASQ (t [1, 60] = 7.97, $p < .05$, $d = 0.51$). Medium to large effect sizes were found on all measures. Thematic analysis of personal narratives from teachers supported the quantitative data, including decreases in self- and other-directed

stress. The combined findings support improvements in mindful awareness and reductions in stress. One important limitation of this study is that assessments were collected at the beginning and end of the school year. In general, perceived stress tends to be higher at the beginning of every school year. The reported reductions in stress may reflect a natural academic cycle, rather than effects of WRP. The importance of including a control group is also illustrated by this confounding influence.

Strengths and limitations—Given that WRP has been operating since 2008, the feasibility and acceptability of this program, at least in this school district, seem evident. Long-term sustainability of WRP may be a challenge, in part because substantial funding is needed to implement and maintain the program—albeit, some of the funding was provided by WRP. The generalizability of this program to other school districts nationwide is an unanswered question. This particular school district serves a small, affluent, predominantly Caucasian population[3] that is not representative of most school districts. In particular, budget restrictions and fewer financial resources from local organizations (e.g., Parent-Teacher Associations) could make WRP substantially more challenging to implement in many urban, ethnically diverse, or low SES school districts.

One factor that might both be considered a strength and a limitation is the aim of WRP to fully integrate mindfulness throughout the district, essentially working to create a community that naturally engages in contemplative practices. Should it achieve that aim, WPR seems more likely to promote a self-sustaining environment of mindfulness than most programs. Challenges might arise, however, when attempting to enlist a sufficiently large percentage of the administrators, teachers, and staff within a school district to implement a community-wide mindfulness curriculum. Not all teachers or other school personnel will be interested in developing a personal mindfulness practice, and some may even discourage their colleagues from doing so. Once trained, school personnel may or may not maintain a daily practice of mindfulness without the ongoing support of WRP facilitators. In this respect, implementing a “train-the-trainer” model might reduce long-term costs and enhance sustainability. Additional research on the effectiveness of this program should include a multi-modal randomized controlled study that includes (in addition to school personnel outcomes), subjective and objective assessments of student wellness, academic outcomes, and multi-year follow-ups.

Discussion

James (1890/1950) believed that the ability to maintain steady awareness, moment-by-moment, is the foundation of emotional intelligence. In addition, the capacity to use mindful awareness to recognize emotions and to navigate them with some measure of equanimity may bolster executive functioning (Black, Semple, Pokhrel, & Grenard, 2011; Flook et al., 2010). Fundamentally, every mindfulness curriculum includes components that cultivate attention and concentration. The school-based programs described here are similar in some ways, and quite different in others. Each one consists of a different, complex amalgamation of theories, aims, approaches, and techniques. Some programs are compartmentalized into

[3]Population is 90% Caucasian, with a median household income of $64,756. Data from 2013 U.S. Census.

discrete training classes, while others have implemented a “whole-school” or even district-wide immersion model. Program durations range from four weeks to many years. Some programs use external facilitators to teach students while others train educators to teach mindfulness to their students. Several require or emphasize that facilitators maintain a personal mindfulness practice, while others do not. *Inner Explorer* is delivered entirely using MP3 recordings, which essentially require no facilitator at all. *Mindful Moment* begins with instruction from trained facilitators, then shifts to audio recordings. Learning to facilitate a program ranges from one hour of listening to recorded information to extended residential retreats supplemented with daily personal practice and weekly coaching. Facilitator trainings are variously offered in-person, online, both, or not at all. *Mindful Schools*, which may be the most successful program in terms of its extended reach, includes instruction on obtaining the “buy-in” from school districts, administrators, and funding agencies that is essential to program sustainment.

What these programs have in common is that none has been evaluated in rigorous, randomized controlled trials, conducted by researchers independent of the program developers, sufficiently powered, controlled for implementation fidelity and threats to internal validity, and using reliable and externally valid outcome measures. The few studies that include control groups are mainly passive “wait-listed” controls. None of these programs has yet been evaluated in comparison with other mindfulness programs or against other pedagogic curricula. Nor have any been evaluated longitudinally to ascertain either the long-term benefits or their potential risks. Although most studies report positive outcomes, these mainly derive from subjective self-report or observational data obtained from participants or stakeholders—further confounded by small sample sizes and weak research designs. Data are being used to market these programs without undergoing scientific scrutiny regarding its reliability or validity. In fact, we simply do not know which of these programs (or their varying components) is effective, for whom, how, or why. Given the limited evidence, we are unable to make any confident assertions about either the short or the long-term effectiveness of these ten mindfulness programs to achieve their stated aims.

Mindfulness programs in schools, however, do appear quite feasible to implement and acceptable to many school administrators, teachers, and students. A good deal of circumstantial evidence supports this conclusion. The programs described here and many others like them, by their “real world experiences,” have been successfully implemented. Individual program evaluation support includes high recruitment and retention rates (SRMC), qualitative feedback from teachers (IE, MM, MP, SRMC) and students (MM, MP, SRMC), broad program dissemination (IE, MS, RK, SQP, SRMC), and long-term sustainability (MMBS).

In some arenas, mindfulness is being treated as a panacea for all ills—physiological, psychological, behavioral, and social. It probably is not. Although early trends are promising, it seems vital to remain mindful of the fact that we are teaching impressionable children skills that, in profound ways, may change the way they think, perceive, and interact in the world. It seems likely that we are altering the structure and functioning of their developing brains in, yet, unknown ways. Most adult and youth mindfulness research has focused on psychological outcomes, with less attention given to neurological changes,

performance or success metrics, health outcomes, or observable behavioral changes. We strongly encourage researchers to evaluate programs using these objective and quantifiable metrics.

Limited research with youth has shown promise for the effectiveness of mindfulness-based programs in schools to improve attention and executive functioning, bolster social-emotional resiliencies, and help teachers and students manage school-related stressors. Many schools have begun to integrate these programs into their curricula, despite the absence of rigorous research supporting their effectiveness. We hope that this paper promotes the sharing of research ideas and conduct of well-designed studies. Combining controlled research methodologies with community-based program evaluations seems likely to bring innovative multidisciplinary perspectives to complex educational issues. Encouraging university-based researchers to connect and collaborate with administrators, educators, and school-based clinicians will greatly advance our understandings of mindfulness-based interventions in K-12 education.

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Table 1

Summary of Programs Reviewed

Program	Began	Target Population(s)	Primary Program Aims	Instructional Format	Key Components	Duration	Resources
Inner Explorer (IE)	2007	Pre-K to K Grades 1–5 Grades 6–8	Strengthen self-awareness; promote self-management of emotions	Pre-recorded MP3s	Mindfulness education, breath meditation, body scan, progressive muscle relaxation, personal journaling	5–10 minutes, daily for 10 to18 weeks Pre-K to K has 50 × 5-minute segments Other two programs have 90 × 10-minute segments	www.innerexplorer.org Bakosh (2013) Bakosh, et al. (2014)
Master Mind (MM)	2009	Grades 4–5	Mindfulness education; substance abuse prevention	Teacher-led curriculum	Mindful breathing; “mindful journeys” (e.g., body scan and mindful eating); mindful movement; everyday mindfulness; daily home practice	15 minutes, daily for 4 weeks	www.irtinc.us Parker & Kupersmidt (2014) Parker et al. (2014)
Moment Program (MP)	2010	Grades 6–7	Promotion of healthy peer relationships; improve academic performance	Teacher-led curriculum	Similar to Master Mind	15 minutes, daily for 4 weeks	www.irtinc.us Parker, et al. (in preparation)
Mindfulness and Mind-Body Skills for Children (MMBS)	1999	Ages 3 to 13	Enhance self-awareness; improve self-efficacy and resilience; develop social-emotional skills; prevent risky behaviors; improve learning potential	MMBS trained instructor-led classes, which teachers then integrate into a “whole school” curriculum	Awareness of breath and body sensations, sounds, movement, thoughts, and emotions. Yoga, “loving kindness” practice, guided imagery; and “mindful circles”	45 minutes, once weekly for a minimum of 2 years	http://mindbody-il.com Limone (2011) Sheinman (2014) Sheinman et al. (2011)
Mindful Schools (MS)	2007	Grades K-5 Grades 6–12	Build attention, self-regulation, and empathy	Teacher-led classes, facilitated by teachers who have attended an MS training program	Breath and body exercises; mindfulness in sensory modes (e.g., listening and eating); mindfulness of thoughts and emotions. Teachers learn about neurobiology of mindfulness and communicating about mindfulness	15 minutes, 2 to 3 times weekly for 10–15 weeks K-5 program has 30 modules 6–12 program has 25 modules	www.mindfulschools.org Black & Fernando (2014) Fernando (2013) Smith et al. (in preparation)

Program	Began	Target Population(s)	Primary Program Aims	Instructional Format	Key Components	Duration	Resources
Resilient Kids (RK)	2009	Grades K-12	Teach self-regulation and emotional equanimity; improve self-confidence; improve focus, and ability to transition between tasks; build stronger and healthier school communities; reduce behavioral problems, violence, and bullying	RK trained instructor-led classes	Yoga, breath work, mindfulness practices, discussions, journaling, storytelling, games, and drawing	30 minutes, twice weekly for 32 weeks	www.resilientkids.org
Still Quiet Place (SQP)	2003	Ages 5 to 18	Improve affective and behavioral self-regulation and general well-being	SQP trained instructor-led classes with pre-recorded CDs/MP3s for home practice	Breathing and feeling practices, body-scan, thought-watching practices, mindful eating, walking meditation, “love and kindness” practice	30 to 60-minutes, once weekly for 8 weeks	www.stillquietplace.com Goldin et al. (2006) Saltzman & Goldin (2008)
Stress Reduction and Mindfulness Curriculum (SRMC)	2010	Elementary & middle school	Improve affective self-regulation; social-emotional wellness; anger management; problem resolution; and interpersonal relationships	SRMC trained instructor-led classes	Yoga, meditation, breathing, tai-chi, centering, and other mindfulness techniques	45 minutes, 4 times weekly for 12 weeks or 2 times weekly for 24 weeks	http://hlfinc.org Mendelson et al. (2010) Mendelson et al. (2013)
Mindful Moment (MM)	2014	Elementary & high school	Similar to SRMC	MM trained instructor-led classes, followed by a “whole school” curriculum, with audio recordings and a “Mindful Moment Room”	Similar to SRMC	15 minutes, twice daily, conducted throughout school year	http://hlfinc.org
Wellness and Resilience Program (WRP)	2008	Pre-K to 12	Reduce teacher stress; increase enthusiasm for teaching; teach children about their “inner experiences” through art and nature; learn mindfulness meditation for relaxation	Teacher-led “whole school” curriculum, supported by WRP trained “mindfulness coaches”	Focused breathing, body scan, progressive muscle relaxation, music, tactile perceptual activities, mandala coloring, use of “snow globes” and “breathing buddies,” “peace corners” and “time-in” spaces	Variable time depending on teacher’s familiarity with program, conducted throughout school year	www.talkaboutwellness.org MacNeil, et al. (2011)