Mindfulness (2019) 10:1707–1720
https://doi.org/10.1007/s12671-019-01101-1

REVIEW

Mindfulness and Social-Emotional Competencies: Proposing Connections Through a Review of the Research

Laura L. Feuerborn[1] · Barbara Gueldner[2]

Published online: 26 April 2019

Abstract

Objectives The purpose of this study was to explore linkages between mindfulness-based practices (MBP) applied in schools and a social and emotional (SEL) framework using the five competency areas endorsed by the Collaborative for Academic, Social, and Emotional Learning (self-awareness, self-management, social awareness, relationship skills, and responsible decision-making). A qualitative exploration of linkages was conducted to identify ways the two might be integrated in schools and to stimulate transdisciplinary dialogue.

Method A literature review yielded 40 studies that met the criteria: (a) use of MBP, (b) study conducted in a school setting, (c) inclusion of a goal to promote mindfulness, and (d) at least one outcome variable relevant to at least one of the five SEL competency areas. After coding SEL-related constructs measured in the studies, we reached consensus for the SEL competency area under which each construct best fits and reviewed the extent to which constructs were measured across the five SEL competency areas.

Results Results suggested a conceptual fit between MBP and a SEL framework. Each of the five competency areas varied in their representation of the effects of MBP on students. The competency area of self-management was represented in all studies reviewed. No studies mentioned the use of the five competency areas in a SEL framework to guide or classify outcome variables. Only eight studies measured mindfulness as a construct.

Conclusions Future evaluations of MBP in schools should consider how outcomes fit within the context of a SEL framework to further understand the linkages between MBP and SEL.

Keywords Mindfulness · Students · Systematic review · Schools · Social-emotional learning · Social · Emotional competency

Over the last several decades, the Social and Emotional Learning (SEL) framework has been increasingly used to conceptualize, discuss, and address the areas needed to effectively build mental health and resilience in youth. When selecting the most effective course of SEL programming to implement, an initial step that school professionals must take is to determine the extent to which programs or strategies target key SEL domains as identified by the Collaborative for Academic, Social, and Emotional Learning (CASEL 2015). These domains or competency areas include self-awareness, self-management, social awareness, relationships skills, and responsible decision-making and include specific skills in each domain. These competency areas have been shown to be essential to social, emotional, and academic development in the short and long term (e.g., Durlak et al. 2011; Taylor et al. 2017). School leadership teams often lead the strategic and systematic integration of SEL practices in schools and are charged with selecting programs and strategies that provide students with the essential social-emotional skills needed to be successful in daily life, e.g., to bounce back from adversity, deal with conflict, make healthy decisions, and effectively regulate their thoughts and emotions. Given the application of SEL in schools, along with the increasing application of mindfulness-based practices (MBP) with youth, schools must decide whether or not to adopt and integrate MBP in their schools and identify ways in which MBP might be most effectively aligned within their existing system of supports to best meet students' needs.

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s12671-019-01101-1) contains supplementary material, which is available to authorized users.

✉ Laura L. Feuerborn
feuerl@uw.edu

[1] University of Washington, Tacoma, 1900 Commerce Street, Tacoma, WA 98402, USA

[2] Successful Kids Today, Steamboat Springs, CO, USA

The field is experiencing an upsurge in the application of MBP in schools (Greenberg and Harris 2012; Maynard et al. 2017). Evaluation studies of MBP typically report results of the effectiveness of MBP in schools in terms of constructs measured as outcome variables (e.g., attention, anxiety). There is also an emergent discussion surrounding the integration of MBP with a SEL framework, albeit to date, largely theoretical (Gueldner and Feuerborn 2016; Lawlor 2016). Schools would benefit from an enhanced understanding of the extent to which MBP addresses SEL from the perspective of the five-competency-area framework being increasingly applied to large-scale SEL implementation efforts throughout the USA, such as CASEL's Collaborating Districts Initiative. It is essential for schools to understand how the programming they select, organize, and implement has the potential to benefit students, not only in specific construct domains of interest, but also from a systematic approach to SEL that prioritizes five primary areas of competencies for success as an implementation framework. Understanding the extent to which MBP are targeting the five competency areas may provide information about the skills that students may learn using MBP, help schools in their selection process, and encourage researchers to design evaluation studies with a five competency area and SEL framework in mind. This approach may complement the more common method of summarizing the use of MBP in schools by way of their effects on individual constructs and skills (Zenner et al. 2014; Maynard et al. 2017). Furthermore, an enhanced and more nuanced transdisciplinary dialogue between SEL and MBP may increase our understanding of the extent to which MBP may be addressing the SEL competency areas (see discussion on a transdisciplinary approach in Stokols 2006).

In a school-based SEL framework, systematic and developmentally appropriate instruction is utilized across a multi-tiered system, including universal policies and programming for all students, and targeted and intensive interventions for students in need of additional social and emotional supports. SEL programs and strategies available today target a variety of skills and are based on inter-related theoretical perspectives. Child and adolescent development, principles of instruction, neuroscience, behavioral and cognitive therapy, and positive psychology have all influenced a wide variety of SEL programs (Zins et al. 2004). For example, the *Social Decision Making/Problem Solving Program* addresses social problem-solving strategies, which include emotion and problem identification, goal setting, brainstorming solutions, and evaluating the results of trying a strategy (Elias and Butler 2005). As another example, *Promoting Alternative Thinking Strategies* (PATHS) targets emotion identification, relaxation strategies, and perspective taking (Greenberg et al. 1995). With the application of such evidence-based programs, schools aim to boost healthy emotional and behavioral skills, decrease psychopathological symptoms and conduct problems, and improve academic performance.

Convincing evidence for the effectiveness of SEL programming has contributed to the rise in legitimizing SEL in educational settings. A meta-analysis by Durlak et al. (2011) examined 213 school-based SEL programs and found evidence of improvement in social and emotional skills, conduct problems, attitudes toward self and others, and academic performance. Sklad et al.'s (2012) meta-analysis reviewed 75 "school-based social, emotional, and/or behavioral (SEB) programs" (p. 892) and found similar evidence of benefit for students, in addition to a reduction of substance abuse. Further, benefits to students in the USA and abroad appear to be robust over time, ranging from 1 to 18 years, as found in a recent meta-analysis of 82 SEL interventions (Taylor et al. 2017). These analyses included studies conducted over the past five decades, demonstrating long-standing interest in the promotion of social and emotional skills.

In light of the increasing application of MBP in school settings, it is worth noting the importance for school personnel to have a solid understanding of the definition of and theoretical foundations that influence school-based MBP, as well as the outcomes that are believed to result from engaging in MBP. A challenge to this goal may reside in the fact that the definition of mindfulness is multi-faceted and inconsistently operationalized (Bishop et al. 2004). In brief, mindfulness has been conceptualized as paying attention to one's current experience with an attitude of non-judgment, curiosity, and acceptance (Bishop et al. 2004) and with clear intention or rationale for practicing (Shapiro et al. 2006). These components have been proposed to be primary mechanisms for producing desired outcomes (Shapiro et al. 2006). The goal of mindfulness practice is to intentionally experience a relationship with thoughts and emotions that includes an increased awareness of present moment experiences with an open and curious attitude. Doing so is believed to result in a "shift in perspective" (Shapiro et al. 2006, p.377) that can contribute to improved understanding of the variability of and changing topography of one's experiences; increased tolerance for unpleasant emotional experiences; improved reflection, flexibility, and regulation; and fewer instances of engaging in maladaptive coping strategies to avoid discomfort (Bishop et al. 2004; Shapiro et al. 2006). Indeed, school settings are interested in applying MBP because of the evidence supporting, and sometimes, the promise of improving students' psychosocial well-being (Greenberg and Harris 2012). At the same time, given the complex conceptualization of mindfulness as a construct, it is essential for schools to have a scientifically informed understanding of basic theoretical foundations of mindfulness and associated social and emotional competencies that may influence school success (Felver et al. 2013a).

Many MBP include a focus on internal experiences (e.g., emotions, thoughts), while observing the inevitable distractions that occur and returning one's attention to the breath (Shapiro et al. 2006). In other MBP, students may focus on

an external sensation as a focal point (e.g., sound) to practice (Bishop et al. 2004; Greenberg and Harris 2012). Examples of MBP with youth and in school settings include sitting meditation, moving, and breathing techniques (Burke 2010). Such practices have been used as a means to provide universal prevention and intervention for students in educational settings (e.g., Burke 2010; Maynard et al. 2017). Manualized programs that draw from theories of mindfulness have become available in recent years and are implemented in schools. For example, in the *Mind Up* program, students participate in 12 lessons and learn mindfulness through experiential learning (e.g., mindful tasting), along with understanding others' perspectives, and practicing gratitude and kindness (Hawn Foundation 2011). *Move Into Learning*, an eight-week program for elementary-age students aimed at stress reduction and behavior regulation, incorporates mindfulness meditation, yoga, breathing, writing, and other arts to deliver information and practice skills (Klatt et al. 2013). Also, *Learning to Breathe*, a 6–18 session program for adolescents, uses mindfulness and discussion to improve emotion awareness and management, attention, and stress management (Broderick 2013).

Despite the increasing rate of implementation and acceptance of MBP in school settings, the evidence for its effectiveness in schools is promising, yet still emerging. Zenner et al. (2014) reviewed 24 school-based programs across four continents that applied MBP and involved 1348 elementary through high school–age students, and results of this review indicated that the most compelling outcomes associated with MBP were in students' ability to pay attention and students' and teachers' satisfaction. Felver et al. (2016) reviewed 28 studies evaluating MBP in school settings and noted outcomes indicating decreased psychopathologies, such as reductions in behavior problems, anxiety, depression, suicide ideation, affective disturbances, and problems with executive functioning and attention. Also, several studies reported increased social and emotional skills, such as emotion regulation, coping, positive affect, optimism, and classroom engagement and behavior. However, these researchers noted many limitations in the research and concluded that many questions still remain. Maynard et al. (2017) reviewed 61 international studies and found positive outcomes in the areas of cognitive, social, and emotional skills but no significant impact on behavioral and academic skills. Both groups of researchers concluded that there are challenges associated with the quality of studies and advocated for thoughtful application of MBP with youth and in schools.

Such thoughtful application may include the consideration of how MBP may fit within a SEL framework. Similarities are evident when the goals and implementation practices of both are considered. First, most MBP and SEL programs developed for school-aged youth aim to support the development of social, emotional, and behavioral skills necessary for resilience, academic performance, and quality of life (Durlak et al. 2011; Zenner et al. 2014). Second, cultivating attention or awareness is a primary focus in MBP, as well as SEL programs, such as those having a cognitive-behavioral theoretical orientation (Shapiro et al. 2006). Third, MBP in schools apply similar principles of instructional design as SEL programs. Lessons are taught and practiced in the classroom, time is reserved for instruction and practice, additional practice in other settings (e.g., playground) is promoted, and supplemental materials (e.g., letters to parents) are used to sustain and generalize skills to other situations (Gueldner and Feuerborn 2016). Fourth, both SEL and MBP can be implemented across a multi-tiered system of prevention and support. Felver et al. (2013a) reviewed the use of MBP across multi-tiered systems and found that, just as other programs classified under a SEL umbrella, MBP have been used and have potential as a tier one or universal prevention program (e.g., *Learning to Breathe*; Metz et al. 2013), a tier two or targeted, small group intervention (e.g., *Mindfulness-based Cognitive Therapy*; Semple et al. 2005), and as a tier three, intensive intervention for students needing the highest level of support (e.g., *Soles of the Feet*; Felver et al. 2013b). Finally, MBP are being infused with existing SEL programs, demonstrating potential compatibility between the two (Gueldner and Feuerborn 2016; Zenner et al. 2014). As an example, the second edition of *Strong Kids/Teens*, SEL programs with a cognitive-behavioral orientation, recently mobilized the use of MBP as a brief and complementary means to promote self-awareness and regulation (Carrizales-Engelmann et al. 2016).

Three broad differences exist between SEL programs/strategies and MBP that are pertinent to our discussion. First, as compared to the theories that underpin MBP, SEL programs have been based on a wider range of theories such as cognitive-affective and cognitive-behavioral theories (CBT), ecological theories of behavior, and social learning theories. There appears to be no consensus in the field for the most prominent or most effective SEL theory (Brackett et al. 2015). Second, although the mechanisms of SEL and MBP are not fully understood, there are some differences (Jones et al. 2017; Lindsay and Creswell 2017). For example, SEL programs based on CBT are designed to facilitate positive change through questioning and changing thoughts and attributions in the presence of uncomfortable stimuli (Creed et al. 2011). In contrast, MBP are used to improve attention to thoughts and experiences from a curious, compassionate, and accepting stance (Lindsay and Creswell 2017). Third, the strategies used in other SEL programs and MBP may differ at times. For example, delivery of a CBT-based SEL program may involve the use of cognitive-behavioral strategies to modify behavioral responses, promote social problem-solving, and identify cognitive errors for the purposes of challenging and changing them. In contrast, MBP are largely based on cultivating awareness of thoughts and physical sensations through sitting, breathing, and/or movement (Burke 2010)—with less

emphasis on actively changing thoughts and behaviors. Despite these differences, the goals are quite similar: to improve overall functioning and well-being.

Given that MBP are used in schools in similar ways as SEL programs and often have similar goals, the exploration of whether there are additional theoretical and empirical links between MBP and SEL may prove useful. As previously stated, CASEL, the leader in SEL promotion and information dissemination, endorses five social and emotional competency areas that are critical to student development: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (CASEL 2015). The five SEL competency areas and definitions are listed in Table 1. These five broad domains comprise multiple sub-skills including: recognizing emotions and thoughts, assessing strengths and limitations, having a sense of optimism and confidence, regulating emotions and behaviors, working toward goals, taking others' perspectives, finding resources, communicating effectively, and understanding social norms (Weissberg et al. 2015).

A closer look at the adult and child literature suggests that the sub-skills associated with each of the five competency areas have likely been evaluated in the mindfulness research. For example, MBP encourage awareness of emotional signals and thoughts (Goldin and Gross 2010; Metz et al. 2013) and can positively affect self-concept and optimism (Franco et al. 2011; Schonert-Reichl et al. 2015). These skills would seem to fit in the first competency area, *self-awareness*. Improvements in attention through MBP (Jha et al. 2007; Schonert-Reichl and Lawlor 2010) may have the potential to help students set and attain goals. MBP have also resulted in lower levels of stress (Kuyken et al. 2013) and anxiety (Chen et al. 2012; Beauchemin et al. 2008), and the timely processing (Farb et al. 2012) and regulation of emotional signals (Chambers et al. 2009). Consequently, students may be better equipped to think clearly and respond with improved emotion regulation (Broderick and Metz 2009). Such constructs appear to fit under the guidelines of the second competency area, *self-management*. When we consider the third and fourth competency areas, *social awareness* and *relationship skills*, skills of interest include the following: understanding multiple perspectives, understanding social and ethnical norms, recognizing resources, establishing and maintaining relationships, communicating effectively, resolving conflict, and recognizing, seeking, and offering assistance (CASEL 2015). Meiklejohn et al. (2012) indicated that one of the aims of MBP in K-12 curricula is to improve social competencies, and Huppert and Johnson (2010) proposed that relationships may benefit from MBP due to improved ability to take another's perspective, cultivate careful responses, and pay greater attention to positive aspects of interpersonal exchanges. MBP can increase problem-solving, cognitive flexibility (Moore and Malinowski 2009), and empathy (Lutz et al. 2008; Schonert-Reichl et al. 2015); all of which play a role in the development and maintenance of relationships. The fifth competency area, *responsible decision making*, involves making respectful and constructive choices based on ethics, safety, social norms, evaluating consequences, and the well-being of self and others (CASEL 2015). MBP may increase problem-solving and cognitive flexibility (Moore and Malinowski 2009) as well as the ability to consider different perspectives (Block-Lerner et al. 2007)—all needed to appraise contextual information when making decisions.

Given the similarities between MBP and other SEL programs and the observation that MBP seem to be targeting construct areas that may fit within the SEL five competency area model, we investigated the extent to which studies evaluating MBP in the schools measured constructs that may be linked with the SEL competency areas. We hypothesized that there may be unexplored connections in the SEL and MBP literature, and by elucidating the extent to which school-based MBP are targeting constructs associated with each of the five SEL competency areas, we could assist both researchers and school practitioners in facilitating an enhanced understanding of the ways in which MBP can be considered within the SEL framework, be woven into this multi-tiered system of support, and forge a complimentary means by which school leadership teams select MBP-based programs and strategies. This study reviewed the extent to which each of the five competency areas is being measured when MBP in the schools are evaluated. This study is not a meta-analytic review, but a preliminary exploration to encourage transdisciplinary understanding and further dialogue. Specifically, by conducting this exploratory study, we aimed to (a) identify the constructs evaluated by studies, examining the effects of MBP on students in school settings; (b) explore the extent to which constructs may be related to the five SEL competency areas; (c) estimate the extent to which each of the five SEL competency areas is represented in the mindfulness-based studies conducted in school settings; and (d) make recommendations for future evaluations of MBP in the schools within the context of this SEL framework.

Method

Search and Information Sources

To start, we conducted a review of published research that applied and evaluated MBP in school settings. We located research by searching for studies using the electronic data bases PsychINFO, PSYarticles, Google Scholar, ERIC and EBSCO and using the keywords "mindfulness," "students," "social emotional learning," and "schools." First, we conducted our search by combining the terms "mindfulness" "social emotional learning" (with "AND"). We then searched for

"mindfulness" AND "schools" along with "mindfulness" AND "students."

Following this search of the databases, we reviewed the reference lists of 14 literature reviews and meta-analyses conducted on MBP with youth and identified additional references that appeared to fit our inclusion criteria based on their titles. We then reviewed the abstracts of the studies that appeared to fit our inclusion criteria. This initial search using only study titles and abstracts yielded 73 studies.

Eligibility Criteria and Study Selection

We reviewed the full 73 articles to determine if the study did indeed fit our inclusion criteria: (a) the use of MBP, (b) study conducted in a school setting with students, (c) inclusion of a goal to promote mindfulness, and (d) at least one construct or outcome variable relevant to the five SEL competency areas. We sought to be inclusive of studies drawing from diverse theoretical frameworks and methodologies, and as such, we did not exclude studies based on design, method, or analysis. We reviewed peer-refereed sources only, thus excluding books, dissertations, and conference papers.

Articles were excluded for the following reasons: study was not conducted in a school-based setting ($n = 15$), MBP was not an independent variable ($n = 7$), dependent variables did not include constructs related to at least one of the five social-emotional competency areas ($n = 4$), the study was not an evaluation (e.g., theoretical paper, $n = 3$), adults were the subjects of the study ($n = 3$), and inability to retrieve the article for inspection ($n = 1$). This round of review eliminated 33 studies, bringing the total number to 40 studies. All researchers agreed to the decisions to include and exclude studies based on the aforementioned criteria.

As we encountered studies that were potentially outside the aim and scope of this review, we communicated to determine whether these studies should be excluded from this exploratory study. During these discussions, we confirmed our decision to include only those studies that self-described the intervention or strategy as mindfulness and offered instruction on mindfulness as an awareness of the present experience, such as sensations in the body, thoughts, and/or the breath. We included yoga and Tai Chi if at least one of the primary aims of the study was mindfulness. We also included studies evaluating compassion-based meditations practices, such as loving kindness meditations, as they included a mindfulness component. We did not evaluate the study design or methods.

Data Collection Process and Data Items

The five SEL competency areas and the definitions provided by CASEL (see Table 1) were used as the basis to propose potential connections between the constructs measured in the MBP studies and SEL. We coded each study by assigning each construct measured in the MBP study to one of the five SEL competency areas. In making these coding decisions, we closely inspected the CASEL definitions and related sub-skills for each competency area (Table 1) and applied conceptual reasoning, theory, and when available, empirical evidence. To provide examples of this process, we coded the construct of "self-efficacy" under the SEL competency area of Self Awareness, the construct "dysregulation" under Self-Management, the construct "empathy" under Social Awareness—and so forth. We coded

Table 1 SEL competencies as defined by CASEL

SEL competency	CASEL definition
Self-awareness	The ability to accurately recognize one's emotions and thoughts and their influence on behavior. This includes accurately assessing one's strengths and limitations and possessing a well-grounded sense of confidence and optimism.
Self-management	The ability to regulate one's emotions, thoughts, and behaviors effectively in different situations. This includes managing stress, controlling impulses, motivating oneself, and setting and working toward achieving personal and academic goals.
Social awareness	The ability to take the perspective of and empathize with others from diverse backgrounds and cultures, to understand social and ethical norms for behavior, and to recognize family, school, and community resources and supports.
Relationship skills	The ability to establish and maintain healthy and rewarding relationships with diverse individuals and groups. This includes communicating clearly, listening actively, cooperating, resisting inappropriate social pressure, negotiating conflict constructively, and seeking and offering help when needed.
Responsible decision-making	The ability to make constructive and respectful choices about personal behavior and social interactions based on consideration of ethical standards, safety concerns, social norms, the realistic evaluation of consequences of various actions, and the well-being of self and others.

Competencies and definitions from http://www.casel.org/social-and-emotional-learning/core-competencies/

each construct under one competency area and coded the most advanced SEL competency to which the construct applied. There exists a progressive complexity across the five SEL competencies, beginning with the most fundamental area of self-awareness, progressing to self-management, social awareness, and ending with relationship skills and responsible decision-making.

We (the two authors) coded the constructs independently, using independent spreadsheets to record the construct assignments along with the demographics of the participants, study design, methodology, information about the independent variable (type or amount of MBP), dependent variables, assessment measures, and findings or results. We did not code constructs and outcomes that were not directly related to the SEL competency areas such as physiological outcomes (e.g., heart rate, cortisol levels, headaches), academic outcomes (e.g., grades, reading comprehension), acceptability, and feasibility.

Our coding process occurred in two stages to allow for an opportunity to formatively revise the process if necessary. In the first stage, we independently coded the first batch of studies ($n = 24$) and discussed the findings. We calculated an agreement of 73% on the first round of constructs coded, and then discussed areas of coding differences to find full consensus (100% agreement) and to prepare for coding the final batch of studies. In our discussions, we reaffirmed our decisions to base our codes on the manner in which the constructs were described and reported in the study. We then independently coded the second batch of studies, resulting in an inter-coder agreement of 77%, achieving the minimal acceptable ICA criterion of 70% for this type of exploratory research (Neuendorf 2002). We met once again to discuss areas of coding differences and again arrived at 100% agreement on all constructs.

Results

Results include descriptive information of the studies followed by an analysis of construct-to-SEL competency areas assignments measured in the studies. We collected descriptive information to better understand the school-based studies investigating MBP, including setting and participants, program and program facilitators, type of MBP implemented, tools used to measure SEL-related constructs, and study design and analysis. Also, we analyzed the number of constructs coded per SEL competency, the number of studies measuring the constructs within each competency, and the proportion of MBP studies finding significance in each SEL competency area.

Setting and Participants

The location, school level, and school type varied across the studies reviewed. Studies were conducted across countries including Australia, Belgium, Canada, Hong Kong, Ireland, Spain, Sweden, and the USA. Studies were conducted across all school levels including pre-Kindergarten/preschool, elementary, middle, and high, and type of school included public and private, including alternative and charter schools, parochial schools, boarding schools, residential schools for students with disabilities, and schools located within a university campus. Participants varied in race, ethnicity, and age/grade, and number of participants in each study ranged widely—from 3 to 521. A table with detailed information pertaining to the type of MBP evaluated, the study design and analysis, and participant demographics is available from the lead author.

Programs and Program Facilitators

The theoretical framework of the programs or strategies upon which the studies were based also varied widely, as did the types of programs or practices implemented, and the roles and expertise of the program facilitators. Researchers drew from theory of mindfulness-only or a mixture of mindfulness and cognitive-behaviorally-based foundations (e.g., MBCT, DBT, ACT), neuropsychology (e.g., executive functioning), and movement-based mindfulness (e.g., yoga). The purpose or overarching goal of the programs or practices included both prevention and intervention. Across the 40 evaluation studies, we noted 23 manualized, mindfulness-based programs (e.g., *Mind Up*, *Smiling Mind*, *Mindful Schools*, *Learning to Breathe*) and five programs that were described as "based on" an established framework or model of MBP (e.g., *MBSR*, *Planting Seeds*, *MBCT*). When programs were not named in the studies, program elements were described and often included awareness of breath, thoughts, emotions, and senses; movement practices; kindness practices; psychoeducation; and/or spiritual practices such as prayer. Programs were delivered by group discussion, audio/video recordings, and/or scripted lessons. Many studies incorporated elements of home practice. The duration of the programs ranged from 3 sessions to 48 sessions—some as brief as 3 min and others lasting up to 100 min a session. Program facilitators included classroom teachers, researchers, mindfulness instructors, a school counselor, a school psychologist, clinical psychologists, a yoga instructor, and university graduate students. Most facilitators had received some training in the specific program or practice studied.

Measures

Researchers used a variety of tools to measure constructs. Researchers used questionnaires, direct observations, performance assessments, and interviews; but most often, researchers measured constructs through a number of social, emotional, and behavioral rating scales, including self, parent, and teacher reports. In the use and interpretation of rating scales, researchers applied total scores, composite scores,

subtest or scale scores, and even individual item scores. The largest number of measures were used to assess the constructs coded within the self-management domain ($n = 90$); followed by self-awareness ($n = 24$), relationship skills ($n = 17$), responsible decision-making ($n = 6$), and then social awareness ($n = 3$). A list of the measurement tools used in the studies is available online as supplemental material.

Design and Methods

Researchers employed diverse methodologies and designs including pre and post with and without control, single subject research, qualitative, and mixed methods. Researchers used both non-randomization and randomization techniques including randomization of individuals, groups, and classrooms. Some studies included follow-up measures to assess the duration of effects. Researchers used a wide range of methods to analyze data including statistical analysis, visual analysis, and qualitative thematic analysis.

Studies and Constructs per Competency Area

An overview of the number of constructs represented in each of the five competency areas, the number of studies per competency area, and the proportion of studies finding significance in each competency area is provided herein. Table 2 includes more complete information pertaining to the studies, constructs, and findings. This table lists the competency areas, construct themes and/or specific constructs that we propose fit within each competency area, and the studies that measured these constructs. As noted previously, our aim was neither an appraisal of the quality of the studies nor a meta-analysis of the effectiveness of MBP, as such an analysis falls outside the scope of the current study. However, because readers might find a general account of the results per construct to be helpful (e.g., significant findings, positive trends, mixed results, no significant findings, and results not in the desired direction), we have noted these findings in Table 2. Studies such as qualitative and single-subject studies did not use statistical analysis whereas others reported results that just missed the p value cutoff, so relevant findings within these studies are included under *those that indicated trends in the desired direction*. All results are reported as they were reported in the study.

To better understand the extent to which the constructs measured in the studies fit within each of the five SEL competency areas, and to also determine the number of studies which measured constructs within these competency areas, we quantified the number of constructs assigned to each competency area. By far, the competency area under which we coded the largest number of constructs was self-management ($n = 128$). We assigned the next largest number of constructs to self-awareness ($n = 29$), followed by relationship skills ($n = 12$), responsible decision-making ($n = 6$), and social awareness ($n = 3$).

To better understand the extent to which studies are measuring constructs that may fit into each competency area, we quantified the number of studies that measured constructs within each of the five competency areas. The competency area under which we coded the largest number of studies was self-management. All 40 studies evaluated at least one construct that was assigned to self-management. The competency area with the next highest number of studies represented was self-awareness ($n = 18$), followed by relationship skills ($n = 15$), responsible decision-making ($n = 3$), and last, social awareness ($n = 2$).

The competency area with the largest proportion of quantitative studies with significant findings (in the desired direction) was responsible decision-making (67%; $n = 3$), followed by self-management (62%; $n = 24$), social awareness (50%; $n = 1$), relationship skills (40%; $n = 6$), and then self-awareness (33%; $n = 6$). In other words, out of the three studies that measured constructs in the responsible decision-making competency area, two studies found significant results—and so forth.

Other Observations

During the coding process and the review of our results, we noted three unexpected observations. First, most of the studies did not mention or explicitly discuss the SEL competency areas as defined by CASEL; that is, researchers did not use this competency language. Second, we noted that the majority of the constructs measured were symptoms or problems, with relatively few measuring strengths or assets. Third, we found it noteworthy that only eight studies explicitly measured the construct of mindfulness—despite it being a goal of all studies.

Discussion

The purpose of this study was to review the research on MBP in school settings to explore the extent to which each of the five SEL competency areas is represented in these evaluation studies. The goal was not to evaluate the strength or weaknesses in the studies and outcomes, but to achieve a better understanding of the types of SEL-related constructs that were measured and the extent to which each of the five competency areas are represented in these evaluations. It is our intention to provide information that can be used by scholars and schools in research design and when choosing MBP for use within an SEL framework. We also aim to encourage further transdisciplinary dialogue between the areas of MBP and SEL, offering a complementary approach to reviewing the utility of MBP in schools. In light of increasing use of a SEL framework and MBP in schools, informed decisions on these matters are essential.

Table 2 SEL competency constructs measured and studies coded

Self-awareness	Study
Awareness (of emotions, self, thoughts, mindfulness)	*Broderick and Metz (2009), [a]Costello and Lawler (2014), [a]Le and Gobert (2015), *Metz et al. (2013), [b]Mendelson et al. (2010), [a]Reid and Miller (2009), [a, b]Sibinga et al. (2013), [a]Wall (2005), [a]Wisner (2014)
Mindfulness (general mindfulness, mindful breathing, observations, presence)	[a]Edwards et al. (2014), [c]Huppert and Johnson (2010), *, [b]Lau and Hue (2011), [a]Le and Gobert (2015), [b]Noggle et al. (2012), *Schonert-Reichl et al. (2015), [b]Sibinga et al. (2013)
Emotional clarity	*Broderick and Metz (2009), *Metz et al. (2013)
Autonomy	[b] Lau and Hue (2011)
Perceived competence for learning	[b]Reid and Miller (2009)
Self-efficacy in emotion regulation	*Metz et al. (2013)
Self-concept	*Franco et al. (2011), [c] Schonert-Reichl and Lawlor (2010), [e]Reid and Miller (2009), *Schonert-Reichl et al. (2015)
Self esteem	[d]Reid and Miller (2009), [b]White (2012)
Self-acceptance and self-compassion	*Edwards et al. (2014), [b]Lau and Hue (2011), [b]Viafora et al. (2014)
Optimism	[c]Schonert-Reichl and Lawlor (2010), *Schonert-Reichl et al. (2015)
Purpose in life	[b]Lau and Hue (2011)
Positive psychology	[b]Noggle et al. (2012)
Self-management	**Study**
Openness and acceptance/non-acceptance of experience	[b]Broderick and Metz (2009), [b]Lau and Hue (2011), [b]Metz et al. (2013), [b]Sibinga et al. (2013), [c]Viafora et al. (2014)
Affective strength	*Wisner and Norton (2013)
Coping	[a, b]Sibinga et al. (2013), [c]White (2012), [a]Wisner (2014)
Curiosity & learning	[a]Reid and Miller (2009)
Emotional & behavioral strengths	[c]Wisner and Norton (2013)
Engagement in goal directed activities	[b]Metz et al. (2013)
Goal directed activity (difficulties in)	[b]Broderick and Metz (2009)
Intrapersonal strength	*Wisner and Norton (2013)
Vigor & activity	[b]Noggle et al. (2012)
Well-being (total score)	[c]Kuyken et al. (2013), [b]Lau and Hue (2011), [a]Wall (2005)
Well-being: environmental mastery	[b]Lau and Hue (2011)
Well-being: personal growth	*Lau and Hue (2011)
Psychological well-being	[c]Huppert and Johnson (2010)
Resilience	[c]Huppert and Johnson (2010)
Self-regulatory skills: resiliency	[b]Noggle et al. (2012)
School functioning	*Wisner and Norton (2013)
Academic engagement (on-task behavior)	[a]Carboni et al. (2013), [a]Felver et al. (2013b)
Attention, concentration	*Black and Fernando (2013), [a]Costello and Lawler (2014), *Klatt et al. (2013), [b]Le and Gobert (2015), [d]Mendelson et al. (2015), [b]Parker et al. (2014), [b]Razza et al. (2015), *Schonert-Reichl and Lawlor (2010), [a]Semple et al. (2005), [a]Wilson and Dixon (2010), [a]Wisner (2014)
Cognitive flexibility	[b]Flook et al. (2010)
Effortful control	[a, b]Razza et al. (2015)
Executive functioning	*, [b, c]Flook et al. (2010), *Parker et al. (2014), *, [a]Razza et al. (2015), *, [c]Schonert-Reichl et al. (2015)
Shift	*Flook et al. (2010)
Working memory	[c]Flook et al. (2010)
Inhibitory control	[b]Razza et al. (2015)
Emotional control	[c]Flook et al. (2010), *Schonert-Reichl et al. (2015)
Access to emotion regulation strategies	*Metz et al. (2013)
Emotion regulation	[b,]*Broderick and Metz (2009), *Flook et al. (2015)
Self-regulation of emotional reactivity	[e]Costello and Lawler (2014)

Table 2 (continued)

Regulation of classroom behaviors	[a]Costello and Lawler (2014)
Regulation strategies	[b]Mendelson et al. (2015)
Self-regulation	[c]Le and Gobert (2015), [b]White (2012)
Self-regulation of rumination and mind wandering	[c]Costello and Lawler (2014)
Self-regulation of thoughts and feelings	[a]Costello and Lawler (2014)
Self-control	[c]Black and Fernando (2013), [c]Parker et al. (2014)
Delay of gratification	[b] Flook et al. (2015)
Calmness	*Broderick and Metz (2009), [a]Costello and Lawler (2014), [a]Le and Gobert (2015), [a]Wall (2005), [a]Wisner (2014)
State of mind	[a]Wisner (2014)
Acting with mindful awareness	[b]Sibinga et al. (2013), [c]Viafora et al. (2014)
Relaxation	[a]Le and Gobert (2015), [a]Wall (2005)
Skills to manage stress	[a]Le and Gobert (2015)
Mood	*Noggle et al. (2012), [c]Semple et al. (2005)
Affect: positive and negative	[b]Broderick and Metz (2009) (positive affect), *Broderick and Metz (2009) (negative affect), [b]Noggle et al. (2012) (positive affect), *Noggle et al. (2012) (negative affect), [c]Schonert-Reichl and Lawlor (2010) (positive affect), [b]Schonert-Reichl and Lawlor (2010) (negative affect)
Happiness	[b]Arthurson (2015)
Anger	[a]Arthurson (2015), [b]Noggle et al. (2012), *Pahnke et al. (2014) [a]Sibinga et al. (2013)
Hostility	[b]Edwards et al. (2014), [b]Sibinga et al. (2013) *Wright et al. (2011)
Anxiety (general, trait, state, fear)	*Beauchemin et al. (2008), [b]Bei et al. (2013), [b]Edwards et al. (2014), *Franco et al. (2011), [a]Noggle et al. (2012), [b]Pahnke et al. (2014), [c]Parker et al. (2014), [e]Semple et al. (2005), *, [b]Sibinga et al. (2013), [b]Viafora et al. (2014)
Fear	[b]Arthurson (2015)
Anxious/depressed	[c]Semple et al. (2005)
Suicidal ideation	[a]Le and Gobert (2015)
Depression, sadness	*Edwards et al. (2014), *Joyce et al. (2010), [c]Kuyken et al. (2013), *Lau and Hue (2011), [a]Le and Gobert (2015), [a]Mendelson et al. (2010), [b]Mendelson et al. (2015), [b]Noggle et al. (2012), [a]Pahnke et al. (2014), *Raes et al. (2014), [c]Ricard et al. (2013), *Schonert-Reichl et al. (2015), [b]Sibinga et al. (2013)
Sadness	[b]Arthurson (2015)
Emotions: positive & negative	[b]Mendelson et al. (2010)
Emotional arousal	*Mendelson et al. (2010)
Emotional symptoms	*Pahnke et al. (2014)
Internalizing symptoms	[a]Mendelson et al. (2015), [c]Semple et al. (2005)
Psychological inflexibility	[b]Viafora et al. (2014)
Psychological distress	*Pahnke et al. (2014)
Stress	[b]Arthurson (2015), *Costello and Lawler (2014), *Edwards et al. (2014), [c]Kuyken et al. (2013), [b]Lau and Hue (2011), [a]Metz et al. (2013), [b]Noggle et al. (2012), [c]Pahnke et al. (2014), [b]Sibinga et al. (2013), [b]White (2012)
Stress management	[a]Wisner (2014)
Stress reduction	[c]Costello and Lawler (2014)
Stress response: involuntary	*Mendelson et al. (2010)
Somatic complaints/somatization	*Broderick and Metz (2009), *Metz et al. (2013), [c]Ricard et al. (2013), [b]Sibinga et al. (2013)
Confusion & bewilderment	[a]Noggle et al. (2012)
Intrusive thoughts	*Mendelson et al. (2010)
Rumination	[b]Broderick and Metz (2009), *Mendelson et al. (2010), *Sibinga et al. (2013)
Aggression	*Parker et al. (2014), *Ricard et al. (2013), *Schonert-Reichl et al. (2015), *Schonert-Reichl and Lawlor (2010)
Behavior	[a]Bakosh et al. (2016), *Klatt et al. (2013), [c]Pahnke et al. (2014)
Conduct problems	[b]Pahnke et al. (2014), *Ricard et al. (2013)
Disciplinary sanctions	[a]Mendelson et al. (2015)
Dysregulation	*Mendelson et al. (2015)
Emotional & behavioral problems	*Joyce et al. (2010)
Externalizing	[e]Semple et al. (2005)
Fatigue and inertia	[b]Noggle et al. (2012)
Hyperactivity	*Klatt et al. (2013), [c]Ricard et al. (2013)
Hyperactivity/inattention	[c]Carboni et al. (2013), *Pahnke et al. (2014)
Impulsivity	[b]Broderick and Metz (2009), [a]Le and Gobert (2015), [a]Mendelson et al. (2010), [b]Metz et al. (2013)
Oppositional/dysregulated behavior	[b]Klatt et al. (2013), *Schonert-Reichl and Lawlor (2010)
Problem behaviors	*Beauchemin et al. (2008), [a]Semple et al. (2005)

Table 2 (continued)

Social awareness	Study
Empathy	*Schonert-Reichl et al. (2015)
Perspective taking	*Schonert-Reichl et al. (2015)
Sense of interconnection	[a]Wall (2005)
Relationship skills	Study
Language & communication	[b]Flook et al. (2015)
Care, helpfulness, kindness, respect for others	[c]Black and Fernando (2013), *Flook et al. (2015), [a]Schonert-Reichl et al. (2015)
Family involvement	*Wisner and Norton (2013)
Group participation	[c]Black and Fernando (2013)
Peer, other relationships	[b]Lau and Hue (2011), [a]Le and Gobert (2015), [b]Mendelson et al. (2010), *, [b]Pahnke et al. (2014)
Prosocial skills	*Flook et al. (2015), [b]Joyce et al. (2010), *Pahnke et al. (2014), *Wisner and Norton (2013)
Sharing & cooperation	*Schonert-Reichl et al. (2015)
Social & emotional development, competence	[a]Beauchemin et al. (2008), *Flook et al. (2015), *Mendelson et al. (2015), *Schonert-Reichl and Lawlor (2010)
Peer acceptance	*Schonert-Reichl et al. (2015)
Trustworthiness	*Schonert-Reichl et al. (2015)
Conflict	[b]Sibinga et al. (2013)
Social problems	*Parker et al. (2014), [c]Ricard et al. (2013)
Responsible decision-making	Study
Authority acceptance	*Mendelson et al. (2015)
Cognitive decision-making	[b]Mendelson et al. (2015)
Social responsibility	[b]Schonert-Reichl et al. (2015)
Starts fights	*Schonert-Reichl et al. (2015)
Intention to use substances	[b]Parker et al. (2014)
Disciplinary sanctions	[a]Mendelson et al. (2015)

The codes reflect how the results were reported in the study. Results from studies are coded using this key:

*Significant findings in the desired direction; significance reported at the .01–.05 level. [a] Results were reported as in the desired direction. Results reported as either marginally significant, a trend, or tests of significance were not conducted or appropriate (e.g., visual analysis & qualitative studies). [b] Insignificant findings or no effects noted. [c] Mixed results. [d] Results not in the desired direction. [e] Constructs and measurements were not reported in the results

Our findings suggested that the majority of research evaluating MBP in the schools emphasized measuring constructs that fit within the self-management competency area. In fact, every study included in this review measured at least one construct assigned to this domain. We assigned far fewer constructs and number of studies to the other four competency areas, self-awareness, relationship skills, responsible decision-making, and social awareness, respectively. More than half of the studies measuring constructs within the self-management and responsible decision-making competencies found significant results in the desired direction.

The limited number of constructs assigned to areas other than self-management may be an indication of what the researchers chose to measure rather than the full potential of MBP within a SEL framework. Indeed, there are MBP-based curriculum used in schools that specifically address other competency areas such as self-awareness and relationship skills through the use of MBP (e.g., *Learning to Breathe*, Broderick and Metz 2009, *MindUP*, Schonert-Reichl et al. 2015). Therefore, the fact that self-management constructs were more frequently measured does not necessarily reflect the potential impact of MBP on all five competency areas. Rather, self-management might be the competency area most populated with constructs because the majority of emotional and behavioral problems and symptoms that are pressing concerns in schools were coded here. Indeed, we found that constructs representing problems and symptoms were most frequently measured across the studies included in this review, with assets and strengths measured considerably less frequently. This may be a consistent pattern in school-based MBP research, as Schonert-Reichl et al. also noted a limited focus on social-emotional competence in the MBP literature. This trend may be present in the field of SEL as well—despite the influence of positive psychology on SEL and calls for enhanced attention to strengths and assets as compared to deficits and pathology (2010).

Studies that have evaluated mindfulness-based practices (MBP) in the schools appeared to measure similar outcome variables as those in non-mindfulness-based SEL studies. A basic review and comparison of the MBP studies included in the Zenner et al. (2014) meta-analysis and the studies included in the Durlak et al. (2011) meta-analysis of SEL programs, suggested such similar constructs were measured such as: psychological symptoms like depression (MBP: Joyce et al. 2010; SEL: Merry et al. 2004) and anxiety (MBP: Beauchemin et al. 2008; SEL: Baker and Butler 1984), aggression (MBP: Schonert-Reichl and Lawlor 2010; SEL: Grossman et al. 1997), and managing emotions (MBP: Metz

et al. 2013; SEL: Greenberg et al. 1995). The similarities in construct measurement, between studies that evaluated school-based MBP and those that evaluated SEL, suggest to us a likely and logical link between the two, yet this link is not often discussed in the literature.

Another salient finding was that the many studies included in our review did not use the vernacular of the SEL competencies, and in fact, no evaluations included in our review were structured around the measurement of the five SEL competencies. However, we noted some discourse pertaining to both MBP and SEL competency areas. For example, Bakosh et al. (2016) included a brief discussion of how the competency areas were woven into the design of their *Mindfulness-Based Social and Emotional Learning* program. Also, Schonert-Reichl et al. (2015) discussed the integration of MBP in SEL programs as "value added," and Le and Gobert (2015) discussed the program evaluated in their study to be based on MBSR and SEL. Mendelson et al. (2015) expounded on this topic by stating that SEL is integrated into their program to promote skills such as problem-solving, communication, and decision-making, and emotional regulation. Other researchers discussed SEL more generally and suggested MBP to be complementary to school-based programs that promote well-being (Noggle, Steiner, Minami, & Khalsa, 2012) and reduce risk (Wisner and Norton 2013). Finally, Razza et al. (2015) compared MBP and SEL and posited that MBP could be more feasible as a method to promote self-management as compared to typical SEL programs because MBP can be implemented without the need for specific resources or settings.

Limitations and Future Research

Although this study was exploratory and conceptual in nature, and not a meta-analysis of outcomes, there were important challenges that affected the interpretation of our findings. First, limiting our criteria to published studies and those in English may have excluded important studies from our review. Second, we limited studies to those published via peer review, and hence, did not include other studies available such as dissertations and theses. Future research could be more inclusive of other research and research published in other languages. Third, our coding of constructs into the SEL competency areas remains to be tested. We grappled with challenges throughout the coding process, including inconsistencies with how the researchers measured constructs, the majority of constructs measured being problems or symptoms rather than SEL skills and assets, and the overlap and interrelationship amongst the competency areas—an issue also noted in existing literature (Denham 2015).

Clearly, the full potential for MBP to fit within the five competencies that structure the SEL framework is yet to be determined and is outside the scope of this exploratory study. We neither evaluated the strength of the studies nor the extent to which constructs within each competency area yielded strong outcomes. Our primary aims were to (a) gain a better conceptual understanding of the extent to which the constructs used to evaluate the effectiveness of MBP in schools may align with five competency areas known to facilitate social and emotional competence, (b) to introduce a complementary approach by which scholars can evaluate MBP using a SEL framework and school leadership teams may consider programming options, and (c) encourage transdisciplinary dialogue to highlight the issues thus far described—the value of heightening the conversation around the importance of evaluating MBP used in schools with a five competency SEL framework in mind, as compared to studying single constructs in isolation. Not every SEL program addresses all five competency areas, and it is difficult to determine which of the five competencies are the "active ingredients" that lead to the most desired outcomes (Weissberg et al. 2015, p.13). Yet, it is essential to study the extent to which these competency areas are being enhanced via specific strategies in order to understand which components are the most effective in producing positive student outcomes (Weissberg et al. 2015).

Although further in-depth review and discussion regarding the mechanisms for change and the specific strategies applied are outside the scope of this paper, we hypothesize that MBP are targeting the same or similar competency areas that are used to organize constructs measuring overall SEL program outcomes. It could be that MBP may affect other competency areas (e.g., self-awareness) to a greater extent, and indeed, a primary aim of MBP is to cultivate attention and awareness. However, measurement challenges as well as a pressing interest in schools to focus on the reduction of emotional and behavioral problems limit the implications of this study. Future research in this area could bring clarity to the degree of impact MBP has on self-awareness, social awareness, relationships skills, and responsible decision-making. Also, future MBP researchers could emphasize strengths and assets as this will help us further assess the extent to which MBP align with competency area sub-skills such as motivation, perseverance, and goal attainment. Last, future MBP research could more consistently define and measure mindfulness. In the current study, less than a quarter of the studies measured mindfulness as a construct or outcome, despite it being an aim of the evaluated program or strategy.

Our observation of a limited discussion of the SEL competency areas may not be unique to studies evaluating MBP, but rather a potential point for future discussion both in the SEL and the MBP literature. If the competency areas are to be the organizational framework for SEL, it would follow that the use of such a framework would help to organize study results and implications for the promotion of these competency areas. As Payton et al. asserted nearly two decades ago, SEL competencies should be "specifically and intentionally applied" to

the areas in which they seek to effect change (Payton et al. 2000, p.4). Although our process of classifying constructs neatly within the SEL competencies had limitations, our findings may help researchers and school practitioners consider the SEL competency areas when selecting focal outcomes, generating hypotheses about the potential benefits of programs, and identifying strategies that best fit the needs of the population receiving them.

In summary, we recommend that future studies include the following: (a) consideration of a SEL framework in study design and selection of outcome measures; (b) implications according to the five SEL competency areas that may be affected by MBP; (c) a replication of our process whereby constructs were assigned to competency areas; (d) an investigation of the constructs that are associated with lesser measured competency areas; (e) an emphasis on outcomes that are strength-based; and (f) measurement of mindfulness as a construct. By addressing these important questions in the field, we stand to deepen our understanding of MBP in the context of school-based SEL, thereby empowering school mental health practitioners, leaders, and educators to make data-informed decisions for program adoption, and ultimately, better meet the needs of all students.

Author Contributions LF and BG shared responsibility in all aspects of this study, from conceptualization; literature retrieval, review, and analysis; data entry and analysis; and writing of the manuscripts. Both authors approved the final version of the manuscript for submission.

Compliance with Ethical Standards

This article does not contain any studies with human participants or animals performed by any of the authors.

Conflict of Interest The authors declare that they have no conflict of interest.

References

Studies included in the exploratory review are marked with an *

*Arthurson, K. (2015). Teaching mindfulness to year sevens as part of health and personal development. *Australian Journal of Teacher Education, 40*(5).

Baker, B., & Butler, J. (1984). Effects of preventive cognitive self-instruction training on adolescent attitudes, experiences, and anxiety. *Journal of Primary Prevention, 5*, 17–26.

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

*Beauchemin, J., Hutchins, T. L., & Patterson, F. (2008). Mindfulness meditation may lessen anxiety, promote social skills, and improve academic performance among adolescents with learning disabilities. *Complementary Health Practice Review*, *13*(1), 34–45.

*Bei, B., Byrne, M. L., Ivens, C., Waloszek, J., Woods, M. J., Dudgeon, P., Murray, G., Nicholas, C. L., Trinder, J., & Allen, N. B. (2013). Pilot study of a mindfulness-based, multi-component, in-school group sleep intervention in adolescent girls. *Early Intervention in Psychiatry, 7*(2), 213–220.

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., et al. (2004). Mindfulness: a proposed operational definition. *Clinical Psychology: Science and Practice, 11*(3), 230–241.

*Black, D. S., & Fernando, R. (2013). Mindfulness training and classroom behavior among lower-income and ethnic minority elementary school children. *Journal of Child and Family Studies*, *23*(7), 1242–1246.

Block-Lerner, J., Adair, C., Plumb, J. C., Rhatigan, D. L., & Orsillo, S. M. (2007). The case for mindfulness-based approaches in the cultivation of empathy: does nonjudgmental, present-moment awareness increase capacity for perspective-taking and empathic concern? *Journal of Marital and Family Therapy, 33*(4), 501–516.

Brackett, M. A., Elbertson, N. A., & Rivers, S. A. (2015). Applying theory to the development of approaches to SEL. In C. E. Domitrovich, R. P. Weissberg, & T. P. Gullotta (Eds.), *Handbook of social and emotional learning: research and practice* (pp. 20–32). New York: The Guilford Press.

Broderick, P. C. (2013). *Learning to breathe: a mindfulness curriculum for adolescents to cultivate emotion regulation, attention, and performance*. Oakland: New Harbinger Publications.

*Broderick, P. C. & Metz, S. (2009). Learning to BREATHE: a pilot trial of a mindfulness curriculum for adolescents. *Advances in School Mental Health Promotion*, *2*(1), 35–46.

Burke, C. A. (2010). Mindfulness-based approaches with children and adolescents: a preliminary review of current research in an emergent field. *Journal of Child and Family Studies, 19*(2), 133–144.

*Carboni, J. A, Roach, A. T. & Fredrick, L. D. (2013). Impact of mindfulness training on the behavior of elementary students with attention-deficit/hyperactive disorder, *Research in Human Development, 10*, 234–251.

Carrizales-Engelmann, D., Feuerborn, L. L., Gueldner, B. A., & Tran, O. K. (2016). *Merrell's strong kids/strong teens*. New York: Brookes Publishing.

Chambers, R., Gullone, E., & Allen, N. B. (2009). Mindful emotion regulation: an integrative review. *Clinical Psychology Review, 29*(6), 560–572.

Chen, K. W., Berger, C. C., Manheimer, E., Forde, D., Magidson, J., Dachman, L., & Lejuez, C. W. (2012). Meditative therapies for reducing anxiety: a systematic review and meta-analysis of randomized controlled trials. *Depression and Anxiety, 29*(7), 545–562.

Collaborative for Academic, Social, and Emotional Learning. (2015). *Social and emotional learning core competencies*. Retrieved from http://www.casel.org/social-and-emotional-learning/core-competencies/.

*Costello, E. & Lawler, M. (2014). An exploratory study of the effects of mindfulness on perceived levels of stress among school-children from lower socioeconomic backgrounds. *The International Journal of Emotional Education, 6*(2), 21–39.

Creed, T. A., Reisweber, J., & Beck, A. T. (2011). *Cognitive therapy for adolescents in school settings*. New York: Guilford Press.

Denham, S. A. (2015). Assessment of SEL in educational contexts. In J. A. Durlak, C. E. Domitrovich, R. P. Weissberg, & T. P. Gullotta (Eds.), *Handbook of social and emotional learning* (pp. 285–300). New York: Guilford Press.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Development, 82*(1), 405–432.

*Edwards, M., Adams, E. M., Waldo, M., Hadfield, O. D., & Biegel, G. M. (2014). Effects of a mindfulness group on Latino adolescent students: examining levels of perceived stress, mindfulness, self-

compassion, and psychological symptoms. *The Journal for Specialists in Group Work, 39*(2), 145–163.

Elias, M. J. & Butler, L. B. (2005). *Social decision making, social problem solving for middle school students: A curriculum for academic, social, and emotional learning*. Champaign, IL: Research Press.

Farb, N. A. S., Segal, Z. V., & Anderson, A. K. (2012). The mindful brain and emotion regulation in mood disorders. *Canadian Journal of Psychiatry, 57*, 70–77.

Felver, J. C., Doerner, E., Jones, J., Kaye, N. C., & Merrell, K. W. (2013a). Mindfulness in school psychology: applications for intervention and professional practice. *Psychology in the Schools, 50*(6), 531–547.

*Felver, J. C., Frank, J. L., & McEachern, A. D. (2013b). Effectiveness, acceptability, and feasibility of the soles of the feet mindfulness-based intervention with elementary school students. *Mindfulness*, *5*(5), 589–597.

Felver, J. C., Celis-de Hoyos, C. E., Tezanos, K., & Singh, N. N. (2016). A systematic review of mindfulness-based interventions for youth in school settings. *Mindfulness, 7*(1), 34–45.

*Flook, L., Smalley, S. L., Kitil, M. J., Galla, B. M., Kaiser-Greenland, S., Locke, J., ... & Kasari, C. (2010). Effects of mindful awareness practices on executive functions in elementary school children. *Journal of Applied School Psychology, 26*(1), 70–95.

*Flook, L., Goldberg, S. B., Pinger, L., & Davidson, R. J. (2015). Promoting prosocial behavior and self-regulatory skills in preschool children through a mindfulness-based kindness curriculum. *Developmental Psychology, 51*(1), 44–51.

*Franco, C., Mañas, I., Cangas, A. J., & Gallego, J. (2011). Exploring the effects of a mindfulness program for students of secondary school. *International Journal of Knowledge Society Research, 2*(1), 14–28.

Goldin, P., & Gross, J. (2010). Effect of mindfulness meditation training on the neural bases of emotion regulation in social anxiety disorder. *Emotion, 10*, 83–91.

Greenberg, M. T., & Harris, A. R. (2012). Nurturing mindfulness in children and youth: current state of research. *Child Development Perspectives, 6*, 161–166.

Greenberg, M. T., Kusche, C. A., Cook, E. T., & Quamma, J. P. (1995). Promoting emotional competence in school-aged children: the effects of the PATHS curriculum. *Development and Psychopathology, 7*(01), 117–136.

Grossman, D. C., Neckerman, H. J., Koepsell, T. D., Liu, P. Y., Asher, K. N., Beland, K., ... & Rivara, F. P. (1997). Effectiveness of a violence prevention curriculum among children in elementary school: a randomized controlled trial. *Journal of the American Medical Association, 277*(20), 1605–1611.

Gueldner, B. A. & Feuerborn, L. L. (2016). Integrating mindfulness-based practices into social and emotional learning: A case application. *Mindfulness, 7(1)*, 164–175.

Hawn Foundation. (2011). *The MindUp curriculum: brain-focused strategies for learning—and living*. New York, NY: Scholastic Teaching Resources.

*Huppert, F. A., & Johnson, D. M. (2010). A controlled trial of mindfulness training in schools: the importance of practice for an impact on well-being. *The Journal of Positive Psychology, 5*, 264–274.

Jha, A. P., Krompinger, J., & Baime, M. J. (2007). Mindfulness training modifies subsystems of attention. *Cognitive, Affective, & Behavioral Neuroscience, 7*, 109–119.

Jones, S. M., Barnes, S. P., Bailey, R., & Doolittle, E. J. (2017). Promoting social and emotional competencies in elementary school. *The Future of Children*, 49–72.

*Joyce, A., Etty-Leal, J., Zazryn, T., Hamilton, A., & Hassed, C. (2010). Exploring a mindfulness meditation program on the mental health of upper primary children: a pilot study. *Advances in School Mental Health, 3*(2)*,* 17–25.

*Klatt, M., Harpster, K., Browne, E., White, S., & Case-Smith, J. (2013). Feasibility and preliminary outcomes for move-into-learning: an arts-based mindfulness classroom intervention. *The Journal of Positive Psychology, 8*(3), 233–241.

*Kuyken, W., Weare, K., Ukoumunne, O. C., Vicary, R., Motton, N., Burnett, R., Cullen, C., Hennelly, S., & Huppert, F. (2013). Effectiveness of the mindfulness in schools programme: non-randomised controlled feasibility study. *The British Journal of Psychiatry, 203,* 126–131.

*Lau, N. S. & Hue, M. T. (2011). Preliminary outcomes of a mindfulness-based programme for Hong Kong adolescents in schools: well-being, stress and depressive symptoms. *International Journal of Children's Spirituality, 16*(4), 315–330.

Lawlor, M. S. (2016). Mindfulness and social emotional learning (SEL): a conceptual framework. In K. A. Schonert-Reichl & R. W. Roeser (Eds.), *Handbook of mindfulness in education* (pp. 65–80). New York: Springer.

*Le, T. N. & Gobert, J. M. (2015). Translating and implementing a mindfulness-based youth suicide prevention intervention in a Native American community. *Journal of Child and Family Studies, 24*(1), 12–23.

Lindsay, E. K., & Creswell, J. D. (2017). Mechanisms of mindfulness training: monitor and acceptance theory (MAT). *Clinical Psychology Review, 51*, 48–59.

Lutz, A., Brefczynski-Lewis, J., Johnstone, T., & Davidson, R. J. (2008). Regulation of the neural circuitry of emotion by compassion meditation: effects of meditative expertise. *PLoS One, 3*(3), e1897.

Maynard, B. R., Solis, M. R., Miller, V. L., & Brendel, K. E. (2017). Mindfulness-based interventions for improving cognition, academic achievement, behavior and socio-emotional functioning of primary and secondary students. *Campbell Systematic Reviews 2017: 5*. Campbell Collaboration.

Meiklejohn, J., Phillips, C., Freedman, M. L., Griffin, M. L., Biegel, G., Roach, A., ... & Isberg, R. (2012). Integrating mindfulness training into K-12 education: fostering the resilience of teachers and students. *Mindfulness, 3*(4), 291–307.

*Mendelson, T., Greenberg, M. T., Dariotis, J. K., Gould, L. F., Rhoades, B. L., & Leaf, P. J. (2010). Feasibility and preliminary outcomes of a school-based mindfulness intervention for urban youth. *Journal of Abnormal Child Psychology, 38*(7), 985–994.

*Mendelson, T., Tandon, S. D., O'Brennan, L., Leaf, P. J., & Ialongo, N. S. (2015). Brief report: moving prevention into schools: the impact of a trauma-informed school-based intervention. *Journal of Adolescence, 43*, 142–147.

Merry, S., McDowell, H., Wild, C. J., Bir, J., & Cunliffe, R. (2004). A randomized placebo-controlled trial of a school-based depression prevention program. *Journal of the American Academy of Child & Adolescent Psychiatry, 43*(5), 538–547.

*Metz, S. M., Frank, J. L., Reibel, D., Cantrell, T., Sanders, R., & Broderick, P. C. (2013). The effectiveness of the learning to BREATHE program on adolescent emotion regulation. *Research in Human Development, 10*(3), 252–272.

Moore, A., & Malinowski, P. (2009). Meditation, mindfulness and cognitive flexibility. *Conscious Cognition, 18*, 176–186.

Neuendorf, K. A. (2002). *The content analysis guidebook*. Thousand Oaks: Sage.

*Noggle, J. J., Steiner, N. J., Minami, T., & Khalsa, S. B. S. (2012). Benefits of yoga for psychosocial well-being in a US high school curriculum: a preliminary randomized controlled trial. *Journal of Developmental & Behavioral Pediatrics, 33*(3), 193–201.

*Pahnke, J., Lundgren, T., Hursti, T., Hirvikoski, T. (2014). Outcomes of an acceptance and commitment therapy-based skills training group for students with high-functioning autism spectrum disorder: a quasi-experimental pilot study. *Autism, 18*(8), 953–964.

*Parker, A. E., Kupersmidt, J. B., Mathis, E. T., Scull, T. M., & Sims, C. (2014). The impact of mindfulness education on elementary school students: evaluation of the master mind program. *Advances in School Mental Health Promotion, 7*(3), 184–204.

Payton, J. W., Wardlaw, D. M., Graczyk, P. A., Bloodworth, M. R., Tompsett, C. J., & Weissberg, R. P. (2000). Social and emotional learning: a framework for promoting mental health and reducing risk behavior in children and youth. *Journal of School Health, 70*(5), 179–185.

*Raes, F., Griffith, J. W., Van der Gucht, K., & Williams, J. M. G. (2014). School-based prevention and reduction of depression in adolescents: a cluster-randomized controlled trial of a mindfulness group program. *Mindfulness, 5*(5), 477–486.

*Razza, R. A., Bergen-Cico, D., & Raymond, K. (2015). Enhancing preschoolers' self-regulation via mindful yoga. *Journal of Child and Family Studies, 24*(2), 372–385.

*Reid, E. & Miller, L. (2009). An exploration in mindfulness: classroom of detectives. *Teachers College Record, 111*(12), 2775–2785.

*Ricard, R. J., Lerma, E., & Heard, C. C. (2013). Piloting a dialectical behavioral therapy (DBT) infused skills group in a disciplinary alternative education program (DAEP). *Journal for Specialists in Group Work, 38*(4), 285–306.

*Schonert-Reichl, K. A. & Lawlor, M. S. (2010). The effects of a mindfulness-based education program on pre-and early adolescents' well-being and social and emotional competence. *Mindfulness, 1*(3), 137–151.

*Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F., & Diamond, A. (2015). Enhancing cognitive and social-emotional development through a simple-to-administer mindfulness-based school program for elementary school children: a randomized controlled trial. *Developmental Psychology, 51*(1), 52-66.

*Semple, R. J., Reid, E. F., & Miller, L. (2005). Treating anxiety with mindfulness: an open trial of mindfulness training for anxious children. *Journal of Cognitive Psychotherapy, 19*(4), 379–392.

Shapiro, S. L., Carlson, L. E., Astin, J. A., & Freedman, B. (2006). Mechanisms of mindfulness. *Journal of Clinical Psychology, 62*(3), 373–386.

*Sibinga, E. M., Perry-Parrish, C., Chung, S. E., Johnson, S. B., Smith, M., & Ellen, J. M. (2013). School-based mindfulness instruction for urban male youth: a small randomized controlled trial. *Preventive Medicine, 57*(6), 799–801.

Sklad, M., Diekstra, R., Ritter, M. D., Ben, J., & Gravesteijn, C. (2012). Effectiveness of school-based universal social, emotional, and behavioral programs: do they enhance students' development in the area of skill, behavior, and adjustment? *Psychology in the Schools, 49*(9), 892–909.

Stokols, D. (2006). Toward a science of transdisciplinary action research. *American Journal of Community Psychology, 38*(1–2), 79–93.

Taylor, R. D., Durlak, J. A., Oberle, E., & Weissberg, R. P. (2017). Promoting positive youth development through school-based social and emotional learning interventions: a meta-analysis of follow-up effects. *Child Development, 88*(4), 1156–1171. https://doi.org/10.1111/cdev.12864.

*Viafora, D. P., Mathiesen, S. G., & Unsworth, S. J. (2014). Teaching mindfulness to middle school students and homeless youth in school classrooms. *Journal of Child and Family Studies, 24*(5), 1179–1191.

*Wall, R. B. (2005). Tai chi and mindfulness-based stress reduction in a Boston public middle school. *Journal of Pediatric Health Care, 19*(4), 230–237.

Weissberg, R. P., Durlak, J. A., Domitrovich, C. E., & Gullotta, T. P. (2015). Social and emotional learning: past, present, and future. In J. A. Durlak, C. E. Domitrovich, R. P. Weissberg, & T. P. Gullotta (Eds.), *The handbook of social and emotional learning*. New York: Guilford Press.

*White, L. S. (2012). Reducing stress in school-age girls through mindful yoga. *Journal of Pediatric Health Care, 26*(1), 45–56.

*Wilson, A. N. & Dixon, M. R. (2010). A mindfulness approach to improving classroom attention. *Journal of Behavioral Health and Medicine, 1*(2), 137–142.

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

*Wisner, B. L., & Norton, C. L. (2013). Capitalizing on behavioral and emotional strengths of alternative high school students through group counseling to promote mindfulness skills. *The Journal for Specialists in Group Work, 38*(3), 207–224.

*Wright, L. B., Gregoski, M. J., Tingen, M. S., Barnes, V. A., & Treiber, F. A. (2011). Impact of stress reduction interventions on hostility and ambulatory systolic blood pressure in African American adolescents. *Journal of Black Psychology, 37*(2), 210–233.

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

Zins, J. E., Weissberg, R. P., Wang, M. C., & Walberg, H. J. (2004). *Building academic success on social and emotional learning: What does the research say?* New York, NY: Teachers College Press.