Efficacy of the Settle Your Glitter Curriculum:

Impact on Kindergarten, First, and Second Grade Students

Karen L. Thierry

Momentous Institute

Author Note

Karen Thierry, Research and Evaluation, Momentous Institute.

We wish to thank the children, parents, teachers, staff, and administrators at the participating schools. We are also grateful to community partners for their support of the programming and research.

Correspondence concerning this report should be addressed to Karen Thierry, Research and Evaluation, Momentous Institute, 106 East Tenth Street, Dallas, Texas 75203. E-mail: kthierry@momentousinstitute.org

Abstract

This study examined the impact of the Settle Your Glitter, mindfulness-based curriculum on kindergarten, first, and second grade students' emotion recognition, self-control, and social problem solving. Students from one school (n = 186; 66% African American and 20% Latinx) experienced the curriculum over the course of a school year, while students from another school (n = 214; 84% African American and 11% Latinx) experienced the business as usual academic curriculum. At the end of the school year, intervention students demonstrated better emotion recognition (Cohen's d = 0.38) and problem-solving skills (Cohen's d = .26) than control students. The effect on emotion recognition was moderated by students' pretest levels of self-control, such that intervention students with lower initial levels of self-control had greater gains in emotion recognition skills than control students with lower initial self-control levels. No difference between the intervention and control students' emotion recognition gain scores was found for those who scored at higher initial levels of self-control. No direct impact of the intervention on self-control was found.

Keywords: mindfulness, social emotional competence, social emotional learning, early childhood

Evaluation of the Settle Your Glitter Curriculum:

Impact on Kindergarten, First, and Second Grade Students

Students learn best in the context of caring, supportive relationships with their teachers and peers (Klem & Connell, 2004; MacNeil, Prater, & Busch, 2009). In an environment of safe relationships, they are more likely to be in a regulated state needed to focus and make good decisions. However, many students arrive at school in a dysregulated state due to various stressors experienced at home and/or in their neighborhood. Stressful events, or adverse childhood experiences (ACES, e.g., abuse, neighborhood violence, parental incarceration) can impact children within any socioeconomic or demographic category (Pechtel & Pizzagalli, 2011), but ACEs are more prevalent in the context of environments where children and families have insecure access to facilities and services needed to support their basic needs (e.g., housing, food, healthcare) in addition to a lack of access to enrichment opportunities that can facilitate children's social, emotional, and cognitive development (e.g., parks, museums). According to prevalence data analyzed by Bethell et al. (2017), 62% of children living from families with the lowest levels of income were reported to have experienced one or more adverse events, compared to 26% of children from the highest income levels. School-based prevention programs that include an explicit focus on developing young children's ability to understand and manage their emotions, thoughts, and behaviors is a critical approach to enhancing students' resilience so that they have the opportunity to learn and flourish in their schools and communities.

School-based prevention programs that target the development of cognitive, emotional and interpersonal competencies (Jones & Bouffard, 2012) have been characterized as social emotional learning (SEL) programs. Included under the umbrella of SEL is the ability to self-regulate along with the ability to understand and identify emotions and interact well with others (Denham & Brown, 2010; Durlak et al., 2011; Weissberg & Cascarino, 2013). Many SEL programs focus on training teachers to use a curriculum from which students can be directly taught these skills. Although teachers recognize the importance of social emotional competence for students' learning (Civic Enterprises, Bridgeland, Bruck, & Hariharan, 2013), teacher training on how to enhance students' social and emotional development is largely absent from teacher preparation courses offered by higher education institutions (Schonert-Reichl, Kitil, & Hanson-Peterson, 2017). As a result, a prescribed SEL curriculum might assist teachers by providing them with the vocabulary needed to teach these skills along with strategies they can infuse into their everyday practices. SEL curricula for early childhood and elementary students incorporate lessons

on core social-emotional skills, including self-regulation (e.g., holding information in working memory, inhibiting undesired behaviors, cognitive flexibility), self-awareness (e.g., ability to identify emotions), and relationship skills (e.g., perspective-taking) (Bierman, Domitrovich, et al., 2008; Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008; Flook et al., 2015; Lynch, Geller, & Schmidt, 2004; Vestal & Jones, 2004).

Studies examining the effect of these programs on students' social-emotional skills have indicated promising results. For instance, Promoting Alternative Thinking Strategies (PATHS; Domitrovich, Cortes, & Greenberg, 2007) is a prekindergarten through sixth grade curriculum with an emphasis on helping young children identify and understand their emotions. Other skills promoted include problem solving and acting prosocially. Results of randomized control trials of PATHS showed that the program led to greater gains in intervention students' emotion understanding, problem solving, and prosocial behaviors (Bierman, Domitrovich, et al., 2008; Bierman, Nix, et al., 2008; Domitrovich et al., 2007; Greenberg, Kushe, Cook, & Quamma, 1995). Another program, known as I Can Problem Solve, also focuses on enhancing children's emotion knowledge and problem solving and includes lessons for prekindergarten through fifth grade. Studies examining the efficacy of this program have similarly shown that it leads to greater gains in students' emotion regulation, prosocial behavior, and problem solving (Boyle & Hassett-Walker, 2008; Feis & Simons, 1985; Shure & Spivack, 1982).

Skill-building through PATHS, I Can Problem Solve, and many other SEL programs that have undergone efficacy testing is guided by social learning theory (Bandura, 1977, 1986). As a result, these programs tend to prioritize self-awareness and relationship skill components of SEL, although some attention may be given to supporting self-regulation skills.

Another promising SEL curricular approach is rooted in cognitive regulation models and developmental neuroscience and focuses on the construct of mindfulness, defined as a state of consciousness in which one is aware and attentive to the present moment (Brown & Ryan, 2003; Kabat-Zinn, 1994). Mindfulness can be developed via practices that require one to sustain the focus of attention on particular objects (e.g., the breath) or mental contents (e.g., family members, friends). Other variations involve paying attention to moment-to-moment fluctuations in one's mind (i.e., the stream of consciousness) as a way to further develop the ability to concentrate and manage stress and emotions. These practices thus center on meditation exercises involving deep breathing and attention to one's senses.

Zelazo and Lyons (2012) suggested that mindfulness practices may engage both top-down, cognitive self-regulatory processes, or executive functions linked with prefrontal cortical development, and bottom-up processes associated with arousal and anxiety linked with subcortical regions of the brain (e.g., the amygdala). That is, as individuals focus their attention on moment-to-moment experiences (e.g., noticing their breath) and are reminded to bring their attention back to those particular experiences when their mind wanders, they are practicing the kind of sustained attention that enables the control of thoughts, behaviors, and emotions (i.e., executive functions). Diamond (2013, 2014) identified three core executive functions: 1) inhibitory control (resisting habits, temptations, or distractions), 2) working memory (mentally holding and using information), and 3) cognitive flexibility (adjusting to change). These functions should be engaged during mindfulness practices. For instance, focusing attention on the breath requires one to inhibit interference from environmental distractors. Instructions to shift attention to specific thoughts or particular sounds in the room requires cognitive flexibility. Holding in mind the information to which one is attending requires working memory. With these core executive functions as a foundation, one can then engage in higher-order thinking, such as perspective-taking and problem solving (Diamond, 2014).

Studies of programs based in social learning theory actually suggest that cognitive regulation may be a key moderator of the impact of SEL programs on other skills like emotion understanding and problem solving. For instance, Bierman, Nix, et al. (2008) found that the PATHS program was especially beneficial for children who began the school year with low levels of executive function, with these children showing the greatest improvement in social skills and emergent literacy (e.g., letter identification and phonological awareness). Similarly, in a study of a kindness curriculum with prekindergarten students, impact on students' social competence was moderated by children's baseline levels of executive functioning, such that students who started out with lower levels of executive function showed greater improvements in social competence relative to similar students in a control group (Flook et al., 2015).

Although mindfulness-based techniques have been widely studied with adults (Flook et al., 2010; Jha, Krompinger, & Baime, 2007; Ortner, Kilner, & Zelazo, 2007; Schonert-Reichl et al., 2015; Tang et al., 2007), only a few mindfulness-based programs have been developed and tested for efficacy with early childhood and elementary students. One such program, known as MindUP, includes lessons on breathing and mindful awareness practices (e.g., mindful seeing, mindful eating, etc.) for prekindergarten through twelfth grade students. MindUP also includes extension of these more self-focused practices to other-focused practices, similar to other mindfulness programs

developed for older children and adolescents (Flook et al., 2010; Kaiser-Greenland, 2010; Napoli, Crech, & Holley, 2005; Saltzman & Goldin, 2008). For instance, the curriculum includes lessons on perspective-taking and acts of kindness to help develop students' understanding of others and increase prosocial behaviors. A unique aspect of MindUP is the inclusion of introductory lessons that teach students about primary parts of their brain (e.g., the amygdala and the prefrontal cortex) and the roles these parts play in their emotions and cognition. The developers' rationale for inclusion of lessons on the brain is that it provides students (and teachers) with information about what happens in their brain when they are for instance, upset or angry versus content and relaxed. The curriculum then connects that knowledge of the brain with the breathing practices as a strategy to help students focus their attention and calm themselves when needed. Studies of other types of interventions with young children, in fact, show that they benefit from background knowledge regarding why and/or how strategies can help them (Schneider & Pressley, 1989).

Two quasi-experimental studies of the use of MindUP with adolescents indicated greater gains in fourth through eighth grade students' executive functions, teacher-reported prosocial behaviors, and student-reported optimism, empathy, and perspective-taking (Schonert-Reichl & Lawlor, 2010; Schonert-Reichl et al., 2015). In another quasi-experimental study involving the use of MindUP with prekindergarten students, teachers reported greater gains in MindUP students' executive functioning, specifically working memory skills and planning and organizing skills, compared to students in a business-as-usual control group (Thierry, Bryant, Nobles, & Norris, 2016). At the end of kindergarten, students in the MindUP group also had higher vocabulary and reading scores than those in the control group.

To date, no studies of MindUP have been conducted with students in kindergarten through third grade, although the lessons can be implemented at each of these grade levels. Like some other SEL programs, MindUP lessons are not specific for each grade level. Instead, the same lesson content is provided for a range of grade levels (e.g., prekindergarten through second grade; third grade to fifth grade, etc.). Teachers and students may benefit from having a curriculum designed for a specific grade level, especially during the prekindergarten through second grade years when significant developmental shifts in cognitive capacity is occurring (e.g., self-regulation and understanding others' point of view).

To address the need to adapt lessons for students' developmental level, the Settle Your Glitter mindfulness-based curriculum was created in consultation with early childhood education and mental health experts who had in

depth training in mindfulness practices. This curriculum includes unique sets of lessons and activities for each of the following grade levels: prekindergarten (3- and 4-year-old versions), kindergarten, first, and second grade. Practices that are common across grade levels include teaching students about parts of their brain and using their breath to self-regulate. For instance, one practice, adapted from Kaiser-Greenland (2010), involves using a glitter ball to teach students about what happens in their brain when they are dysregulated (i.e., "When the glitter ball is shaken up, it gets cloudy; this is what it can feel like in your brain when you get upset or scared."). Students are taught to use their breath to regulate their emotions, which then helps them to think more clearly and make good decisions (i.e., "The glitter settles to the bottom of the ball."). The name of the curriculum was derived from this practice.

In addition, although the lessons are based in mindfulness, a "trauma lens" is threaded throughout the curriculum content to enhance teachers' understanding of how ACEs, or trauma, might affect students' behavior in the classroom. The strategies included in the lessons are meant to support all students in the classroom but may be particularly beneficial to students with low self-control skills. In one quasi-experimental study of the Settle Your Glitter curriculum for prekindergarten students, teachers and students in four schools within an urban school district implemented the curriculum over the course of a school year, while teachers and students in four other schools, matched to the intervention schools on a number of characteristics, experienced their business-as-usual practices. Results indicated that intervention students demonstrated greater gains in executive functions (working memory, inhibition, and cognitive flexibility) than control students (Thierry, Vincent, Bryant, Kinder, & Wise, 2018).

The current study represents the first investigation of the impact of the *Settle Your Glitter* curriculum on students in kindergarten through second grade. At each of these grade levels, the curriculum includes lessons that target self-regulation (e.g., impulse control, attentional control), self-awareness (e.g., emotion understanding), and relationship skills (e.g., problem solving, empathy, perspective-taking). One school used the curriculum over the course of a school year in their kindergarten through second grade classrooms, while a similar school in the same district conducted business as usual practices in these same grade level classrooms. Near the beginning and end of the school year, students at both schools were assessed on emotion recognition, self-control, social problem-solving, and social perspective-taking. One important difference in practices between the two schools, other than the Settle Your Glitter curriculum, was that the control school employed a literacy coach who worked with teachers to improve students' reading comprehension skills. The intervention school did not utilize this special literacy coach. The skill area that might be impacted by the literacy coach was perspective-taking, given that the social perspective-

taking test involved listening to stories and identifying characters' points of view. As a result, predictions for impact of Settle Your Glitter focused on three of the four skill areas assessed: emotion recognition, self-control, and social problem solving. In particular, intervention students should demonstrate better performance on each of these three skill tests than control students. Similar to that found in previous studies, baseline levels of self-control might serve as a moderator for improvements in emotion recognition and problem solving, such that intervention students with low levels of self-control at baseline should show greater gains in these skills over time than those with high levels of self-control at baseline.

Method

Participants

Teachers and students from two elementary schools in a district located in a medium-sized city in the southeastern region of the United States participated in the study. Teachers and students from one school participated in the Settle Your Glitter program, and teachers and students from the other school served as a wait-list control using the following matching criteria: geographic proximity, enrollment size, student ethnicity, students classified as English language learners, students who qualified for free or reduced price lunch (i.e., economically disadvantaged), student mobility rate, teachers' years of experience, and state academic accountability ratings.

Each school had 14 kindergarten through second grade teachers (N = 28) with five teachers at kindergarten, five teachers at first grade, and five teachers at second grade. At the beginning of the school year, a total of 499 kindergarten through second students were enrolled in the two schools and 464 students (93% of all enrolled at start of year) completed the assessment in the fall (215 at the intervention school and 249 at the control school). During the school year, 64 students from the schools (29 from the intervention school and 35 from the control school), or 14% of those assessed in the fall, withdrew and enrolled in other schools. As a result, the total number of students with both fall and spring test results was 400 (186 from the intervention school and 214 from the control school), with approximately equal numbers of girls (47%) and boys (53%). The mean age of students in the intervention school (M = 6.69 years, SD = .95) was similar to the mean age of students in the control school (M = 6.68 years, SD = .91). Although both schools had a majority of African-American students, the control school's percentage of African-American students (84%) was higher than that of the intervention school (66%). The intervention school had more Latinx or Hispanic students (20%) than the control school (11%). The vast majority of students at both

schools qualified for free or reduced price lunch (96% in the intervention school and 98% in the control school). Table 1 shows the distribution of students across these demographic characteristics.

Procedure

Students in the control school experienced their business as usual practices plus the support of literacy coach (see description below), while students in the intervention school experienced the business as usual academic practices plus the Settle Your Glitter mindfulness-based curriculum (see description below). Two curriculum-trained consultants provided teachers and school administrators in the intervention school with professional development on the curriculum along with nine monthly hour-long consultation sessions on lesson delivery (see description below).

Teachers administered a web-based, social-emotional skills assessment in the fall (i.e., September or November) and at the end of the school year (i.e., May). Due to scheduling constraints, the fall administration of the assessment was different for the intervention and control schools. Students in the intervention school completed the fall assessment in September, and students in the control school completed the assessment in November. For both the fall and end-of-year administration, school leaders scheduled the assessment for all classrooms during a one week time window.

Using the Classroom Assessment Scoring System for kindergarten to grade three (CLASS; see description below), two district staff members, who were certified on CLASS, observed teachers in their classrooms once during the spring semester. They observed an equal number of classrooms within each school.

Business As Usual Practices

Teachers in the control school implemented their business as usual academic curriculum; however, this school decided to utilize a literacy coach who began working with control teachers during the current study's implementation period. In addition, this school's disciplinary procedures were guided by the use of Restorative Practices. Restorative Practices is not a curriculum; rather it is a positive approach to addressing peer conflict by engaging those involved in conflict resolution techniques. As a result, this approach focuses on relationship-building activities and targets both those who were the aggressors in a conflict and those who were the victims. Teachers and administrators model empathetic and compassionate responses and help facilitate a dialogue with students to understand the root cause of a conflict, with the students involved helping to determine consequences for their behavior.

Settle Your Glitter Curriculum

Settle Your Glitter consists of 15 units with differing numbers of lessons at each grade level. The lessons across all grade levels target the following social emotional competencies: 1) self-regulation, 2) self-awareness, 3) understanding others, and 4) being a "changemaker," defined as promoting acts of kindness and compassion through community service projects. The curriculum consists of 53 lessons at kindergarten, 35 lessons at first grade, and 30 lessons at second grade (see Appendices A-C for grade level units and lessons with objectives). A core self-regulation practice included at all grade levels was deep breathing. Once this lesson was taught, deep breathing became a regular practice that teachers engaged in with students a minimum of three times each day (at the start of the day, mid-day, and at the end of the day). If students needed to self-regulate at other times of the day, either as a group or individually, teachers could use the practice at those additional times. Teachers taught the lessons over the course of the school year (October through May), and they could spend about 1 to 2 weeks on each lesson (i.e., teaching the lesson one week and engaging in extension activities from the lesson in the second week).

Two curriculum-trained consultants led one full-day professional development seminar on the curriculum for teachers at all grade levels. Half of the day was spent discussing and modeling selected lessons. During the other half of the day, the trauma lens contained within the curriculum was introduced, with the discussion focusing on how ACEs, trauma, and stress can negatively impact the development of young children (particularly related to the hypothalamic-pituitary-adrenal axis) and result in behavioral challenges in the classroom.

These consultants also provided nine online booster sessions with teachers throughout the school year (once per month) to discuss any questions that teachers had about implementing the curriculum. One of the consultants also provided monthly feedback sessions (nine in total) for two school administrators who supported teachers with curriculum questions throughout the school year. Mid-year, one of the consultants conducted a 20-min observation of each teacher delivering a lesson to capture the quality of the lesson delivery. The consultant rated the teachers on their lesson delivery using an observational tool developed specifically for this curriculum (see description below).

Measures

Fidelity of implementation. To document dosage adherence of the curriculum, teachers completed monthly surveys where they indicated the extent to which each lesson was delivered to students and the extent of student engagement during each lesson. Completion of each lesson was rated on a scale from 1 to 5 with 1 indicating

that *none* of the lesson was delivered and 5 indicating that *all* of the lesson was delivered. Student engagement during each lesson was rated on a scale from 1 to 5 with 1 indicating students were *not engaged* and 5 indicating students were *very engaged*.

A formative assessment of teachers' explicit instruction of the *Settle Your Glitter* lessons was developed for the purpose of this study. Mid-year, a curriculum consultant observed each teacher delivering a lesson to their class and rated teachers on four components of explicit instruction: use of social emotional vocabulary throughout the lesson, use of real-world examples of the targeted skills, encouragement of student interaction, and use of "wrap up" to emphasize important points. For each component, the consultant rated the teacher using a scale from 1 to 4, with 1 indicating the component was *not at all evident* and 4 indicating the component was *very evident*. Ratings for each of the four components were averaged to obtain a score that reflected the quality of teachers' lesson delivery.

Quality of classroom. Two district staff members, certified on the kindergarten to third grade CLASS (Pianta, La Paro, Hamre, 2008), rated teachers on the quality of their interactions with students. This observational assessment was used to ensure that teachers across the schools did not differ on important teacher-student interactional styles that can affect students' social emotional competence. CLASS assesses three primary domains of teachers' interactions with students: 1) emotional support, 2) classroom organization, and 3) instructional support. Each domain consists of dimensions of specific teacher-student and student-student interactions shown to predict students' social-emotional and academic outcomes (Burchinal, Vandergrift, Pianta, & Mashburn, 2010; Downer et al., 2011; Mashburn et al., 2008). Emotional support includes four dimensions: positive climate, negative climate, teacher sensitivity, and regard for student perspectives. Classroom organization consists of three dimensions: behavior management, productivity, and instructional learning formats. Instructional support includes three dimensions: concept development, quality of feedback, and language modeling. Observations were conducted in the spring for all teachers at both schools. Teachers were observed for four 20-minute cycles (80 minutes total), as recommended by the CLASS protocol. Classrooms were rated on each of the ten dimensions using a scale from 1 to 7, with 1-2 indicating *low levels* of the dimension, 3-5 indicating *mid-levels*, and 6-7 indicating *high levels*. Dimension scores were averaged across each cycle. Overall dimension scores within each of the three CLASS domains were then averaged to create domain scores for each teacher.

Social emotional competence. Social emotional competence was assessed using the SELweb Early Education assessment (McKown, Allen, Russo-Ponsaran, & Johnson, 2013), which is designed for students in

kindergarten through third grade. This web-based task consists of four subtests assessing the following social-emotional skills: 1) emotion recognition, 2) self-control, 3) social perspective-taking, and 4) social problem solving. Students completed the assessment individually by logging in to one of their classroom desktop computers. Students sat approximately 20 in from the screen wearing headphones which provided them with verbal instructions on how to complete the assessment along with continuous narration of test items, questions, and response options. The assessment could be completed in either English or Spanish. The subtests were presented sequentially with more and less challenging subtests alternating in order to minimize student fatigue. The subtests were administered in the same order for all students. The duration of the assessment was 45 min, which was completed in multiple sessions (session range = 2 to 3).

Emotion recognition, or the ability to identify what others are feeling, was assessed using a series of faces for which students chose the correct feeling expressed (e.g., happy, sad, angry). Self-control, or the ability to modulate thoughts and feelings to achieve a goal, was assessed using games that required waiting for varying lengths of time, with longer waiting periods corresponding to bigger rewards. One game tapped delay of gratification and another tapped students' toleration for frustration. Social perspective-taking, or the understanding of others' thoughts and intentions, was assessed using narrated stories with pictures that presented characters encountering various dilemmas. Based on the dilemma, students selected how a specific character was thinking about a particular situation (e.g., why the character acted or responded in different ways). Social problem solving, or the ability to think through social challenges, was assessed using narrated stories with pictures that presented characters encountering challenging situations, such as conflict among peers. Students were to select the response that represented the best resolution to the challenging situation.

SELweb yields separate norm-referenced scores for each subtest. Scores in the average, or meets expectations category, range from 90 to 114. Scores greater than or equal to 115 are considered above expectations, scores from 70 to 89 are considered below expectations, and scores less than 70 are considered well below expectations.

Data Analyses

Students' gender and ethnicity were included in preliminary analyses of the effect of group on all relevant dependent measures (with the exception of the implementation measures). No main effects of these variables or interactions with group were found, and all analyses were therefore collapsed across these factors. Analyses of

covariance were used to examine the effect of group on the dependent measures. As previously indicated, there was a difference between the groups in the timing of the initial administration of the assessment, with intervention students completing the assessment in September and control students completing the assessment in November. As a result, the delay between the pretest and posttest was included as a covariate in all analyses. In addition, pretest scores on the outcomes measures were also included as a covariate. Although the unit of matching was at the school level, the small number of schools and classrooms did not provide sufficient power to use a multilevel model (Snijders, 2005). In all analyses, an alpha level of .05 was used, and where appropriate, effect sizes were calculated using Cohen's *d*, where an effect size of .20 is considered small, .50 is considered medium, and .80 is considered large (Cohen, 1988). To examine self-control as a moderator of impact of the curriculum on outcome changes over time, hierarchical linear regression analyses were used.

Results

Implementation of the Settle Your Glitter Curriculum

Teacher-reported lesson completion. All of the teachers rated the extent to which they completed each lesson and how engaged their students were in the content (using a scale ranging from 1 to 5, with 5 indicating highest levels of fidelity of lesson completion and student engagement). These ratings were completed for all units except unit 15, which teachers could not complete due to competing end-of-year district priorities. Average lesson completion ratings for each unit ranged from 4.50 to 5.00 (see Table 2) and average student engagement ratings ranged from 3.72 to 5.00 (see Table 3). Teachers thus indicated high levels of dosage adherence to the curriculum and high levels of student engagement in the lessons.

Formative observations of teachers. In the spring, teachers in the intervention school were observed teaching a lesson from the curriculum to capture quality of implementation (ratings ranged from 1 to 4). Scores were similar across grade levels (M = 3.20, SD = .58) and tended to be in the high quality range.

Baseline Comparisons of Intervention and Control Groups

Quality of classrooms. To ensure there were no differences between the intervention and control schools in the quality of the classrooms, teachers' CLASS scores in each domain were entered into a Group (intervention, control) X CLASS Domain (emotional support, classroom organization, instructional support) MANOVA, with CLASS domain as the multivariate factor. Typically, intensive coaching on CLASS dimensions is needed in order to obtain improvements in these areas (Hamre, Downer, Jamil, & Pianta, 2012; Pianta, Mashburn, Downer, Hamre, &

Justice, 2008). Given that the program did not include this type of intensive CLASS coaching, we did not anticipate group differences in teachers' CLASS scores as a result of training on the curriculum alone. Results of the MANOVA indicated only a main effect of domain, $F(2, 23) = 83.99$, $p < .01$, but no effect of group (see Table 4 for CLASS domain means by group). Post-hoc pairwise comparisons indicated that classrooms scored higher on emotional support ($M = 3.97$, $SD = 1.24$) than on classroom organization ($M = 3.17$, $SD = 1.07$) and instruction support ($M = 1.58$, $SD = .49$). Classrooms also scored higher on classroom organization than on instructional support. Overall, classrooms scored in the mid-range for emotional support, lower mid-range for classroom organization, and low range for instructional support. These CLASS domain levels are somewhat lower than that found in other studies involving larger samples of lower elementary teachers in different parts of the country (Pianta et al., 2008). Given the similarity in teachers' scores in the intervention and control schools, any group differences found in students' improvement in social emotional competence cannot be attributed to differences in the quality of their classrooms.

Social emotional competence. The intervention and control group students' pretest scores on the SELweb subtests were compared to ensure there were no preexisting differences between the groups. Pretest scores (emotional recognition, self-control, social problem solving, and social perspective-taking) were entered into separate two-way ANOVAs with group (intervention vs. control) and grade (kindergarten, first, second) as the independent variables. For emotion recognition, a Group X Grade interaction, $F(2, 391) = 3.54$, $p < .05$, was found. Independent samples *t*-tests indicated no difference between the treatment groups for kindergarten and second grade students. At first grade, control group students ($M = 103.54$, $SD = 16.35$) scored higher than intervention group students ($M = 94.27$, $SD = 20.26$). For self-control, a Group X Grade interaction, $F(2, 391) = 3.03$, $p < .05$, was found. No treatment group differences were indicated for first and second grade students. For kindergarten students, intervention students ($M = 86.76$, $SD = 13.13$) had higher scores than control students ($M = 82.65$, $SD = 14.69$). For social problem solving, no group differences were found. For social perspective-taking, a main effect of group, $F(1, 391) = 4.61$, $p < .05$, was found, indicating that control students ($M = 86.53$, $SD = 12.66$) had higher scores than intervention students ($M = 84.06$, $SD = 12.63$). Table 5 shows the pretest means for each subtest by group and grade.

Given these baseline differences for certain measures and grade levels (emotion recognition at first grade, self-control at kindergarten, and social perspective-taking at all grade levels), analyses of group differences on

posttest measures included pretest scores as a covariate. All analyses also included the delay between the pretest and posttest as a covariate (to account for the difference in timing of the groups' pretest administrations).

Impact of Settle Your Glitter on Posttest Measures

Emotion recognition. To examine group differences on emotion recognition posttest scores, a Group (intervention, control) X Grade (kindergarten, first grade, second grade) ANCOVA was run with pretest emotion recognition score and test delay as covariates. A main effect of group, $F(1, 392) = 8.02$, $p < .01$, was found (see Figure 1). Intervention students ($M_{adjusted} = 103.10$, $SE = 1.91$) had higher posttest scores than control students ($M_{adjusted} = 93.50$, SE = 1.72), with the between-group effect size ($d = 0.38$) near medium range.

Self-control. The Group (2) X Grade (3) ANCOVA on self-control posttest scores yielded no effects of group or grade. Students in the intervention ($M_{adjusted} = 91.50$, $SE = 1.79$) and control ($M_{adjusted} = 90.84$, $SE = 1.63$) schools had similar posttest scores (see Figure 1).

Social problem solving. The Group (2) X Grade (3) ANCOVA on problem solving posttest scores yielded a main effect of group, $F(1, 389) = 3.74$, $p < .05$. Students in the intervention school ($M_{adjusted} = 92.73$, $SE = 2.16$) had a higher posttest scores than students in the control school ($M_{adjusted} = 85.30$, $SE = 1.96$), with the between-group effect size ($d = 0.26$) in the small range (see Figure 1).

Social perspective-taking. To confirm our hypothesis regarding the advantage that the control school would have in perspective-taking as a result of this school's utilization of a literacy coach, we also conducted the Group (2) X Grade (3) ANCOVA on perspective-taking posttest scores, controlling for both pretest scores and test delay. Results indicated main effects of grade, $F(2, 391) = 5.57$, $p < .01$, and of group, $F(1, 391) = 4.55$, $p < .05$. First grade ($M_{adjusted} = 89.57$, $SE = 1.10$) and second grade ($M_{adjusted} = 89.47$, $SE = 1.15$) students had higher posttest scores than kindergarten students ($M_{adjusted} = 85.12$, $SE = 1.06$). Students in the control school ($M_{adjusted} = 91.56$, $SE = 1.67$) had higher posttest scores than those in the intervention school ($M_{adjusted} = 84.56$, $SE = 1.85$). This finding is consistent with the fact that the control school had a literacy coach who helped to support teachers throughout the school year in working with students' reading comprehension skills, central to which involved taking the perspective of different story characters.

Moderators of Effect of Settle Your Glitter on Subtest Difference Scores

Hierarchical linear regression analyses were used to test whether baseline levels of self-control moderated group differences in subtest gains. Difference scores (posttest scores minus pretest score) for each subtest were used

as the dependent measures. Predictors were treatment group, age (in years), test delay, pretest scores on the dependent measure, and pretest self-control scores. The predictor variables were entered hierarchically with the second and third block used to test for moderators of the impact of the curriculum on gain scores, which resulted in the following blocks: (1) main effects of each predictor variable, (2) interaction between group and pretest score on the dependent measure, and (3) interaction between group and pretest self-control scores.

For emotion recognition (see Table 6), group was a positive predictor (favoring intervention students) of difference scores, controlling for test delay, age, and pretest emotion recognition and self-control scores. In addition, there was a significant interaction between group and pretest self-control scores. A three-way interaction with age, group, and pretest self-control was also tested but was not significant and did not add any accounted variance to the model. To examine between-group differences accounting for the two-way interaction, a median split was applied to students' self-control pretest scores, and a Treatment Group (2) X Self-control Level (High, Low) ANOVA was run on emotion recognition difference scores. A Group X Self-control Level interaction, $F(1, 396) = 7.70$, $p < .01$, was found. Simple effects analyses indicated that intervention students in the low self-control group had larger difference scores than control students in the low self-control group and intervention students in the high self-control group (see Figure 2). No difference between intervention and control students in the high self-control groups was found, nor was there a difference between high and low self-control students within the control group.

For problem solving, the interactions were not significant. Along with treatment group (favoring intervention students), pretest scores on problem solving (but not self-control) were significant predictors of changes in problem solving over time. The relationship between initial levels of problem-solving and the problem-solving difference score was negative such that the lower the initial problem-solving score, the larger were the gains in problem solving, regardless of treatment group.

For perspective-taking, the interactions were not significant. Along with treatment group (favoring the control students), pretest scores on perspective-taking and pretest scores on self-control were significant predictors of changes in perspective-taking over time. Pretest levels of perspective-taking were negatively associated with perspective-taking difference scores, indicating that the lower the initial levels of perspective-taking, the larger the gains in perspective-taking, regardless of treatment group. However, for this measure, pretest levels of self-control were positively associated with perspective-taking difference scores, such that the higher the initial level of self-

control, the higher the gains were in perspective-taking. This relationship between pretest self-control and perspective-taking gains was thus opposite from the patterns found on the other measures.

Discussion

The Settle Your Glitter curriculum had a positive impact on students' emotion recognition and problem-solving skills. These findings are consistent with areas of impact indicated for other SEL programs, such as PATHS (Bierman, Domitrovich, et al., 2008; Bierman, Nix, et al., 2008; Domitrovich et al., 2007) and I Can Problem Solve (Boyle & Hassett-Walker, 2008; Alvarado et al., 2002; Santos et al., 2003). The theoretical mechanism for change within these other programs is based on social learning theory. The theoretical mechanism for change within the Settle Your Glitter curriculum is based on cognitive regulation and mindfulness approaches. As a result, primary strategies in Settle Your Glitter focused on breathing practices and self-awareness activities, which were predicted to be most beneficial for students who were more dysregulated at the start of the program. This idea was supported by the finding that self-control served as a moderator for the impact of the curriculum on kindergarten through second grade students' emotion recognition. That is, it was the students with lower initial levels of self-control who showed the greatest gains in emotion recognition skills. This pattern of treatment effects as a function of baseline competency levels is consistent with previous studies where larger gains in social emotional competence were evident for children with lower baseline executive functioning (Diamond & Lee, 2011; Bierman et al., 2008; Flook et al., 2015). Although students in both the intervention and control groups showed improvement in self-control over time, only the intervention students demonstrated improvement in emotion recognition, a skill that was featured in early lessons of the Settle Your Glitter curriculum.

We had predicted that students in the intervention group would also show greater improvements in self-control compared to those in the control group, but results indicated no impact of the curriculum on this measure at any grade level. Regardless of treatment group, students showed improvement in self-control skills over time. One reason for the null effect of the curriculum on self-control could be related to the type of self-control that was captured by the SELweb assessment. That is, the self-control subtest assessed students' delay of gratification and tolerance for mild frustration using a simple response inhibition task involving games that required waiting for varying lengths of time, with longer waiting periods corresponding to bigger rewards. This type of inhibitory control increases dramatically in early childhood between the age of two and five years (Campbell, 2006; Carlson, Davis, & Leach, 2005). Self-regulation tasks that require more complex inhibitory control responses, notably those involving

working memory and cognitive flexibility, undergo more protracted development beyond early childhood (Carlson, 2005; Garon, Bryson, & Smith, 2008). In studies of mindfulness-based programs where impact on self-regulation have been found, the assessments used (i.e., flanker test, hearts and flowers test) more heavily taxed all three of these core execution functions (Schonert-Reichl et al., 2015; Thierry et al., 2018). Hence, the SELweb self-control test used in the current study may not have picked up on changes in these more complex inhibitory control responses that may have been more likely to be impacted by the curriculum.

Consistent with the fact the control school utilized a literacy coach to support teachers in engaging students' reading comprehension, students in the control school showed greater improvement on social perspective-taking than students in the intervention school. At the control school, Restorative Practices was used to help manage disciplinary issues. This program focuses on enhancing students' conflict resolution skills through discussions that focus on understanding others' points of view. This program's emphasis on perspective-taking could be an additional explanation for the control students' greater improvement in perspective-taking. However, if this hypothesis were correct, the greatest levels of improvement in this skill area might be evident for students who had more problems with self-control at the start of the year. However, moderator analyses revealed the opposite pattern. The students who showed the greatest level of improvement in perspective-taking, regardless of treatment group, were the ones who scored at higher levels of self-control at the beginning of the year.

In addition, although control students demonstrated greater improvement in perspective-taking skills, they did not show any improvement in emotion recognition and problem solving. If the greater improvement in control students' perspective-taking skills were a result of Restorative Practices, then these students should have also shown improvement in these other skills, which are in many ways foundational for the ability to accurately identify the perspectives of others (e.g., recognizing the emotions conveyed by facial expressions should facilitate the cognitive process of understanding how someone is feeling and thinking). The literacy coach support is thus the more likely explanation for the control students' greater improvement in perspective-taking.

Limitations and Future Research Directions

In sum, the results of the present study contribute to a growing body of research showing that mindfulness practices can enhance young children's social emotional competence. The current study extended the positive impact of this type of program to kindergarten through second grade students. However, some important limitations of the current study must be mentioned. In this quasi-experimental design, the small number of schools and

classrooms did not provide sufficient power to use a multilevel analytical model (Snijders, 2005). Another limitation was the lack of randomization of students to the mindfulness and control conditions. Although the groups were matched as closely as possible on a number of teacher-level and student-level demographic characteristics, baseline differences between the groups were found for selected measures, which had to be controlled for statistically. Future studies should utilize a randomized-control design to provide added confirmation for the positive effects of mindfulness on young children's social emotional competence. Future studies might also examine the impact of this program on elementary students' self-regulation using assessments that tax all three core executive functions. In addition, the unique impact of the curriculum on students' perspective-taking skills should be further explored. Significant development in perspective-taking occurs during the age periods tested in this study and this skill continues to undergo development through adolescence. Perhaps the effect of a mindfulness program on perspective-taking is more potent for older children. For instance, using self-report measures of perspective-taking (and empathy), Schonert-Reichl and Lawlor (2010) found that the MindUP curriculum resulted in greater improvements in fourth grade through seventh grade students' perspective-taking and empathy. Nevertheless, the Settle Your Glitter curriculum was shown to be effective at enhancing skills that are foundational and complementary to perspective-taking, in particular emotion recognition and problem solving.

Compliance with Ethical Standards

Institutional Review Board (IRB) approval was obtained from the IRB committee of Momentous Institute. All study procedures were conducted in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Within this review, approval was obtained to use the following FERPA exception for active parental consent: Research Conducted For or on Behalf of Educational Institutions [34 CFR 99.31 (a)(6)]. Specifically, this guideline states that schools may disclose personally identifiable information from students' educational records without parental consent to organizations that have entered into an agreement to conduct studies on behalf of the schools that are evaluating programs aimed at improving instruction.

References

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bethell, C. D., Davis, M. B., Gombojav, N., Stumbo, S., & Powers, K. (2017). *Issue brief: Adverse childhood experiences among U.S. children*. Retrieved from Johns Hopkins University, Bloomberg School of Public Health, http://www.cahmi.org/projects/adverse-childhood-experiences-aces

Bierman, K. L., Domitrovich, C. E., Nix, R. L., Gest, S. D., Welsh, J. A., Greenberg, M. T., …Gill, S. (2008). Promoting academic and social-emotional school readiness: The Head Start REDI program. *Child Development, 79*, 1802-1817.

Bierman, K. L., Nix, R. L., Greenberg, M. T., Blair, C., & Domitrovich, C. E. (2008). Executive functions and school readiness intervention: Impact, moderation, and mediation in the Head Start REDI program. *Development and Psychopathology, 20*, 821-843.

Boyle, D. & Hassett-Walker, C. (2008). Reducing overt and relational aggression among young children. *Journal of School Violence, 7*, 27-42.

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*, 822-848.

Burchinal, M., Vandergrift, N., Pianta, R. C., & Mashburn, A. J. (2010). Threshold analysis of association between child care quality and child outcomes for low-income children in pre-kindergarten programs. *Early Childhood Research Quarterly, 25*, 166-176.

Civic Enterprises, Bridgeland, J., Bruce, M., & Hariharan, (2013). *The missing piece: A national teacher survey on how social emotional learning can empower children and transform schools*. A report prepared for the Collaborative on Academic, Social, and Emotional Learning (CASEL). Washington, DC.

Cohen, J. (1988). *Statistical power analysis* (2nd ed.). Hillsdale, NJ: Erlbaum.

Denham, S. A., & Brown, C. (2010). "Plays nice with others": Social emotional learning and academic success. *Early Education and Development, 21*, 652-680.

Diamond, A., (2013). Executive functions. *Annual Review of Psychology, 64*, 135-168.

Diamond, A. (2014). Want to optimize executive functions and academic outcomes? Simple, just nourish the human

spirit. In P. D. Zelazo and M. D. Sera (Eds.), *Minnesota Symposium on Child Psychology, Vol. 37. Developing cognitive control processes: Mechanisms, implications, and interventions* (pp. 205-230). New York, NY: Wiley.

Diamond, A., Barnett, W. S., Thomas, J., & Munro, S. (2007). Preschool program improves cognitive control. *Science, 318*, 1387-1388.

Diamond, A., & Lee, K. (2011). Interventions shown to aid executive function development in children 4 to 12 years old. *Science, 333*, 959–964.

Domitrovich, C. E., Cortes, R., Greenberg, M. T. (2007). Improving young children's social and emotional competence: A randomized trial of the preschool PATHS curriculum. *Journal of Primary Prevention, 28*, 67–91.

Downer, J. T., Lopez, M. L., Grimm, K. J., Hamagami, A., Pianta, R. C., & Howes, C. (2011). Observations of teacher-child interactions in classrooms serving Latinos and dual language learners: Applicability of the Classroom Assessment Scoring System in diverse settings. *Early Childhood Research Quarterly, 27*, 21-32.

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

Eigsti, I. M., Zayas, V., Mischel, W., Shoda, Y., Ayduk, O., Dadlani, M., . . . Casey, B. J. (2006). Predicting cognitive control from preschool to late adolescence and young adulthood. *Psychological Science, 17*, 478-484.

Feis, C. L., & Simons, C. (1985). Training preschool children in interpersonal cognitive problem solving skills: A replication. *Prevention in Human Services*, 59–70.

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*, 44-51.

Flook, L., Smalley, S. L., Kitil, M. J., Galla, B. M., Kaiser-Greenland, S., Locke, J., Ishijima, E., & Kasari, C. (2010). Effects of mindful awareness practices on executive functions in elementary school children. *Journal of Applied School Psychology, 26*, 70-95. doi: 10.1080/15377900903379125.

Garon, N., Bryson, S. E., & Smith, I. M. (2008). Executive function in preschoolers: A review using an integrative framework. *Psychological Bulletin, 134*, 32–60.

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*, 117-136.

Hackman, D. A., & Farah, M. J. (2008). Socioeconomic status and the developing brain. *Trends in Cognitive Sciences, 13*, 65-73.

Hamre, B. K., Downer, J. T., Jamil, F. M., & Pianta, R. C. (2012). Enhancing teachers' intentional use of effective interactions with children. In R. C. Pianta, W. S. Barnett, L. M. Justice & S. M. Sheridan (Eds.), *Handbook of early childhood education* (pp. 507-532). New York: Guildford Press.

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., & Bouffard, S. M. (2012). Social and emotional learning in schools: From programs to strategies. *Social Policy Report, 26*, 1-33.

Kabat-Zinn, J. (1994). *Mindfulness meditation for everyday life*. New York: Hyperion.

Kaiser, A. P., Hancock, T. B., Cai, Xinsheng, Foster, E. M., Hester, P. P. (2000). Parent-reported behavioral problems and language delays in boys and girls enrolled in Head Start classrooms. *Behavioral Disorders, 26*, 26–41.

Kaiser-Greenland, S. (2010). *The Mindful Child*. New York, NY: Free Press.

Klem, A. M., & Connell, J. P. (2004). Relationships matter: Linking teacher support to student engagement and achievement. *Journal of School Health, 74*(7), 262–273.

Lynch, K. B., Geller, S. R., & Schmidt, M. J. (2004). Multi-year evaluation of the effectiveness of a resilience-based prevention program for young children. *Journal of Primary Prevention, 24*, 335-353.

MacNeil, A. J., Prater, D. L., & Busch, S. (2009). The effects of school culture and climate on student achievement. *International Journal of Leadership in Education, 12*(1), 73–84.

Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A., Bryant, D., & Burchinal, M. (2008). Measures of classroom quality in pre-kindergarten and children's development of academic, language, and social skills. *Child Development, 79*, 732-749.

McKown, C., Allen, A. M., Russo-Ponsaran, N. M., & Johnson, J. K. (2013). Direct assessment of children's social-

emotional comprehension. *Psychological Assessment, 25*, 1154-1166.

Napoli, M., Krech, P. R., & Holley, L. C. (2005). Mindfulness training for elementary school students: The Attention Academy. *Journal of Applied School Psychology, 21*, 99-125.

Ortner, C. N. M., Kilner, S. J., & Zelazo, P. D. (2007). Mindfulness meditation and reduced emotional interference on a cognitive task. *Motivation and Emotion, 31*, 271-283.

Pechtel, P., & Pizzagalli, D. A. (2011). Effects of early life stress on cognitive and affective function: An integrated review of human literature. *Psychopharmacology, 214*, 55-70.

Pianta, R. C., La Paro, K. M., & Hamre, B. K. (2008). *Classroom assessment scoring system manual: Pre-k.* Baltimore, MD: Brooks Publishing.

Pianta, R. C., Mashburn, A. J., Downer, J. T., Hamre, B. K., & Justice, L. (2008). Effects of web-mediated professional development resources on teacher-child interactions in prekindergarten classrooms. *Early Childhood Research Quarterly, 23*, 431-451.

Ponitz, C. C., McClelland, M. M., Matthews, J. S., & Morrison, F. J. (2009). A structured observation of behavioral self-regulation and its contribution to kindergarten outcomes. *Developmental Psychology, 45*, 605-619.

Riggs, N. R., Greenberg, M. T., Kusché, C. A., & Pentz, M. A. (2006). The mediational role of neurocognition in the behavioral outcomes of a social-emotional prevention program in elementary school students: Effects of the PATHS curriculum. *Prevention Science, 7*, 91-102

Saltzman, A., & Goldin, P. (2008). Mindfulness based stress reduction for school-age children. In S. C. Hayes & L. A. Greco (Eds.), *Acceptance and mindfulness interventions for children, adolescents, and families* (pp. 139-161). Oakland: Context Press/New Harbinger.

Schneider, W., & Pressley, M. (1989). Is good strategy use possible? In W. Schneider & M. Pressley, *Memory development between 2 and 20* (pp. 161-194). New York: Springer-Verlag.

Schonert-Reichl, K. A., Kitil, M. J., & Hanson-Peterson, J. (2017). *To reach the students, teach the teachers: A national scan of teacher preparation and social and emotional learning*. A report prepared for the Collaborative for Academic, Social, and Emotional Learning (CASEL). Vancouver, B.C.: University of British Columbia.

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*, 137-151.

Schonert-Reichl, K. A., Oberle, E., Lawlor, M. S., Abbott, D., Thomson, K., Oberlander, T. F., & Diamond, (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*, 52-66.

Selman, R. L. (1975). Level of social perspective-taking and the development of empathy in children: Speculations from a social-cognitive viewpoint. *Journal of Moral Education, 5*, 35-43

Shonkoff, J. P., Boyce, W. T., & McEwen, B. S. (2009). Neuroscience, molecular biology, and the childhood roots of health disparities: Building a new framework for health promotion and disease prevention. *JAMA, 301*, 2252–2259.

Shure, M. B., & Spivack, G. (1982). Interpersonal problem solving in young children: A cognitive approach to prevention. *American Journal of Community Psychology*, *10*, 341–356.

Snijders, T. A. B. (2005). Power and sample size in multilevel modeling. In B. S. Everett & D. C. Howell (Eds.), *Encyclopedia of Statistics in Behavioral Science* (pp. 1570-1573). Chicester: Wiley.

Tang, Y. Y., Ma, Y., Wang, J., Fan, Y., Feng, S., Lu, Q., . . .Posner, M.I. (2007). Short-term meditation training improves attention and self-regulation. *Proceedings of the National Academy of Sciences of the United States of America, 104*, 17152-17156.

Thierry, K. L., Bryant, H. L., Nobles, S. S., & Norris, K. S. (2016). Two-year impact of a mindfulness-based program on preschoolers' self-regulation and academic performance. *Early Education and Development, 27*, 805-821.

Thierry, K. L., Vincent, R. L., Bryant, H. L., Kinder, M. B., & Wise, C. L. (2018). A self-oriented mindfulness-based curriculum improves prekindergarten students' executive functions. *Mindfulness, 9*, 1443-1446.

Vestal, A., & Jones, N. A. (2004). Peace building and conflict resolution in preschool children. *Journal of Research in Childhood Education, 19*, 131-142

Weissberg, R. P., & Cascarino, J. (2013). Academic learning + social-emotional learning = national priority. *Kappan, 95*, 8-13.

Zelazo, P.D., & Lyons, K. E. (2012). The potential benefits of mindfulness training in early childhood: A developmental social cognitive neuroscience perspective. *Child Development Perspectives*, 0, 1-7.

Table 1

Demographic Characteristics of Students by Group

Variable	Intervention	Control	Total
Participants (*n*)	186	214	400
Age (years)			
M	6.69	6.68	6.68
SD	.95	.91	.92
Gender			
Boys	55%	51%	53%
Girls	45%	49%	47%
Ethnicity/Race			
African American	65.6%	83.9%	75.3%
Latina/o	20.4%	10.9%	15.4%
White	4.8%	3.8%	4.3%
Other	8.6%	1.4%	4.8%
Asian	0.5%	-	0.3%
Test Language			
English	98.9%	98.6%	98.7%
Spanish	1.1%	1.4%	1.3%
Free/Reduced Lunch			
Yes	96.0%	98.0%	97.0%
No	4.0%	2.0%	3.0%

Table 2

Teacher Self-Ratings of Fidelity of Lesson Completion

	Kindergarten *M* (*SD*)	First Grade *M* (*SD*)	Second Grade *M* (*SD*)
Unit 1: Stage-setting	5.00 (.00)	4.89 (.47)	4.58 (.79)
Unit 2: Brain	5.00 (.00)	4.80 (.41)	5.00 (.00)
Unit 3: Breath	4.75 (.45)	4.75 (.46)	4.67 (.82)
Unit 4: Feelings	4.67 (.50)	5.00 (.00)	5.00 (.00)
Unit 5: Body	4.50 (.55)	5.00 (.00)	5.00 (.00)
Unit 6: Impulse Control	5.00 (.00)	4.00 (.00)	4.83 (.41)
Unit 7: Gratitude	4.78 (.44)	5.00 (.00)	5.00 (.00)
Unit 8: Optimism	4.87 (.35)	4.80 (.42)	4.75 (.62)
Unit 9: Grit	4.87 (.52)	4.80 (.42)	4.67 (.49)
Unit 10: Resilience	5.00 (.00)	4.50 (.55)	5.00 (.00)
Unit 11: Perspective taking	5.00 (.00)	4.67 (.52)	5.00 (.00)
Unit 12: Empathy	4.86 (.05)	4.75 (.40)	4.86 (.44)
Unit 13: Kindness	4.86 (.01)	4.75 (.42)	4.86 (.40)
Unit 14: Compassion	4.86(.01)	4.75 (.40)	4.86 (.40)

Note. Ratings based on scale from 1 to 5, with 5 indicating highest level of completion.

Table 3

Teacher Self-Ratings of Student Engagement in Lessons

	Kindergarten *M* (*SD*)	First Grade *M* (*SD*)	Second Grade *M* (*SD*)
Unit 1: Stage-setting	4.22 (.43)	3.72 (.89)	3.75 (.87)
Unit 2: Brain	4.50 (.52)	4.33 (.49)	4.25 (.50)
Unit 3: Breath	4.25 (.62)	4.38 (.74)	4.17 (.75)
Unit 4: Feelings	4.67 (.50)	4.50 (.55)	4.67 (.58)
Unit 5: Body	4.50 (.55)	4.50 (.55)	5.00 (.00)
Unit 6: Impulse Control	4.33 (.50)	4.50 (.58)	4.33 (.52)
Unit 7: Gratitude	4.33 (.99)	4.50 (.58)	4.17 (.41)
Unit 8: Optimism	4.13 (.35)	4.40 (.52)	4.33 (.49)
Unit 9: Grit	4.27 (.59)	4.70 (.67)	4.50 (.52)
Unit 10: Resilience	4.25 (.45)	3.83 (.41)	4.38 (.52)
Unit 11: Perspective taking	4.75 (.45)	4.00 (.00)	4.17 (.41)
Unit 12: Empathy	4.38 (.50)	4.31 (.50)	4.34 (.51)
Unit 13: Kindness	4.38 (.50)	4.31 (.52)	4.34 (.50)
Unit 14: Compassion	4.38 (.40)	4.31 (.52)	4.34 (.52)

Note. Ratings based on scale from 1 to 5, with 5 indicating highest level of student engagement.

Table 4

Teachers' CLASS Scores by Domain and Group

CLASS Domain	Intervention *M* (*SD*)	Control *M* (*SD*)	Both Groups *M* (*SD*)
Emotional Support	4.12 (1.44)	3.84 (1.09)	3.97 (1.24)
Class Organization	3.14 (1.15)	3.20 (1.05)	3.17 (1.07)
Instructional Support	1.45 (0.47)	1.69 (0.50)	1.58 (0.49)

Table 5

SELweb Observed Pretest and Posttest Subtest Means (M) and Standard Deviations (SD) by Grade and Group

	Intervention		Control	
	Pretest	Posttest	Pretest	Posttest
Grade	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Emotion Recognition				
Kindergarten	90.14 (18.71)	97.71 (16.49)	88.35 (20.73)	90.88 (20.49)
First Grade	94.27 (20.26)	95.52 (4.64)	103.56 (16.23)	103.94 (3.86)
Second Grade	99.60 (14.93)	100.08 (9.55)	99.92 (13.25)	100.31 (8.85)
Perspective-Taking				
Kindergarten	84.84 (12.22)	83.87 (12.82)	84.71 (10.94)	86.40 (12.91)
First Grade	81.88 (10.75)	85.90 (13.86)	86.89 (11.92)	92.93 (14.95)
Second Grade	85.35 (14.47)	89.68 (12.62)	88.83 (15.23)	90.40 (12.32)
Problem Solving				
Kindergarten	84.97 (16.55)	86.56 (17.31)	85.60 (15.51)	84.21 (17.30)
First Grade	84.57 (18.26)	90.05 (16.61)	91.40 (16.08)	91.11 (16.64)
Second Grade	93.43 (17.14)	91.63 (15.55)	91.79 (16.72)	89.84 (16.76)
Self-Control				
Kindergarten	86.76 (13.13)	92.56 (13.04)	82.65 (14.69)	89.37 (13.99)
First Grade	85.32 (17.31)	92.50 (11.73)	88.94 (14.24)	90.97 (14.12)
Second Grade	92.22 (13.87)	91.25 (12.78)	88.47 (12.53)	90.83 (13.26)

Table 6
Summary of hierarchical regression analysis predicting emotion recognition difference score

Predictor	β	Semi-Partial Correlation
Block 1		
Group	0.35***	.14
Age	-0.02	-.01
Test delay	-0.33**	-.13
Pretest emotion recognition score	-0.63***	-.60
Pretest self-control score	0.02	.01
Model, $F(5, 394) = 57.28$, $p < .01$		
Block 2		
Group	0.60**	.10
Age	-0.02	-.01
Test delay	-0.33**	-.13
Pretest emotion recognition score	-0.59***	-.42
Pretest self-control score	0.01	.01
Group X Pretest emotion recognition	-0.25	-.05
Model, $F(6, 393) = 48.05$, $p < .01$		
Block 3		
Group	1.17***	.16
Age	-0.01	-.01
Test delay	-0.32**	-.13
Pretest emotion recognition score	-0.62***	-.44
Pretest self-control score	0.14**	.09
Group X Pretest emotion recognition	-0.09	-.02
Group X Pretest self-control	-0.77**	-.12
Model, $F(7, 392) = 43.62$, $p < .01$, $R^2 = .44$		

Note. $R^2 = .42$ for Block 1; $\Delta R^2 = .002$ for Block 2; $\Delta R^2 = .02$ ($p = .22$) for Block 3 ($p < .01$)

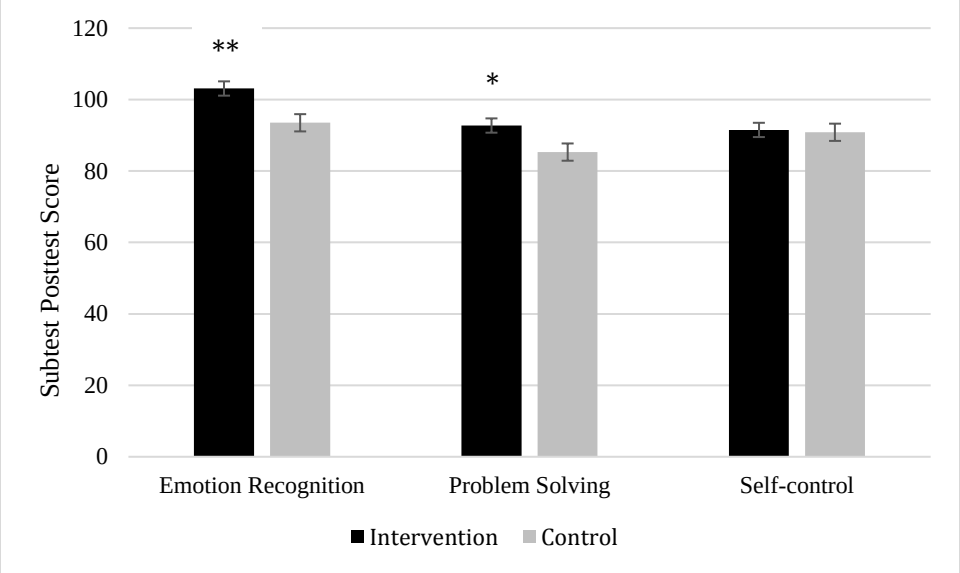

Figure 1. Kindergarten through second grade students' posttest scores (adjusted means) on SELweb subtests (Error bars represent standard errors.)

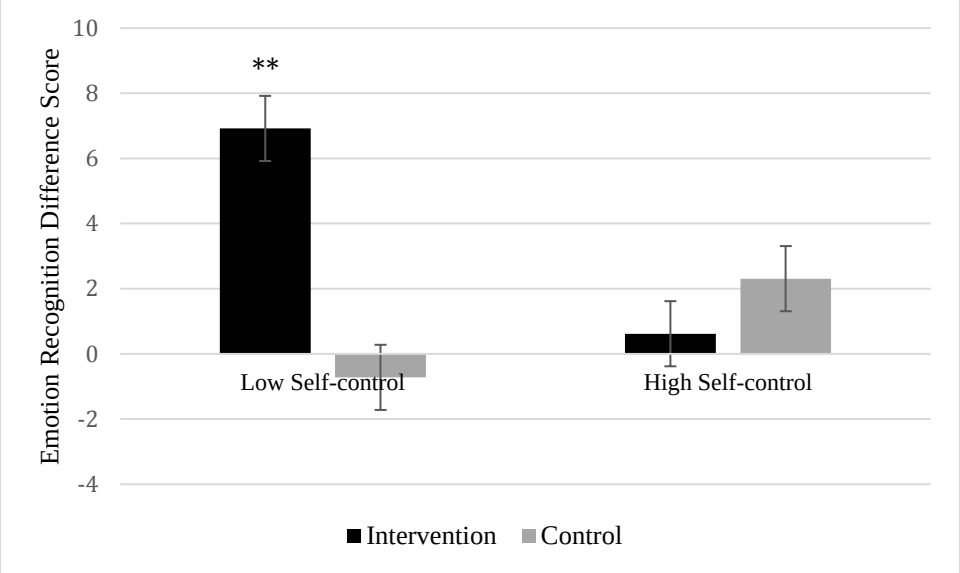

Figure 2. Emotion recognition difference scores as a function of pretest levels of self-control and treatment group: Kindergarten through second grade students (Error bars represent standard errors.)

Appendix A

Kindergarten Settle Your Glitter Lessons and Objectives

Unit	Lesson	Objective: Students will…
1.Setting the Stage	You've got a Friend in Me! Doing the Right Thing in the Right Way Everyone is Special Taming Transitions Mirror Me! Morning Meeting Closing Circle You've Got a Job to Do Friend Patrol	• Understand that everyone has an important job in the classroom. • Understand that there are routines used every day in the classroom. • Know how to follow routines and procedures. • Practice listening to their peers and sharing during morning meeting and closing circle. • Know how to transition from one activity to another. • Understand that everyone has an important job in the classroom. • Practice listening to their peers and sharing during morning meeting. • Practice listening to their peers and sharing during closing circle. • Understand that everyone has an important job in the classroom. • Know how to perform classroom jobs. • Be able to recognize a problem and offer strategies to help solve the problem.
2. The Brain	Parts of the Brain The Amazing Amygdala The Helpful Hippocampus The Perfect Prefrontal Cortex	• Understand that they have a brain inside their head that sends messages to their bodies. • Learn that their brain also controls their feelings. • Learn about three parts of the brain. • Understand that they have a brain that allows them to think, feel and make decisions. • Learn about one of the three main parts of the brain, the Amygdala, and its function. • Learn about one of the three main parts of the brain, the Hippocampus, and its function. • Learn about one of the three main parts of the brain, the Prefrontal Cortex, and its function.
3. Breath	Belly Breathing Settle Your Glitter	• Become aware of their breath. • Learn what a deep belly breath feels like. • Understand that breathing on purpose can help us feel better. • Understand that sometimes we experience strong emotions and need a way to settle them down.

	Calm and Happy	• Learn that when the glitter is shaken up, our amygdala is in charge • Learn that when the glitter is settled, our prefrontal cortex is in charge • Learn that in order to solve problems and learn, we need to have our glitter settled.
	Breathing on Purpose	• Become aware of and control their own breathing. • Understand that breathing influences how their bodies feel. • Understand that they can control their impulses and emotions by managing their breathing patterns. • Become aware of and control their own breathing. • Understand that breathing influences how they feel.
4. Feelings	How Do You Feel?	• Be able to identify feelings in self and others by attending to specific facial expressions
	How I Feel and What I Do	• Make cause and effect connections between specific feelings and behaviors.
	Different Children, Different Feelings	• Explore the feelings of others and discuss why people may have different emotional reactions to the same event
5. Body	Do You See THAT?!	• Understand that mindful observation will help them pay attention to important things around.
	Listen Up!	• Understand that listening attentively will help them pay attention to important things.
	Movement Awareness	• Understand that being conscious of how your body helps you to control its movements
6. Impulse Control	Sometimes I Just Have to Wait!	• Practice using self-calming strategies.
	STOP and GO	• Practice self-control by learning to identify what an impulse feels like.
	Bubble Catch	• Practice self-control by managing their impulses.
7. Gratitude	An Attitude of Gratitude	• Understand what gratitude is and will be skilled at finding things for which they can be thankful. • Verbalize several things for which to be grateful.
	How Does Being Thankful Make Me Feel?	• Understand what gratitude is and will be skilled at finding things for which they can be thankful. • Verbalize several things for which to be grateful.
	Practicing Gratitude	• Understand what gratitude is and will be skilled at finding things for which they can be thankful. • Verbalize several things for which to be grateful.
8. Optimism	ISH	• Understand that perfect is not always possible!
	Optimistic Thinking	• Analyze approaching a challenge with optimism. • Understand that there are many things they can do if they approach tasks with a positive mindset. • Understand that perfect is not always possible.

	Think of the Possibilities	• Understand that mistakes are opportunities to see things in a different way. • Understand that there are many things they can do if they approach new tasks with a positive mind.
9. Grit	What is Grit?	• Learn that grit is a characteristic that can help them succeed at difficult tasks
	The Power of Yet	• Understand that using a new strategy is a way to show grit • Learn that grit is a characteristic that can help them succeed at difficult tasks. • Understand that that using a new strategy is a way to show grit
	The Most Magnificent Thing	• Students will select helpful strategies to use during challenging tasks. • Learn that grit is a characteristic that can help them succeed at difficult tasks. • Understand that using a new strategy is a way to show grit. • select helpful strategies to use during challenging tasks.
10. Resilience	From Frustration to Joy!	• Understand that negative feelings experienced during setbacks change quickly. • Learn that even when setbacks happen, things usually turn out just fine.
	Self-Talk: Hopeless or Helpful?	• Understand that negative feelings experienced during setbacks change quickly. • Understand that self-talk matters.
	Setbacks and Happy Endings	• Understand that negative feelings experienced during setbacks change quickly. • Understand that self-talk matters. • Learn that even when setbacks happen, things usually turn out just fine.
11. Perspective Taking	Perspective Box	• Understand that others may have perspectives that are different from their own.
	What Do You See?	• Understand that others may have perspectives that are different from their own.
	Hey, Little Ant	• Understand that others may have perspectives that are different from their own.
12. Empathy	What is Empathy? (Part 1)	• Learn that helping others is a way to show that you care about them
	What is Empathy? (Part 2)	• Learn that helping others is a way to show that you care about them.
	How Can I Help?	• Learn that helping others is a way to show that you care about them.

13. Kindness	Your Invisible Bucket	• Understand that being kind feels good. • Learn to initiate acts of kindness by focusing on others' needs.
	Being Helpful is Kind	• Understand that helping others is a way to show you care. • Learn to initiate acts of kindness by focusing on others' needs.
	The Kindness Challenge	• Learn to initiate acts of kindness by focusing on others' needs.
14. Compassion	Service Project 1: Paper Hugs	• Send a paper "hug" to the school staff. Hugs are cut-outs of the students' handprints stapled on opposite sides of a piece of ribbon, and attached to a card sent to members of the school staff
	Service Project 2: Save the Paper and the Planet	• Wwork together to make recycle bins for the school. Students will also have the opportunity to deliver the bins to several classrooms and teach other students why recycling is important.
	Service Project 3: Puppy Love	• This service learning project gives students the opportunity to act on their compassion for homeless animals. This project will allow students to partner with individuals who care for these animals and connect prospective families to animals in need of a home. A field trip to the SPCA or nearby animal shelter will provide an authentic learning experience for students.
15. Hope	Little Kids, Big Goals!	• Learn that their caregivers have hopes and dreams for their futures.
	Nothing Stopped Her!	• Explore possibilities for their own futures. • Learn that obstacles shouldn't stop pursuit of goals.
	Unlimited	• Explore possibilities for their own futures • Learn that obstacles shouldn't stop pursuit of goals.

Appendix B

First Grade Settle Your Glitter Lessons and Objectives

Unit	Lesson	Objective: Students will…
1.Setting the Stage	Share the Space Snapshots!	• Experience a sense of ownership of the classroom space.
	Doing the Right Thing in the Right Way	• Understand that routines and procedures allow them to function independently.
	Expectation Station	• Participate in outlining expectations that support a positive classroom environment.
	We are Powerful Problem Solvers!	• Be able to recognize a problem and offer strategies to help solve the problem. • Develop skills to work through challenges that are common in the classroom.
	Morning Meeting	• Become familiar with the structure and purpose of morning meeting. • Practice listening to their peers and sharing important information.
	Closing Circle	• Become familiar with the structure and purpose of closing circle. • Practice listening to their peers and sharing during closing circle.
2. The Brain	The Amazing Brain	• Understand that their brain is inside their head and controls everything they do. • Learn three parts of their brain: amygdala, hippocampus and prefrontal cortex. • Learn that their brain controls their feelings.
	My Amazing Brain in Action	• Understand that they have a brain that allows them to think, feel and make decisions. • Learn the primary functions of the amygdala, hippocampus and prefrontal cortex.
	Settle Your Glitter	• Understand they have a brain that allows them to think, feel and make decisions. • Be skilled at using the glitter ball to calm big emotions.
3. Breath	Chiming In Running to Stand Still	• Practice the technique of breathing with a chime. • Learn language associated with self-regulation • Understand breath is a helpful tool in calming our bodies and minds.
4. Feelings	Sometimes I'm Up, Sometimes I'm Down My Anger is Big Today	• Learn new vocabulary to describe their emotions. • Understand that feelings change in their intensity. • Understand that feelings change in their intensity.

5. Body	Every Brain, Every Body We Feel, We Do	• Understand that the brain and body are connected. • Develop awareness of how different emotions affect sensations in their body. • Understand the way their brain influences how their body feels. • Understand ways to respond when they are having strong feelings.
6. Impulse Control	Bubbling Up Pass the Cup	• Understand what impulses are and how they feel in their bodies. • Learn ways to control impulses. • Practice focusing their attention and regulating their bodies • Understand how mindfulness relates to impulse control and tuning out distractions.
7. Gratitude	Count Up Challenge Thank You Station	• Understand what gratitude is and will be skilled at finding things for which they can be thankful. • Verbalize several things for which to be grateful • Understand what gratitude is and will be skilled at finding things for which they can be thankful. • Explain the importance of expressing gratitude to others. • Practice expressing gratitude in different ways.
8. Optimism	Maybe Something Beautiful Maybe Eyes	• Understand that opportunities exist in every situation. • Understand that opportunities exist in every situation. • Adopt an optimistic perspective when faced with challenging circumstances.
9. Grit	The Challenge Muscle Marble Challenge	• Learn that grit is a characteristic that can help them succeed at difficult tasks. • Select helpful strategies to use during challenging tasks. • Understand that using a new strategy is a way to show grit. • Learn that grit is a characteristic that can help them succeed at difficult tasks. • Understand that using a new strategy is a way to show grit. • Select helpful strategies to use during challenging tasks.
10. Resilience	Bouncing Back Find Your Friendly Phrase!	• Learn what it means to “bounce back.” • Identify times when they’ve been able to “bounce back” from a difficult situation. • Understand that self-talk matters. • Identify a friendly phrase that works well for them.

11. Perspective Taking	What's Your Perspective?	• Understand that others' perspectives may differ from their own. • Accept multiple perspectives as valid. • Be able to see two different visual perspectives.
	Lend Me Your Lens	• Understand that others' perspectives may differ from their own. • Accept multiple perspectives as valid.
12. Empathy	Standing in Those Shoes	• Understand that we all experience similar feelings. • Learn how empathy affects themselves and others.
	Feeling Invisible	• Learn how empathy affects themselves and others. • Understand that we share commonalities with others. • Understand that we all share feelings.
13. Kindness	Each Kindness	• Explore the impact of kindness. • Identify how they have given or received kindness.
	Three Gates	• Learn how to assess their speech with a kindness lens. • Identify speech that is kind.
14. Compassion	Compassionate Acts	• Learn to identify compassion. • Practice compassion through role-play.
	Looks Like, Sounds Like, Acts Like	• Learn to identify compassion. • Practice compassion through role-play.
15. Hope	The Gardener	• Explore possibilities for their own futures • Learn that obstacles shouldn't stop pursuit of goals.
	What's Your Dream?	• Explore possibilities for their own futures. • Learn that obstacles shouldn't stop pursuit of goals.

Appendix C

Second Grade Settle Your Glitter Lessons and Objectives

Unit	Lesson	Objective: Students will…
1.Setting the Stage	Together We Can!	• Understand that everyone in the class community is important. • Identify tasks that are best done together.
	Me + We	• Participate in creating expectations that support a positive classroom environment. • Pay attention to others when they are speaking. • Use listening skills to identify the feelings and perspectives of others.
	Morning Meeting	• Pay attention to others when they are speaking. • Use listening skills to identify the feelings and perspectives of others. • Become familiar with the structure and purpose of morning meeting and closing circle.
	Closing Circle	• Become familiar with the structure and purpose of morning meeting and closing circle. • Pay attention to others when they are speaking. • Use listening skills to identify the feelings and perspectives of others.
2. The Brain	Don't Flip Your Lid!	• Learn that good thinking requires a calm brain. • Learn about three parts of the brain.
	Zoom In and Zoom Out	• Learn about three parts of the brain. • Differentiate between focused attention and general attention.
3. Breath	Puppy Mind	• Demonstrate management of attention through coping skills, such as breathing. • Identify ways to calm themselves, such as belly breathing and counting.
	Amygdala Breathing	• Identify ways to calm themselves, such as belly breathing and counting.
4. Feelings	66 Ways That Make Us Feel I Can Handle Tough Stuff	• Identify emotions related to situations or events. • Demonstrate constructive ways to handle situations that cause upsetting emotions.
5. Body	Body Clues	• Learn to Identify physical cues that indicate strong emotions, such as anger.
	Keeping Anger Small	• Practice strategies to manage emotions (ex: walk away, remove oneself from a triggering event).
6. Impulse Control	What if…? That's Better	• Discuss the importance of controlling impulses. • Demonstrate constructive ways to handle situations that cause upsetting emotions.

7. Gratitude	Hidden Helpers	• Be able to define gratitude. • Be skilled at recognizing the things others do for them.
	We Can Be Hidden Helpers	• Be skilled at expressing gratitude to people who help them. • Be able to define gratitude. • Be skilled at recognizing the things others do for them. • Be skilled at expressing gratitude to people who help them
8. Optimism	Amazing YOU!	• Identify a goal, hope or dream. • Demonstrate constructive ways to handle situations that are challenging.
	Catch a Chance	• Identify a goal, hope or dream.
9. Grit	I've Got Grit	• Be able to define grit. • Know grit is a characteristic that can help them succeed at difficult tasks. • Be skilled at recognizing behaviors that show grit.
	Challenging But Not Impossible	• Be able to define grit. • Know grit is a characteristic that can help them succeed at difficult tasks.
10. Resilience	Looking Like Lou Learn, Grow and Be Brave	• Name activities or tasks they may need help to improve. • Identify and implement the steps needed to achieve a goal. • Celebrate their accomplishments.
11. Perspective Taking	Do You Fear What I Fear?	• Be able to define perspective. • Experience how others' perspectives may be different from their own. • Practice seeing things from a different perspective.
	Do You Feel What I Feel?	• Be able to define perspective. • Experience how others' perspectives may be different from their own. • Practice seeing things from a different perspective.
12. Empathy	Bad Seed Behavior	• Practice empathy by imagining how others might feel.
	Empathy Flowers	• Begin to understand that experiences impact behavior. • Demonstrate empathy by showing concern for others.
13. Kindness	Kindness Dominoes!	• Explore how kindness impacts themselves and their classmates.
	Sandpaper or Silk?	• Identify kindnesses they have received or given to others. • Identify speech that is kind.

14. Compassion	Service Learning Project	• Identify compassionate actions • Learn how compassion affects themselves and others. • Learn to identify compassion. • Practice compassion through role-play.
15. Hope	From Goal to Great Winning Words	• Identify a short term goal for academic success and/or classroom behavior. • Celebrate accomplishments by saying or doing nice things for themselves when a goal is reached.