



Cultivating Compassion in Jewish-Israeli Kindergartners: The Effectiveness of Mindfulness- and Empathy-Based Interventions As Facilitators of Compassion

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ABSTRACT

We examined the effectiveness of a mindfulness-based intervention (MBI) compared to a social-emotional empathy-based intervention (EBI), and a passive control group in promoting compassion among Jewish-Israeli kindergartners. Three middle-class public kindergartens were randomly assigned to the MBI ($n = 26$; $M_{age} = 5.03$), EBI ($n = 24$; $M_{age} = 5.02$), or control groups ($n = 24$; $M_{age} = 5.16$; $N_{girls} = 40$). The interventions lasted 12-weeks. Pre- and post-intervention, children's cognitive compassion was assessed utilizing computerized continuous performance tasks for attention/impulsivity, and structured observations of attention to teacher and on-task behaviors; emotional compassion was measured with structured observations of prosociality, negative affect, social-emotional difficulties, and aggression; intentional and actual compassion was measured using a compassionate responding paradigm. *Research Findings:* Results showed that MBI participants decreased impulsivity and improved sustained attention, increased attentiveness to the teacher, and reduced social difficulties and aggression – these effects did not appear for either other group. Additionally, the MBI and EBI participants increased prosociality and compassionate behaviors more than the control group, however the magnitude of change from the MBI was significantly larger. The MBI increased cognitive, emotional, intentional, and behavioral skills and understanding that are essential components necessary to engage in compassion. *Practice or Policy:* MBIs can be effectively led by teachers and integrated into school curriculum to facilitate just and caring educational communities.

Imagine that you ask a five-year-old to hand over a piece of their candy to a crying peer who accidentally lost theirs. You can think of innumerable possible responses. Some children might show a pouting lip on their face, expressing that they really don't want to give away a piece of their candy. Others could respond a little angry and annoyed, as if they are being punished for a peer losing their candy. Still others might respond by uttering a few empathetic words to their peer while kindly sharing their candy. Each response is understandable, but it is yet to be identified in the larger body of literature if prosociality and social-emotional training in early childhood education can promote more compassionate and caring responses. To further understand what interventions best promote compassion, the current paper compares the effects of mindfulness-based with empathy-based social-emotional interventions on Jewish-Israeli kindergartners' compassion and the necessary components that contribute to experiencing compassion.

Compassion is a unique form of prosociality that encompasses not just positive attitudes and behaviors that benefit others, but also the recognition of and attention to the distress and suffering in others and the drive to alleviate that pain (Jazaieri et al., 2014). More specifically, compassion involves four parts: 1) a cognitive awareness of, 2) an emotional concern with, 3) an intention to relieve, and 4) an actual social response to relieve the suffering of others (Jinpa, 2010). Engaging with others and oneself with more compassion is related to general indicators of positive well-being (e.g., increased positive affect, decreased psychological distress, increased psychological flexibility). Compassion is also related to increased altruistic behaviors – behaviors that benefit the good of others at a sacrifice to the self – and social-connectedness (see Jazaieri et al., 2018). As a result, increasing compassionate care is seen as a desirable outcome overall. However, to date, few studies have examined how to increase compassion, especially in early childhood.

Early childhood marks a period of tremendous development in cognitive, social, and emotional abilities (see Housman et al., 2018) – each a necessary developmental component for compassion. At this age, cognitive advancements in memory, attention, and learning strategies, along with repeated practice, enhance newly honed skills across domains, including social-emotional developments (Ray & Smith, 2010). Although a review of the literature found the social-emotional skill of prosociality develops in infancy and early childhood, there is a complex interplay between cognitive, social, and emotional influences on prosociality. Paulus (2014), author of this review, posits that even at this young age, prosociality can be driven by empathic concern, attention to and understanding of others' suffering, or social care and compassion. Throughout early childhood, girls demonstrate greater attunement to emotional cues, show concern for others' distress, and develop perspective taking, all of which are fundamental to experiencing and expressing compassion; these skills are less fully developed in boys in early childhood (Rochat, 2023). Moreover, advancements in theory of mind – typical at this stage of development for all youth – are directly linked to both cognitive and affective empathy, which promote prosocial behaviors (Bensalah et al., 2016).

However, integral to the development of compassion is cognition. Svetlova et al. (2010) found that with cognitive development comes the understanding that an altruistic act comes at a cost to oneself. In their study, older children who were able to understand the personal cost of an altruistic act were less likely to engage in that behavior than were younger children who did not yet have the cognitive ability to understand the personal cost. Similarly, in an assessment of compassionate behavior among 4-year-olds, Green et al. (2018) found that children were strongly motivated to provide compassion to others, however, significantly less frequently when it came at a cost to oneself. Scholars assert that this development of prosociality and these related skills follow a universal trajectory across cultures through early childhood; however, beginning in middle childhood, cultural context, including socialization and social norm effects, contributes to variability in prosociality (Callaghan & Corbit, 2018). As a result, contexts in early childhood, such as kindergarten, are particularly well-suited to facilitate the cognitive, social, and emotional development that is already taking place to enhance prosocial development and promote the growth of care, compassion, and altruism (Housman et al., 2018; Perkins et al., 2022).

Although, to date, little research has assessed interventions aimed directly at promoting compassion in early childhood, numerous school-based interventions have tried to increase empathy and prosociality in order to support children's social and academic success (Malti et al., 2016). In fact, a recent meta-analysis found that of the reviewed school-based interventions implemented to promote positive social, emotional, and behavioral development among kindergartners, social-emotional learning (SEL) approaches were most frequently utilized (Sabey et al., 2017). SEL approaches can hone children's emotional awareness and regulation and facilitate empathy development to increase prosocial affect and behaviors. However, being able to attend to and recognize emotions and feel empathy is not sufficient to express compassion for others. One can feel empathy, recognizing the emotional state of another, without feeling sympathy – feeling concern for the other person's emotional state; or experiencing compassion – the need to alleviate negative emotions (Spinrad & Gal, 2018). Beyond this, results of multiple meta-analyses find that the effectiveness of SEL

interventions, specifically regarding prosociality and positive social development outcomes, are inconsistent (Wigelsworth et al., 2016), small in effect (Durlak et al., 2011, 2022; Taylor et al., 2017), or based on results of questionable evidence (Sabey et al., 2017). Scholars have called for high-quality studies with clear evaluative methods to analyze further the effects of social-emotional programs, such as SEL, on kindergartners' development (Durlak et al., 2022; Sabey et al., 2017).

Another intervention approach more recently (but less frequently) utilized is mindfulness-based interventions (MBIs) within a classroom setting. MBIs can be conducted to increase prosociality in general, but compassion, more specifically, in early childhood (Berti & Cigala, 2020; Flook et al., 2015; Perkins et al., 2022; Schonert-Reichl et al., 2015). Mindfulness is often defined as purposeful physical, cognitive, and emotional attention to "being in the world" (Kabat-Zinn, 1994; Shapiro & Carlson, 2009). More specifically, mindfulness practice allows children to reach specific awareness "through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p. 144). The relation between mindfulness training and self-regulation has been addressed often, as through mindfulness practice children learn to recognize sensations, feelings, and thoughts in the present moment. Mindfulness focuses on compassion by viewing emotions, feelings, and thoughts without judgment and by accepting them for what they are. Additionally, through mindful practice children learn to accept and then extend care to others (see Berger, Brenick, Lawrence, et al., 2018; Berger, Brenick, & Tarrasch, 2018; Berti & Cigala, 2020). There is a burgeoning literature on the relation between mindfulness and positive prosociality among children, though it is still highly understudied in early childhood (see Berti & Cigala, 2020; Lawlor, 2016; Perkins et al., 2022).

Theoretical Connection Between SEL and Mindfulness

Lawlor (2016) draws from SEL and mindfulness scholarship to conceptualize the relation between the two approaches, particularly in terms of school-based interventions for young children. Below we summarize the ways in which MBIs intertwine with social-emotional competency learning and can further enhance the development of compassion and care. First, Lawlor (2016) describes that mindfulness practice helps develop social-emotional competence in terms of self-awareness; children become attuned to their own emotions and values, and are, in turn, better able to recognize, explore, and express their emotions and values. This relates to the emotional component of compassion, that is the emotional concern with the suffering of others (Jinpa, 2010). Second, by teaching children to be present in the moment and to focus attention to their senses with great care, they sharpen skills of cognitive and behavioral inhibition, cognitive and emotional regulation, and self-management – all of which allow for more thoughtful reactions. In this way, mindfulness approaches to SEL facilitate the cognitive component of compassion (Jinpa, 2010) by heightening one's ability to attend to others' suffering. Furthermore, social awareness is developed in similar fashion to SEL interventions, such as learning perspective taking and empathy. Through these practices in MBIs, youth can build yet another essential component of compassion, the intention to relieve suffering of others and enact care. Finally, relationship skills and responsible decision making are facilitated through mindful listening – listening thoughtfully without judgment, and enacting care for others and not just for the self. However, mindfulness practice moves beyond this by deepening the connection of empathizing with others to build concern for their suffering then motivation to address that suffering and, finally, to take action to alleviate their suffering – compassion (Jinpa, 2010; Lawlor, 2016).

Empirical Evidence of Mindfulness-Based Interventions in the School

MBIs in the school context provide a set of practices that helps children to improve cognitive skills (e.g., attention, self-regulation), and social-emotional competence (e.g., empathy, sympathy, recognition of others' suffering), and be more aware of their behavioral (e.g., inhibitory control) and mental habits (e.g., motivation to address suffering of others, judging others; Andreu et al., 2021; Napoli et al.,

2005; Schonert-Reichl et al., 2015; Viglas & Perlman, 2018). Practices in MBIs include mindful breathing, attention to the five senses, body awareness, mindful walking/eating, and visualization activities (e.g., visualizing instances of generosity, caring). These practices help guide participants to explore themselves and others slowly and purposefully, including their experiences, emotions, thoughts, and behaviors. It is important to note that some programs are mindfulness-based SEL programs that fuse SEL approaches, such as role playing, with mindfulness practices (i.e., Berger, Brenick, Lawrence, et al., 2018; Brenick et al., 2019; Mind Up: Schonert-Reichl et al. 2015), whereas other programs comprised solely mindfulness practice (e.g., Berti & Cigala, 2020; Flook et al., 2015).

Social and Self-Awareness

MBIs are related to significant increases in social and self-awareness in youth which, in turn, facilitate the development of compassion. Berti and Cigala (2020) conducted a 6-week-long pilot MBI with Italian preschoolers and utilized a behavioral observation during free play to measure prosociality (i.e., helping, sharing, comforting); they found a significant increase in prosociality among children in the MBI. Furthermore, children in their MBI demonstrated increased understanding of their own emotions as well as emotional and cognitive perspective taking – both indicative of self-awareness development. Additionally, Flook et al. (2015), found that preschool-aged children who were in their Kindness Curriculum MBI acted less selfishly by sharing stickers with other children in a designed task and showed greater social competence (e.g., teacher rated empathy, compassion for others' feelings) compared to the control group participants. Viglas and Perlman (2018) and Black and Fernando (2014) administered the Mindful School program, which incorporates key mindfulness techniques such as mindful thoughts and breathing and its utility in slowing down our cognitive processes and reactions, and body awareness, including its connection to mindful emotional reactivity. Viglas and Perlman (2018) employed survey methodologies to assess kindergartners' prosociality; they found that kindergartners in the MBI demonstrated significant increases in sharing, caring, and helping. Furthermore, teacher observations of lower income ethnically minoritized kindergarten and elementary school students who participated in the MBI showed increased caring and respect for others (Black & Fernando, 2014). Similar results emerged for MBIs that also included SEL content and practices. Schonert-Reichl and Lawlor (2010) implemented an intervention (Mindfulness Education (ME) program) that combined mindfulness skills, such as mindful attention, quieting the mind, and acknowledging the self and others, with social-emotional learning, such as self-regulation, goal setting, and learned optimism. Among their sample of Canadian elementary school children, a similar pattern of social and self-awareness development emerged. Youth participants in their MBI increased significantly in terms of empathy, compassion, and social and emotional competence. In a randomized control trial of Open Mind-Korea – an integrated mindfulness-based social-emotional learning intervention that included activities such as, Samatha meditation, lovingkindness, gratitude and interconnection activities, and feelings finder – Korean preschoolers who participated in the intervention showed significant increases in general prosocial behaviors of helping, sharing, consoling, and cooperating (Kim et al., 2020).

Self-Management of Emotions and Attention

It is not just by increasing social and self-awareness that mindfulness practice facilitates care and compassion, however, but also through self-management of one's emotions and attention (Lawlor, 2016). Schonert-Reichl et al. (ME program: Schonert-Reichl & Lawlor, 2010; Mind Up program: Schonert-Reichl et al., 2015) and Kim et al. (2020) report mindfulness practice relates significantly to decreased aggressive and oppositional behaviors, as well as improved inhibitory control. In a study of U.S. preschool children, those who participated in a yoga-based MBI involving mindful yoga postures and breathing exercises, showed improved regulation of their behavior and attention following the 25-week long intervention (Razza et al., 2013). Teachers have reported that mindfulness interventions contributed to the improvement of preschool students' executive functioning (U.S.; Thierry et al., 2016). For example, students

engaged in goal directed behavior and organizational strategies more frequently and showed longer attention spans. Across multiple cultures, preschool (Singapore; Lim & Qu, 2017), kindergarten (Spain; Moreno-Gómez & Cejudo, 2019), and early elementary school students' (U.S. 1st-3rd graders; Napoli et al., 2005) selective and sustained attention improved as a result of practice in mindful meditation, movement, visualization, body awareness, and breathing. Importantly, Moreno-Gómez and Cejudo (2019) found that social skills, like prosociality, were significantly related to increased attention and decreased maladaptive behaviors and negative affect. Similarly, other researchers have found that children who engage in mindfulness practice are better self-regulated (Jackman et al., 2019; Viglas & Perlman, 2018), less driven by anger or aggression (Moreno-Gómez & Cejudo, 2019), and more driven by care (Andreu et al., 2021). Mindfulness promotes focused attention on the self and others which creates the optimal conditions to fully develop perspective taking, empathy, and compassion for others.

Relationship Skills and Responsible Decision Making

Relationship skills and responsible decision making are the final two competencies through which MBIs promote compassion. First and foremost, basic tenets of mindfulness include directed and present awareness and listening, the absence of judgment, and care for the self and others (Kabat-Zinn, 2003). Practicing these skills enhances relationship skills and responsible decision making as defined by Lawlor (2016). Previous research shows that kindergartners increase their social skills as a result of participating in MBIs (Moreno-Gómez & Cejudo, 2019). Furthermore, through mindfulness training, elementary school children were able to attend to and listen to others without intense reactivity or judgment (Black & Fernando, 2014). With a sample of Jewish-Israeli school-aged children, Berger, Brenick, and Tarrasch (2018) findings reflect aspects of relationship skills and responsible decision-making competencies. Their work found that participants in the MBI decreased their negative stereotypes and prejudice about the outgroup. That is, participants were becoming aware of and suspending the judgment placed upon others and adapting their cognition to alleviate others' suffering. It remains unclear what specific mechanism is responsible for increased compassionate behavior, whether it is a mindfulness-based intervention or social-emotions-based intervention. In other words, it has yet to be determined whether a child would be more willing to show altruistic compassion because of their ability to feel the same as another child (i.e., experience empathy as a result of social-emotional skills training), or because of their ability to be mindful, reflect upon their own and others' emotions, and express care and compassion without judgment.

Current Study

Altogether, the current study investigated the effects of an MBI in Jewish-Israeli (an understudied population) kindergarten classrooms on children's social-emotional competences as they relate to compassion. Numerous scholars have highlighted the need for research on MBIs in the school with children, especially in early childhood (e.g., Berti & Cigala, 2020; Flook et al., 2015; Lawlor, 2016; Perkins et al., 2022; Viglas & Perlman, 2018). Furthermore, Berti and Cigala (2020) have called for research on the effects of mindfulness training on young children's emotional competence using larger sample sizes, direct measures, and comparison interventions (see also Perkins et al., 2022); we comparatively assess two interventions approved by the Israeli Ministry of Education but as of yet empirically untested. Additionally, these scholars suggest that teachers also be familiarized with mindfulness practice to assist children in their own practice.

To address these gaps in the literature, we randomly assigned three Jewish-Israeli kindergarten classes to a treatment group: 1) the MBI, 2) the empathy-based SEL intervention (EBI), or 3) the "business as usual" control group. Over the course of 12 weeks the interventions were carried out and children were assessed prior to and just after the intervention period. We predicted that the children in the MBI would show higher rates of compassion and the skills, such as cognitive regulation, essential

to all forms of compassion, than children in the EBI and the control group. Specifically, we predicted that:

- (1) Children in the MBI would have higher rates of cognitive compassion as measured by cognitive regulation skills fundamental to cognitive compassion, namely, attention, on-task behavior, and omissions, commissions, and standard deviation of reaction time to a computerized task, than would children in the EBI and the control group.
- (2) Children in the MBI and EBIs would have higher rates of emotional compassion, as measured by prosociality and absence of negative affect, social difficulties, and aggression, than would children in the control group.
- (3) Children in the MBI would have higher rates of intentional and actual compassion as measured by compassionate behavior observations, than would children in the EBI and the control group.

Method

Participants

The study was conducted with 74 Israeli-Jewish kindergarten students ($M_{age} = 5.08$ years, $SD = 0.48$). Twenty-six kindergartners were in the experimental group and received the MBI intervention ($n_{girls} = 13$; all participants self-identified as girls or boys), 24 kindergartners were in active control group and received the SEL empathy-based intervention ($n_{girls} = 12$), and finally, 24 kindergartners were in the passive control group and were exposed to “business as usual” ($n_{girls} = 15$). The mean age of the children in the experimental group was 5.03 years-old ($SD = 0.52$), in the active control group 5.02 years-old ($SD = 0.43$) and in the passive control group 5.16 years-old ($SD = 0.50$). The three groups did not differ significantly in age.

Procedure

Recruitment

The participants were students from a cluster of three public kindergartens with similar socio-economic backgrounds (i.e., middle-class) in Ramat-Gan, a city in central Israel. The Ministry of Education’s area supervisor presented an overview of the programs to the cluster manager, who then randomly assigned the kindergarten classes to one of the three study groups by “drawing straws.” Once assigned to a study condition, the kindergarten teachers described the classroom intervention program to the parents, including the practices, techniques, homework assignments, and assessment methods. Parents of the kindergartners were then emailed a consent form including information about the study and contact information for the researchers and asked to provide written consent approving their children’s participation in the study. Parents and kindergarten teachers were informed that all collected data would remain confidential. Only four parents—one from the experimental group, one from the active control group, and two from the passive control group – did not consent to have their children participate in the study. As a result, these children participated in the classroom activities but no data from these children were included in the study. The study was conducted in accordance with the ethical guidelines for human subjects at Tel Aviv University. Additionally, it was approved by the chief scientist of the Israeli Ministry of Education.

Interventions

For both the experimental (MBI) and the active control (EBI) groups, the kindergarten teachers were trained to deliver the respective programs in 2018, prior to the implementation of the interventions in 2018–2019. A total of 24-hours of training was provided in a group setting. Other trainees were

kindergarten teachers who did not participate in the current study. The training was conducted by senior psychologists who developed the two programs.

MBI: Mindfulness-Based Intervention (Experimental Group). The KEN program (Berger, 2020) – the MBI for the present study – is informed by the Call to Care (C2C) program (Dodson-Lavelle et al., 2014) and concepts and practices from the Sustainable Compassion Training (Makransky, 2007); it was developed to be applied within the Israeli context. The program has been internally reviewed but this is the first independent empirical assessment. The program utilizes mindfulness practices to enhance attention and emotion regulation capacities, as well as cultivate compassionate and caring attitudes and prosocial behaviors. There are four units in the MBI: basic mindfulness skills, accepting care from others, developing self-care, and extending care toward others. The “basic mindfulness” unit includes teaching children vagal breathing strategies, practicing response inhibition and body-scan, and practicing mindful breathing, senses (sight, sound, smell, taste, and touch), and movements (yoga, walking, eating). The “accepting care” unit teaches children to label and communicate their feelings and needs, to identify individuals who can provide their emotional needs, and to reexperience moments of safety and warmth. The “self-care” unit teaches children how to appreciate their strengths and accept their weaknesses, satisfy their needs without hurting others, and practice gratitude. Finally, the “giving care to others” unit helps children to cultivate perspective-taking and empathy as well as to develop awareness of the needs of the community. A pilot run of the program was conducted in the year prior to this study. Presently, the program was implemented by kindergarten teachers in 12 weeks via two daily activities: 1) 20-minutes of whole-kindergarten circle time (large group) and 2) 30-minutes of small groups of 4–6 children. The focus of the large group meetings was primarily on basic mindfulness practices. In the small groups, however, the focus was directed to the three care units which required more individual attention (for more details see Supplemental Materials).

EBI: Empathy-Based SEL Intervention (Active Control Group). The EBI for the present study was the *Pitpetu* program (Gachten-Zar, 2017), a program designed to promote emotional discourse with kindergarten students. *Pitpetu* has been approved by the Israeli Ministry of Education and internally evaluated, however, this is the first independent empirical assessment. The program was developed based on the BASIC PH model of coping and resiliency which outlines six coping modalities – spiritual, emotional, social, imagery, cognitive, and somatic (Lahad, 2017). The *Pitpetu* program focuses on three of the BASIC PH modalities – the emotional, cognitive, and somatic modalities which are each embodied by a unique puppet. The puppet called “heart” represents the emotional modality and copes with daily situations in the kindergarten by expressing its feelings and being empathetic toward others. The “brain” puppet represents the cognitive modality and deals with daily kindergarten issues by gathering information, thinking, and using rational decision making. The “muscle” puppet represents the somatic modality by coping with daily kindergarten struggles through muscular relaxation, breathing, or other physical activities. Importantly, the EBI teachers in our study were familiar with and well-practiced at using the puppets in their classrooms.

In the first stage, the kindergarten students were introduced to the puppets operated by the kindergarten teacher, and interact with the puppets to get to know and be comfortable with them. Then, the children were shown photograph cards depicting preschoolers who exhibit a variety of feelings across various social situations. In the photographs, some children exhibit positive feelings such as happiness, love, excitement, and pride, whereas others exhibit negative feelings such as anger, fear, disappointment, or sadness. Next, the kindergarten students were asked to identify the feelings of the children in the photographs, share similar feelings that they have experienced, and suggest ways to cope with some of the challenging situations. The different puppets served as role models helping the preschoolers to identify the photographed children’s feelings and deal with the social situations. For instance, the “heart” puppet helped the preschoolers to label the feelings of the photographed children and suggested ways that the children can express and regulate their feelings. The “brain” puppet assisted the kindergartners in analyzing the social situations and

helped them utilize problem-solving strategies to deal with the challenging situations. Finally, the “muscle” puppet showed the preschoolers how to attend to the children’s body signals and how to use body-oriented techniques to cope with the social experiences. As with the experimental intervention, the active control intervention was implemented in 12 weeks of two daily activities: 1) a 20-minute whole kindergarten assembly, and 2) a 30-minute small groups of 4–6 children (for more details see Supplemental Materials).

The “Business as Usual” Intervention (Passive Control Group). This kindergarten class received the Israeli Ministry of Education curricular program which included teaching the children literacy and numeracy, basic scientific facts (e.g., the globe, seasons of the year, body parts, animals, plants), and cultural events (e.g., holidays, religion). These educational materials were presented to the children via age-appropriate books, video clips, and music as well as experiential activities during circle time. In order to match the procedure of the two other groups, the kindergarten teacher was instructed to deliver these materials in 20-minute kindergarten circle time meetings as well as 30-minute small groups of 4–6 children.

Fidelity

Fidelity assessments were performed to ensure that all the kindergarten teachers followed the MBI and EBI protocols. The monitoring schedule was set before the interventions began but remained unknown to the teachers. Each of the two kindergarten teachers were assessed on four occasions by two raters to ensure fidelity. Ratings were performed on 6-point Likert-type scales ranging from 0 (not at all as stipulated in the program) to 5 (exactly as stipulated). The rating of the teachers’ adherence to the program was applied to three areas: whether (1) the teacher adhered to the topics, (2) the exercises were followed, and (3) the children participated actively in the session. All assessments of the kindergarten classrooms scored either 4 or 5 on the three domains with strong interrater reliability (Cohen’s kappa = 0.83), confirming high fidelity to both programs.

Blinding and Measures Administration

The Computerized Continuous Performance Task (CPT), observations, and compassion response procedure were administered in the kindergarten setting about one week before and two weeks after the interventions. Trained clinicians, who were blind to the participants’ experimental conditions, administered the assessments to the children. According to their reports, aside from occasional difficulties in understanding some of the instructions, no negative reactions were observed or reported by the students.

Measures

Continuous Performance Task: Attention (Cognitive Regulation)

To measure sustained attention, we utilized the CPT, developed by Tsal et al. (2005). This assessment allowed for an objective measure of cognitive regulation, in/attention, and inhibition – critical mindfulness skills that are foundational to focusing our thoughtfulness on others and enacting cognitive compassion. In the CPT, participants were presented with a sequence of 160 different geometric shapes of different colors, presented in the center of the screen. Sixteen different combinations of colors and shapes were used, including: squares, circles, triangles, and stars in red, blue, green, or yellow. Participants were instructed to respond as fast as possible by pressing the spacebar with their preferred finger as soon as the target – a red square – appeared and to withhold responses to all other stimuli. The target appeared on 70% of the trials. 7.5% of the trials contained non-red squares, 7.5% presented red, non-square geometric shapes, and 15% presented geometric shapes which differed in both color and shape from the target stimulus. Each stimulus was presented for 100 ms and was separated from the next by an interval of 1000, 1500, 2000, or 2500 ms. The various stimulus types and interstimulus intervals were randomly intermixed. The task consisted of a single block of 160 trials

preceded by 15 practice trials. This task has been shown to have high test-retest and internal reliability, as well as convergent and divergent (discriminant) validity (Shalev et al., 2011).

Three measures were used in the current study: (a) proportion of commissions, namely trials in which participants responded to a non-target stimulus; false alarms (a high commission rate indicates the subject's tendency to impulsivity (Gross-Tsur et al., 2006); (b) proportion of omissions, namely trials in which participants did not respond to the target; misses of the target (a high omissions rate indicates inattention (Allan & Lonigan, 2015; Riccio et al., 2001); and (c) the standard deviation of reaction times in responding to the target, which measure lapses in sustained attention (Tsal et al., 2005). A low standard deviation indicates a homogeneous performance (i.e., the reaction time was consistent throughout the task), which is indicative of a high sustained attention.

Behavioral Observations: Attention, Prosociality, Social-Emotional Difficulties

Structured observations were conducted as an adaptation of Minnesota Preschool Affect Checklist (MPAC; Sroufe et al., 1984). Two research assistants participated in training sessions prior to actual MPAC observations. Post-training inter-reliability for each scale ranged from 83% – 92% (88% average at the conclusion of training). The research assistants were blinded to the condition in which the classroom was placed, observed the children's behavior for 15 minutes on three different days before the onset of the interventions and for 15 mins on three different days two weeks following the interventions. The observations took place during a semi-structured activity within the classroom. All of the kindergartners wore large name tags, which helped the observers identify each participant. The teachers introduced the observers to the children, telling them that the observers are students who came to learn how the kindergarten works. Since pre-service teachers and researchers from different universities often visit these kindergartens for observational purposes, this is not an unusual event. The research assistants made themselves relatively inconspicuous and, during the 15-minute observation periods, rated the frequency with which a child engaged in any of the following behaviors on a scale from 1 (not at all) to 5 (very often). There were three clusters of behaviors that were targeted in the observations: attention, prosociality, and social-emotional difficulties.

Attention. Participants were observed in terms of their *attention to the teacher* and being *on-task*. *Attention to the teacher* involved whether the child is attentive to the preschool teacher (e.g., looks at the teacher when they are talking), and if the child follows instructions provided by the preschool teacher. Being *on-task*, or having sustained involvement in an activity, was observed when the child was engaged in the activity and remained involved in the process through the activity. Observer agreement was high with 83% interrater agreement reflecting substantial interrater reliability, Cohen's Kappa = 0.70.

Prosociality. *Prosociality* was observed when a child helped another child or the teacher(s). Acts of prosociality could include a child directing positive emotions at a particular person, sharing with others, taking turns with other children (a clear beginning and end of each child's turn during an activity should be observed), or cooperating with other children to achieve a common goal. Observer agreement was high with 92% interrater agreement reflecting substantial interrater reliability, Cohen's Kappa = 0.71.

Social-Emotional Difficulties. Social-emotional difficulties were observed via three outcome variables: *negative affect*, *social difficulties*, and *aggression*. *Negative affect* involved a child expressing displeasure, discomfort, distress via facial, vocal, or bodily cues. Negative emotions included fear, anger, frustration, and emotional distress. Negative affect could be directed at a particular person or simply a general emotional experience. *Social difficulties* were observed when a child was socially and emotionally withdrawn and appeared uninvolved and uninvested in class activities or disconnected from classmates and teachers. *Aggression* was noted if a child displayed any type of aggression (verbal or physical; proactive or reactive) directed at other children or the teachers. For example, the child

could hit, kick, shove, knock over, throw objects, bite, curse, or take an object from another child forcefully. Observer agreement was high with 88% interrater agreement reflecting substantial interrater reliability, Cohen's Kappa = 0.71.

Modified Compassionate Response Paradigm: Compassionate Behavior

Given the strong relation between altruistic behaviors and compassion (Jazaieri et al., 2018) and previous research with this methodological approach (Green et al., 2018), our assessment of compassionate behavior involved a modified compassionate response paradigm utilizing three game tasks with a puppet (the puppets were familiar to the children as they were used in the classroom for other purposes as well). At the beginning of the paradigm, the kindergartner was given a prize, and then two more were set aside for when the child and the puppet completed their tasks (this was done for each task attempted). Then, in a form of parallel play, the kindergartner and the puppet both had the same task to complete in front of them (e.g., a puzzle), but the puppet always had too few pieces to complete their task. The puppet had three prompts, each increasing in level of distress about not being able to finish and not getting the prize that they really wanted and being so upset/going to cry, that they said to the child as time for the task was nearing an end. The child was scored on whether they helped the puppet before any prompt was said, after hearing one, two, or three prompts, or not at all. For the initial task neither the puppet nor the child had any prize; for the remaining two tasks, the child had received at least one prize.

Results

Preliminary Data Analyses

Participants were assessed on all measures prior to the interventions (at the equivalent time in the control group) and two weeks after their completion. MANOVAs were performed for the variables of interest to examine baseline differences between the three groups in the pre-measures. No significant effects for group emerged for any outcome measure at the baseline (all $ps > 0.05$).

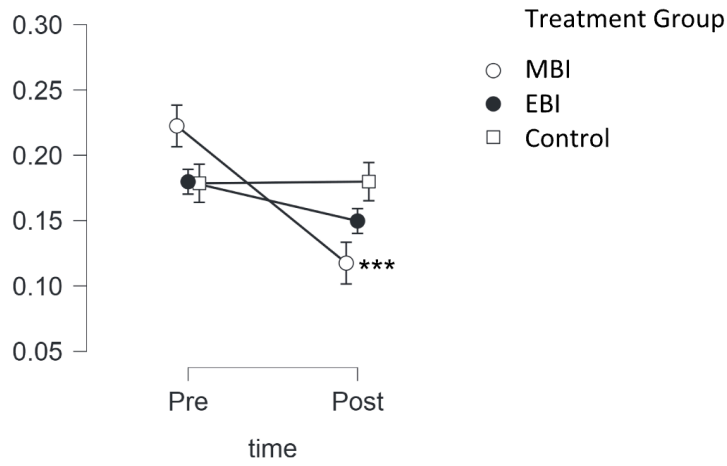
Cognitive Compassion: Cognitive Regulation via CPT Task

In order to assess hypothesis one, separate 3×2 repeated measures ANOVAs were performed for commissions, omissions, and reaction time standard deviations – skills necessary for the cognitive component of compassion – with the within-subjects effect of time of measurement (2: pretest, posttest) and the between-subjects factor of group (3: MBI, EBI, control group). Significant effects were followed by Tukey Honest Significant Difference (HSD) post-hoc comparisons to control for Type-I error inflation. Results of the primary analyses for commissions and standard deviations of reaction times supported hypothesis one, whereas results for omissions trended in support of hypothesis one.

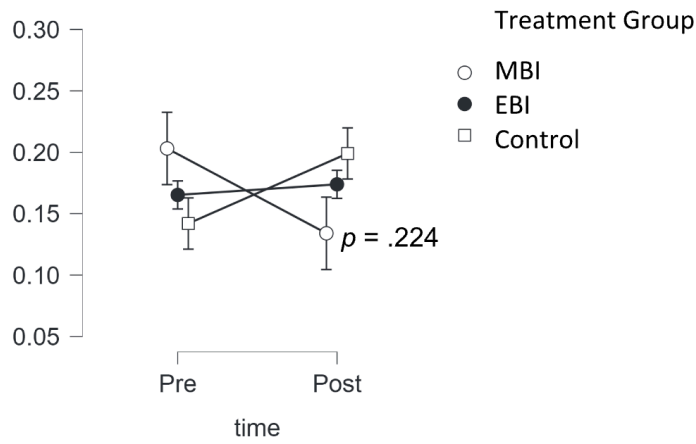
The repeated measures ANOVA on percent of commissions yielded a significant effect of time, $F(1,68) = 15.94$, $p < .001$, $\eta_p^2 = 0.19$, and a significant interaction between time and group, $F(2,68) = 8.05$, $p < .001$, $\eta_p^2 = 0.19$. As can be seen in [Figure 1a](#), Tukey's HSD revealed a significant reduction in the commissions rate (i.e., reduced impulsivity) in the mindfulness group only ($p < .001$).

The repeated measures ANOVA on percent of omissions yielded a significant interaction between time and group, $F(2,68) = 4.11$, $p = .02$, $\eta_p^2 = 0.11$. Tukey HSDs were non-significant for all three groups, however. [Figure 1b](#), depicts a slight reduction trend in the omissions rate (i.e., reduced inattention) in the MBI only ($p = .224$).

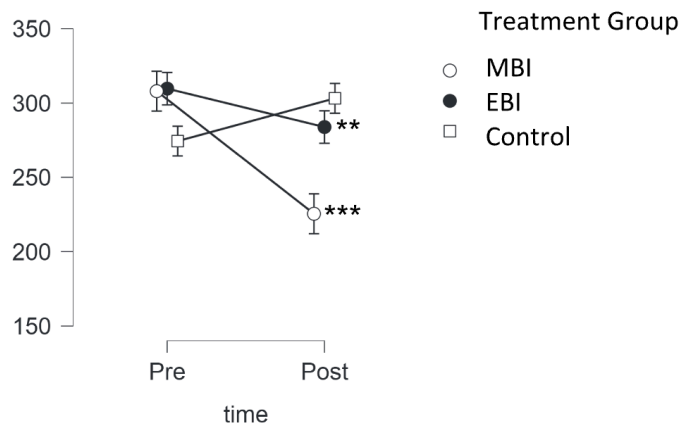
The repeated measures ANOVA on standard deviation of reaction times yielded a significant effect of time, $F(1,68) = 7.71$, $p = .007$, $\eta_p^2 = 0.25$, and a significant interaction between time and group, $F(2,68) = 11.24$, $p < .001$, $\eta_p^2 = 0.25$. As can be seen in [Figure 1c](#), Tukey's HSD revealed a significant



a. *Proportion of Commissions by Group and Time*



b. *Proportion of Omissions by Group and Time*



c. *Reaction Time Standard Deviation by Group and Time*

Figure 1. Computerized continuous performance task: interaction of time by task by group. ** = $p < .01$. *** = $p < .001$.

reduction in standard deviation of reaction times (i.e., improved sustained attention) in the MBI ($p < .001$), together with a slighter reduction in the EBI ($p = .05$).

Cognitive and Emotional Compassion: Behavioral Observations of Attention, Prosociality, and Social-Emotional Difficulties

To examine the effects of the program on the children's observed behaviors in the classroom, 3 (group: MBI, EBI, control group) x 2 (gender: girls, boys) x 2 (time: pretest, posttest) ANOVAs, with repeated measures on the last variable, were conducted. Pairwise comparisons or paired sample t-tests with Bonferroni adjustments to control for Type-I error inflation were conducted, as appropriate, to probe significant interactions. This analytical approach was applied for each of the behavioral observed measures: (1) Attentiveness to the teacher, (2) On-task, (3) Prosociality, (4) Negative affect, (5) Social difficulties, and (6) Aggression. Significant effects with intervention groups emerged for attentiveness to the teacher, prosociality, social difficulties, and aggression.

In partial support of hypothesis one, significant results emerged for the MBI group for the attention outcome measure, but not the on-task outcome measure. A significant main effect for time, ($F(1,68) = 24.75, p < .001, \eta_p^2 = 0.27$), which was qualified by a significant interaction between time and group, ($F(2,68) = 7.66, p < .001, \eta_p^2 = 0.18$), emerged for attentiveness to the teacher. The pairwise comparisons revealed that only the MBI participants showed significant changes in attention from pre- to posttest and that MBI participants were more attentive at posttest than at pretest (see Table 1 for *M*s and *SD*s). The magnitude of this effect was quite large, Cohen's $d = 0.83$. However, for children's on-task behavior, time was the only effect to emerge as significant, ($F(1,68) = 11.42, p < .001, \eta_p^2 = 0.14$), indicating that over time all participants showed improvements in being on-task unrelated to their intervention group ($M_{pre} = 2.57, SD = 0.07; M_{post} = 2.81, SD = 0.08$). Also, unrelated to our hypotheses, a significant effect for gender emerged for attention to the teacher ($F(1,68) = 6.36, p < .05, \eta_p^2 = 0.09$); girls ($M = 3.04, SE = 0.10$) were more attentive than were boys ($M = 2.68, SE = 0.11$).

Table 1. Behavioral observation measures mean and standard deviation at each time point.

Measure	Group	Pre-test		Post-Test	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Attentiveness to teacher	MBI	2.54	0.72	3.29	0.75
	EBI	2.83	0.67	3.02	0.76
	Control	2.71	0.69	2.83	0.73
On-task	MBI	2.65	0.56	3.01	0.75
	EBI	2.46	0.62	2.71	0.67
	Control	2.60	0.59	2.71	0.69
Prosociality	MBI	2.35	0.81	2.94	0.78
	EBI	2.46	0.74	2.71	0.76
	Control	0.35	0.52	0.19	0.38
Negative affect	MBI	0.31	0.53	0.12	0.33
	EBI	0.38	0.57	0.19	0.44
	Control	0.35	0.52	0.19	0.38
Social Difficulty	MBI	0.37	0.56	0.13	0.30
	EBI	0.31	0.46	0.17	0.38
	Control	0.38	0.56	0.23	0.42
Aggression	MBI	0.38	0.55	0.08	0.39
	EBI	0.29	0.53	0.13	0.27
	Control	0.42	0.58	0.23	0.42

* $p < .05$, ** $p < .01$, *** $p < .001$.

The patterns of significant effects for prosociality, negative affect, social difficulties, and aggression showed partial support for hypothesis two. First, the results for prosociality fully supported hypothesis two. A significant effect for time, ($F(1,68) = 14.51, p < .001, \eta_p^2 = 0.18$), was qualified by a two-way interaction between time and group, ($F(2,68) = 3.84, p < .05, \eta_p^2 = 0.14$). Paired sample t-tests revealed that both the MBI ($t(25) = -3.49, p < .001$) and EBI ($t(23) = -2.15, p < .05$) group participants showed increased prosociality from pretest to posttest (see Table 1 for *Ms* and *SDs*). The magnitude of the effects differed, however. For the MBI group, the effect size was large, Cohen's $d = 0.87$; whereas, for the EBI group, the effect size was medium, Cohen's $d = 0.57$.

Second, the findings for both social difficulties and aggression partially supported hypothesis two in that only the MBI participants, not the EBI participants, showed reductions in these outcomes significantly more than did children in the control group. For social difficulties, a significant main effect for time, ($F(1,68) = 4.22, p < .05, \eta_p^2 = 0.06$), which was qualified by a significant interaction between time and group, ($F(2,68) = 3.98, p < .05, \eta_p^2 = 0.11$), demonstrated that children in the MBI group showed fewer social difficulties at the posttest than at the pretest ($t(25) = 2.78, p < .01$; Cohen's $d = 0.60$). This effect was not found in either of the other groups. Similarly, a significant interaction between time and group, ($F(2,68) = 5.56, p < .01, \eta_p^2 = 0.14$), emerged for aggression. MBI participants showed less aggression at the posttest ($t(25) = 1.79, p < .05$; Cohen's $d = 0.60$) than at the pretest. Again, this effect was not found in either of the other groups (see Table 1 for *Ms* and *SDs*).

Finally, the results for negative affect did not support hypothesis two. A significant main effect for gender emerged, ($F(1,68) = 6.89, p < .05, \eta_p^2 = 0.09$), which was qualified by a significant interaction between gender and group, ($F(2,68) = 4.12, p < .05, \eta_p^2 = 0.11$). Pairwise comparisons revealed that male participants in the EBI group ($M = 0.58, SE = 0.10$) were significantly more likely to express negative affect than were participants in the MBI group ($M = 0.23, SE = 0.08; p < .05$) or the control group ($M = 0.15, SE = 0.09; p < .01$).

Intentional and Actual Compassion: Modified Compassionate Response Paradigm

A 2 (gender: girls, boys) x 3 (treatment group: MBI, EBI, control group) x 3 (task: tangram, puzzle, matching) x 2 (time: pretest, posttest) ANOVA with repeated measures on the last two variables was conducted to assess whether children in the MBI would have higher rates of intentional and actual compassion as measured by a modified compassionate response paradigm, than would children in the EBI and the control group (hypothesis three). Significant effects were followed up with post-hoc paired samples t-tests or pairwise comparisons with Bonferroni adjustments for multiple comparisons, as appropriate.

Relevant to hypothesis three, a main effect for time emerged as significant ($F(1, 68) = 82.91, p < .001, \eta_p^2 = 0.55$), but this was qualified by the following two-way interactions: time by group ($F(2, 68) = 9.78, p < .001, \eta_p^2 = 0.22$) and time by task ($F(2, 136) = 19.25, p < .001, \eta_p^2 = 0.22$). All of these effects were further qualified by the significant three-way time by task by group interaction ($F(4, 136) = 4.00, p < .01, \eta_p^2 = 0.11$; see Figure 2a–c). Follow-up pairwise comparisons demonstrated that no significant differences were found between the pretest and posttest scores of compassionate behavior in the control group for any of the three tasks. However, significant increases in compassionate behavior at the posttest emerged in both the tangram and the matching tasks, the second and third tasks in the paradigm, for the MBI and EBI groups. Children in the MBI group showed the greatest magnitude of change in terms of increased compassionate behaviors for the tangram ($p < .001$) and matching tasks ($p < .001$) – both with large effect sizes, Cohen's d 's equal to 0.85 and 0.88, respectively. Next, the increases shown in posttest values among children in the EBI group for the tangram ($p < .001$; Cohen's $d = 0.59$) and matching ($p < .01$; Cohen's $d = 0.58$) tasks were both of medium effect size. Finally, Cohen's d values comparing the magnitude of the groups' effects in comparison to one another, yielded moderate to large effect sizes between the MBI and control groups, small effects between the EBI and control groups, and small to moderate effects between the MBI and EBI groups (see Table 2 for effect sizes).

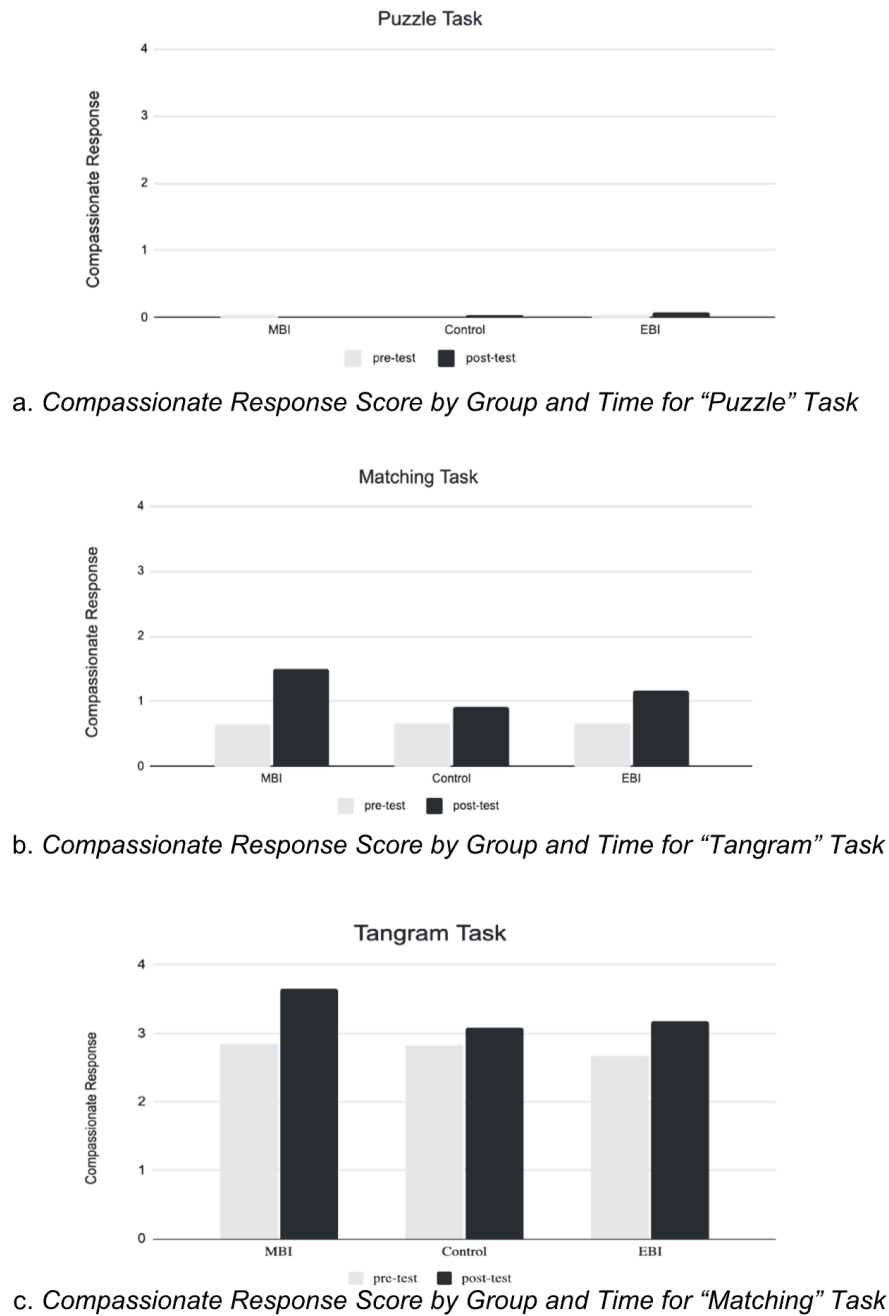


Figure 2. Modified compassionate response paradigm: interaction of time by task by group. Compassionate response score: **4** = helped with no prompt; **3** = helped with one prompt; **2** = helped with two prompts; **1** = helped with three prompts; **0** = did not help.

Though not related to our hypotheses or primary research questions, the repeated measures ANOVA also yielded significant main effects for gender ($F(1, 68) = 5.84, p < .05, \eta_p^2 = 0.08$) and task ($F(2, 136) = 421.80, p < .001, \eta_p^2 = 0.86$). Overall, girls were significantly more compassionate – intentionally and actually – in all tasks than were boys (see Table 3 for *M*s and *SD*s). As for tasks, children’s levels of compassion differed significantly across each task at $p < .001$ level, with children being most compassionate in the tangram task and least in the puzzle task (Table 3). Both of these main effects, however, were qualified by an higher-order two-way interaction between gender and task ($F(2, 136) = 3.86, p < .05, \eta_p^2 = 0.05$); this interaction revealed that the significant gender difference in compassionate behavior was driven primarily by the tangram task. Girls were significantly more compassionate

Table 2. Effect sizes for pre-test/post-test effect comparisons by group and task pre-test/post-test.

	MBI v. Control	EBI v. Control	MBI v. EBI
Task			
Tangram	0.80	0.26	0.52
Matching	0.53	0.23	0.30

Klauer's d_{Korr} (2001) calculated using https://www.psychometrica.de/effect_size.html. Effect sizes for "Puzzle" are not included because post-hoc analyses were not significant.

Table 3. Means and standard deviations/errors of compassion and helping scores by gender and task.

	Tangram	Puzzle	Matching	Overall (gender)
Girls	3.26 (0.02)	0.03 (0.11)	1.13 (1.03)	1.47 (0.08)
Boys	2.79 (0.99)	0.04 (0.19)	0.71 (0.93)	1.17 (0.09)
Overall (task)	3.01 (0.09)	0.04 (0.02)	0.91 (0.12)	

in their responses for the tangram task than were boys (Cohen's $d = 0.57$) but showed no significant difference on either of the other tasks (Table 3). This was further qualified by a three-way time by task by gender interaction, ($F(2, 136) = 3.51, p < .05, \eta_p^2 = 0.05$). Pairwise comparisons revealed that although girls were significantly more compassionate in their responses for the tangram task at both pretest and posttest, they also became more compassionate in their responses to the matching task at the posttest than did boys ($ps < 0.05$).

Discussion

The present study made significant novel contributions to the fields of early childhood social-emotional development, specifically that of compassion, and mindfulness intervention and practice. These contributions were both methodological and empirical. First, in line with calls from the field (e.g., Berti & Cigala, 2020; Flook et al., 2015; Lawlor, 2016; Perkins et al., 2022; Viglas & Perlman, 2018), this study examined the potential benefit of MBIs with children, particularly those in early childhood. Second, we used a variety of measures of outcome variables, including direct measures, and employed a comparison intervention as well as a control group – features lacking from many previous studies in the field of mindfulness interventions (Berti & Cigala, 2020; Perkins et al., 2022). With this design we were able to investigate how MBIs might fare in promoting compassion, not just in comparison to a control group, but also to an EBI. Such a comparison was clearly warranted given the ubiquity with which SEL interventions are used in the school setting, the clear connections between mindfulness practice and social-emotional learning and development (Lawlor, 2016; Moreno-Gómez & Cejudo, 2019), and the unique offerings of mindfulness practice that address all four aspects of compassion (cognition, emotion, intention, behavior). Overall, the major novel empirical contributions of this study demonstrate strong support for MBIs in facilitating young children's compassion, more than either the control or the EBI groups.

Mindfulness Based Interventions: Effects on Cognitive Skills Related to Compassion

Our findings reveal that mindfulness practice clearly promotes young children's cognitive skills essential to compassion (Jinpa, 2010). More specifically, after participating in the MBI, children's CPT results indicated decreased impulsivity, trends in increased attention (task-based attention), and improved sustained attention. Behavioral observations showed increased attentiveness to the teacher, as well. These results did not emerge for the control group or the EBI group, in strong support of hypothesis one. Significant improvements in attention and self-regulation variables as demonstrated

by the children in our MBI, are in line with previous research (Poehlmann-Tynan et al., 2016; Schonert-Reichl & Lawlor, 2010; Schonert-Reichl et al., 2015; Viglas & Perlman, 2018). Improvements in attention, focus, and self-regulation are key to the self-management core competency of SEL. Likewise, the core SEL component of self-awareness highlights children's abilities to attend to, explore, and address their own and others' emotional needs and values (Lawlor, 2016). At a more fundamental level, children must be skillful in controlling and focusing their attention and engaging in cognitive inhibition and self-regulation in order to engage in cognitive compassion by attending to others, their suffering, and their needs. Increases in our measures of attentiveness to the teacher and sustained attention after the MBI reflect self-awareness and the attunement to the needs of the self and others. Youth who receive MBIs during this early stage of development are able to increase their self-awareness and therefore, increase their attunement to the needs of the self and others (see Schonert-Reichl & Lawlor, 2010). Moreover, growth in the relationship skills core SEL competency is facilitated by the mindful practice of non-reactive listening. Non-reactive listening (e.g., attentiveness to the teacher in the current study) facilitates the skills necessary to pursue and maintain positive relationships and healthy conflict resolution (Lawlor, 2016). Furthermore, developing these skills with the teacher can carry over to similar social domains, such as relationship bonding with peers, community members, or even strangers (see Berger, Brenick, Lawrence, et al., 2018). Children who practice self-management, as described by the model, and develop their relationship skills are able to sustain selective control and approach social-emotional difficulties with others by expressing kindness and compassion.

Mindfulness Based Intervention: Effects on Prosociality

Along with the development of the cognitive skills necessary to attend to the needs of the self as well as to social situations in which others need compassion, young children must also develop the emotional understanding of the needs of others who are suffering (Jinpa, 2010). Although our findings offer only partial support for hypothesis two – that children in the MBI and EBIs would have higher rates of emotional compassion, as measured by prosociality and absence of negative affect, social difficulties, and aggression than would children in the control group – they offer even greater support for the added benefits of MBIs. The only outcome measure that fully supported hypothesis two was prosociality. MBI and EBI participants all increased in prosocial behaviors. However, the magnitude of the effect was stronger for the MBI. Mindfulness intervention can increase a child's ability to recognize one's own needs as well as the needs of others especially when looking at sharing and cooperation (Ahammer & Murray, 1979; Berti & Cigala, 2020). This suggests that mindfulness training allows children to be aware of their surroundings and allows them to partake in helping situations. This is supported by the idea that children in the preschool period are able to provide cognitive empathic responses (Bensalah et al., 2016; Svetlova et al., 2010). Youth in the MBI translated their developing self-attunement into increased prosociality and even compassion (discussed later) as they aligned their actions with intrinsic values rather than external motivators. The emotional underpinnings of compassion were shown (e.g., helping others, cooperating, sharing, turn taking), indicating the increased alignment with intrinsic values critical to self-awareness as defined in Lawlor's (2016) model.

Mindfulness Based Interventions: Effect on Negative Behaviors

The remaining three outcome measures tested for hypothesis two, social difficulties, aggression, and negative affect, showed varying levels of support for our predictions. First, the pattern of results for social difficulties and aggression were the same. Results for both measures supported hypothesis two in that MBI participants showed significant decreases in these measures at the posttest. At the same time, the results only offer partial support for the hypothesis because both the control group and the EBI group did not show posttest decreases in these measures. Thus, although the findings offer only

partial support for our initial hypothesis two, they offer *stronger* support for the benefits of MBIs. Furthermore, a vast literature on child development highlights that improved social skills result when intrapersonal and interpersonal emotions are self-regulated (Denham, 2006; Housman et al., 2018; Moreno-Gómez & Cejudo, 2019; Taylor et al., 2017). This manifested as a reduction in social difficulties and aggression as witnessed by our participants in the MBI group – an effect that did not appear for either other group. Previous research in MBIs found that MBI participation improved the social adaptation and skills of young children post-intervention (Moreno-Gómez & Cejudo, 2019). Additionally, increased prosociality as well as decreased social difficulties and aggression all facilitate growth in relationship skills and allow for the expression of compassion within those relationships.

Negative affect is the one outcome measure with result patterns that did not support hypothesis two at all. The MBI did not lead to decreased negative affect. However, the gender by group interaction revealed that boys in the EBI showed more negative affect than boys in the MBI or control group. It is possible that this effect emerged because boys, who are typically gender-typed to show no or less emotion (see Brown et al., 2015) in the EBI learned explicitly about expressing emotions.

Mindfulness Based Interventions: Effect on Altruistic Compassion

Finally, in addition to exploring the cognitive and emotional components of compassion, we hypothesized about the intentional and actual engagement in compassionate behaviors as measured in our behavioral observation task paradigm (hypothesis three). Intrinsic interests have an impact on children's intentions to and actual engagement in altruistic compassionate behaviors when there is a cost involved. Green et al. (2018) previously utilized the behavioral response methodology with a distressed puppet from which our compassionate response paradigm is modified. They found that some of the four-year old participants assessed did not share their resources with a distressed puppet but, instead, showed compassion physically (e.g., hugging) to avoid the consequences of personal loss. The compassionate acts of sharing material possessions – giving up one's desired prizes to a puppet who expresses distress and suffering at a cost to oneself – demonstrate the rejection of external motivators. Responsible decision making involves the ability to ignore internal stimuli and make decisions that are not pro-self, but are dependent on compassion through thoughtful, unbiased observations (Lawlor, 2016). Children in our study participated in this same paradigm and did not show a difference in their altruistic compassionate behaviors (giving up prizes when then would get nothing at all). Developmentally, this is not unexpected based on previous findings in the literature (Green et al., 2018). Conversely, helping in the later tasks still involved sacrificing a prize in that game, yet a child would have potentially already received at least some prize at that point. However, compassionate responses were increased for children in the interventions after they had received one prize of their own from a previous task. Even with the extrinsic incentive of a reward, self-interests related to the avoidance of personal loss can mitigate the effects of choosing compassionate behaviors. Moreover, the fact that youth in the MBI outperform youth in the EBI, highlights the added benefits of a mindfulness-based approach, especially when taken together with the entirety of our findings. Furthermore, these results might indicate the criticality of increased attention to the needs and suffering of others as well as the self as the foundation of self-awareness. Such extensions are fundamental to the self-awareness component of the mindfulness model of SEL (see Lawlor, 2016).

Limitations and Areas for Future Research

The current study addressed numerous gaps in the literature, particularly heeding the call for research on school-based MBIs with *young children* (e.g., Flook et al., 2015; Lawlor, 2016; Perkins et al., 2022; Viglas & Perlman, 2018), and utilizing direct measures, comparison interventions, and teachers who are familiarized with mindfulness practice (Berti & Cigala, 2020; Perkins et al., 2022). Still, the study is not without limitations that must be mentioned as well.

Although our findings on school-based MBIs and compassion with kindergartners are promising and they add to the burgeoning literature on MBIs with young children in general (e.g., Berti & Cigala, 2020; Lim & Qu, 2017; Moreno-Gómez & Cejudo, 2019; Poehlmann-Tynan et al., 2016; Viglas & Perlman, 2018; and see; Perkins et al., 2022), this work needs to be replicated. The current study was conducted in three schools in one city with a unique socio-historical political context. Though it could be argued growing up amidst an ongoing protracted conflict, such as that in the Middle East, could make it all the more difficult for an intervention for compassion to be successful (see Berger, Brenick, & Tarrasch, 2018; Berger, Brenick, Lawrence, et al., 2018; Brenick et al., 2019, 2024), this work should be conducted in various contexts – with and without conflict – to ensure generalizability. For example, Black and Fernando (2014) carried out a school-based MBI with low income, racially minoritized youth and found the intervention increased attention, participation in activities, caring and respect among this population. Thus, future research should include more schools, more communities, and more contexts to determine the effectiveness of MBIs in a wider range of young children in varying life circumstances.

Additionally, the interventions in the present study were delivered by trained teachers already working in the schools. Having trained teachers deliver the interventions cuts costs, minimizes the need for children to develop a relationship with the intervention leader, and establishes a strong foundation of the program within the school, independent from the researchers. Our teachers received intensive training, however, future research could assess the effects of interventions led by teachers who were already mindfulness practitioners prior to receiving training for the intervention. Another area for future research could include continued training for the teachers to determine if that influences the effectiveness of the intervention or the teachers' feelings of self-efficacy in intervention delivery as well as their own outcomes of practice.

We used multiple methods of data collection for the current study, including a computer task, behavioral observations in a naturalistic setting, and behavioral observations in a laboratory setting with a compassionate response paradigm. This method of data collection allowed for more objective assessments. However, as mentioned above, Green et al. (2018) noted when they conducted the behavioral task observations the objective coding scheme did not quite capture the fact children would engage in compassionate behaviors like hugging the puppets – something that would not be captured in the original coding format. Future research could benefit from having multiple reporters including the more objective direct assessments. Parents, teachers, and even the children can provide important information about how they perceive the child participants to be improving (or not) over the course of the interventions to which observers are not always privy.

Cognitive compassion was addressed through measures of executive functions, i.e. attention control, on task behaviors and impulsivity. Although perspective taking was not assessed in our study, it is presumed that in order to show compassion to another individual, a recognition of struggle or frustration in others is needed, a core aspect of perspective taking. Future studies should assess perspective taking as a component of cognitive compassion.

Additionally, emotional compassion involves the recognition of emotions, a key component of compassion. Although our study did not directly assess recognition of emotions, we assessed higher order prosociality which infers that some degree of emotion regulation and recognition is necessary for compassionate behaviors to prevail. Future studies should assess recognition of emotions as a foundation of emotional compassion.

Finally, our study had a sampling power of 74 kindergarten students from three kindergarten classes of our choosing, with interventions randomized. Due to resource constraints (limited number of kindergartners per class and kindergartens implementing these new interventions in general and that were comparable in profile), we were unable to secure a larger sample. Although the sample size is smaller than ideal, this study is a first of its kind to evaluate MBI and EBI in relation to each other and its promotion in compassionate behaviors for Jewish-Israeli students in protracted conflict. Future repetition of study particularly with larger samples is warranted to further validate the results of this study.

Conclusion

The present findings demonstrate the great promise of mindfulness practice as a means to facilitate the development of compassion in young children. The MBI increased cognitive, emotional, intentional, and behavioral skills and understanding that are essential components necessary to engage in compassion (Jinpa, 2010). These programs can be led by teachers and incorporated into the school curriculum. Moreover, the benefits of mindfulness practice will likely spillover into better academic performance and fewer behavioral issues in the school. Thus, starting mindfulness practice in young childhood helps develop the whole child and build compassionate communities.

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Disclosure Statement

No potential conflict of interest was reported by the author(s).

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Data Availability Statement

Due to the nature of this research, participants of this study did not agree for their data to be shared publicly, so supporting data is not available.

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