Distribution Agreement

In presenting this thesis as a partial fulfillment of the requirements for a degree from Emory University, I hereby grant to Emory University and its agents the non-exclusive license to archive, make accessible, and display my thesis in whole or in part in all forms of media, now or hereafter now, including display on the World Wide Web. I understand that I may select some access restrictions as part of the online submission of this thesis. I retain all ownership rights to the copyright of the thesis. I also retain the right to use in future works (such as articles or books) all or part of this thesis.

Steven Starr   April 15, 2015

Feasibility of Teacher-Taught Cognitively-Based Compassion Training Program for Enhancing
Pro-social Attitudes and Behaviors with Elementary School Children

by

Steven Starr

Philippe Rochat, Ph.D.

Adviser

Department of Psychology

Philippe Rochat, Ph.D.

Adviser

Patricia Brennan, Ph.D.

Committee Member

Aiden Downey, Ph.D.

Committee Member

Geshe Lobsang Tenzin Negi

Committee Member

2015

Feasibility of Teacher-Taught Cognitively-Based Compassion Training Program for Enhancing
Pro-social Attitudes and Behaviors with Elementary School Children

By

Steven Starr

Philippe Rochat, Ph.D.

Adviser

An abstract of
a thesis submitted to the Faculty of Emory College of Arts and Sciences
of Emory University in partial fulfillment
of the requirements of the degree of
Bachelor of Arts Honors

Department of Psychology

2015

Abstract

Feasibility of Teacher-Taught Cognitively-Based Compassion Training Program for Enhancing Pro-social Attitudes and Behaviors with Elementary School Children

By Steven Starr

This study investigates the comparative efficacy of a short-term, teacher-taught compassion cultivation program known as Cognitively-Based Compassion Training (CBCT) versus Mindfulness Attention Training (MAT) and no training for enhancing pro-social attitudes and behaviors of elementary school students. 1st and 4th grade classes were randomly assigned to receive seven weeks of CBCT, MAT, or no training from their trained teachers, with children completing pre- and post-intervention measures of a Story Stem task to measure pro-social reasoning, a distributive justice task to measure pro-social sharing, and the Olweus bullying questionnaire to measure perceptions and frequency of bullying. To supplement this data, a school ethnography and teacher practice and instruction logs were also conducted to gather a qualitative assessment of how well the program was implemented and how it could be improved upon for future administration. Results showed that for the Story Stem task, children in both the 1st and 4th grade CBCT classes had significantly greater improvements in pro-social reasoning than both the MAT and no training classes. No other significant effects of intervention were found for either the distributive justice or bullying questionnaire measures. Considerable limitations in the teacher training and the program implementation were incurred invalidating a critical assessment of this program. Corrections and future directions are discussed.

Feasibility of Teacher-Taught Cognitively-Based Compassion Training Program for Enhancing Pro-social Attitudes and Behaviors with Elementary School Children

By

Steven Starr

Philippe Rochat, Ph.D.

Adviser

An abstract of
a thesis submitted to the Faculty of Emory College of Arts and Sciences
of Emory University in partial fulfillment
of the requirements of the degree of
Bachelor of Arts Honors

Department of Psychology

2015

Acknowledgments

Role of Funding Source

Table of Contents

Feasibility of a Teacher-Taught Cognitively-Based Compassion Training Program for
Elementary School Children

Introduction

As U.S. schools start to veer away from high-stakes, academic achievement (Duncan, 2015), there is a growing positive youth development perspective in education that is inspiring the creation of evidence-based health prevention and promotion programs aimed at bolstering students' social, emotional, cognitive, behavioral, and moral competencies (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2011). This movement is fueled by concern from educators, clinicians, and parents that schools' narrow focus on academic outcomes has sacrificed the safety, support, and nurturance of students' *whole* well-being (Association for Supervision and Curriculum Development, 2007; Learning First Alliance, 2001; Rose & Gallup, 2000), and is leaving children not only ill-equipped to deal with damaging social-emotional issues like anxiety, depression, bullying, and substance use (Greenberg, et al, 2003), but also unprepared for collaborative and ethical civic engagement in 21st century democratic society (Cohen, 2006).

One notable branch of this health prevention/promotion movement that is addressing this dilemma is that of Social Emotional Learning (SEL), which entails teaching students the underlying skills and knowledge necessary for managing emotions, developing empathic and positive relationships, and making responsible decisions for conflict resolution (CASEL, 2014a; Cohen, 1999). In an extensive and rigorous meta-analysis of 213 SEL program studies with over 270,000 students, it was found that as compared with controls, children in SEL programs had greater improvements in emotional distress, conduct problems, social-emotional competencies, positive attitudes towards self and others, pro-social behavior, and even academic achievement (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). SEL programs are prominent during elementary school—with over half of the students in Durlak et al.'s meta-analysis coming

from elementary schools—because it is during this period of development that these faculties are foundational and malleable (Catalano et al, 2003; Rimm-Kaufman & Hulleman, 2014).

Related to the SEL movement, contemplative science is also starting to take hold in school settings to engender similar social-emotional resilience and positive behavior outcomes (Roeser & Pinela, 2014). Contemplative science is an interdisciplinary conglomerate of fields such as psychology, neuroscience, and medicine that investigates the effects of contemplative practices, i.e. meditation, on the body, brain, and psyche (Thompson, 2007). Many of these mental trainings derive from long-standing Buddhist traditions but have been secularized to allow for dissemination in both clinical and non-clinical settings. Two of these practices, which are the focus of this research and will be explained more in depth later—mindfulness: non-judgmental present moment awareness, and compassion: an outlook that is sensitive and responsive to the well-being of others—are now being applied with youth, predominantly in schools, which is beckoning the undertaking of creating and uncovering the most developmentally effective methods, mechanisms, and outcomes for this new, younger demographic. This recent approach represents multiple shifts in the contemplative science investigation from predominant application with adults to youth, from addressing bio-medical conditions like anxiety and depression to also social-emotional qualities, and from clinical intervention to universal health prevention and promotion. Nevertheless, burgeoning data is showing comparable effects for improving psychopathology, attention, behavioral functioning, and social-emotional competencies (Burke, 2010; Greenberg & Harris, 2012; Zoogman, Goldberg, Hoyt, & Miller, 2014).

There is a fair bit of overlap between mindfulness-based practices and SEL techniques regarding attention and emotion regulation (Garrison Institute, 2005), but whereas SEL programs

involve a more didactic pedagogy of emotion-regulation, peer relations, and social problem-solving, school-based contemplative practices necessitate a meditative component to emotional and social learning. To be sure, the argument is not to pit contemplative practices against SEL because they have a considerable amount to do with each other, but rather that there is a strong case to bring contemplative techniques into the classroom for inducing relative social-emotional outcomes. With contemplative practices being more of life-long care practices as opposed to a school-specific curriculum, and with meditation training demonstrating enduring neurological and psychological modifications, as will be detailed later, there is good reasoning for their adoption into the classroom. The pragmatism of bringing this training into schools is especially prominent when enhancing the social and emotional competencies of both students and teachers through mindfulness and compassion training is perceived to induce a more caring and relational classroom environment ripe for engaged teaching and learning (Jennings & Greenberg, 2009).

As it stands however, there are a multitude of insufficiencies concerning contemplative education practice and research that warrant critical attention (Garrison Institute, 2005) and that this research seeks to rectify. For one, there is a considerable lag between the extent of empirical data for contemplative practices in schools and the enthusiasm for them. Of the studies that have been conducted, few are reputable with many lacking randomized controls, having vague operationalization, heavily relying on self-report instead of objective measures, and without follow-up analysis. Another problem in integrating contemplative methodologies in early education is that there is such a myriad of program formats, protocols, and definitions for mindfulness and contemplative practices, most of which are imprecise, that it is necessary to better define the characterizations of these programs to examine what works and in which contexts. While well-established programs like MindUp (http://thehawnfoundation.org/mindup/)

and Mindful Schools (http://www.mindfulschools.org/) have teacher training protocols and a standardized curriculum, many programs administer their own homegrown formulas. Last, and most central to this study, concerns the comparative effects between the popular contemplative practice of mindfulness, which is what most school program research involves, and compassion training, a burgeoning niche in contemplative science aimed at creating cultures of caring and kindness in classrooms. Though there has been much less study of compassion training, emerging research indicates that cultivating compassion can provide the same emotion regulation capacities as mindfulness and also yield more pro-social benefits, inciting significant interest for incorporating these programs into schools.

To explicate further, the reasons for why compassion is important are both theoretical and empirical. On the theoretical side, compassion is considered to be much more than an emotional state but also a template for one's outlook on ethics and relationships with self, others, and the world. Brain science and other new cognitive fields of study are showing how faculties like kindness and compassion are not fixed but rather skills that are adaptable through training (Jazaieri et al, 2013), with domain increases leading to psychosocial improvements such as emotion regulation, self-concept, social-connectedness, pro-sociality, and positive affect (detailed later). As broad statements for individuals' and society's need for compassion, connection, and pro-sociality, first our own personal health and well-being depends on warm, secure, close relationships (Cohen, 2004) with loneliness and isolation posing as a risk factor of mortality (Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015), but also from an evolutionary perspective, it is now being reconceived how empathic care is what has truly been crucial for the thriving of social creatures as opposed to the previously touted survival of the fittest paradigm (De Waal, 2009).

As such, the main objective of this study is to corroborate the relative efficacy of a compassion training protocol known as Cognitively-Based Compassion Training (CBCT) over Mindful Awareness Training (MAT) and no training for enhancing pro-social reasoning and behavior in first and fourth grade students. Pro-social here is defined as thinking or acting in a way that is in the interest of others even if it comes at lack of benefit or the expense of one's self. To do this, 1st and 4th grade classes were each randomly assigned to receive either seven weeks of CBCT training, MAT training, or no training, with pre- and post-intervention measures taken using a Story Stem battery to examine both the extent to which children employ social-emotional faculties to resolve interpersonal disputes and if their resolutions demonstrate compassion, a distributive justice dictator game that looks to see the extent of children's pro-social sharing of stickers between a non-competitive and competitive condition, and the Olweus Bullying Questionnaire to probe students' sensitivities and responsiveness to bullying. Qualitative data in the forms of school ethnography and teacher training and instruction logs were conducted to gather a more comprehensive assessment of how well the program was implemented and how it can be improved upon in the future.[1]

This research follows from a prior study by Dodson-Lavelle et al (2014), which found CBCT to be more effective than MAT with elementary school students for conducing closer and more inclusive peer networks and for enhancing social reasoning. But while this study looks to replicate the comparative efficacy of CBCT, it is also explorative in that takes place at a new school, adds a no training/ genuine control group, modifies the Story Stem battery to look more specifically at faculties of compassion, and adds the distributive justice dictator game task and

---

[1] Interview questions about the successes, challenges, perceived importance and efficacy, and ambition to continue implementing CBCT in the classroom were sent to the teachers, school counselor, and the school's curriculum coordinator but were not completed or returned.

the Olweus Bullying Questionnaire. The intention of all of these new features will be explored further in the rationale section. The most unique feature of this study however is that it marks a progression in the paradigm for how CBCT is implemented in schools, whereby certified instructors no longer come in and teach the program to the students as was done in the original study, but instead the school teachers themselves are trained to carry out the protocol in their own classrooms. Though not the outcome focus of this study, training teachers as well in mindfulness and contemplative practices seems to also confer salutary personal and professional benefits from bolstering social-emotional resilience (Meiklejohn, 2012). At any rate, this cascade model for achieving greater curriculum reach is akin to the dissemination strategy of the validated school-based terror and trauma resiliency program ERASE-Stress (Berger, Gelkopf, & Heineberg, 2012; Gelkopf & Berger, 2009), which is promoted by health professionals associated with Stanford University's Center for Compassion and Altruism Research and Education. In this regard, this research is just as much a feasibility study for instituting compassion training in the classroom on a larger scale past what a limited number of certified instructors can manage.

Given the recency of developmental contemplative science, a comprehensive review of the current models and empirical findings will be reviewed to portray the state of this field and explicate the impetus for this study.

Contemplative Science

The past 30 years has seen an exponential proliferation of contemplative science research, mostly concerning mindfulness and its clinical benefits for mental and behavior health but also some for improving emotional awareness and social relationships (Brown, Ryan, & Creswell, 2007). Still, the field of contemplative science is nascent; within that, contemplative

science in youth education is more nascent; and within that, compassion science as compared to mindfulness science is even more nascent. Thus, the theoretical basis for these practices outpaces the empirical evidence—though there is a growing corpus of research supporting their application. In order to contextualize and provide sufficient coverage for the many facets of the current state of the field of developmental contemplative science, there will multiple-layered literature review. First, the backgrounds for mindfulness and compassion training/CBCT will be covered to elucidate the context and empirical evidence for the two contemplative practices. Following that, a neurocognitive and psychosocial development framework will be evaluated to show the motivation and implications for introducing contemplative practices to youth. Last, the review will turn to the pertinent issue of this study, the empirical bases for mindfulness and CBCT programs in schools, thus setting up the rationale for the study.

Mindfulness

When it comes to contemplative practices in the West, mindfulness is the most popular and well-known training. The inception of the mindfulness movement is credited to Jon Kabat-Zinn (1982) for his integration of the practice into a clinical program to help patients with chronic pain and stress. Mindfulness is a cognitive appraisal technique that has participants practice "paying attention in a particular way: on purpose, in the present moment, and non-judgmentally (Kabat-Zinn, 1994)" to buffer against the rumination and catasrophization of negative circumstances, which can exacerbate psychological and somatic conditions (Brosschot, Gerin, & Thayer, 2006; Kabat-Zinn & Hahn, 2009). This technique has since become adapted into somewhat of a third-wave of cognitive-behavioral therapy in Mindfulness-Based Interventions like Mindfulness-Based Cognitive Therapy as well as Commitment and

Acceptance Therapy and Dialectical Behavioral Therapy (Baer, 2005; Cullen, 2011), which have been used to help treat a diverse range of maladies including anxiety, stress, depression, mood disorders, eating disorders, substance abuse, ADHD, insomnia, fibromyalgia, and arthritis (Brown, Marquis, & Guiffrida, 2013; Hoffman & Sawyer, 2010; Khoury et al, 2013). In conjunction with its demonstrated psychological efficacy, mindfulness practice has also been shown to induce neurological modifications (Cahn & Polich, 2006; Jha, Krompinger, & Baime, 2007) that reflect changes in cognitive functions like attention, memory, and psychosomatic awareness (Hölzel et al, 2009; Zeidan, Johnson, Diamond, David, & Goolkasian, 2010). Because of its abstract, introspective, and interoceptive nature, mindfulness has most commonly been used with adults; however, and as will be reported later, both developmental research and empirical trials advocate its adaptability and efficaciousness for youth (Burke, 2010; Greenberg & Harris, 2012; Zoogman et al, 2014).

Compassion Training

Compassion training, as compared to mindfulness, is a much more recent and understudied practice in contemplative science. Compassion, which is defined as a motivational attitude that wishes to alleviate suffering, both for others and for self (Gilbert, 2005; Gyatso, 2000), surpasses mindfulness in that it does not solely entail becoming attuned to inner thoughts and sensations, but it also inspires a particular mentality that is sensitive to the welfare of others within a framework of ethics and interpersonal well-being (Ozawa-de Silva, Dodson-Lavelle, Raison, & Negi, 2012). Various trainings in compassion cultivation have become standard programs and therapies (Hoffman, Grossman, & Hinton, 2011) and have shown empirical efficacy not just in mindfulness-like qualities of buffering against emotional worry and the

insidious effects of stress (Pace et al, 2009; Wallmark, Safarzadeh, Daukantaite, & Maddux, 2013), but also in bolstering self-concept (Neff, 2011), positive affect (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Klimecki, Leiberg, Lamm, & Singer, 2012), social connectedness (Hutcherson, Seppala, & Gross, 2008), pro-social sharing (Leiberg, Klimecki, & Singer, 2011; Weng et al, 2013), and helping behavior (Condon, Desbordes, Miller, DeSteno, 2014). Like mindfulness, neurobiological correlates and modifications have also been found in compassion-trained practitioners (Mascaro, Darcher, Negi, & Raison, 2015), including increased limbic responsivity to other's distress (Desbordes et al, 2012), activity in regions associated with social cognition and emotion regulation underscoring gains in empathic accuracy (Mascaro, Rilling, Negi, & Raison, 2012), and altruistic behavior (Weng et al, 2013).

Cognitively-Based Compassion Training (CBCT)

In the camp of compassion training, CBCT is a protocol developed at Emory in 2005 designed to systematically cultivate feelings of compassion through orienting practitioners from more self-focused to more others-focused thinking. This occurs by progressing through eight ordered modules of 1) developing attention and stability of mind, 2) cultivating insight into the nature of mental experience, 3) cultivating self-compassion, 4) developing equanimity, 5) developing appreciation and gratitude for others, 6) developing affection and empathy, 7) realizing wishing and aspirational compassion, and 8) realizing active compassion for others (Ozawa-de Silva & Dodson-Lavelle, 2011) in weekly training classes comprised of teachings, meditations, and discussions. CBCT is inspired from the Tibetan Buddhist *lojong* (mind training) tradition, where through a sustained course of analytical contemplations, practitioners come to realize a potential for real happiness through relinquishing superficial self-interest, developing

compassion, and assisting in the care and benefit of others. Though rooted in Tibetan Buddhism, CBCT doesn't include any religious elements, but rather appeals to fundamental human dispositions of suffering and happiness as well as values of empathy, gratitude, love, and compassion, making the protocol applicable in any setting, even schools.

The first empirical investigation of CBCT was conducted to look at its effect on stress and immune function with college students (Pace et al, 2009). It was found that though CBCT did not significantly differ from the waitlist control group on stress biomarkers, there was a moderate positive correlation within the CBCT group between practice time and improved stress and immune functioning. This finding was corroborated in a follow-up study with undergraduates that confirmed that more compassion meditation time leads to better stress and immune response, rather than lower pre-existing stress predicting meditation practice time (Pace et al, 2010). In another CBCT study with adolescents in foster care investigating its effects on reducing stress and psychosocial and behavioral functioning (Pace et al, 2013), again it was found that participants who practiced CBCT longer had lower inflammatory biomarkers and anxiety as well as increased emotion regulation. These research findings pose the positive yet difficult dilemma with the efficacy of CBCT in that classes alone and surface understanding of the concepts is not enough to affect bio-psycho-social changes, but what is needed is committed and dedicated engagement with the CBCT sittings and exercises past the weekly classes.

While CBCT was developed initially to address stress and anxiety with college undergraduates, because of its credible ability to promote positive attitudes and behaviors, it has since been employed with an array of populations including foster care children, women inmates, PTSD combat veterans, breast cancer survivors, and elementary school students. The study with school children will be reviewed shortly in the section on contemplative practices in elementary

schools. To note, qualitative assessments of teaching CBCT to youth do in fact show that the

children engage well with the material and are not iatrogenic (Ozawa-de Silva & Dodson-

Lavelle, 2011; Reddy et al, 2013; Zoogman et al, 2014) with an adapted pedagogy that focuses

less on longer sittings and more on interactive discussions and activities like stories and games.

Developmental Perspective of Contemplative Science

While the aforementioned research has shown that mindfulness and CBCT can induce

positive benefits in biological, cognitive, emotional, and social domains in adults, developmental

research in neuroscience and psychology gives justifiable support for why elementary school

children also benefit. In fact, because of the neurocognitive and psychosocial sensitivity of this

age, elementary school may be one of the more critical periods for taking up these practices

(Davidson et al, 2012) with respect to long-term implications.

Neurocognitive Development

Cognitive models indicate that social-emotional regulation and contemplative practices

are feasible for elementary school children (Riggs, Greenberg, Kusché, & Pentz, 2006; Zelazo &

Lyons, 2012) particularly because of recent developments in the frontal cortex and subcortical

structures that subserve top-down regulation of cognitive and affective processes (Anderson,

2002; Davidson & Rickman, 1999). Known as iterative reprocessing (Cunningham & Zelazo,

2010), these new executive capacities permit the system of mental functions necessary for the

contemplative practices of mindfulness and compassion, which encompass the abilities to

monitor thoughts and sensations, reflect on subjective experiences, regulate emotions and

behaviors, and facilitate pro-social faculties like perspective taking, empathy, and compassion

(Zelazo & Lyons, 2012). With these neural networks and faculties being so formative at this

stage of development, this middle childhood period is extra sensitive for experiential malleability (Davidson & McEwen, 2012; Schlaug et al, 2009).

Executive function and self-regulation have been shown to be improved for children by contemplative practices like mindfulness (Diamond, 2012), whereby exercising the executive cognitive-affective processes implicated by mindfulness and compassion training potentiate those recruited neural circuits (Stiles, 2008) to form more hardwired neurospychological patterns, i.e. 'train your mind, change your brain' (Begley, 2008). And not only is proficiency with executive function and self-regulation predictive of school readiness (Blair, 2002; Blair & Diamond, 2008), but also long-term cognitive and social competence like school achievement, resiliency, and coping (Mischel, Shoda, Rodriguez, 1989) as well as physical and psychological health, income, and public safety like substance dependence and criminal activity (Moffitt et al, 2011). Also, in the realm of moral psychology, moral judgment seems to involve both cognitive and affective aspects in the pre-frontal, parietal, and cingulate cortices (Greene & Haidt, 2002; Greene, Nystrom, Engell, Darley, & Cohen, 2002), which are also areas purposed in compassion training (Desbordes et al, 2012; Mascaro et al, 2012).

Psychosocial Development

Besides the neurocognitive evidence demonstrating the brain-related importance of contemplative practices in the elementary school period, there are also significant psychosocial reasons for introducing these practices at this age. As Eccles (1999) describes, elementary school is the period when children are first beginning to spend substantial time outside the home, away from family, and with peers and other adults, where certain values and behaviors are taught and reinforced. The ability to internalize nuances in values and behaviors corresponds to the recent

solidifications in executive functioning, self-awareness, theory of mind, and perspective taking, from which children develop self-concept, form more empathic and cooperative relationships, and become more attuned with pro-social and moral values (Eisenberg & Miller, 1987; Litvack-Miller, McDougall, & Romney, 1997). Erikson's theory of psychosocial development sets the dilemma of the elementary school stage at industry versus inferiority, meaning that children either adopt a sense of diligence and worth about their role in their world or can oppositely become disillusioned and feel discouraged about their ability to engage constructively (Erikson, 1963). In this sense, this period is foundational for grounding children's perception of their abilities and how they see themselves relating to and taking on different roles in their emotional and social world—traits that can be stable across lifespan (Hamilton, 2000). CBCT, because of its self-compassionate, others-oriented, and ethical-relational framework, thus serves as model training for positive, pro-social development, past the basic self-regulatory and awareness principles of mindfulness.

Regarding this study's measures of pro-social reasoning, pro-social sharing, and bullying consciousness and prevention, there are developmental circumstances that make these faculties relevant and positively amenable through compassion training. In terms of pro-social reasoning, children in middle childhood are found to be able to elaborately deliberate on issues of right and wrong witnessed through their ability to discriminate between social and moral conventions (Buchannan-Barrow & Barrett, 1998) and to appraise the moral relativity of actions based on intentionality (Helwig & Prencipe, 1999) as well as concepts of harm, rights, and justice (Helwig & Jasiobedzka, 2001). From one study with elementary school students that investigated the development of pro-social moral judgment by having children discuss resolutions to moral dilemmas where the needs of one group conflict with the needs of others (e.g. sharing your own

village's minimal food supply with a nearby village that lost all of their crops in a flood), it was found that while the youngest children tended to project more hedonistic, approval-oriented, and need-based considerations, as children got older, they demonstrated increasingly empathic judgments and others-oriented reasoning (Eisenberg-Berg, 1979). This trend signifies an expanding capacity for empathy and compassion, and one that could be heightened with CBCT, which teaches broadly extend endearment and concern for others. Theoretically, children who cultivate greater levels of compassion through CBCT would have an increased proclivity toward pro-social moral reasoning in terms of coming up with resolutions that are supportive of others who are in distress considering that valuing others and empathic responsibility are motivational factors for helping people in need (Batson, Eklund, Chermok, Hoyt, & Ortiz, 2007; Chapman, Zahn-Waxler, Cooperman, & Iannotti, 1987).

Related, there is a significant positive relationship between children's pro-social moral reasoning and pro-social sharing (Eisenberg-Berg & Hand, 1979). In past distributive justice games where young children were tasked to decide how to allocate economic tokens between themselves and others, results affirmed that children become increasingly more giving and altruistic with age (Eisenberg & Fabes, 1998; Harbaugh, Krauss, & Liday, 2003; Rochat et al, 2009), though it has also been shown that generosity decreases under conditions of competition (Houser & Schunk, 2009). Greater compassion theoretically would again buffer against self-interest to conduce more pro-social and generous sharing, even in cases of competition. Pro-sociality is not just a boon on an individual level for occasioning more positive relationships and social-adjustment (Crick, 1996) and bringing greater personal happiness in cases such as economic distribution (Aknin, Dunn, & Norton, 2012), but also on a societal whereby our care and connection with others is the bond necessary for human flourishing (De Waal, 2009).

On the other side of seeing how CBCT might bolster pro-social behavior, it is also of interest to examine how CBCT might inhibit anti-social bullying behavior. While elementary school children are for the first time becoming more pro-social and are building more elaborate and long-term friendships, they also begin to engage in noticeable anti-social behavior and peer rejection (Newcomb, Bukowski, & Pattee, 1993; Pedersen Vitaro, Barker, & Borge, 2007) like developing prejudices and in- and out-group biases (Aboude, 2003). This behavior is related to bullying, which is a pervasive school violence issue with nearly a quarter of public elementary and secondary schools reporting daily or weekly bullying amongst students (National Center For Educational Statistics, 2014). Since bullies are found to have a deficit in 'moral compassion' (Gini, Pazzoli, Hauser, & 2011), not only should greater compassion lessen the occurrence of bullying because bullies would be taught tolerance and endearment of others, but it should also make students more sensitive to the victims of bullying and compel them to try to prevent it.

Contemplative Science in Education

With the appropriation of contemplative practices for youth having been laid, now the utilization of mindfulness and CBCT in elementary school will be examined. An oft-referenced quote about contemplative education comes from William James (1890), who noted in his seminal book *The Principles of Psychology*, "the faculty of voluntarily bringing back a wandering attention, over and over again, is the very root of judgment, character, and will... An education which should improve this faculty would be the education par excellence. But it is easier to define this ideal than to give practical directions for bringing it about." This statement shows William James' appeal, even back over 100 years ago, to the profundity of mindfulness training as the *root* of higher 'character,' though he also alludes to the elusiveness of this faculty. In a theoretical article on the implications of a contemplative education, Roeser and Peck (2009)

also describe how this pedagogy implies practicing mindfulness within a context of learning, personal growth, and ethics, for it is only with a clear and focused mind that a person can then be attentive and motivated to learn, hamper emotional and behavioral impulses, and also be sensitive to the perspectives, needs, and well-being of others. They cite that because it is not of typical human focus to hold steady awareness and be intentionally concerned with the interests of others, this faculty can only be attained through experiential training (Wallace, 2006). Intuitively, since contemplative consciousness is a skill that warrants training, it is a lot easier to habituate a person to this particular way of thinking at the beginning of metacognitive development rather than later in adult life after decades of counterproductive cognitive patterns.

Mindfulness in Elementary School

There have been several larger-scale, randomized-control, empirical studies of mindfulness training programs for elementary school students that provide valid support for mindfulness in schools. Some of the studies have evaluated mindfulness practices as compared to controls on measures of attention and behavior. For example, Napoli, Krech, & Holley (2005) studied the effects of a 24-week mindful attention program taught by professionally trained mindfulness instructors with 1st, 2nd, and 3rd graders and found that children who went through the training had significantly improved scores on selective attention task measures, a test anxiety scale, and teacher ratings of ADHD-like behaviors. In a study by Flook et al (2010), 2nd and 3rd graders who went through 8 weeks of training in mindful awareness practices showed significant improvements on both parent and teacher ratings of behavioral control, metacognition, and executive function using the Behavior Rating Inventory of Executive Function. These improvements were especially strong for children with the lowest pre-intervention marks. In a

recent study with 3rd, 4th, and 5th graders in the Netherlands who went through 6 weeks of

mindfulness practices taught by an outside instructor, it was found that children had significantly

lower self-reports of ruminative thinking, emotional functioning, and subjective well-being as

well as parent-reported anxiety and aggression (van de Weijer-Bergsma, Langenberg, Brandsma,

Oort, & Bögels, 2014). It is mportant to note that in this study like in the Flook et al (2010)

study, the effects were much stronger for children who had higher pre-intervention rumination,

indicating that mindfulness interventions may be better suited for children who have low pre-

existing mindfulness traits. In addition, the effects grew from post-test to follow-up indicating an

'incubation period' for seeing effects more fully materialize, emphasizing the importance of

follow-up studies in that there might not be immediate effects of the trainings.

While those studies focused more on attention and behavioral functioning, other control

studies have focused more on social-emotional outcomes. Mendelson et al (2010) conducted a

12-week mindfulness study with 4th and 5th graders in an underserved urban community and

found that children in the mindfulness group improved on self-reported subscales of rumination,

intrusive thoughts, and emotional arousal, but did not have significant differences in self-

reported mood or relationships with peers or teachers. Schonert-Reichl and Lawlor (2010)

investigated the effects of a 10-week Mindfulness Education program with 4th through 7th

graders—the precursor to the MindUp program, which is perhaps the most esteemed and

validated teacher taught mindfulness in elementary school program—and found that children in

the program had significant improvements in self-reported optimism and teacher ratings of

attention/concentration, aggressive/oppositional behavior, and social-emotional competence

including empathy and compassion. The benefits surrounding self-concept, were found to be

stronger in pre-adolescent children (4th and 5th graders) than in early adolescent children (6th and

7th graders). In an even more comprehensive continuation of that study, which refined the MindUp program (Schonert-Reichl et al, 2011), the 4th and 5th graders who went through the program as compared with an active control social-responsibility curriculum group had greater improvements in mindfulness, cortisol stress regulation, cognitive control in a computerized Stroop task, self-reported levels of depression, empathy, perspective-taking, optimism, emotional control, peer-rated aggression, pro-social behavior (sharing, trustworthiness, helpfulness, and taking other's views, and kindness), and math scores.

These studies present a captivating baseline of evidence for the cognitive, emotional, and behavioral self-regulatory effects of mindfulness, but in terms of eliciting pro-social attitudes and behaviors, mindfulness on its own doesn't appear to be the directive technique. The last few lessons of the MindUp curriculum focus on acknowledging others and expressing gratitude, which are qualities that extend past the main principles of mindfulness, but the program does not specifically attempt to modify concepts of self and others within a contemplative framework of compassion. In that regard, a recent study by Flook, Goldberg, Pinger, & Davidson (2015) tested the pro-sociality effects of a 12-week Mindfulness-Based Kindness curriculum for preschoolers that propounded values like empathy, gratitude, and sharing from a mindfulness base. It was found that children who went through this curriculum had significantly larger gains in social competence like pro-social behavior and emotion regulation as rated by their teachers, had greater marks on indicators of social-emotional development and demonstrated less selfishness in a sharing task as compared to the control group. Again, the largest gains being found with lower baseline marks. This program begins to show how values like kindness can be sprung from a mindfulness curriculum, though it still does not place the pro-social, ethical-relational valuation of compassion as the central contemplative aim.

CBCT in Elementary School

In terms of a universal school program that looks to contemplatively cultivate compassion, CBCT is the only protocol to the author's knowledge that has been empirically studied. This current study follows from a pilot study that did not only show the feasibility of using CBCT with elementary age children (Ozawa-de Silva & Dodson-Lavelle, 2011) but also its relative efficacy over MAT on various social-emotional measures. In the original study by Dodson-Lavelle et al (2014), 2nd and 3rd grade classrooms were randomized to receive either 10 weeks of CBCT or MAT taught by certified instructors from the CBCT teacher certification program at Emory University twice a week for 30 minutes each. The children were tested pre- and post-intervention on measures of implicit associations of race where children made quick judgments ascribing positive and negative attributes to black and white faces, on social connectivity using socio-grams that had children chart their peer networks in three concentric circles from 'people they think about a lot and feel close with' to 'people they like but are not the most important people in their life' to 'people who they do no think about often,' and social reasoning (using the same Story Stem measure applied in this study), which scaled children's resolutions of two different interpersonal dilemmas on dimensions of perspective-taking, emotionality, compassion, equanimity, and mentalizing. Results showed that there was no pre-intervention bias in children for black and white faces in either class, but the children who participated in CBCT as compared with MAT became more socially connected by adding more friends into their inner socio-gram circles and demonstrated more proficient social reasoning. Breaking down the social reasoning task, while children in the MAT cohort increased scores on dimensions of compassion, equanimity, and mentalizing, the CBCT group significantly improved in their scores in all categories—compassion, equanimity, mentalizing, perspective-

taking, and emotionality. Also, children in the CBCT group had significantly higher scores than the MAT group on dimensions of compassion, equanimity, and mentalizing, and emotionality. These findings demonstrated how CBCT could be used as an effectively superior training to mindfulness for ushering pro-social qualities in school children.

Rationale

With these promising results, this study looks to replicate the CBCT versus mindfulness pilot study design in continuing to seek validation for the utility of a compassion-laden educational curriculum. But this study also comes with changes from the original study in terms of being hosted at a different school, comprising of different age-groups, including a genuine control group, modifying the social-reasoning Story Stem task, adding two behavioral measures in the distributive justice task and the bullying questionnaire, and most momentously, changing to a teacher-taught model of program instruction instead of outside personnel. In addition to the empirical quantitative data, a school ethnography and teacher training and instruction logs were also collected. These changes and additions are noteworthy for several implicative reasons:

For this study taking place at a new school, there are two important factors making the switch favorable: On one hand, the current school requested for CBCT to be piloted in its classrooms based on the accordance of CBCT's themes with the school's values of global tolerance, appreciation, and citizenship; on the other hand, because the school is a charter school with a large population of immigrant and refugee students, it has a more generalizable 21st century school milieu of racial, ethnic, and economic diversity than the previous independent school. Also, because of the original school's progressive tenets, some of the children had already been explicitly exposed to concepts like mindfulness, making this new host school an opportunity to assess the contemplative curriculums in an environment where such practices are

not familiar. Granted the project of incorporating contemplative practices into schools on a wide scale level is still a sensitive undertaking over concerns of the secularization of the practices, hosting at this school that is enthusiastic about adopting contemplative compassion training into its curriculum is an excellent prospect for demonstrating its feasibility and building its reputation.

The decision to conduct the program with 1st and 4th graders was made in order to get a wider age-range of elementary school children. With the original school having mixed-age classrooms, the children that participated fell within the 2nd and 3rd grade age. Here that breadth is expanded. Even though there is a larger age gap, there is no a priori expectation that children will show developmental distinctions regarding the effects of compassion training.

It was important to add the genuine control group so that it could be examined not just how CBCT compares to mindfulness, but how these two trainings compare to classroom time as usual, to see if there are relative effects of contemplative trainings. Since it is very plausible that psychosocial development will naturally occur from natural maturation and from the students becoming more familiar with each other over the course of the year, it is necessary to see if there are any changes in pro-social reasoning and behavioral occur from the contemplative practice groups that are distinct from the no training group.

The reason for modifying the original social-reasoning measure to include examining the specific resolution that the children provide was to be able to inspect not just the extent to which children call upon relevant social-emotional reasoning dimensions, which is of typical Kholbergian moral reasoning paradigms (Kohlberg, 1984), but also to see whether or not children change to engage directly in compassionate solution making.

Also it was important to add the distributive justice behavior measure and the bullying questionnaire to examine how these trainings not only affect attitudes, but how those attitudes translate into actual behaviors, particularly pro-social sharing and the very real school issue of bullying. Distributive justice sharing tasks are good, direct measures of children's actual pro-social tendencies, and the bullying questionnaire, though self-report, tackles surveying the pervasiveness attitudes toward the critically-relevant issue of school bullying.

The greatest methodological shift with this research however is putting the training and curriculum implementation in the hands of the teachers instead of outside, certified personnel. This adaptation is necessary because there are simply not enough certified teachers and resources to cover teaching compassion training on a large-scale educational level. If this method is successful, which has been shown for both SEL programs (Durlak et al, 2011) as well as with MindUp program (Schonert-Reichl & Lawlor, 2010; Schonert-Reichl et al, 2011), then a more integral phase of CBCT in schools can ensue where compassion training can become continuous and self-sustained within the classroom as an integrated pedagogy rather than a limited few-week-long protocol. In addition to the potential benefits of students training in contemplative practices and compassion training, though not the focus of this study, having teachers participate as well also has shown to increase teacher mindfulness, attention, and compassion in addition to lowering occupational stress and burnout (Flook, Goldberg, Pinger, Bonus, & Davidson, 2013; Jennings, Frank, Snowberg, Coccia, & Greenberg, 2013; Roeser et al, 2013; Roeser, Skinner, Beers, & Jennings, 2012) to compound a classroom climate that models and conduces learning and positive social-emotional development (Jennings & Greenberg, 2009).

For collecting a school ethnography and teacher training and instruction logs, these qualitative measures are very important data in the feasibility stage of this research to evaluate

the compatibility of the school setting, implementation fidelity, and perception of the effects and benefits of compassion training. These reports enrich the quantitative data to get a more comprehensive understanding as to what elements of the program were useful or problematic for implementing the curriculum. The school ethnography and observation will help describe the context of the school and possibly why the programs were or were not effective within this setting, which is essential because since there is no uniform school across the country, it needs to be uncovered what contextual factors assist or abet program success. The teacher training and instruction logs will help verify how much time was put into teaching the program curriculums to get at any sort of 'dose-response' effects since it is important to try to gauge how much time in class is necessary or appropriate to teach these practices.

Methods

Participants

Participants for this study consisted of 46 students from three 1st grade and two 4th grade classrooms at a charter elementary school in metro-Atlanta, Georgia. The 1st grade classes were randomly assigned to receive curriculum practice in CBCT ($n = 4$), MAT ($n = 6$), or no training ($n = 13$), and the 4th grade classes were assigned to CBCT ($n = 6$) or MAT ($n = 17$). In the 1st grade, the ages of the children ranged from 71-86 months ($M = 79.85$, $SD = 5.09$), and in the 4th grade, the ages ranged from 109-123 months ($M = 118.8$, $SD = 6.52$). According to IRB policy, only children whose parents gave them consent were allowed to participate in the study.

School Setting

The school where this study took place is a K-5 International Baccalaureate World charter school in metro-Atlanta that intentionally welcomes refugee and immigrant students

along with local children. Students at this school come from approximately thirty different countries, many of which have faced war and of developing status. Challenges for some of the students include prior histories of trauma, no former schooling, and poor English skills with non-English speaking parents. The institution acknowledges being underfunded and having to deal with issues of substandard facilities and equipment and non-competitive teacher salaries, but claims that the dedicated support from faculty, staff, and the community helps them provide a commendable whole-child education that prizes music, art, language, physical education, and recess in addition to core language arts, social science, and math classes. The school's values are modeled after the International Baccalaureate Primary Years Programme, which emphasizes respect and appreciation for multicultural diversity. With multicultural respect and appreciation being one of the goals of the school's mission, they requested to have this CBCT study administered at their school.

School Observation and Ethnography

The halls of the school are archetypical of any publicly-funded traditional school that could use a renovation: plain in style, straight walkways, paneled ceilings, fluorescent lighting, and dull tile floor with cool-shaded red and blue colored cinderblock walls. The walls are decorated with student's artwork and class projects such as family biographies and U.S. history, as well as posters and message boards communicating the school's International Baccalaureate ethos of respect for others and multicultural appreciation. For example, in the first grade hallway outside of one of the classrooms, students' drawings of their native country's flags are posted, which comprise of a diversity of home countries including Myanmar, Thailand, India, Zambia, Somalia, South Korea, Taiwan, Jamaica, and Ireland. Also prominently displayed in the hall is a

poster entitled 'What does a global citizen do?' Beneath it, it lists the attributes of 'Accepts all

people,' 'Protects the environment,' 'Helps all people,' and 'Works for others.' Global

citizenship abounds as the theme of the school and can even be heard to prompt children's good

behavior, such as when a teacher exclaimed, "I'm looking for global citizens!" while attempting

to get a rowdy class lined up at the door. These sentiments of accepting, protecting, helping, and

working for others are shared with CBCT, which is why the school was keen on piloting CBCT

in their classrooms.

Messages of global citizenship and model behavior are also consistent within the

classrooms. In each class there is a large, circle rug depicting the globe encircled by handholding

children from all different world cultures. On the classroom walls, even though most of the

content is dedicated to academic figures, there is also the same print of the 'What does a global

citizen do?' as well as student drawings and definitions for different character values such as

respect, cooperation, tolerance, appreciation, creativity. One class also had hand-written

'essential agreement pact' that included rules like 'respect one another,' 'be polite,' 'think before

you act,' and 'take care of others belongings' signed by all of the students.

Experimental Design

In this study, entire classrooms as opposed to individual children were randomly assigned

to receive CBCT, MAT, or no training in order fit the classroom-centered curricular design of

the program. In the 1st grade, one class was each assigned to CBCT, MAT, or no training, while

in the 4th grade there was only a CBCT and MAT class because one other class dropped out. The

CBCT class served as the experimental group, the MAT class served as the active control, and

the no training class served as the genuine control.

Contrary to the pilot study where certified instructors CBCT came in to teach the children for two, 30-minute sessions each week, in this study, teachers were trained in the CBCT or MAT protocols by the instructors before implementing the instructions into their own classrooms. CBCT teachers were trained following a manual for how to teach CBCT to children (Richards, Ozawa-de Silva, & Dodson-Lavelle, 2015/ unpublished) and MAT teachers were trained in the first two mindfulness modules of CBCT. The teacher trainings took place over twelve weeks, and though it was planned on to meet once per week for an hour and a half each week, due to holidays, planning days, and the extracurricular demands of the teachers, there were only eight meetings. Of these eight meetings, teachers were not able to make every session because of their own busy and tired schedules (how many weeks each teacher made will be reported in the training and instruction log results later). Starting on the sixth week after the four classes of teacher training, the teachers began instructing the lessons in their classrooms for the remaining seven weeks leading up to data collecion. The order of the lesson topics that they taught each week followed in the same order of the protocol they were trained in. Teachers were not given explicit instructions for how long to teach the trainings in their classrooms but were given instruction ideas and exercises to integrate into the school day and were told to try 3-4 times a week for as long as seemed fit. Teacher training and instruction logs were kept to record the details of each training session and how long the teachers personally practiced and instructed the practices in their classrooms each week. These numbers will be reported later in the teacher training and instruction log section.

Children were assessed pre- and post-intervention on three measures: the Story Stem Task, the Distributive Justice Dictator Game, and the Olweus Bullying Questionnaire. For the Story Stem and Distributive Justice tasks, female research assistants who otherwise had no

contact with the participants tested the children in private spaces. For the Olweus Bullying Questionnaire, the children filled out the Scantron survey form together in their classrooms.

Intervention Protocols:

Cognitively-Based Compassion Training (CBCT)

The CBCT protocol was taught to the designated teachers by certified CBCT instructors before they taught what they learned in their classrooms. The protocol utilizes lecture, meditation, and discussion to teach eight progressive compassion cultivation topics: 1) *developing attention and stability of mind* to learn how to focus attention on an anchor such as the breath, 2) *cultivating insight into the nature of mental experience* to practice monitoring the mind's running discourses on thoughts, memories, emotions, planning, etc, 3) *self-compassion*, which means recognizing one's own desire to be happy and making sure that one's self is properly taken care of before focusing on others 4) *cultivating equanimity* so as to break down categories of in-groups and out-groups between friends, strangers, and enemies to see that everybody is striving for the same basic desires to be happy and free from suffering, 5) *developing appreciation and gratitude for others* based on realizing our interdependence with others and the benefits we receive from them, 6) *developing affection and empathy* through reflecting on the kindness of others and the limits of self-cherishing, 7) *realizing the aspiration for love and compassion* with love being the wish for others to be happy and compassion being the wish for others to be free from suffering, and finally 8) *realizing engaged love and compassion* where the aspiration for love and compassion become realized and engaged.

The protocol has been adapted to be taught to children and includes suggestions and materials for how to teach these ideas to kids in the classroom. To make CBCT appropriate for

children, longer and more complicated meditations are replaced with interactive sittings, lessons, stories, and games designed to teach the same topic ideas. Examples of some of these materials and exercises includes a video series of puppets that teaches about meditation and compassion, a comic that teaches about recognizing and quelling intra-psychic distress early before a spark becomes a wildfire, and a discussion exercise on gratitude and appreciation for others regarding the chain of interdependence and reliance of others necessary for you to come into possession of, for example, your favorite sweater (Ozawa-de Silva & Dodson-Lavelle, 2011).

Mindfulness Awareness Training (MAT)

The MAT classes are set as the active control groups to examine whether there are significant pro-social reasoning and behavior enhancements arising from the additional compassion sentiments. As an intentional matching, the MAT practices consisted of the first two modules of CBCT 1) *developing attention and stability of mind* and 2) *cultivating insight into the nature of mental experience.* MAT teachers attended training at the same times as the CBCT teachers, but were taught separately by two mindfulness instructors. Likewise, they worked through topic overview, guided meditations, and discussions and were taught child-friendly ways to teach these ideas in the classroom. Examples include mindful breathing, body scan exercises where children practice focusing attention on sensations happening at specific parts of the body, mindful eating where children perceptively eat treats like a raisin paying particular attention to all its flavor, texture, consistency, etc, and mind jar activities where jars are filled with water, glitter, and other particles that when shook up simulate a disgruntled mind, but when allowed to settle, goes back to being clear.

No Training

In order to examine any degree of change brought on by CBCT or the Mindfulness group, there is also no training or class time as usual group, which serves as the genuine control group. As the title implies, teachers are not trained in a particular protocol and carry on with typical curriculum without allotting time for CBCT or mindfulness training.

Study Measures:

Teacher Practice and Instruction Logs

With each training session, instructors took detailed notes on attendance, what they taught and practiced, and also teachers' talking points in discussions. At the end of each training class, the training instructors wrote a reflection on how the session went. Throughout the 12-week teacher training and classroom implementation span, both CBCT and MAT teachers were asked to keep a weekly diary on their personal practice time, how much time was spent instructing in the classroom, and a reflection on how their practice and instructions were going.

Story Stem Task

The Story Stem task is adapted from the MacArthur Story Stem Battery (Bretherton & Oppenheim, 2003) to measure children's pro-social reasoning. In this task, two situations are narrated to the students that each set up an interpersonal dilemma for a child character, and then the students are asked how the story should finish. In the first story, a young boy's friends come over with musical instruments wanting to play music, however his mother says she has a headache. In the second story, a young girl has her best friend over to play, but when her younger sister wants to join, the best friend objects and says that she won't play if the little sister

is included. These story stems are read aloud by the experimenter to an individual child who is also presented with drawings of the storyline. After the beginning of the story is told, the experimenter then asks, "tell me what happens next in the story?" prompting an open-ended response. The experimenter can ask for clarification about responses but doesn't prompt certain answers.

Students' responses for how the story end are recorded, transcribed, and later analyzed according to what extent the children apply the attitudes and motivations of the characters along five dimensions of 1) perspective-taking, or children putting themselves in the places of the story characters, 2) emotionality, or how much children appeal to the emotions of the characters in the story such as feeling sad, upset, angry, etc, 3) compassion, or how much children invoke empathy or compassion, 4) equanimity, or not being swayed by circumstantial or emotional content but rather resorting to concepts like justice or fairness, and 5) mentalizing, or attribution to the mental states such as the thoughts or beliefs of others. The scores are scaled from 0 to 3 with low scores indicating a lack of the dimension's use and high scores indicating a dimension's considerable appeal and expression. A 20% subsample of the narratives was randomly chosen to be recoded and yielded a Cohen's kappa score of .701 for inter-rater reliability of the coding.

In addition to the five dimensions, it was also marked whether or not the children's resolutions are supportive of the person in distress, which would be demonstrative of compassion. There were four categorical possibilities of providing no resolution, a resolution that is egalitarian and considers both parties equally, a resolution that favors one party, and a resolution that demonstrates deference to authority.

Distributive Justice Dictator Game

Modified from the original study from which it was borrowed (Houser & Schunk, 2009), in this task, children participate in two different distributive justice dictator sharing games that differ in their level of competitiveness. In the first condition, there is no stipulation of competition and children are given 10 stickers to share however they want with the rest of their classmates. In the second game, the children are again given 10 stickers to share with their classmates, but this time they are told about the competitive element where whoever finishes the game with the most stickers will get a bonus prize of, shiny stickers. What is recorded is how many original stickers children kept for themselves to see if there is a difference in sharing patterns between the two conditions as a result of the changed degree in self-interest to keep stickers.

Olweus Bullying Questionnaire

The Olweus Bullying Questionnaire (Solberg & Olweus, 2003) was used to gauge students' orientation to and the prevalence of bullying at school. In this questionnaire, bullying fell under three categories of *verbal bullying* (saying mean and hurtful things or making fun, telling lies, spreading rumors, or sending mean notes about someone), *relational bullying* (ignoring or excluding or purposely leaving someone out of something on purpose), *physical bullying* (hitting, kicking, pushing, or locking someone inside of a room), and "other hurtful things like that." The questionnaire is comprised of 40 likert-scale questions about the frequency (not at all in the past couple of months to several times a week), the methods (verbal, relational, physical), and other circumstantial details of bullying (where it took place, by whom, did parents and teachers know?) both from a victim's and a perpetrator's perspective. Two questions were

added that ask how often students have tried to prevent bullying or tried to help a bully become friendlier to other students. The bullying measure was only taken with the 4th grade students because bullying does not appear as a common issue until pre- and early adolescence, which is the age group the Olweus Bullying Questionnaire was designed (Solberg & Olweus, 2003).

Results

Teacher Practice and Instruction Log

Though it was planned to meet once a week for an hour and a half, out of the 12-week span of teacher training, there were meetings on only eight of those weeks due to holidays, workshop days, and other planning activities. For the CBCT cohort, the 1st grade teacher attended five of those sessions and the 4th grade teacher attended seven of the sessions. Over the twelve weeks, the 1st grade teacher spent a total of 226 minutes (an average of almost 19 minutes per week) with outside-of-school personal CBCT meditation practice. The 4th grade teacher, who was not the head teacher but that class' special education instructor, spent 623 minutes (an average of almost 52 minutes per week) of outside CBCT meditation practice. More importantly, in terms of how much time was spent instructing the teachings to students, for the seven weeks the program was run in the class, the 1st grade teacher spent 55 minutes (an average of just under 8 minutes per week) and the 4th grade teacher spent 391 minutes (an average of just over 55 minutes a week) teaching to the students.

For the MAT cohort, there were also eight training sessions over the 12-week span. Because the first grade mindfulness teacher dropped out, the 4th grade MAT teacher volunteered to instruct both the 4th grade and 1st grade classes. This teacher attended seven out of the eight sessions and spent 167 minutes on outside personal practice (an average of almost 14 minutes a week). In the eight weeks that the programs were run in the classrooms, first graders received 58

minutes of MAT instruction time and the fourth graders spent 57 minutes of MAT practice time (averages of just over 8 minutes a week).

Story Stem Task

The Story Stem task involved children responding to two interpersonal dilemmas concerning a boy whose friends come over to play instruments at his house but his mom has a headache, and a girl whose best friend will not play with her unless her little sister is excluded. The students' responses for both stories were graded 0-3 on the extent that they expressed the motivations and attitudes of the characters in the stories along dimensions of perspective taking, emotionality, compassion, equanimity, and mentalizing. Average word counts were taken for each class to capture verbosity and resolutions were also noted as to whether there was not a specific resolution, the resolution was egalitarian, the resolution favored one party, or the resolution showed deference to authority (see narrative coding schematics).

For the first grade, a 2 (test time) by 3 (class) by 2 (story stem) by 5 (dimension) mixed-design ANOVA was run with mean dimension score as the dependent measure. This yielded both a significant effect of dimension, $F(4,16) = 6.868, p = .002, \eta^2 = .632$ with scores for emotionality (M±SE = .938±.108) , equanimity (.708±.091) , and mentalizing (.847±.102) being higher than perspective-taking (.375±.096) and compassion (.556±.095) and also a significant effect of story stem, $F(1,19) = 5.462, p = .031, \eta^2 = .223$, with scores for the stem story about the girl and her friend (M±SE = .789±.058) being higher than the boy and his mom (M±SE = .581±.077).

There was also a significant effect of test time $F(1,19) = 7.65, p = .012, \eta^2 = .287$ with scores showing an increase in the mean difference of the combined dimension scores between

pre-test (M±SE = .594±.075) and post-test (M±SE = .775±.044). Additionally there was a significant interaction of class by test time, $F(2,19) = 8.279$, $p = .003$, $\eta^2 = .466$ whereby at pre-test there was not a significant difference in the combined scores ($p > 1$) between the CBCT class (M±SE = .525±.159) and the MAT class (M±SE = .633±.130) or between the CBCT class (M±SE = .525±.159) and no-training class (M±SE = .625±.092), but at post-test, the mean score difference was moderately greater ($p = .086$) for the CBCT class (M±SE = 1.050±.093) than the MAT class (M±SE = .767±.076) and significantly greater ($p < .000$) for the CBCT class (M±SE = 1.050±.093) than the no-training class (M±SE = .508±.053).

Just the same as with the first grade, in the fourth grade, after running a 2 (test time) by 2 (class) by 2 (story stem) by 5 (dimension) mixed ANOVA with mean dimension score as the dependent measure, there showed to be a significant effect of both dimension $F(4,14) = 6.585$, $p = .003$, $\eta^2 = .653$ with scores for emotionality (M±SE = .916±.155) , equanimity (1.095 ± .103) , and mentalizing (1.093±.149) being higher than perspective-taking (.423 ± .094) and compassion (.695 ± .109), and also a significant effect of story stem, $F(1,17) = 12.999$, $p = .002$, $\eta^2 = .433$, with scores for the story about the girl and her friend (M±SE = 1.101±.133) being higher than scores for the story about the boy and his mom (M±SE = .588±.082).

There was also a significant effect of test time $F(1,17) = 10.646$, $p = .005$, $\eta^2 = .385$ with scores at post-test showing an increase in mean score difference from pre-test (M±SE = .311±.095). Additionally, there was a moderate interaction of test time by class $F(1,17) = 3.119$, $p = .095$, $\eta^2 = .155$ where there was not a significant difference at pre-test in mean dimension score ($p = .753$) between the CBCT class (M±SE = .72±.169) and the MAT class (M±SE = .657±.101), but at post-test, there was a near significant difference ($p = .053$) between the CBCT class (M±SE = 1.200±.165) and the MAT class (M±SE = .80±.099).

The average word count of the children's responses was also recorded to see if there were significant differences between classes in the verbosity of the children, which could mediate the frequency and degree of expression of the dimensions, however a univariate ANOVA between class and average word count revealed no significance, $F(4,41) = .491, p = .742$.

Looking at the nature of students' resolutions for both the 1st and 4th graders, Pearson Chi Square showed omnibus insignificant interactions of classes changing resolutions between test times for both story stems test. Children had fairly even splits between not providing a solution, providing an egalitarian solution, a unilateral solution, and a deference to authority solution.
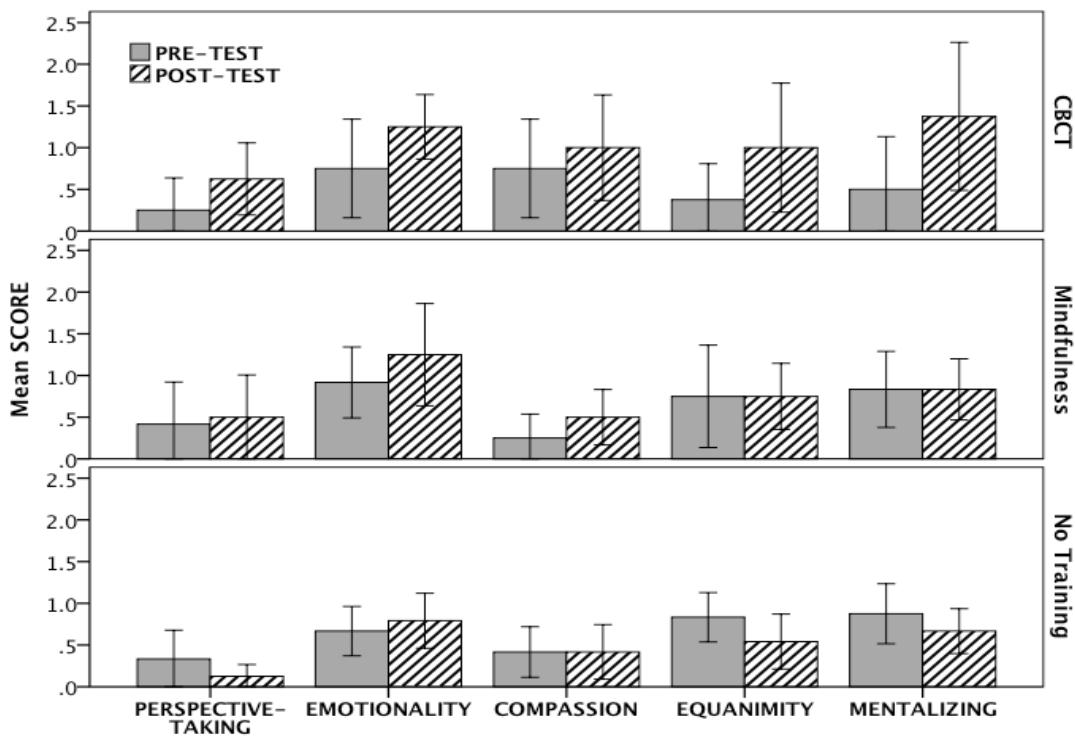

Figure 1: 1st grade mean differences between pre- and post-intervention scores for the story stem dimensions as a function of class [CBCT (n = 4), Mindfulness (n = 6), and No Training (n =12)]. Bars represent 95% CI.
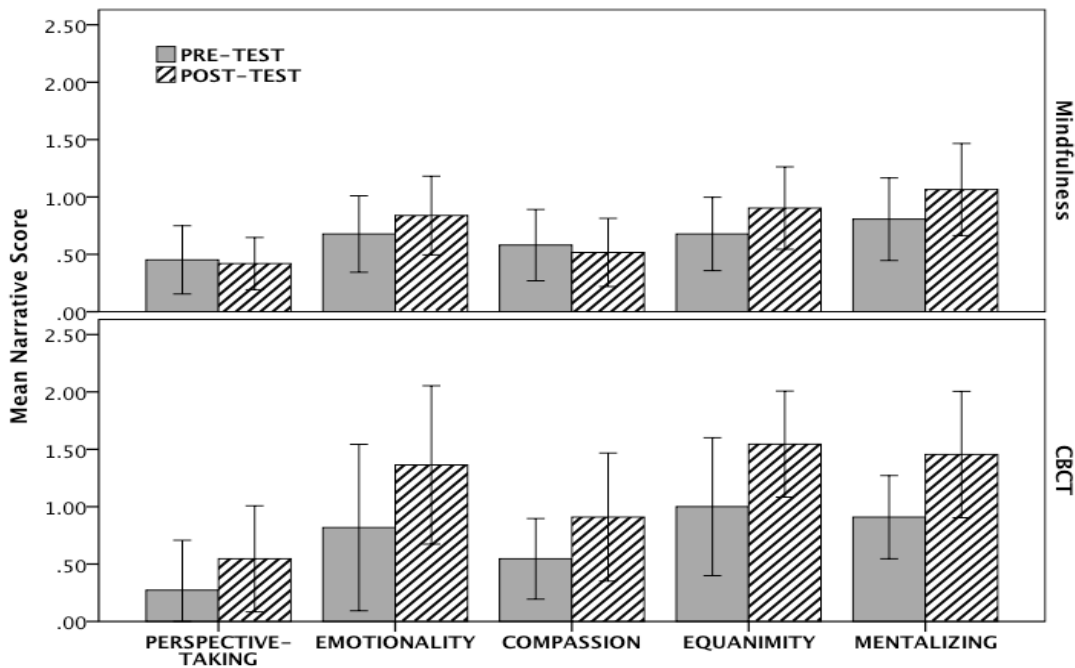
Figure 2: 4th grade mean differences between pre- and post-intervention scores for the story stem dimensions as a function of class [Mindfulness (n = 14) and CBCT (n = 5)]. Bars represent 95% CI.

Distributive Justice Dictator Game

The distributive justice game involved two conditions: the first, a non-competitive round where the students freely distributed their ten stickers with the rest of their classmates, and the second, a competitive round where the student who finished the sharing with the most stickers out of their classmates won extra, shiny stickers.

First looking at the 1st grade, a 2 (test time) by 2 (condition) by 3 (class) mixed ANOVA with number of stickers kept for self as the dependent measure showed a significant effect of condition, $F(1,19) = 16.916$, $p = .001$, $\eta^2 = .471$ with children keeping more stickers for themselves in the competitive rounds than the non-competitive rounds at both pre-test and post-test. This generally showed that there was not a buffering of self-interested sharing between the noncompetitive and competitive rounds. There was also a near-significant effect of test time by condition, $F(1,19) = 4.222$, $p = .054$, $\eta^2 = .182$, with follow-up pairwise comparisons showing

that overall, children took less stickers for themselves at post-intervention than pre-intervention in both the non-competitive rounds (M±SE = -.917 ± .237) and competitive rounds (M±SE = -.472 ± .155). Last, there was a significant interaction of condition by test time by class, $F(1,2) =$ 4.966, $p = .018$, $\eta^2 = .343$ whereby in the non-competitive condition, children in the CBCT class took more treats for themselves at post-intervention (M±SE = 6.25 ± .302) than pre-intervention (M±SE = 5.75 ± .444), children in the MAT class took less treats for themselves at post-intervention (M±SE = 5.5 ± .246) than pre-intervention (M±SE = 6.0 ± .363), and children in the no-training class took less treats for themselves at post-intervention (M±SE = 5.667 ± .174) than pre-intervention (M±SE = 5.75 ± .256), and in the competitive condition, children in the CBCT class took less at post-intervention (M±SE = 7.5 ± .593) than pre-intervention (M±SE = 6.5 ± .434), children in the MAT class took less at post-intervention (M±SE = 6.33 ± .355) than pre-intervention (M±SE = 6.5 ± .484), and children in the no-training class took less at post-intervention (M±SE = 6.0 ± .251) than pre-intervention (M±SE = 6.25 ± .343). However, follow-up pairwise comparisons revealed no significant differences between CBCT and either the MAT or no training classes over test time and conditions.

Like in the 1st grade, in the 4th grade, a 2 (test time) by 2 (condition) by 3 (class) mixed ANOVA with number of stickers kept for themselves as the dependent measure showed a significant effect of condition, $F(1,21) = 17.031$, $p = .000$, $\eta^2 = .448$ with children keeping more stickers for themselves in the competitive rounds than the non-competitive rounds both pre-test and post-test. There was also a significant effect of test time, $F(1,21) = 6.207$, $p = .021$, $\eta^2 = .228$ in that children took less stickers regardless of condition at post intervention (M±SE = 5.49±.149) than pre-intervention (M±SE = 5.895±.247). There was an insignificant effect of group by test time $F(1,21) = 17.031$, $p = .352$, $\eta^2 = .041$.
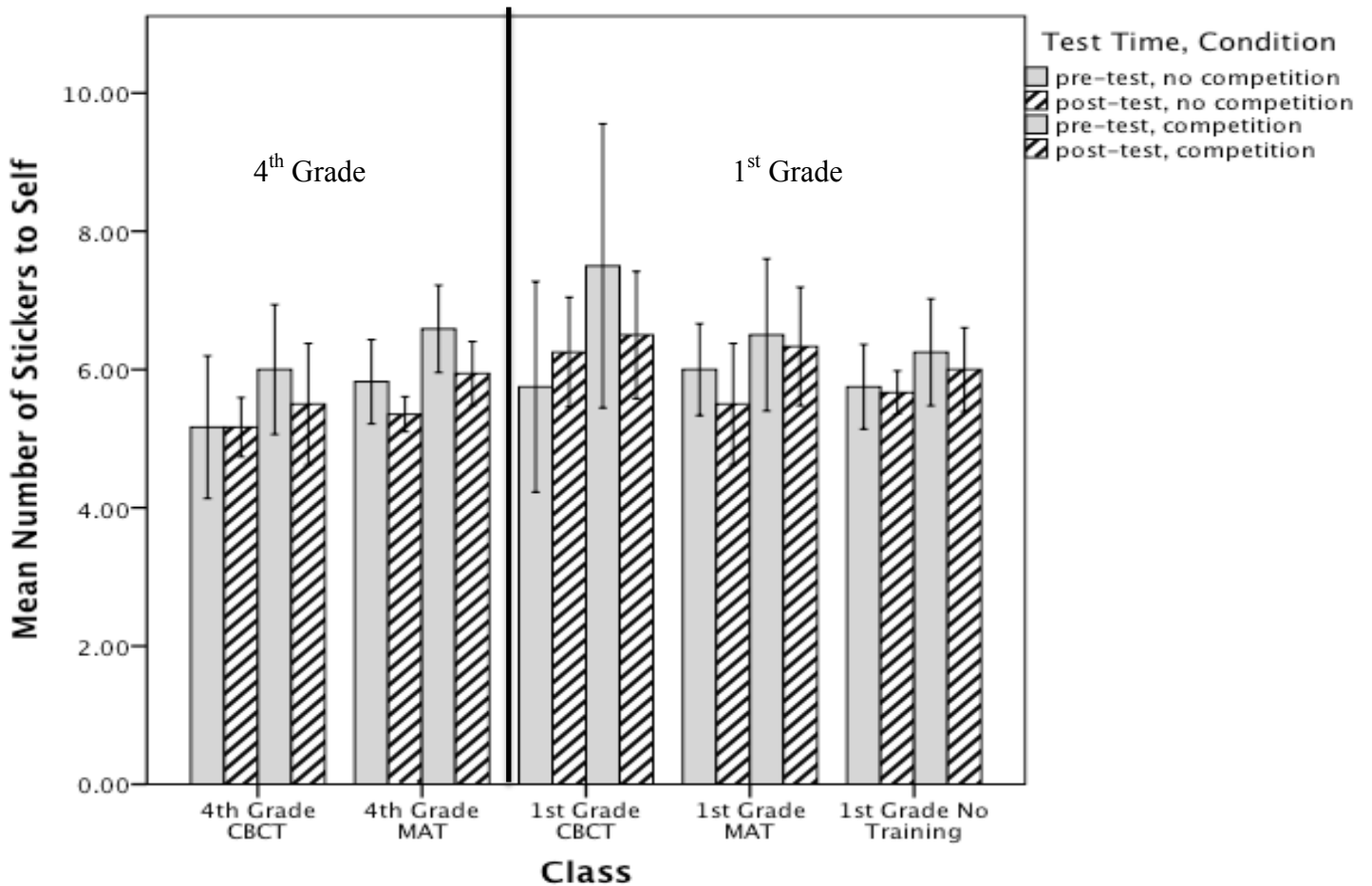
Figure 3: The mean number of stickers that 1st and 4th graders took for themselves across both test times and conditions [4th Grade CBCT (n=6), 4th grade MAT (n=17), 1st Grade CBCT (n=4), 1st Grade MAT (n=6), 1st Grade No Training (n=12)]. Bars represent 95% CI.

Olweus Bullying Questionnaire

With the Olweus Bullying Questionnaire plus the added questions consisting of a total 42 multiple-choice questions and covered a wide range of school bullying details, only questions pertinent to this study regarding outcomes of changes in the perception and frequency of bullying were selected to be analyzed. These questions include 1) *When you see a student your age being bullied at school, what do you feel or think?* 2) *Do you think you could join in bullying a student whom you do not like?* 3) [How often] *have you been bullied at school in the past couple of months?* 4) *How often have you taken part in bullying another student(s) at school in the past*

couple of months? And 5) *How often in the past month have you tried to help prevent bullying?*
Again, only 4th grade students completed this questionnaire.

The first two questions target children's perception toward the act of bullying. For the
first question, *When you see a student your age being bullied at school, what do you feel or
think?*, the answer choices are: "that is probably what he or she deserves, "I do not feel much," "I
feel a bit sorry for him or her," and "I feel sorry for him or her and want to help him or her." A
Pearson Chi Square test found a significant interaction between the CBCT and MAT classes for
changed answers pre- and post-intervention, χ^2 =10.558, Crammer's V = .728, p = .005, however
when examined closer, it was revealed that out of the students that changed their answers, for the
CBCT class, all the children recorded that they feel sorry and want to help in both the pre- and
post-tests, and for the MAT class, one student initially said they did not feel much but then said
they feel a bit sorry post-intervention while the rest of the children demonstrated sensitivity at
both times by saying they feel a bit sorry or feel sorry and want to help. This shows that though
there was more 'change' in the MAT class, the change was of little practical significance since
most children already showed sympathy for others being bullied.

Next to be analyzed was the question *Do you think you could join in bullying a student
whom you do not like?*, with the answer choices being "Yes," "Yes, maybe," I do not know,"
"No, I do not think so," "No," and "Definitely no." Again, Pearson Chi Square test yielded a
significant interaction of changed answers between the CBCT and MAT classes, χ^2 =36.54,
Crammer's V = .676, p = .013, but like with the first question, changes in answers did not seem
to reflect a strong influence from intervention type, with most children showing pre-existing
reluctance to bullying by falling into the "No" and "Definitely no" categories.

The other three questions to be analyzed sampled the frequency of students' experiences with bullying or being bullied. Answer choices for each question consisted of "not at all" "only once or twice," "2-3 times per month," "about once a week," and "several times a week." Since these choices imply numerical degrees, answers were given 1 through 5 values respective of how they were just listed and repeated measures analyses were run on all of these questions. The first analysis comprised of a conglomerate of nine questions asking [how often] *have you been bullied at school in the past couple of months?* by means of specific verbal, relational, and physical bullying tactics, i.e. being called mean names, being excluded, being hit. The average score of the nine questions was the dependent measure in a 2 (test time) x 2 (class) mixed design ANOVA, which revealed a non-significant interaction of time by class intervention type $F(1,17) = 1.274$, $p = .275$, $\eta^2 = .07$, indicating that no particular intervention had a significantly greater effect of changing the frequency of children being bullied. Both the CBCT (M±SE =1.806±.173) and MAT classes (M±SE = 1.379±.118) fell between not being bullied in the past couple of months and only happening once or twice.

For the question *How often have you taken part in bullying another student(s) at school in the past couple of months?*, another 2 (test time) by 2 (class) mixed ANOVA was not significant, $F(1,18) = 2.371$, $p = .141$, $\eta^2 = .116$, though there did show to be a significant between-group effect, $F(1,17) = 12.730$, $p = .002$ $\eta^2 = .414$ with the CBCT class showing significantly higher rates of bullying (M±SE = 3.0±2.191) than the MAT class (M±SE = 1.0714±.267). In this case, the small sample size and large standard deviation likely explain the higher mean of bullying in the CBCT class rather than the class having a bully issue. Plus, with the mean score for the MAT class indicating that they have virtually never bullied in the past

couple of months and the mean score for the CBCT class indicating they have only bullied 2-3 times a month, this could very well entail more of an honest report than a belligerent finding.

Last, for the question *How often in the past month have you tried to help prevent bullying?,* a 2 (test time) by 2 (class) mixed ANOVA revealed a non-significant interaction, $F(1,17) = .708$, $p = .142$, $\eta^2 = .04$ with the CBCT class showing a slightly lower rate of trying to prevent bullying (M±SE = 2.5714±1.134) compared to the MAT class (M±SE = 2.75±.1602), but again of little practical meaning with falling between only once or twice and 2-3 times a month.

Discussion

This study found limited support for the efficacy of CBCT for inducing pro-social attitudes and behavior in the children. The most notable findings came from the Story Stem task where both 1st and 4th grade children's conglomerate score of pro-social reasoning (perspective-taking, emotionality, compassion, equanimity, and mentalizing) did in fact significantly increase between pre- and post-test, though there were no significant differences for any particular subscales of pro-sociality. In the 1st grade, the CBCT class ended up seeing a significantly greater change in scores from pre-test to post-test compared to both the MAT and no-training classes, which went from the lowest score in the grade to the highest score. In the 4th grade, again the CBCT class had a significantly greater change in score from pre-test to post-test as compared with the MAT class. Together, these results indicate the pro-social reasoning enhancing qualities of CBCT over MAT and no-training. However, it must be noted that the scores on the tests were very low with both the 1st grade and 4th grade CBCT classes improving from a pre-test mean score of about half a point (no use of the dimensions at all) to a post-test mean score of just over one point (a brief mentioning of the dimension). Thus the significance of the change does not provoke much meaningful practical consideration, not to mention the very low sample size,

which is a recurrent limitation in all of these measures. Last, there was no significant evidence

for CBCT or any intervention modifying specific solutions. This story stem task is challenging

for teasing engaged pro-social, compassionate reasoning since children can exhibit great depth of

reasoning in the pro-social subscales but side against the person being treated unfairly or can

conversely side with the person that is being treated unfairly but not have great depth of pro-

social reasoning. Therefore, a perhaps better litmus test for gauging compassion would be to

have children explicitly explain how they would act in social situations where compassionate

actions are primed such as seeing a child struggling to carry books and then examine their

reasoning and intent.

In the distributive justice task, children became slightly more generous overall from pre-

test to post-test in both conditions, but the amount was fractional (less than half a sticker), and

was not underscored by class. Most likely this represents the developmental trend toward greater

pro-sociality throughout middle childhood and/or the children growing more familiar with each

other rather than any intervention effect. There was no significant effect of intervention in that no

particular class showed any significant changes in pro-social sharing between the pre- and post-

intervention test dates and there was no buffering effect with students keeping significantly more

stickers for themselves in the competitive round than the non-competitive round. Concerning

these results, this measure may not be sensitive enough to tap into changes elicited by increases

in pro-social compassion even if they were to occur. The fact that children were demonstrating

modest levels of sharing at just over 50% stickers kept for themselves in both the non-

competitive round and competitive rounds shows that the students did not have deficits in pro-

social sharing where major changes in generosity could occur. It should not be expected that

compassionate children would be pro-social to the point of over-egalitarian self-sacrifice because

compassion does not mean allowing one's self to be taken advantage of but includes making sure the self is provided for. And for the competition round, though it is a catchy setup for seeing if children can resist self-interest, it still might not be the best paradigm for probing selflessness since children are prompted to self-maximize goods. Perhaps a better measure than sharing extraneous stickers bestowed to them for investigating compassionate pro-social behavior would be an inequity aversion dictator game where children decide how to rectify an economic situation where someone is being treated unfairly, or an unemphasized donation task where children have a chance to donate tokens they won playing a game to others whose tokens were somehow unfairly taken. Another great naturalistic option would be to look for spontaneous acts of kindness like the method utilized in Condon et al (2014) where participants blindly had an opportunity to give up their seat for a confederate on crutches.

For the bullying questionnaire, there also were no significant effects of CBCT or any of the other interventions for changing how the students felt about witnessing bullying or whether they thought they could bully someone. Additionally the actual frequency of children bullying/ being bullied did not significantly vary. Any slight changes in responses and interactions between groups most likely had to do with disparate and low-power sample sizes and did not reflect any meaningful real-life values, such as changing bullying patterns from 'never' to 'only once or twice.' Again children reported pre-existing empathy for bully victims and reluctance to bully others and thus there was not much room for significant improvement. The fact that this measure is self-report is also of course a limitation with the accuracy of answers being questionable on account of social desirability response bias. Bullying on the terms used here may not be quite age-appropriate at least for earlier elementary school students in addition to the temporality of the questions (in the past couple of months) perhaps also causing uncertainty. In

conjunction with the suggestion above, it would be worthwhile to come up with a more naturalistic, compassionate behavior measure rather than a survey that relates to interpersonal conflict solving.

As stated, the lack of significant findings could in part come from how this method of compassion training is being used as a universal, school-based health prevention and promotion measure to reinforce social-emotional competencies and not as a short-term program for correcting clinically-pathologized behavior. With children already demonstrating normative pro-social reasoning and behavior, it is harder to conduce significant change processes, relative to what has been shown with mindfulness studies where effect sizes are larger in clinical populations than non-clinical (Zoogman et al, 2014) and also how in school mindfulness programs it is the children with the lowest baseline marks who seem to make the greatest gains (Flook et al, 2010; Flook et al, 2015; van de Weijer-Bergsma et al, 2014). This dilemma is at least true for the short-term, so while research should continue to employ measures that are sensitive to tap social-emotional capacities like perspective-taking, empathy, kindness, and pro-sociality, it would be opportune to investigate stable, longer-term curriculums, especially with how greater increases in social-emotional capacities have been found in follow-up studies, indicating an incubation period for outcomes to germinate (van de Weijer-Bergsma et al, 2014). Soon to be published, a 20-year retrospective report of adults whose teacher taught them a mindfulness-based learning curriculum in the 4th and 5th grade is preliminarily showing hopeful results for positive long-term psychological health and wellbeing (Cheek, Kabat-Zinn, Liqschitz, Nakamura, & Vago, 2014).

Strengths and Limitations

Though this study was strong in design, feasibility, and compatibility, there were substantial limitations with the sample size, teacher training, and classroom instruction that surely hindered potential pro-social enhancements and nullifies a critical assessment of the teacher-taught model of CBCT. The miscarriage of the implementation thus shifts the attention of the conversation toward identifying the strengths and weaknesses of the program to plan how to rectify the flaws and continue pursuing a reputable and evaluable teacher-taught CBCT program in schools. As a telltale of the confounding stage of this research in taking an evidence-based intervention and implanting it into a real-world setting, Durlak and DuPre (2008) give a precise description in a meta-analysis of successful health prevention and promotion programs: "Social scientists recognize that developing effective interventions is only the first step to improving the health and well-being of populations. Transferring effective programs into real-world settings and maintaining them there is a complicated, long-term process that requires dealing effectively with the successive, complex phases of program diffusion."

Using Durlak and DuPre's *Implementation Matters* meta-analytic report as a guide, which delineates 23 contextual factors of successful health prevention/promotion programs between five cluster categories of Community Level Factors, Provider Characteristics, Characteristics of the Innovation, Organizational Capacity, and Prevention Support System, it can be appraised what facets were accounted for in this study and which were underplayed, limited the efficacy, and need to be improved upon in future implementation:

In regard for the credence and compatibility for CBCT–classroom integration, this research is well situated. There is apt community level backing in terms of a) empirical support with CBCT showing salutary stress and immune benefits (Pace et al, 2009, 2010, 2013) as well

as enhancements in social connectedness and social reasoning for elementary school children (Dodson-Lavelle et al, 2014), b) educational politics with schools being enthusiastic for social-emotional innovation in education—and with SEL programs (Durlak et al, 2011) and mindfulness programs like MindUP (Schonert-Reichl et al, 2010, 2011) demonstrating that teachers can carry out programs effectively, it is well plausible that the teacher-taught CBCT endeavor is viable, and c) sufficient funding with university grants as well as past financing from the Georgia Department of Health and Human Services and the Center for Disease Control.

The other positive station of this endeavor is the strong provider and innovation characteristics. CBCT has a reputable efficacy, appeal, and proficiency for stimulating positive social, emotional, cognitive, behavioral, and ethical changes with elementary school children, which met the aspirations of this school as well as other candidate schools. For this study, the compatibility and adaptability of CBCT to the school's mission for global citizenship and multi-cultural appreciation made for an excellent match of values. For now, CBCT is only being tried in schools that request it, so making sure there is a strong partnership and shared values between the program and the host school is essential. Though it was intended to gather interview responses from the teachers, school counselor, and program coordinator about their successes, challenges, and confidence in the program, which would have been extremely helpful for an enriched qualitative assessment, the interview forms were not returned. Past teacher-taught mindfulness programs however have noted teachers to be satisfied with the easy to administer programs (Schonert-Reichle & Lawlor, 2010) so long as they are given adequate training and preparation.

While the prospects of this project are well supported, the delivery and implementation of this program incurred major limitations and challenges that need to be addressed in future

studies. Major faults were encountered with the small sample size, the training, and the consequential instruction of CBCT to the students. For sample size, there was very low power in the group numbers of this study, a lot having to do with difficulty in getting consent for the students due to parents with low English proficiency being confused by the consent form and what was going on with the study. At any rate, having only 46 students across five classes, having to forgo a 4th grade control class due to dropout, and having discrepant group numbers (e.g. four children in the 1st grade CBCT class and thirteen children in the 1st grade no training class; six children in the 4th grade CBCT class and seventeen children in the 4th grade MAT class) made for tenuous results. This will need to be addressed in future studies to make sure there are enough students in the classes to be able to sufficiently compare classroom interventions.

In terms of training, while most CBCT courses meet once a week for 2 hours, the teachers' courses lasted 1.5 hours; and though the course was supposed to meet for twelve straight weeks, their course was only eight weeks with teachers attending seven and five of those sessions. Not only that, the teachers were not simply taking the course, but were being asked to instruct the modules only five weeks ahead of being introduced to them. Comparatively, in order to become a certified CBCT instructor, trainees complete a yearlong course that includes workshops, a practicum seminar, and supervised co-teaching. This is a problem in relation to past findings for mindfulness programs where even though teachers were in support of the programs and familiar with the concepts, not having personal experience and practice caused difficulty for effective teaching (Kabat-Zinn, 2003).

Resulting from the inadequate training of the teachers to carry out the curriculum, there was a significant lack of classroom CBCT instruction to the students. In the original study,

instructors came in to teach the students for two 30-minute sessions each week for ten weeks. In this study, there was minimal and unchecked teaching of the curriculum, which lasted for only seven weeks. Even though the 4th grade teaching time is much more reasonable than in the 1st grade, another great limitation is that no qualitative report of what the teachers instructed in the classroom was taken. While the instructors told the teachers to reiterate the teachings and exercises to their classes in the order they were taught, there was no qualitative recording of what the teachers actually taught to their students, prohibiting assured knowledge of what the students engaged with. This methodology became more confounding when it was revealed to the training instructors later on that teachers were tending to gravitate toward the earlier, more mindfulness-oriented modules on account of being less comfortable teaching the more analytical compassion topics. This reality further hinders the evaluation of how a compassion pedagogy goes beyond mindfulness when the compassion components of the curriculum were hardly instructed.

Moving Teacher-Taught CBCT Project Further

These issues highlight a need to supply the teachers with more adequate and convenient CBCT training as well as more supervision, support, and structure for teaching it in class. Though it is not realistic for teachers to become certified CBCT instructors, it is necessary to make sure teachers receive the full-course training, be supported in making sure they are comfortable teaching the material throughout the program, and have the means and resources to facilitate teachings of the lessons. What is proposed for the future iteration of this project is arranging a time to administer proper teacher training such as over the summer when teachers can complete the full course without having to also shoulder the stress and responsibility of the school day, having the trainers available to guide and support teachers' instruction progress, and

finalizing the curriculum manual with lesson guides and suggested age-appropriate exercises and materials that teachers could refer to be most comfortable in teaching the material. In relation to this study where there was a wide array of practice times between classes, having more structured and standardized practice procedures would also help systematize the process of investigating what particular features of programs are most effective, which right now is a definite barrier in current research. An excellent model for the advance of this project is the evidence-based MindUp program, grown and refined from pilot studies, but now one that offers thorough teacher training support and a 15-week comprehensive lesson plan.

Appropriate measures also need to be created that can accurately capture the range of putative benefits for compassion training from immune functioning to psychological health to social-emotional competencies. Some suggestions were provided earlier in the discussion regarding changes to the current tasks. It would be sensible to construct measures that are related to elementary school issues like bullying, pro-social helping behavior, and peer relationships to investigate the effects of compassion training on the everyday level. Tests that are naturalistic and ecologically valid could offer the most viable generalizability. Utilization of qualitative measures should also be continued, especially with feedback and suggestion from teachers and faculty on how the curriculums are working in the classrooms and how they can be improved. In this area, school staff can help researchers just as much as researchers for teachers are not simply instruments of the program but active leaders in the implementers with the best knowledge of the school and the children.

Future of Compassion Science and Education

With holding an image for what the CBCT school model could be, it is also imperative to look at where the greater compassion science and, even more specifically, the compassion science in education movement is headed. Rapid development in this field is and will only further help inform the future logistics of the compassion in education mission. Currently there are two large-scale, well-resourced, and well-funded initiatives: one that is investigating the long-term effects of mental training involving mindfulness and compassion, and one that is looking at building contemplative cultures of compassion in classrooms. These projects have the advantage of conducting large-scale, long-term, and well-supported contemplative science investigations that entails robustness unavailable for a project such as this one, but that will significantly contribute to the further understanding and advancement of this work.

The first study under works is called the ReSource Project (see https://www.resource-project.org/en/home.html), which is being conducted by the Max Planck Institute for Human Cognitive and Brain Sciences in Germany. For nearly a year, a span of time hardly matched by any previous studies, experienced meditation teachers, psychotherapists, and research-scientists will be investigating the biological, neurological, and psychological effects of training participants in three contemplative modules—*presence, perspective,* and *affect*—looking at outcomes such as attention, awareness, emotion regulation, stress-reduction, self-care, perspective taking, empathy, compassion, and life satisfaction. The three modules being explored respectively represent the qualities of mindfulness, self-awareness/ perspective taking, and the cultivation of positive emotions like compassion. Teasing these mental processes apart is coveted information in the exploration of the graduated effects of mindfulness to compassion, and the

long-term configuration of this study is advantageous since it is often thought that extensive effects of mental training cannot be realized in a few weeks or months.

The other major project that directly focuses on contemplative and compassion education is the Mind and Life Institute's Call to Care initiative (see http://www.mindandlife.org/research-and-initiatives-category/ethics-education-human-development/), which is being carried out by contemplative scholars, educators, and developmental scientists. With the senior program officer leading Call to Care being one of the lead authors for original classroom CBCT pilot study, CBCT will serve as one of the root models for compassion teaching and learning in education, and will thus be implicit in the outcomes. Focusing initially on the foundational years of education, the 2nd and 3rd grade, this program builds from SEL and contemplative teaching and learning practices to refine the most effective programs for instilling social-emotional intelligence, mindfulness, compassion, and ethics in the classroom. The program is composed of 1) *psychoeducation* to help inform students and teachers of the actual psychological science and reasoning of these practices instead of just coming in and introducing these programs, 2) *contemplation* to hone the values of empathy and compassion, and 3) *skills-training* to practice the interpersonal skills outside of individual contemplation. The initiative has already begun with yearlong training for teachers, because like my study, the future direction of this work is seen to involve teachers as active participants with the students in constructing universal, holistic cultures of compassion in the classroom. The end goal of this initiative is to develop curricula for K-12 classes that can become expansive models in education.

Other Issues in Contemplative Education

To confront the concern that contemplative programs are not appropriate or acceptable for general education because of some inherent religiosity, it must be promulgated how these programs are secular in nature; though not secular as in how is typically thought of in the West as exclusive of religion, but in a democratic sense, inclusive of all religious beliefs and grounded in fundamental human principles like empathy, kindness, and compassion. While there is truth that practices like analytical compassion training are derived from Buddhist traditions, these concepts are not implicated by doctrinal dogmas, but can be valuated just as much to attachment theory, whereby optimal lifespan development and even longevity occurs from close, secure relationships (Holt-Lunstad et al, 2015; Levitt, 1991). Also, mindfulness and compassion practices do not have to be ancient, esoteric techniques as much as cognitive strategies for improved mental fitness and functioning with clinical and scientific evidence demonstrating how these practicing accrue translatable neuropsychological benefits. Schemas of third-wave cognitive-behavioral therapy and positive psychology are demonstrating that, only these techniques to promote human flourishing can fare just as well as preventative care techniques as than interventions. So like how it has been discovered under what pretexts people can be 'evil' (Haney, Banks, & Zimbardo, 1973; Zimbardo, 1995), this investigation explores the other side to see how people can be trained to be compassionate, 'good', and ultimately well.

Given the recency of the contemplative science field, particularly in regard to compassion training versus mindfulness training, there is still much to be uncovered about their differential properties. That being said, studies like the ReSource project and this one are not so much designed to pit compassion training against mindfulness, but how they build from each other to afford graduated benefits. A problem with an 8-10 week compassion training protocol like

CBCT is that it most likely is not able to adequately cultivate the different faculties from mindfulness to compassion in that short time. Like how William James' propounded that bringing back wandering attention is the *root* of judgment, character, and will, it is largely supposed that it is not until one becomes proficient in mindfulness and perspective-taking that compassion can be actualized, which would take more than a few weeks to instill. Cultivating compassion is a long-term practice, not a quick interventional fix. This is why integrating CBCT into the classroom is esteemed because it would allow for necessary long-term adaptation, as opposed to a few weeks, where mindfulness and compassion training can be thoroughly and comprehensively practiced. Also, creating a long-term developmentally appropriate curriculum for children that has interactive exercises and discussions in addition to analytical meditation could also solve the issue of making sure the program teachings are engaging, accessible, and amenable to committed practice and inculcation of the principles.

These caveats strike up the sentiments of Seligman's seminal *Consumer Reports* study (Seligman, 1995) where it was not just revealed that efficacy studies may not be the gold standard for evaluation of real-world interventions where individual and environmental variables cannot be tightly controlled, but also how long-term, dynamic therapies show to be more effective than short-term programs. Of course these contemplative curriculums need to be evidence-based, which is still the emphasis of this research in seeking to uncover the range of benefits for compassion training, but because the intended structures of these programs are meant to be longitudinal and dynamic, it is prudent to look at their *effectiveness* over longer periods of time, where their true efficacy may lie.

In closing, in consideration of this study's findings as well as the coming findings of developmental contemplative science research, future classroom CBCT undertakings need to

focus on making sure to have a well-prepared system of implementation that is equipped for the long-term; this means following from a built relationship with the host school, instigating psychoeducation of the validated reasons for training mindfulness and compassion for the staff, and providing thorough training for the teachers to ensure the program is carried out to a high degree of fidelity. There needs to be the continued use of a strong and rigorous study design with large sample sizes, control groups, and valid measures of emotional, behavioral, and class climate dynamics along with multimethod data collection to capture both quantifiable effects and the qualitative details and feedback from the project. It is under these rigorous and thorough guidelines that there can be worthy progress in the creation and implementation of sustainable and effective educational programs for fruitful cognitive, social, emotional, behavioral, and ethical development.

Conclusion

This study looked to find evidence for the greater utility of teacher-taught Cognitively-Based Compassion Training over Mindfulness Attention Training and No Training for enhancing pro-social reasoning and behavior in elementary school children. Partial efficacy was found for the greater utility of Cognitively-Based Compassion Training over mindfulness and no training for bolstering pro-social reasoning, but challenging circumstances disallowed the protocol from being carried out in an appropriate manner, voiding qualified scrutiny of the null findings. It is not wrong to think that the teacher-taught CBCT method is infeasible as it follows the ranks of successful models of teacher-taught SEL and mindfulness programs in schools, but the operation must be carried on with sufficient preparation and support. This study provided valuable lessons for understanding how to better implement this model of sustainable, school-based compassion training, which will be respected in the next attempt to uncover empirical validity. Compassion

training in schools is a burgeoning but commended enterprise, and concurrent, large-scale studies will only help inform future research and implementation as schools progress to integrate evidenced-based positive youth development programs for promoting social-emotional learning, positive psychological health, and communities of care in schools.

References

Aboud, F. E. (2003). The formation of in-group favoritism and out-group prejudice in young children: Are they distinct attitudes?. *Developmental psychology*, *39*(1), 48.

Aknin, L. B., Dunn, E. W., & Norton, M. I. (2012). Happiness runs in a circular motion: Evidence for a positive feedback loop between prosocial spending and happiness. *Journal of Happiness Studies*, *13*, 347-355.

Anderson, P. (2002). Assessment and development of executive function (EF) during childhood. *Child neuropsychology*, *8*(2), 71-82.

Association for Supervision and Curriculum Development. (2007). The learning compact redefined: A call to action—A report of the Commission on the Whole Child. Alexandria, VA. Retrieved Nov. 29, 2014 from http://www.ascd.org/learningcompact.

Baer, R. (2005). The third wave: New directions in cognitive-behavioral intervention. PsycCRITIQUES, Contemporary Psychology: APA Review of Books, 50(52), Article 8.

Batson, C. D., Eklund, J. H., Chermok, V. L., Hoyt, J. L., & Ortiz, B. G. (2007). An additional antecedent of empathic concern: valuing the welfare of the person in need. *Journal of personality and social psychology*, *93*(1), 65.

Begley, S. (2008). *Train your mind, change your brain: How a new science reveals our extraordinary potential to transform ourselves*. Random House LLC.

Berger, R., Gelkopf, M., & Heineberg, Y. (2012). A teacher-delivered intervention for adolescents exposed to ongoing and intense traumatic war-related stress: A quasi-randomized controlled study. *Journal of Adolescent Health*, *51*(5), 453-461.

Blair, C. (2002). School readiness. Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. American Psychologist, 57, 111–127.

Blair, C., & Diamond, A. (2008). Biological processes in prevention and intervention: The promotion of self-regulation as a means of preventing school failure. *Development and psychopathology*, *20*(03), 899-911.

Bretherton, I., & Oppenheim, D. (2003). The MacArthur Story Stem Battery: Development, administration, reliability, validity, and reflections about meaning. In R. N. Emde, D. P. Wolf, and D. Oppenheim (Eds.), Revealing the Inner Worlds of Young Children. New York: Oxford University Press, pp. 55-80.

Brosschot, J. F., Gerin, W., & Thayer, J. F. (2006). The perseverative cognition hypothesis: A review of worry, prolonged stress-related physiological activation, and health. *Journal of psychosomatic research*, *60*(2), 113-124.

Brown, A. P., Marquis, A., & Guiffrida, D. A. (2013). Mindfulness‐Based Interventions in Counseling. *Journal of Counseling & Development*, *91*(1), 96-104.

Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. Psychological Inquiry, 18, 211–237.

Buchanan‐Barrow, E., & Barrett, M. (1998). Individual differences in children's understanding of the school. *Social Development*, *7*(2), 250-268.

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

Cahn, B.R. & Polich, J. (2006). Meditation states and traits: EEG, ERP, and neuroimaging studies. *Psychological Bulletin* 132:180–211.

Catalano, R. F., Berglund, M. L., Ryan, J. A., Lonczak, H. S., & Hawkins, J. D. (2004). Positive youth development in the United States: Research findings on evaluations of positive youth development programs. *The annals of the American academy of political and social science*, *591*(1), 98-124.

Catalano, R. F., Mazza, J. J., Harachi, T. W., Abbott, R. D., Haggerty, K. P., & Fleming, C. B. (2003). Raising healthy children through enhancing social development in elementary school: Results after 1.5 years. *Journal of School Psychology*, *41*(2), 143-164.

Chapman, M., Zahn-Waxler, C., Cooperman, G., & Iannotti, R. (1987). Empathy and responsibility in the motivation of children's helping. *Developmental Psychology*, *23*(1), 140.

Cheek, J., Kabat-Zinn, J., Lipschitz, D., Nakamura, Y., & Vago, D. R. (2014).*Health & Stress Evaluation of Young Adults – A Long-term Opportunistic Follow-up Assessment of Mindfulness Training in School Children.*Paper presented at the International Symposium for Contemplative Studies, Boston, MA.

Cohen, J. (Ed.). (1999). *Educating minds and hearts: Social emotional learning and the passage into adolescence*. Teachers College Press.

Cohen, J. (2006). Social, emotional, ethical, and academic education: Creating a climate for learning, participation in democracy, and well-being. *Harvard Educational Review*, *76*(2), 201-237.

Cohen, S. (2004). Social relationships and health. *American psychologist*, *59*(8), 676.

Collaborative for Academic, Social, and Emotional Learning. (2014). What is SEL: SEL Defined. Retrieved October 28, 2014, from http://www.casel.org/social-and-emotional-learning/

Collaborative for Academic, Social, and Emotional Learning. (2014). What is SEL: Social and Emotional Learning Core Competencies. Retrieved October 28, 2014, from http://www.casel.org/social-and-emotional-learning/core-competencies/

Condon, P., Desbordes, G., Miller, W. B., & DeSteno, D. (2013). Meditation increases compassionate responses to suffering. *Psychological science*, *24*(10), 2125-2127.

Crick, N. R. (1996). The role of overt aggression, relational aggression, and prosocial behavior in the prediction of children's future social adjustment. *Child development*, *67*(5), 2317-2327.

Cullen, M. (2011). Mindfulness-based interventions: an emerging phenomenon. *Mindfulness*, *2*(3), 186-193.

Cunningham, W. A., & Zelazo, P. D. (2010). The development of iterative reprocessing: Implications for affect and its regulation. In P. D. Zelazo, M. Chandler, & E. A. Crone (Eds.), Developmental social cognitive neuroscience (pp. 81–98). Mahwah, NJ: Erlbaum.

Davidson, R. J., & McEwen, B. S. (2012). Social influences on neuroplasticity: stress and interventions to promote well-being. *Nature neuroscience*, *15*(5), 689-695.

Davidson, R. J., & Rickman, M. (1999). Behavioral inhibition and the emotional circuitry of the brain. *Extreme fear, shyness, and social phobia*, 67-87.

De Waal, F. (2009). *The age of empathy: nature's lessons for a kinder society*. New York: Harmony Books.

Desbordes, G., Negi, L. T., Pace, T. W., Wallace, B. A., Raison, C. L., & Schwartz, E. L. (2012). Effects of mindful-attention and compassion meditation training on amygdala response to emotional stimuli in an ordinary, non-meditative state. *Frontiers in human neuroscience*, *6*.

Diamond, A. (2012). Activities and programs that improve children's executive functions. *Current Directions in Psychological Science*, *21*(5), 335-341.

Dodson-Lavelle, B., Robbins, E., Ozawa-de-Silva, B., Tenzing Negi, L., Pace, T., Raison, C., & Rochat, P. (2014/under review). Enhanced benefits of compassion training for elementary school children. *Developmental Psychology*.

Duncan, A. (2015). America's Educational Crossroads: Making the Right Choice for Our Children's Future. *U.S. Department of Education.* Retrieved Jan 22, 2015 from http://www.education.gov/news/speeches/americas-educational-crossroads-making-right-choice-our-children%E2%80%99s-future.

Durlak, J. A., & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American journal of community psychology*, *41*(3-4), 327-350.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Development*, 82(1): 405-32.

Eccles, J. S. (1999). The development of children ages 6 to 14. *The future of children*, 30-44.

Eisenberg-Berg, N. (1979). Development of children's prosocial moral judgment. *Developmental Psychology*, *15*(2), 128.

Eisenberg-Berg, N., & Hand, M. (1979). The relationship of preschoolers' reasoning about prosocial moral conflicts to prosocial behavior. *Child development*, 356-363.

Eisenberg, N. & Fabes, R. A. (1998). Prosocial development. In W. Damon, & N. Eisenberg (Eds.), Handbook of child psychology: Vol. 3. Social, emotional, and personality development (pp. 701– 778). New York7 Wiley.

Eisenberg, N., & Miller, P. A. (1987). The relation of empathy to prosocial and related behaviors. *Psychological bulletin*, *101*(1), 91.

Erikson, E. H. (1963). *Childhood and society (2nd ed.)*. Oxford, England: Norton & Co.

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

Flook, L., Goldberg, S. B., Pinger, L., Bonus, K., & Davidson, R. J. (2013). Mindfulness for teachers: A pilot study to assess effects on stress, burnout, and teaching efficacy. *Mind, Brain, and Education*, *7*(3), 182-195.

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

Fredrickson, B. L., Cohn, M. A., Coffey, K. A., Pek, J., & Finkel, S. M. (2008). Open hearts build lives: positive emotions, induced through loving-kindness meditation, build consequential personal resources. *Journal of personality and social psychology*, *95*(5), 1045.

Garrison Institute. (2005). Contemplation and education. A survey of programs using contemplative techniques in K-12 educational settings: A mapping report. Garrison, NY: Garrison Institute; 2005.

Gelkopf, M., & Berger, R. (2009). A school‑based, teacher‑mediated prevention program (ERASE‑Stress) for reducing terror‑related traumatic reactions in Israeli youth: a quasi‑randomized controlled trial. *Journal of child psychology and psychiatry*, *50*(8), 962-971.

Gilbert, P. (2005). *Compassion: Conceptualisations, research and use in psychotherapy* (New edition.). London: Routledge.

Gini, G., Pozzoli, T., & Hauser, M. (2011). Bullies have enhanced moral competence to judge relative to victims, but lack moral compassion. *Personality and Individual Differences*, *50*(5), 603-608.

Greenberg, M. T., & Harris, A. R. (2012). Nurturing mindfulness in children and youth: Current state of research. *Child Development Perspectives*, *6*(2), 161-166.

Greenberg, M. T., Weissberg, R. P., O'Brien, M. U., Zins, J. E., Fredericks, L., Resnik, H., & Elias, M. J. (2003). Enhancing school-based prevention and youth development through coordinated social, emotional, and academic learning. *American psychologist*, *58*(6-7), 466.

Greene, J. D., Nystrom, L. E., Engell, A. D., Darley, J. M., & Cohen, J. D. (2004). The neural bases of cognitive conflict and control in moral judgment. *Neuron*, *44*(2), 389-400.

Greene, J., & Haidt, J. (2002). How (and where) does moral judgment work?. *Trends in cognitive sciences*, *6*(12), 517-523.

Gyatso, T. (H.H. the XIV Dalai Lama) (2000). *Transforming the mind: teachings on generating compassion*. London: Thorsons.

Hamilton, C. E. (2000). Continuity and discontinuity of attachment from infancy through adolescence. *Child development*, *71*(3), 690-694.

Haney, C., Banks W. C., & Zimbardo, P. G. (1973). Interpersonal dynamics in a simulated prison. *International Journal of Criminology & Penology*, 1, 69-97.

Harbaugh, W. T., Krause, K., & Liday, S. J. (2003). Bargaining by children. *University of Oregon Economics Working Paper*, (2002-4).

Helwig, C. C., & Jasiobedzka, U. (2001). The relation between law and morality: Children's reasoning about socially beneficial and unjust laws. *Child Development*, *72*(5), 1382-1393.

Helwig, C.C., & Prencipe, A. (1999). Children's judgments of flags and flag-burning. *Child Development*, 70, pp. 132–143

Hofmann, S. G., Grossman, P., & Hinton, D. E. (2011). Loving-kindness and compassion meditation: Potential for psychological interventions. *Clinical psychology review*, *31*(7), 1126-1132.

Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of consulting and clinical psychology*, *78*(2), 169.

Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and Social Isolation as Risk Factors for Mortality A Meta-Analytic Review. *Perspectives on Psychological Science*, *10*(2), 227-237.

Hölzel, B. K., Carmody, J., Evans, K. C., Hoge, E. A., Dusek, J. A., Morgan, L., & Lazar, S. W. (2009). Stress reduction correlates with structural changes in the amygdala. *Social cognitive and affective neuroscience*, nsp034.

Houser, D. & Schunk, D. (2009). Social environments with competitive pressure: Gender effects in the decisions of German schoolchildren. *Journal of Economic Psychology*, *30*(4), 634-641.

Hutcherson, C. A., Seppala, E. M., & Gross, J. J. (2008). Loving-kindness meditation increases social connectedness. *Emotion*, *8*(5), 720.

J Davidson, R., Dunne, J., Eccles, J. S., Engle, A., Greenberg, M., Jennings, P., Jha, A., Jinpa, T., Lantieri, L;,Meyer, D., Roeser, R., & Vago, D. (2012). Contemplative practices and mental training: Prospects for American education. *Child Development Perspectives*, *6*(2), 146-153.

James W. (1890) *The principles of psychology*. New York: Holt.

Jazaieri, H., Jinpa, G. T., McGonigal, K., Rosenberg, E. L., Finkelstein, J., Simon-Thomas, E., & Goldin, P. R. (2013). Enhancing compassion: A randomized controlled trial of a compassion cultivation training program. *Journal of Happiness Studies*, *14*(4), 1113-1126.

Jennings, P. A. & Greenberg, M. T. (2009). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. *Review of educational research*, *79*(1), 491-525.

Jennings, P. A., Frank, J. L., Snowberg, K. E., Coccia, M. A., & Greenberg, M. T. (2013). Improving classroom learning environments by Cultivating Awareness and Resilience in Education (CARE): Results of a randomized controlled trial. *School Psychology Quarterly*, *28*(4), 374.

Jha, A. P., Krompinger, J., & Baime, M. J. (2007). Mindfulness training modifies subsystems of attention. *Cognitive, Affective, & Behavioral Neuroscience*, *7*(2), 109-119.

Kabat-Zinn, J. (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General hospital psychiatry*, *4*(1), 33-47.

Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. Hyperion.

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present and future. Clinical Psychology: Science and Practice, 10, 144–156.

Kabat-Zinn, J. & Hanh, T. N. (2009). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. Random House LLC.

Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., & Hofmann, S. G. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review*, *33*(6), 763-771.

Klimecki, O. M., Leiberg, S., Lamm, C., & Singer, T. (2012). Functional neural plasticity and associated changes in positive affect after compassion training. *Cerebral Cortex*, bhs142.

Kohlberg, L. (1984). *Essays on moral development. Vol. 2, The psychology of moral development: the nature and validity of moral stages*. Harper & Row.

Learning First Alliance. (2001). *Every child learning: Safe and supportive schools*. ERIC Clearinghouse.

Leiberg, S., Klimecki, O., & Singer, T. (2011). Short-term compassion training increases prosocial behavior in a newly developed prosocial game. *PloS one*, *6*(3), e17798.

Levitt, M. J. (1991). Attachment and close relationships: A life-span perspective. *Intersections with attachment*, 183-205.

Litvack-Miller, W., McDougall, D., & Romney, D. M. (1997). The structure of empathy during middle childhood and its relationship to prosocial behavior. *Genetic, Social, and General Psychology Monographs*.

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

Mascaro, J. S., Darcher, A., Negi, L. T., & Raison, C. (2015). The neural mediators of kindness-based meditation: a theoretical model. *Frontiers in Psychology*, *6*, 109.

Mascaro, J. S., Rilling, J. K., Negi, L. T., & Raison, C. (2012). Compassion meditation enhances empathic accuracy and related neural activity. *Social cognitive and affective neuroscience*, nss095.

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

Mischel, W., Shoda, Y., & Rodriguez, M. I. (1989). Delay of gratification in children. *Science*, *244*(4907), 933-938.

Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., Houts, R., Poulton, R., Roberts, B., Ross, S., Sears, M., Thompson, M., & Caspi, A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences*, 201010076.

Napoli, M., Krech, P. R., & Holley, L. C. (2005). Mindfulness training for elementary school students: The attention academy. *Journal of Applied School Psychology*, *21*(1), 99-125.

National Center for Educational Statistics (2014). *Indicators of School Crime and Safety*: 2013 (NCES 2014-042). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved February, 12, 2015, from http://nces.ed.gov/programs/crimeindicators/crimeindicators2013/key.asp outcomes (pp. 67–77). New York: Oxford.

Neff, K. D. (2011). Self-compassion, self-esteem, and well-being. *Social and personality psychology compass*, *5*(1), 1-12.

Newcomb, A. F., Bukowski, W. M., & Pattee, L. (1993). Children's peer relations: a meta-analytic review of popular, rejected, neglected, controversial, and average sociometric status. *Psychological bulletin*, *113*(1), 99.

Ozawa-de Silva, B. R., Dodson-Lavelle, B., Raison, C. L., Negi, L. T. (2012). Compassion and ethics: scientific and practical approaches to the cultivation of compassion as a foundation for ethical subjectivity and well-being. *J. Healthcare Sci. Hum*, *2*, 145-161.

Ozawa-de Silva, B., & Dodson-Lavelle, B. (2011). An education of heart and mind: practical and theoretical issues in teaching Cognitive-Based Compassion Training to children. *Practical Matters*, *1*(4), 1-28.

Pace, T. W., Negi, L. T., Adame, D. D., Cole, S. P., Sivilli, T. I., Brown, T. D., Issa, M.J., & Raison, C. L. (2009). Effect of compassion meditation on neuroendocrine, innate immune and behavioral responses to psychosocial stress. *Psychoneuroendocrinology*, *34*(1), 87-98.

Pace, T. W., Negi, L. T., Dodson-Lavelle, B., Ozawa-de Silva, B., Reddy, S. D., Cole, S. P., & Raison, C. L. (2013). Engagement with Cognitively-Based Compassion Training is associated with reduced salivary C-reactive protein from before to after training in foster care program adolescents. *Psychoneuroendocrinology*, *38*(2), 294-299.

Pace, T. W., Negi, L. T., Sivilli, T. I., Issa, M. J., Cole, S. P., Adame, D. D., & Raison, C. L. (2010). Innate immune, neuroendocrine and behavioral responses to psychosocial stress do not predict subsequent compassion meditation. *Psychoneuroendocrinology*, *35*(2), 310-315.

Pedersen, S., Vitaro, F., Barker, E. D., & Borge, A. I. (2007). The timing of Middle‐Childhood peer rejection and friendship: Linking early behavior to Early‐Adolescent adjustment. *Child Development*, *78*(4), 1037-1051.

Reddy, S. D., Negi, L. T., Dodson-Lavelle, B., Ozawa-de Silva, B., Pace, T. W., Cole, S. P., Raison, C.L., & Craighead, L. W. (2013). Cognitive-Based Compassion Training: a promising prevention strategy for at-risk adolescents. *Journal of child and family studies*, *22*(2), 219-230.

Richards, K., Ozawa-de Silva, B., Dodson-Lavelle, B. (2015/unpublished). Cognitively-based compassion training for children: a guide for children.

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*(1), 91-102.

Rimm-Kaufman, S., & Hulleman, C. (2014). Social and emotional learning in elementary school settings: Identifying mechanisms that matter. In *The Handbook of social and emotional learning*.

Rochat, P., Dias, M. D., Liping, G., Broesch, T., Passos-Ferreira, C., Winning, A., & Berg, B. (2009). Fairness in distributive justice by 3-and 5-year-olds across seven cultures. *Journal of Cross-Cultural Psychology*, *40*(3), 416-442.

Roeser, R. W., & Peck, S. C. (2009). An education in awareness: Self, motivation, and self-regulated learning in contemplative perspective. *Educational Psychologist*, *44*(2), 119-136.

Roeser, R. W., & Pinela, C. (2014). Mindfulness and compassion training in adolescence: A developmental contemplative science perspective. *New directions for youth development*, *2014*(142), 9-30.

Roeser, R. W., Schonert-Reichl, K. A., Jha, A., Cullen, M., Wallace, L., Wilensky, R; Oberle, E., Thomson, K., Taylor, C., & Harrison, J. (2013). Mindfulness training and reductions in teacher stress and burnout: Results from two randomized, waitlist-control field trials. *Journal of Educational Psychology*, *105*(3), 787.

Roeser, R. W., Skinner, E., Beers, J., & Jennings, P. A. (2012). Mindfulness training and teachers' professional development: An emerging area of research and practice. *Child Development Perspectives*, *6*(2), 167-173.

Rose, L. C., & Gallup, A. M. (2000). The 32nd annual Phi Delta Kappa/Gallup poll of the public's attitudes toward the public schools. Phi Delta Kappan, 82, 41–57.

Schlaug, G., Forgeard, M., Zhu, L., Norton, A., Norton, A., & Winner, E. (2009). Training-induced Neuroplasticity in Young Children. *Annals of the New York Academy of Sciences*, *1169*(1), 205-208.

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., Oberle, E., Lawlor, M., Abbott, D., Thomson, K., Oberlander, T., & Diamond, A. (2011). Enhancing cognitive and social emotional development through a simple to administer school program.*Manuscript submitted for publication*.

Seligman, M. E. (1995). The effectiveness of psychotherapy: the Consumer Reports study. *American Psychologist*, *50*(12), 965.

Solberg, M. E., & Olweus, D. (2003). Prevalence estimation of school bullying with the Olweus Bully/Victim Questionnaire. *Aggressive behavior*, *29*(3), 239-268.

Stiles, J. (2008). The fundamentals of brain development: Integrating nature and nurture. Cambridge, MA: Harvard University Press.

Thompson, E. (2007). Mind in life: Biology, phenomenology and the sciences of mind. Cambridge, MA: Harvard University Press.

van de Weijer-Bergsma, E., Langenberg, G., Brandsma, R., Oort, F. J., & Bögels, S. M. (2014). The effectiveness of a school-based mindfulness training as a program to prevent stress in elementary school children. *Mindfulness*, *5*(3), 238-248.

Wallace, B.A. (2006). The attention revolution: Unlocking the power of the focused mind. Somerville, MA: Wisdom; 2006.

Wallmark, E., Safarzadeh, K., Daukantaitė, D., & Maddux, R. E. (2013). Promoting altruism through meditation: an 8-week randomized controlled pilot study. *Mindfulness*, *4*(3), 223-234.

Weng, H. Y., Fox, A. S., Shackman, A. J., Stodola, D. E., Caldwell, J. Z., Olson, M. C., ... & Davidson, R. J. (2013). Compassion training alters altruism and neural responses to suffering. *Psychological science*, *24*(7), 1171-1180.

Zeidan, F., Johnson, S. K., Diamond, B. J., David, Z., & Goolkasian, P. (2010). Mindfulness meditation improves cognition: evidence of brief mental training. *Consciousness and cognition*, *19*(2), 597-605.

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*, *6*(2), 154-160.

Zimbardo, P. G. (1995). The psychology of evil: A situationist perspective on recruiting good people to engage in anti-social acts. Research in Social Psychology, 11, 125-133.

Zoogman, S., Goldberg, S. B., Hoyt, W. T., & Miller, L. (2014). Mindfulness Interventions with Youth: A Meta-Analysis. *Mindfulness*, 1-13.

Story Stem Narrative Coding Schematics

Dimensions of Pro-sociality
   The rationales offered by the child are coded on five dimensions of pro-social reasoning. This coding considers the entire narrative offered by the child (rather than just their concluding statements, as is the case with the coding of the story resolution described below). All verbalizations are graded on a 0-3 scale as described below. In general, higher scores indicate narratives that are more cohesive and elaborative, in which children demonstrate an understanding of the causes of the central story conflict and how the given dimension might aide in resolving this conflict.

A) <u>Perspective-Taking</u>: the extent to which child draws from multiple perspectives to understand and resolve the story. This can involve references to the child's own PERSONAL experience (e.g., their inclination to put themselves in the shoes of the story characters), or references to what the child would do in the characters' positions. Crucially, the child is considering the "viewpoint" of characters outside the primary protagonist.

   0 = no recognition of points of view outside that of the primary protagonist
   1 = child mentions similarity between self or personal experience, or between other characters in the story but provides no further elaboration or description of similarity and why it is meaningful to the resolution
   2 = child provides specific examples for (1) AND explicitly links them to the actions of the characters in the vignette
   3 = child links specific examples in (2) to actions of characters AND describes how this experience would change the course of action (for either themselves if explaining a prior personal experience) or the story characters

B) <u>Emotional language</u>: extent to which children describe the actions of the protagonists using emotional terms (e.g., sad, happy, angry, etc.)

   0 = No emotional descriptions or language consistent with emotional state
   1 = Decontextualized description or evocation of emotional state (language or description not connected to specific instances in the story or conjecture about characters' actions)
   2 = Description or evocation of emotional states that are elaborated and contextual
   3 = Description or evocation of emotional states that are elaborated and contextual AND are used to justify a change in action or behavior

Tally number of emotional expressions/evocations as well as specify whether positive/negative

C) Compassion: extent to which children describe instances of empathy or compassion within the story, or personal feelings of empathy or compassion towards characters in the story. This involves recognition of the causes and potential solutions for the mental/physical suffering or discomfort experienced by characters in the story.

0 =   No language/evocation suggestive of empathy or compassion
1 =   Children describe feelings of empathy/compassion that are decontextualized and not tied to specific events in the story; they do not explicitly reference any cause for suffering or resolution for it
2 =   Children provide contextual examples of empathy/compassion and how they are related to the specific suffering experienced by the story characters
3 =   Children provide contextual examples of empathy/compassion AND describe how this would justify or change an action/behavior

Tally number of empathic/compassionate expressions or evocations; denote when children explicitly use terms "empathy" or "compassion"

D) Equanimity: extent to which children bias story re-telling & resolution toward particular party

0 =   very strong bias toward one character to the exclusion of all others; no recognition that other perspectives might matter or deserve consideration
1 =   other parties deserve recognition but re-telling/resolution still biased
2 =   show generalized evaluative impartiality that is implicit and/or not tied to action (e.g., suggestion that everyone should play fair, but no rationale or example provided)
3 =   child considers all parties in resolving the story; recognition that principles (e.g., of fairness, kindness, justice, etc.); recognition is tied to action or consequence regarding how story should be resolved

E) Mental states: extent to which children describe or reference the mental states or thoughts of the target protagonist or other characters in story

0 =   No description of mental states/thoughts of agents in vignette
1 =   Children reiterate thoughts or mental states described in story but do not elaborate on the perspective of the characters beyond this redescription
2 =   Children describe new perspectives/thoughts/mental states for the story characters but do not connect them to specific actions these characters might take
3 =   Children elaborate on (2) by connecting perspectives/thoughts/mental states to new actions or changes in behavior on part of the story characters

Story Resolution

      Because children may offer several solutions during the course of the story, we chose to code their final verbalization following the last prompt from the Experimenter ("so if you had to end the story here, what would you say? What's the last thing that happens?"). Each child's solution to the story was coded into one of four possible categories as described below:

a) No solution or reiteration: Children offered no resolution to the central conflict, or simply reiterated facts from the story without elaborating on them

b) Egalitarianism: Children offer a resolution that has benefits (or consequences) for all parties involved. The needs of all characters in the story are addressed (although they may not be addressed in equal detail)

c) Favoritism: Children offer a resolution that is biased toward one party; the needs of the other characters in the story are not included in the resolution. (Example: Children elect that the boy should stop playing music so his mother's head feels better.) Note that this solution does not automatically entail that the solution is not pro-social; it is merely targeted toward one party more than others

d) Deference to authority: Children propose that the best way to resolve the story is through the intervention of an authority figure, such as a parent or teacher. This authority figure then decides how the conflict should be fixed. (Example: the boy's mother makes the children play elsewhere; the girl says that their teacher should decide how long they can play with her sister).