Benefits of a Mindfulness-Based Program

in Early Childhood Classrooms

by

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A thesis submitted in conformity with the requirements
for the degree of Doctor of Philosophy
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Doctor of Philosophy (2015)

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Abstract

The effects of a 6-week mindfulness-based intervention program on children's social and emotional functioning in kindergarten classrooms were examined in two related studies. Eight Ontario full-day kindergarten (FDK) classrooms were randomly assigned to either the Mindfulness Group or to a Control Group. The first study examined the effects of the intervention on a direct performance-based measure of self-regulation and a behavioral screening questionnaire completed by teachers. The analyses revealed that the Mindfulness Group showed stronger self-regulation skills, more prosocial behaviors and less hyperactive behaviors relative to the Control Group after receiving the mindfulness-based program. The Control Group showed limited change in the dependent variables over the course of this study. Thus, the results offer preliminary support of implementation of a mindfulness-based program in kindergarten classrooms. The second study examined children's sharing behavior. The analyses of the results from a task designed to examine children's sharing behavior showed no significant differences in general sharing behavior between the Mindfulness Group and the Control Group. However a general pattern of differences in sharing behavior

emerged, offering some support for the hypothesis that children participating in the mindfulness-based program would share more than children who did not participate in the program. Further, in part of the task involving sharing behavior with a "sick stranger" (one of the recipients included in the task), analyses revealed that more children from the Mindfulness Group shared with the *sick stranger* than children from the Control Group. This finding suggested that the mindfulness-based program increased children's empathy. Furthermore, children's reasons for sharing were recorded, coded and analyzed. Two distinct reasons for sharing emerged: reasons related to (1) Characteristics of the Recipient and reasons related to (2) Wanting to Behave Prosocially. However no significant between-group differences were found in children's reasons for sharing. As such, both groups were collapsed and reasons for sharing for all children participating in the study were reported both quantitatively and qualitatively. Implications of this study and directions for future research on mindfulness-based programs in early childhood classrooms are discussed.

Acknowledgments

There are so many people who have contributed to this work, both directly and indirectly. Thank you to my thesis supervisor, Dr. Michal Perlman. You have taught me so much about the science of research, inspiring and motivating me to continue in that direction. A good measure of a good teacher. Thank you to my committee members Dr. Rhonda Martinussen and Dr. Janette Pelletier for your time and important feedback throughout this process. Dr. Jack Miller and Dr. Mary-Louise Vanderlee, I am so grateful for your support and for your presence at my defense. Thank you for believing in this work. To my statistical consultant Dr. Olesya Falenchuk, I'm not only grateful for your help with statistics, but for always having a great metaphor to help me understand all the other aspects of this process that came up for me. You have kept me on track and perhaps unknowingly gave me the strength and confidence I needed to keep going.

I am also so grateful to everyone who worked directly on this project. Thank you to all my research assistants for your help and hard work. Particularly Saira John for being so invested and reliable. To my little assistants Leo and Clea, thank you both for your help stuffing envelopes and for posing as the "sick stranger". Thank you to all the teachers and children who participated in my study. Lana, Debbie, Steve, Robin, Vanessa, Lillian, Christa and Joanne, thank you for welcoming me into your classrooms and for the time you spent to help with this project. And thank you for giving me the opportunity to revisit why I loved being a kindergarten teacher. Those months were by far the most enjoyable part of this project, not to mention, the most important.

When I attempted to "plan out" how I envisioned this process to unfold, Michal had warned me to "always expect the unexpected". Throughout the last 4 ½ years, I truly experienced what that means. Thank you to all my friends who supported me and helped me deal with the various "unexpecteds" that showed up in my life over the last few years. Moronike, Nadia, Shelly, Michelle, Bev, Beatrice, Claire, Pierre, Lee, Rhiannon and Andrew, your friendship means everything to me. And thank you to my partner Julie. Your interest in my work, your support, help and patience, and of course, your love, have been instrumental to the successful completion of this work. We've been through thick and thin, and everything in between, and I feel so happy to be here now with you.

To my sisters Pascale and Gaby, I'm so proud of both of you and see how the last few years have been so transformative for all three of us. It makes me realize how connected we are and I feel so grateful that we have each other. To my Mom and Dad, thank you for all of your unconditional love and support. You're my favourite people to make happy and proud.

Finally, this work is dedicated in loving memory of my dear friend Laura Hamilton. We shared a passion and commitment to making kids happy and she has contributed to this journey of mine more than any single person. Ten years ago, she taught me the importance of getting in touch with my spiritual side. Through her embodiment of strength, kindness, love and compassion, she inspired me to always work on being my best self. Throughout her own journey, she has touched so many people. I am so grateful to be one of them.

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Preface

This dissertation consists of two papers that explore the benefits of implementing a mindfulness-based program in full-day kindergarten (FDK) classrooms. Mindfulness is a heightened way of paying attention and of being present in our awareness of experiences in each moment. It can be applied to sensory experiences, thoughts and emotions by using sustained attention to notice our experience without reacting, or judging it as good or bad (Bishop, 2004; Flook, et al., 2010; Kabat-Zinn, 1990; Napoli, Krech, & Holley, 2005). Mindfulness-based programs designed specifically for classrooms are beginning to emerge (see Meiklejohn, et al., 2012 for a review). Research exploring the efficacy of these programs has demonstrated that their implementation into classrooms is associated with various positive outcomes such as better self-regulation (Flook, et al., 2010; Razza, Bergen-Cico & Raymond, 2013) and improved social and emotional skills (Schonert-Reichl & Lawlor, 2010). Self-regulation and social and emotional skills develop in early childhood and are believed to foster prosocial behavior (Liew, 2012; Meiklejohn, et al., 2012; Skibbe, Connor, Morrison & Jewkes, 2011). Empathy is an important social and emotional skill that develops in early childhood and is believed to motivate prosocial behaviors such as helping, comforting and sharing (Paulus & Moore, 2012; Rieffe, Ketelaar, & Wiefferink, 2010; Robinson, 2008). The development of self-regulation and prosocial behavior facilitate young children's healthy responses to the expectations in the classroom (Zelazo & Lyons, 2012), however to my knowledge only one published study has shown the efficacy of implementing a mindfulness-based program in an early childhood classroom (Razza, et al., 2013; Willis & Dinehart, 2014).

In this dissertation, I explored whether implementing a mindfulness-based program in

kindergarten classrooms with 4-6 year-old children influenced their self-regulation and behaviors related to social and emotional competence. To do this, I adapted and implemented a mindfulness-based program designed for classrooms serving children between the ages of 4 and 12, developed by an organization called Mindful Schools. I was trained and certified to deliver this program and used my knowledge and past experiences of working with this age group as a kindergarten teacher to make adaptations to the program in order to meet the children's developmental needs (see Appendices 1-3 for sample lessons of the program and Appendix 4 for a list of adaptations). I delivered 20-minute lessons, 3 times a week for a 6-week period.

The classrooms participating in this study were either in their first or second year of implementing Ontario's full-day kindergarten (2 classrooms in their first year; 6 classrooms in their second year). Seven of the 8 classrooms participating in this study had more than 26 students (range of 27-31 students in each class) with one certified teacher and one registered early childhood educator. The only classroom with less than 20 students had only one certified teacher and was in the control group.

In the first study presented in paper 1, I present a theoretical model of self-regulation for understanding the potential mechanisms that underlie the effects of mindfulness on children's behavior (Ursache, Blair & Raver, 2012; Zelazo & Lyons, 2012). I describe in detail how the model involves an interaction between cognitive and emotional components of self-regulation. In this bidirectional model, cognitive or "top down" components refer to processes that are more controlled whereas emotional or "bottom up" components refer to processes that are more automatic (see Figure 1). I further explain how optimal arousal is needed for both processes to become integrated to produce gains in self-regulation (see

Figure 2). I also describe how these gains in self-regulation lead to improvements in children's behaviors related to social and emotional competence, specifically prosocial behavior and hyperactivity. Following a literature review of mindfulness-based programs in classrooms, I report the results of a direct performance-based measure of self-regulation called the Head-Toes-Knees-Shoulders (HTKS) task and the teacher version of a behavioral screening questionnaire called the Strengths and Difficulties Questionnaire (SDQ). The HTKS was administered before (Time 1) and after (Time 2) the six-week intervention period to explore whether children receiving the program (Mindfulness Group) improved in this area more than children who did not receive the program (Control Group). The SDQ was completed by teachers at Time 1 and Time 2 and was used to assess teachers' perceptions of children's prosocial and maladaptive behaviors at both time points as a result of the mindfulness-based program. Finally, I tested whether children with difficulties in self-regulation, prosocial behaviors and maladaptive behaviors relating to hyperactivity benefited more from the program than children who do not exhibit difficulties in these domains.

The second part of my dissertation research extended the investigation of the relationship between young children's self-regulation, social and emotional competence and prosocial behaviors. Specifically, I chose to explore one of the prosocial behaviors (sharing) from the SDQ Prosocial Behavior scale to explore in more depth. Thus the second paper examines children's sharing behavior on a task in which they are asked if and how they would like to share stickers with four other children. I adapted this task from a measure designed to investigate young children's prosocial and sharing behavior with three different recipients (*friend*, *nonfriend* and *stranger*) (Moore, 2009). To explore the relationship between children's sharing behavior and empathy, I added a fourth recipient, a *sick stranger*.

Children were given 10 stickers and instructed to share (with the different recipients) or keep as many as they wanted. I compared general sharing behavior of children in the Mindfulness Group to children in the Control Group. I also explored whether more children from the Mindfulness Group, compared with children from the Control Group shared stickers with the *sick stranger*. I then analyzed the reasons children gave for sharing with the four recipients.

The goal of both papers was to explore whether mindfulness is beneficial to young children by providing a detailed report of the impact of the different components involved in the mindfulness-based program used in this study (see Figure 3 for a detailed description of the components of mindfulness-based programs and their impact on children). A variety of measures was selected to provide data that both complement and build on each other to allow for a deeper understanding of the range of potential benefits experienced by children participating in mindfulness-based programs in early childhood classrooms such as kindergarten. The first paper presents quantitative findings to investigate improvements in children's self-regulation and behaviors (specifically, prosocial behaviors and maladaptive behaviors related to hyperactivity). The second paper builds on these findings by exploring prosocial behavior specifically through a quantitative task measuring children's sharing behavior. Also, as empathy is a social and emotional skill that drives sharing behavior, the task included a measure of children's empathy. Finally, to better understand the results of this task, qualitative responses of children's reasons for sharing are analyzed. As such, the findings of the first paper are quantitative while the findings of the second paper are both quantitative and qualitative. The results from both papers provide a fuller report of the effects of a mindfulness-based program on young children in full-day kindergarten classrooms.

Figure 1

Bidirectional model of self-regulation
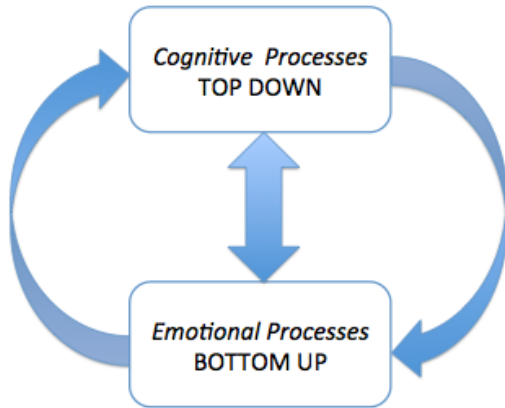
Figure 2

Practicing self-regulation
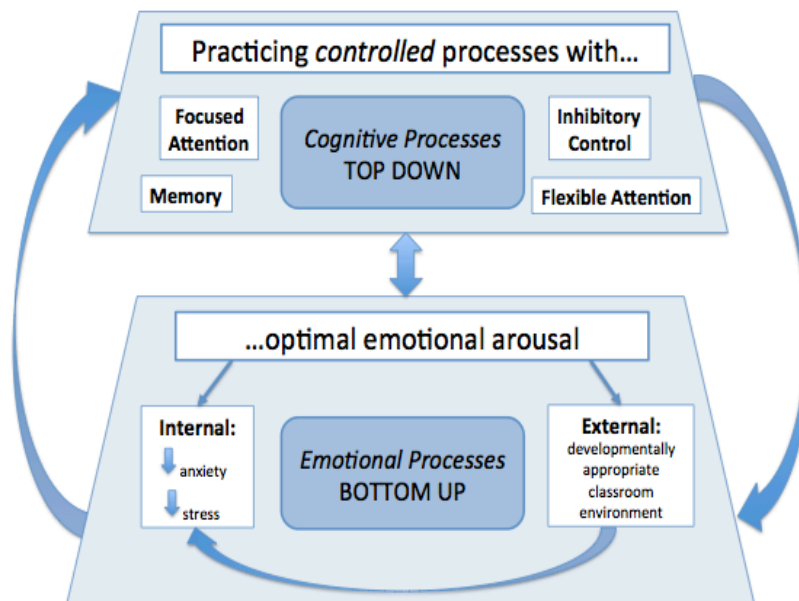
Figure 3

Components of mindfulness-based programs and their impact on children

MINDFULNESS-BASED PROGRAM

Mindful Awareness Practices

Practicing *emotional* processes:

BOTTOM UP

During practice

Mind wanders
(i.e., to a thought/
emotion)

identify emotion

label emotion as neutral

Facilitating *cognitive* processes:

TOP DOWN

Social and Emotional Learning

After practice

group discussion
(sharing about emotions)

develop
awareness
of emotions
(in self and others)

independent
reflection
(journaling)
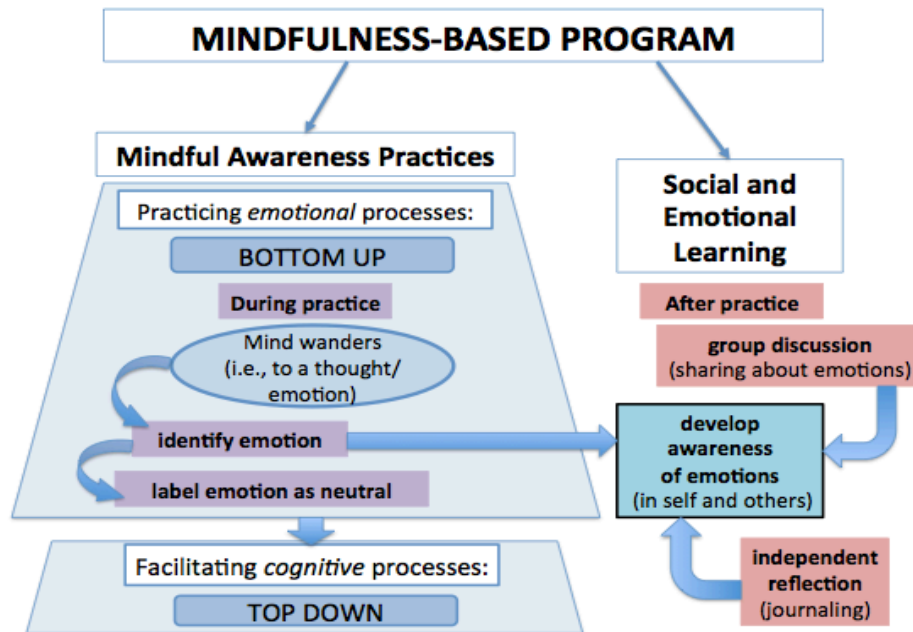
STUDY #1

A mindfulness-based program in early childhood classrooms:

Effects on young children's self-regulation and behavior

ABSTRACT

The effects of a mindfulness-based program on children's self-regulation, prosocial behaviors and maladaptive behaviors were examined in a randomized-controlled study of 127 children (ages 4-6) in 8 full-day kindergarten (FDK) classrooms that were assigned to either the Mindfulness Group ($n = 72$) or to a Control Group ($n = 55$). The program consisted of 20-minute lessons, delivered 3 times a week, for 6 weeks. The Head-Toes-Knees-Shoulders (HTKS) task was used as a direct performance-based measure of self-regulation. The teacher version of the Strengths and Difficulties Questionnaire (SDQ) was used to assess children's prosocial and maladaptive behaviors in five dimensions: Prosocial Behavior, Hyperactivity, Emotional Symptoms, Conduct Problems and Peer Problems. Data from these measures were collected before (Time 1) and after (Time 2) the 6-week period of the study intervention. HTKS scores and scores from 2 of the 5 SDQ scales (Prosocial Behavior and Hyperactivity) improved more in the Mindfulness Group than in the Control Group. Children in the Mindfulness Group improved in self-regulation as measured by the HTKS. They also showed more prosocial behaviors and less hyperactive behaviors. This was especially true for children who had lower HTKS and SDQ scores (on the Prosocial Behavior and Hyperactivity scales) at Time 1. Results highlight the benefits of mindfulness-based programs for children in early childhood classrooms and indicate that they are particularly effective for children with difficulties in self-regulation, prosocial behaviors and maladaptive behaviors related to hyperactivity.

A mindfulness-based program in early childhood:

Effects on young children's self-regulation and behaviors

Mindfulness is commonly defined as "paying attention in a particular way: on purpose, in the present moment, and non-judgmentally" (Kabat-Zinn, 1994, p.4). Almost all cultures have been practicing mindfulness in some form for centuries (Siegel, 2007). In the last few decades, mindfulness-based programs have been developed in western cultures and are now being used across a variety of settings (Hooker & Fodor, 2008). Mindfulness-based stress reduction (MBSR) is the original mindfulness-based program in the west. This program was designed to teach patients how to manage their various medical and psychological symptoms through practicing a series of mindful awareness practices (Kabat-Zinn, 1982; Miller, Fletcher, & Kabat-Zinn, 1995). Research showing the outcomes of MBSR programs in clinical settings showed promising results and has since expanded to include a range of populations, from health care practitioners (Shapiro, Astin, Bishop, & Cordova, 2005) to prisoners (Samuelson, Carmody, Kabat-Zinn, & Bratt, 2007) to individuals looking to improve their overall well-being (Shapiro, Oman, Thoresen, Plante, & Flinders, 2008). As studies reporting the benefits of mindfulness-based programs for adults proliferate, there is a growing interest in exploring how mindfulness-based programs can also benefit adolescents and children. Although most studies within the last decade have focused on age-appropriate mindfulness-based programs delivered to adolescents and children in clinical settings (see Burke, 2010 for a review), the implementation of mindfulness-based programs in educational settings is increasing (Greenberg & Harris, 2012; Meiklejohn, et al., 2012; Willis & Dinehart, 2014; Zelazo & Lyons, 2011). The host of outcomes associated

with implementing mindfulness-based programs in schools includes better executive functions and attention (Flook, et al., 2010; Napoli, et al., 2005; Razza, et al., 2013), improved social skills (Beauchemin, Hutchins & Patterson, 2008; Schonert-Reichl & Lawlor, 2010) as well as increased emotional regulation and overall wellbeing (Broderick & Metz, 2009). In light of these benefits for children and adolescents in school-age and high school classrooms, it is important to explore the effects of a mindfulness-based program on young children in early childhood classrooms.

In the current study, I use a theoretical model of self-regulation to explore whether implementing a mindfulness-based program in full-day kindergarten classrooms improves children's self-regulation. Researchers examining self-regulation in school settings have described the behavioral aspects of self-regulation to include "deliberately applying attentional flexibility, working memory, and inhibitory control to overt actions" (McClelland & Cameron, 2011, p. 32). The development of self-regulation skills in early childhood is particularly important because these abilities are taxed as young children are required to meet the demands of the classroom (Allan & Lonigan, 2011; Willis & Dinehart, 2014; Zelazo & Lyons, 2011). Moreover, self-regulation plays an important role in children's prosocial and maladaptive behaviors in early childhood (e.g., Allan & Lonigan, 2014). Prosocial behaviors as measured by the SDQ (Goodman, 1997), relate to actions children engage in voluntarily to benefit another (Eisenberg & Fabes, 1998). Maladaptive behaviors as measured by the SDQ relate to emotional and social problems such as emotional symptoms, peer and conduct problems as well as hyperactivity (Goodman, 1997). Programs designed to foster self-regulation have also shown reductions in behaviors related to hyperactivity (Reid, Trout & Schartz, 2005). Therefore, I hypothesized that children participating in the mindfulness-based

program would also show a reduction in maladaptive behaviors related to hyperactivity. Most of the maladaptive behaviors related to the other three scales on the SDQ (Emotional Symptoms, Peer Problems and Conduct Problems) are more chronic in nature. As such, a more intensive intervention would likely be required in order to see changes in these behaviors. Also, some of the behaviors on these scales require change not only in the child, but in the people around them (e.g., "generally liked by other children" from the Peer Problems scale). Thus, while the whole SDQ was administered, behaviors related to those three scales were not expected to change over this short period (6-weeks). This will be discussed in more detail in the discussion section of this paper. In the sections that follow, I review the literature on how mindfulness-based programs have been adapted to meet the developmental needs of the various age groups of children in educational settings. I then draw on the literature documenting the benefits of such programs in classrooms to make inferences about how their implementation in an early childhood classroom (i.e., full-day kindergarten) could improve children's self-regulation and behaviors. The application of a theoretical model involving the integration of cognitive and emotional components of self-regulation (described in more detail in the next section) is discussed throughout this introduction.

Adapting mindfulness-based programs for children

Mindfulness-based programs for adults typically run for 8-10 weeks, with single weekly 2-3 hour group sessions. During these sessions, the instructor focuses the lesson on a particular mindfulness exercise and topic (Grossman, Niemann, Schmidt, & Walach, 2004; Proulx, 2003). The lessons include exercises described as either formal mindful awareness

practices (e.g., sitting meditation, body scan) or informal mindful awareness practices (e.g., mindful communication, mindfulness in routine activities). Practices are supported by various topics related to mindfulness such as acceptance, loving-kindness and gratitude (Kabat-Zinn, 1990). Variations of this format have been used in research to examine the impact of such programs on a variety of populations (Meiklejohn, et al., 2012).

Although studies examining the effects of practicing mindfulness with a number of populations have reported a range of benefits such as increased emotional regulation (Broderick & Metz, 2009) and improved executive functions (Chambers, Lo & Allen, 2008; Flook, et al., 2010), as well as reduced symptoms of anxiety, depression and stress (Baer, Carmody & Hunsinger, 2012; Grossman, et al., 2004; Shapiro, Schwartz, & Bonner, 1998; Shapiro, et al., 2008), the exact mechanism underlying how mindfulness works is still unclear (i.e., Chiesa, Serretti & Jakobsen, 2013). The outcomes relate to either controlled regulatory processes (emotional regulation; executive functions known as top down cognitive processes) or automatic influences on behavior (symptoms of anxiety, depression and stress known as bottom up emotional processes). Therefore, it has been suggested that the mechanism involved follows a bidirectional process whereby the mindful awareness practices influence both top down and bottom up processes. That is, mindful awareness practices target both the cognitive regulatory processes by way of training in paying attention to the present moment (top down) while the non-reactive and non-evaluative nature of the practices reduces the automatic emotional influences that affect behavior (bottom up). Both top down and bottom up processes interact with each other allowing both cognitive and emotional regulation to improve over time (Ursache, Blair & Raver, 2012; Zelazo & Lyons, 2012). The theoretical model used to explain how this interaction produces change will be

described in greater detail following a review of the literature exploring the effects of mindfulness-based programs on children in classroom settings. Research exploring outcomes of mindfulness-based programs provides information about the processes underlying the mechanism associated with mindfulness. In turn, understanding how mindfulness works will inform how to design mindfulness-based programs to best target certain outcomes for particular populations such as children in classrooms settings.

The mechanism involved in practicing mindfulness is thought to be similar for both adults and children (Zelazo & Lyons, 2011; Zelazo & Lyons, 2012). As a result, existing research studies examining outcomes of mindfulness-based programs for children have adapted the format for programs designed for adults to accommodate to the developmental level and needs of the particular age group of the children in the classroom receiving the program (Davidson, et al., 2012; Greenberg & Harris, 2012; Meiklejohn, et al., 2012; Zelazo & Lyons, 2012). Due to the nature of children's developing cognitive abilities, mindfulness-based programs for children require adaptations to both the delivery of the sessions and to the nature of the mindful awareness practices to ensure that they are age-appropriate (Burke, 2010; Davis, 2012; Hooker & Fodor, 2008; Semple, Reid, & Miller, 2005; Thompson & Gauntlett-Gilbert, 2008). For example, as children's cognitive functioning developments, their thinking becomes more abstract. However, younger children's thinking is still focused on concrete observable events (Liu & Cummings, 1997; Mensah, 2011; Tuch, 2011). As such, Hooker and Fodor (2008) recommend that exercises are "clear, concrete and descriptive in their instruction" (p. 9). They also recommend that the delivery of lessons follow a progression that is in line with the concrete nature of children's thinking by starting the program with a focus on more concrete mindful awareness practices (such as focused

attention on a particular sound) before moving to more abstract mindful awareness practices (such as focused attention to thoughts in the mind) (Hooker & Fodor, 2008). Also, formal mindful awareness practices must be adapted to account for children's limited self-regulation skills (Burke, 2010; Zelazo & Lyons, 2012). For example, while adults in mindfulness-based programs are typically expected to practice formal mindful awareness practices such as mindful breathing meditation for up to 40 minutes per day (Kabat-Zinn, 1990), Saltzman and Goldin (2008) state "a general rule of thumb is that children usually can practice one minute per their age in years" (p.142).

Another aspect that has been adapted for children is the structure of mindfulness-based programs, which includes the duration of the program as well as the frequency and length of the sessions. Research using different variations of mindfulness-based programs contributes to understanding how each aspect (delivery and nature of practices, duration of program and frequency of sessions) of the adapted programs yields benefits for children (Greenberg & Harris, 2012; Zelazo & Lyons, 2012).

Mindfulness-based programs in classrooms: Benefits for children

Many research studies have provided evidence for the benefits of mindfulness-based programs for adults (see Keng, Smoski, & Robins, 2011 for a review) as well as for adolescents and children (see Harnett & Dawe, 2012 for a review). As schools offer consistent and regular access to all children during their formative years (Schonert-Reichl & Oberle, 2011), there is a growing interest in studying the efficacy of implementing mindfulness-based programs into schools (see Meiklejohn, et al., 2012 for a review). Studies examining the benefits of mindfulness-based programs in classrooms have focused on

outcomes related to skills and behaviors children need in order to experience success in school. Self-regulation and social and emotional competence are significant predictors of school success (e.g., McClelland & Cameron, 2012; O'Brien, Shriver & Weissberg, 2003) therefore skills and behaviors related to these areas are the common outcomes explored in research documenting the benefits of implementing mindfulness-based programs in classrooms. Although this field is growing rapidly, it is important to consider that the few existing studies (e.g., Flook, et al., 2010; Napoli, et al., 2005; Schonert-Reichl & Lawlor, 2010) documenting the benefits of implementing mindfulness-based programs in classrooms have varied on multiple levels. These studies differ on the aspects of the particular program being implemented (e.g., nature of practices, duration of program and frequency of sessions) as well as the design of the study itself (e.g., specific outcomes being measured, types of measures used and age group of children) (Meiklejohn, et al., 2012).

For example, Napoli, et al., (2005) conducted a randomized-controlled study using the Attention Academy Program (AAP), a mindfulness-based program primarily focused on movement activities (such as mindful yoga) designed to help increase children's ability to pay attention. Nine classrooms (grades 1-3) within two elementary schools took part in the study. The 194 children participating in the study were randomly assigned to receive the AAP twice a month over a 24-week period while the other half participated in other activities (i.e., reading). Pre and post-tests included a child self-report questionnaire assessing test anxiety and a teacher-report assessing children's attention-deficit/hyperactivity disorder (ADHD) as well as two performance-based tasks measuring children's selective and sustained attention. Results showed that compared to children in the control group, children who participated in the mindfulness-based program improved on measures of selective

attention and showed a reduction in test anxiety and teacher-ratings of behaviors related to ADHD. The use of multiple measures, including self-reports, teacher-reports and performance-based tasks, in addition to the quality of the design of the study (randomized-controlled, pre/post tests methodology, relatively large sample size), contribute to the strengths of this study and provide evidence for the efficacy of implementing mindfulness-based programs in classrooms for children. However, as the duration of the APP was relatively long with sessions spread out (24-weeks with bimonthly sessions), more research documenting the benefits of programs using a different structure (i.e., shorter, with more frequent sessions) will provide insight into how much mindfulness practice is necessary to predict particular outcomes (Meiklejohn, et al., 2012). Also, research examining the effects of other programs with different types of mindful awareness practices (i.e., sedentary practices) will help determine what common processes underlie the effectiveness of mindfulness-based programs for children.

In fact, in another randomized-controlled study with a smaller sample size ($n = 64$) of a similar age group (grades 2 and 3), Flook et al., (2010) used a program called InnerKids to understand the impact of a mindfulness-based program involving primarily sedentary mindful awareness practices for children (such as sitting meditation and meditation lying down) over a shorter period, with more frequent sessions. The program was delivered twice a week over 8-weeks and both teachers and parents reported improvements in children's executive functions. While this study also revealed the possible benefits of mindfulness-based programs for children in classrooms, the data are based solely on teacher and parent reports which could be biased by informants' perceptions and attitudes. Therefore more research is needed to validate the notion that mindfulness-based programs implemented in

classrooms can improve skills related to school success by including multiple types of measures such as direct performance-based measures and/or child questionnaires. Also, rather than measuring a single outcome (i.e., executive functions), examining a variety of developmentally appropriate outcomes would contribute to a better understanding of how mindfulness-based programs can best target a particular age group.

For example, to measure the effects of a program called Mindfulness Education (ME) on children's well-being and social and emotional competence, Schonert-Reichl and Lawlor (2010) conducted a randomized-controlled study with a larger ($n =246$) and a slightly older sample of children (grades 4-7) than the above-mentioned studies. Six of the 12 classrooms participating in this study received the ME program, delivered by the classroom teachers once a week for 10 weeks (approximately 40-50 minute sessions) while the other 6 classrooms were assigned to a wait list control group. The possible outcomes hypothesized to change for children participating in the program were guided by the four components of the ME program; quieting the mind, mindful attention, managing negative emotions and negative thinking, and acknowledgement of self and others. Results from pre and post child-reports of 3 possible outcomes (optimism, self-concept and affect) showed increases in optimism; however, no group differences were found on the self-concept or affect measures. In addition, pre and post results of the *Teachers' Rating Scale of Social Competence* revealed significant increases in children's social and emotional competence (Schonert-Reichl & Lawlor, 2010).

The similarities and differences between the programs used, and variations in the design of the studies themselves, provide important information about the efficacy of implementing mindfulness-based programs into educational settings. In fact, findings from

the above-mentioned studies have demonstrated that regardless of the nature of the mindful awareness practices (movement vs. sedentary), duration of the program and frequency of the sessions (long with infrequent sessions vs. short with frequent sessions), mindfulness-based programs implemented in classrooms promote change on age-appropriate outcomes related to skills and behaviors needed for school-age children to experience school success.

As little is known about the efficacy of implementing mindfulness-based programs in early childhood classrooms (Willis & Dinehart, 2014; Zelazo & Lyons, 2012), the current study builds on the findings with school-age children by implementing a mindfulness-based program over a short period (6 weeks) with frequent sessions (three times a week) in full-day kindergarten classrooms. Similar to the InnerKids program, the mindful awareness practices included in the Mindful Schools program used in this study are mainly sedentary in nature with a focus on sensory experiences (mindful seeing, listening, eating) and on reflection (see Appendix 1-3 for sample lessons). Moreover, given there is a strong connection between improvements in areas related to self-regulation and behaviors related to social and emotional competence (i.e., prosocial behavior, hyperactivity) (e.g., Riggs, Jahromi, Razza, Dillworth-Bart & Mueller, 2006), I measured self-regulation, prosocial behavior and hyperactivity to provide insight into how mindfulness-based programs may influence outcomes related to school success for young children in early childhood classrooms.

Mindfulness-based programs for children and increasing self-regulation

Several studies have demonstrated the link between practicing mindfulness and improvements in areas related to self-regulation with adults (Jha, et al., 2007; Tang, et al., 2007; Valentine & Sweet, 1999; Weick & Sutcliffe, 2006) as well as with adolescents and

children (Bogels, et al., 2008; Broderick & Metz, 2009; Flook, et al., 2010; Napoli, et al., 2005; Semple, et al., 2005; Semple, et al., 2009; Zylowska, et al., 2008). To better understand the theoretical model of self-regulation presented in this section, I will first provide some context about the challenges in defining self-regulation.

Self-regulation: Recent studies of the development of self-regulation in young children have identified two underlying constructs in self-regulation; executive functions and effortful control (Liew, 2012; Neuenschwander, Rothlishberger, Cimeli & Roebers, 2013; Razza, Bergen-Cico & Raymond, 2013; Zhou, Chen & Main, 2012; Allan & Lonigan, 2014). Stemming from research in the field of cognitive neuroscience, executive function (EF) is characterized as regulatory processes involving an integrative framework of cognitive components such as working memory, response inhibition and attention shifting (Allan & Lonigan, 2014; Blair, Zelazo & Greenberg, 2005; Garon, et al., 2008; Liew, 2012; McClelland & Cameron, 2011; Razza, et al., 2013). Research in the field of temperament and social and emotional development has identified effortful control (EC) as the key facet of emotion regulation allowing children to control reactivity or emotional arousal. EC and EF involve similar components such as inhibition of a dominant response and executive attention (Eisenberg & Spinrad, 2004; Liew, 2012; Neuenschwander, et al., 2013; Raver, 2004; Razza, et al., 2013; Zhou at al., 2012). Both EF and EC work together to enable children to control their behavior (i.e., inhibit an unhealthy dominant response) in order to adapt to the demands of the environment (Razza, et al., 2013). Although most studies have investigated EF and EC in different ways, recent research has identified the potential overlap between definitions, core components and types of measurements used in studies (Allan & Lonigan, 2014; Liew, 2012). Therefore, an integrated account of self-regulation encompassing both frameworks is

most appropriate when examining them in the context of children's school success (Liew, 2012; Neuenschwander, et al., 2013; Zhou, et al., 2012).

The behavioral measure used in this study (HTKS) was designed to measure the broader concept of self-regulation (involving both EF and EC constructs). This broader concept of self-regulation has been defined as the "capability of controlling or directing one's attention, thoughts, emotions and actions" (McClelland & Cameron, 2011, p.136). Therefore, this definition will be at the forefront of discussion on self-regulation for this study. Furthermore, the relationship between self-regulation and mindfulness-based programs will reflect the theoretical model discussed earlier, linking both cognitive (top down) and emotional (bottom up) processes, as both need to be functioning in a reciprocal and interrelated balance in early childhood classrooms when young children are learning to adjust to their classroom environment. Children achieve this balance between top down and bottom up processes when their emotional regulation (bottom up) is within levels that facilitate their cognitive regulation (top down) (Ursache, et al., 2012). Suboptimal bottom up influences such as emotional arousal from external sources (i.e., the classroom environment) or internal sources (i.e., a negative thought) can overwhelm and override cognitive abilities involved in the top down processes of self-regulation. This in turn hinders children's capacity to regulate emotions, making it difficult for them to control their behaviors (Ursache, et al., 2012; Zelazo & Lyons, 2012). On the other hand, practicing the management and control of top down components of self-regulation such as attention, facilitates the management of emotions, creating a positive feedback loop (Ursache, et al., 2012). In the following section, I will describe how this theoretical model of self-regulation helps explain how mindfulness-based programs for children can improve self-regulation.

Impact of mindfulness-based programs on children's self-regulation: Children participating in mindfulness-based programs engage in a series of experiential exercises requiring them to observe and reflect nonjudgmentally on a particular experience moment-to-moment (Zelazo & Lyons, 2012). The experience can be either internal (e.g., sensations in the body) or external (e.g., the fading sound of a bell) and becomes the "target" that children are instructed to focus and sustain their attention on for the duration of the practice. This provides children with practice in attentional processes that are part of the cognitive top down components of self-regulation (Meiklejohn, et al., 2012; Zelazo & Lyons, 2011). Moreover, children also practice reflective processes as they are instructed to simply become aware of their thoughts and emotions, without judging them as good or bad (i.e., viewing them as neutral). Top down components of self-regulation work best with emotionally neutral stimuli (Razza, et al., 2013). Thus, practicing objective nonjudgmental awareness of what arises in the present moment (i.e., thoughts and emotions) interacts with emotional bottom up components of self-regulation. This also produces the optimal levels of arousal needed to facilitate the functioning of top down components of self-regulation (Ursache, et al., 2012; Zelazo & Lyons, 2012). Therefore, mindfulness-based programs designed for classrooms offer children opportunities to practice self-regulation as they target the same processes involved in both cognitive and emotional components of self-regulation (Meiklejohn, et al., 2012; Zelazo & Lyons, 2011).

In fact, the processes involved in self-regulation and mindful awareness practices both include working memory, flexible attention and inhibitory control (Willis & Dinehart, 2014; Zylowska, Smalley & Schwartz, 2009). Mindful awareness practices target controlled cognitive top down components of self-regulation while lessening more automatic bottom up

influences on behavior. In turn, when bottom up influences (i.e., emotional arousal) are optimal, 'space' is created for reflection and self-awareness as children cultivate the nonjudgmental and nonreactive attitude required when being mindful. This "space" allows them to choose a more appropriate response rather than automatically reacting in their habitual way (Ursache, et al., 2012; Zelazo & Lyons, 2012). Over time, the practices improve children's self-regulation, producing outcomes related to areas of social and emotional competence (i.e., increases in prosocial behavior and reductions in hyperactivity).

For example, when children learn to practice mindful breathing, the target is their breath. In stillness, they pay attention to their in and out breath and when they notice that their mind has wandered, and thus their attention is elsewhere (i.e., their thoughts), they must remember the instructions of the practice (working memory) and bring their attention back to their breathing (flexible attention). When children practice paying attention to their breath (top down processes) and begin to notice the thoughts that arise during this practice (and the emotions associated with the thoughts), they become aware of the connection between their minds and their bodies (Jennings & Greenberg, 2009). This increased awareness of their body's responses (i.e., sensations) to an emotional stimulus contributes to children's ability to understand their own emotions, which in turn is a precondition for being able to regulate them (Chiesa, et al., 2013; Eisenberg, Smith, Sadovsky, & Spinrad, 2004). Also, increased self-awareness allows children to recognize that where their attention is determines their state. This awareness helps children reduce their emotional reactions to thoughts or emotions (bottom up influences). With practice and guidance, children can learn that bringing their attention to the present moment interrupts their habitual reactions, allowing them to pause and choose an adaptive response instead (inhibitory control). These increases in abilities help

explain how mindfulness-based programs for children can improve self-regulation. In turn, these improvements can set the stage for the healthy development of social and emotional competence by increasing prosocial behaviors and reducing maladaptive behaviors related to hyperactivity. In the next section, I will describe how the improvements in children's self-regulation contribute to children's social and emotional competence. To do this, I will describe the relationship between self-regulation, mindfulness-based programs, prosocial behavior and hyperactivity.

Mindfulness-based programs for children: increasing prosocial behaviors and reducing maladaptive behaviors

Self-regulation plays a key role in children's social and emotional competence (Liew, 2012; Riggs, et al., 2006). Social competence involves children's ability to positively interact with others (i.e., their peers and/or teachers) in a way that allows them to effectively adapt to their environment (e.g., Denham, et al., 2003; Semrud-Clikeman & Schafer, 2000). Emotional competence involves children's ability to become aware of their emotions, to manage their emotions, to identify others' emotions as well as the ability to show empathy (Saarni, 1999; Semrud-Clikeman & Schafer, 2000). In this section, I will discuss how prosocial behavior and hyperactivity relate to areas of social and emotional competence. I will also address how prosocial and hyperactive behaviors relate to self-regulation by describing the impact of the elements of mindfulness-based programs on these behaviors in children.

Prosocial Behavior: Social and emotional competence is essential for children to exhibit prosocial behavior (Humphrey, et al., 2010; Semrud-Clikeman & Schafer, 2000).

Children exhibit prosocial behavior when they engage in actions such as helping, sharing and cooperating, without an expectation of a personal reward (e.g., Eisenberg, Fabes & Spinrad, 2006; Paulus & Moore, 2011). Prosocial characteristics that motivate prosocial behaviors such as empathy and kindness play an important role in children's social and emotional competence (Denham, et al., 2003; Rieffe, et al., 2010; Robinson, 2008; Semrud-Clikeman & Schafer, 2000). Indeed, research examining the importance of social and emotional learning programs in school settings has demonstrated that increases in prosocial characteristics relate to social and emotional competence and to school success (Schonert-Reichl & Oberle, 2011). Moreover, as researchers have recognized the link between mindfulness and increases in prosocial characteristics (i.e., empathy) (Beddoe, & Murphy, 2004; Beitel, Ferrer & Cecero, 2005; Birnie, Speca & Carlson, 2010; Block-Lerner, et al., 2007; Dekeyser, Raes, Leijssen, Leysen & Dewulf, 2008; Shapiro, Schwartz & Bonner, 1998), mindfulness-based programs for children have the potential to increase empathy and prosocial behavior. Moreover, mindfulness-based programs offer children a balanced approach for teaching them about emotions (i.e., through experiential practices, time for reflection, discussion). In turn, children's ability to understand emotions, which is the cornerstone for the development of emotional and social competence, fosters the development of prosocial behavior (Semrud-Clikeman & Schafer, 2000).

For example, as mentioned earlier, mindful awareness practices allow children to develop an awareness of their emotions, which in turn contributes to their understanding of their own and others' emotions (emotional competence). Stronger self-regulation skills allow children to make more adaptive choices over their behaviors when strong emotions arise (Carson & Langer, 2006; Saarni, 1999, 2000). In turn, their social interactions become more

positive (social competence) leading to more prosocial behavior (Denham, Wyatt, Bassett, Echeverria & Knox, 2009). Moreover, the topics related to prosocial behavior explored throughout mindfulness-based programs both complement and add value to the emotional and social competence children gain from the experiential mindful awareness practices (Davidson, et al., 2012). For example, the topic of kindness can be explored by having children engage in an age-appropriate version of loving-kindness meditation. In the Mindful Schools program, an example of this meditation practice involves having children picture a person whom they love (a parent, sibling, friend or teacher were offered as examples) and while sitting with their "mindful bodies" (still body, eyes closed, back straight) to imagine filling up their heart with love and sending that love to the person they have chosen to picture in their mind (see Appendix 3 for a detailed lesson of this practice). Each practice in each session is followed by guided group discussions where children are encouraged to reflect on the connections between their experiences, emotions and behaviors. Therefore, mindfulness-based programs foster the development of social and emotional competence by teaching children about emotions and prosocial characteristics (i.e., kindness, empathy) through the various aspects of the program (Greenberg & Harris, 2012). In turn, with the combination of gains in self-regulation and in knowledge about emotions and prosocial characteristics, children would be expected to be perceived as exhibiting more prosocial behaviors such as helping and sharing and being kind and considerate of other people's feelings. In this study these behaviors are captured using the teacher version of the SDQ Prosocial Behavior scale.

Hyperactivity: On the other hand, poor self-regulation is associated with maladaptive behaviors related to hyperactivity and children with deficits in self-regulation also show problems with social and emotional competence (Diamond, 2005; Semrud-Clikeman &

Schafer, 2000). Hyperactivity is characterized by difficulties in key areas of self-regulation such as attention and inhibitory control. A number of studies have shown evidence of the positive impact of practicing mindfulness on these areas of self-regulation (Oberle, Schonert-Reichl, Lawlor & Thomson, 2012; Napoli, et al., 2005; Rani & Rao, 1996; Rynczak, 2012; Semple, Lee, Rosa & Miller, 2009). In fact, given that interventions designed to promote self-regulation have been linked to a reduction in behaviors related to hyperactivity (Reid, et al., 2005), researchers are beginning to examine how mindfulness-based programs can help children and adolescents with difficulties in attention and inhibitory control (Carboni, Roach & Fredrick, 2013; van der Oor, Bogels & Peijnenburg, 2012; Singh, et al., 2010; Weijer-Bergsma, Formsma, Bruin & Bögels, 2012).

For example, results from two research studies conducted with school-age children (8-12 year-olds) have provided preliminary evidence for the impact of mindfulness-based programs on reducing symptoms exhibited by children with ADHD. Taken together, findings suggest that young children with ADHD benefit from mindfulness-based programs as shown by a reduction in parent and teacher ratings of general hyperactive behaviors and an increase in observed on-task behavior in the classroom (Carboni, et al., 2013) as well as a reduction in parent ratings of ADHD symptoms and teacher ratings of inattention symptoms (van der Oor, et al., 2012). Less is known about the impact of mindfulness-based programs for younger children with ADHD. However, it seems reasonable to also expect a reduction in young children's maladaptive behaviors associated with hyperactivity (such as restlessness, being overactive, fidgeting) and inattention (e.g., easily distracted, wandering concentration). Children who exhibit hyperactive and inattentive behaviors are also at risk for having social and emotional difficulties (Semrud-Clikeman & Schafer, 2000). Thus, mindfulness-based

programs have the potential to also improve children's social and emotional competence by reducing those behaviors. In this study, the Hyperactivity scale from the teacher version of the SDQ was used to capture teachers' perception of reductions of children's behaviors related to hyperactivity.

The positive and adaptive behaviors associated with increases in self-regulation (i.e., behaviors related to social and emotional competence) are important in early childhood. Therefore, it is not surprising that the only published study investigating the benefits of mindfulness in an early childhood classroom examined self-regulation as an outcome. Razza, et al. (2013), conducted a year long, quasi-experimental study with children ages 3-5 years in two preschool classrooms (one intervention and one control). Mindful yoga was implemented daily in the intervention classroom by the classroom teacher. Pre and posttests (both performance-based measures and parent reports) showed gains in multiple areas of self-regulation for children in the intervention group ($n = 16$) compared to children in the control group ($n = 13$). These results support the notion that mindful awareness practices (such as mindful yoga) implemented in early childhood classrooms are an effective and feasible way to improve young children's self-regulation. Limitations of this study include a small sample size ($n = 29$) as well as not using a set program that can be replicated in other studies. Given these limitations, it is important to build on these preliminary findings investigating the impact of mindfulness in early childhood classrooms. The current study implemented a mindfulness-based program with a set program, with set lessons, over a set period in 4 full-day kindergarten classrooms, including a total of 127 children. The classroom environment in full-day kindergarten is designed to support the development of children's self-regulation. For this reason, full-day kindergarten classrooms should be an appropriate setting for

implementing a program offering young children opportunities to practice self-regulation. In the following section, I describe how the various elements that make up the environment in kindergarten classrooms (i.e., external sources) fit into the theoretical model of self-regulation.

Children's self-regulation in kindergarten classrooms

Self-regulation develops rapidly in early childhood (Bodrova & Leong, 2008; Garon, et al., 2008; Posner & Rothbart, 2006) and plays a central role in young children's development and school success (e.g., Blair & Razza, 2007). Kindergarten classrooms can support the development of adaptive self-regulation skills. Moreover, as the demands on children's autonomy are high in kindergarten classrooms, children need an environment that facilitates the integration of both cognitive (top down) and emotional (bottom up) components of self-regulation in order to help them navigate the classroom (Florez, 2011; McClelland & Cameron, 2011). As stated in the province's guideline for early childhood practice, *How Does Learning Happen? Ontario's Pedagogy for the Early Years*: "Educators can play an important role in supporting self-regulation by providing environments that reduce stressors while recognizing and supporting children's efforts and increasing ability to self-regulate" (p. 30). Therefore, children practice self-regulation by interacting with their environment (Florez, 2011). That is, external sources such as the elements that make up the classroom environment play an important role in the development of children's self-regulation in kindergarten (Ursache, et al., 2012). As such, the theoretical model of the bidirectional interaction between both top down and bottom up processes helps to understand how the elements of the kindergarten classrooms contribute to the development of self-

regulation. These elements consist of the types of learning experiences children engage in, the classroom structure as well as the children's relationships with their teachers and peers.

   As mentioned earlier, when children's emotional arousal is too high, automatic emotional bottom up processes overwhelm children's ability to exercise more volitional cognitive top down processes of self-regulation (Florez, 2011; Ursache, et al., 2012). Therefore, it is critical that the classroom environment is developmentally appropriate and provides optimal levels of arousal to enable the healthy development of self-regulation (Charlesworth, 1998; Ursache, 2012). In fact, research shows that children in developmentally appropriate kindergarten classrooms exhibit significantly less stress than children in developmentally inappropriate classrooms (Burts, et al., 1992). Kindergarten classrooms that are developmentally appropriate offer children a learning environment that is planned based on knowledge of child development (Charlesworth, 1998). A developmentally appropriate classroom is designed to support self-regulation with the understanding that "social, emotional and cognitive learning are interconnected to a greater extent in younger children" (Nissen & Hawkins, 2010, p. 256). Developmentally appropriate kindergarten classrooms are child-centered and play-based, structured with developmentally appropriate rules and routines and supported by positive relationships with teachers and peers (Hemmeter, Ostrosky, & Fox, 2006).

Child-centered classrooms offer children a variety of learning experiences that are planned based on their individual interests, differences and needs. In such classrooms, children are offered choices allowing them to engage in self-directed learning through a variety of appropriate materials and learning experiences (Charlesworth, 1998; Nissen & Hawkins, 2010). Therefore, as children are able to choose learning experiences that match

their interests, their developmental level (i.e., neither too stimulating nor not stimulating enough) and their needs, child-centred classroom environments provide optimal levels of emotional arousal (Nissen & Hawkins, 2010). For example, a child developing their fine motor skills may choose to paint using large paintbrushes rather than drawing with markers or crayons which may still be too difficult to manipulate. By providing a variety of appropriate materials (different sized paintbrushes, markers, crayons), the teacher allows the child to regulate their emotional arousal by choosing the material that best meets their developmental level. In addition to meeting children's individual interests and developmental differences, the child-centred classroom environment also offers areas and learning activities that meet individual children's needs. For example, when a child becomes overwhelmed in a learning activity that requires higher levels of attention (i.e., pretend play with peers) they learn to remove themselves from the situation and choose a learning activity requiring less attention (i.e., reading a book in a quiet area) to regulate their emotional arousal (Nissen & Hawkins, 2010; Ursache, et al., 2012). Therefore, developmentally appropriate child-centred kindergarten classrooms provide optimal levels of emotional arousal as children are provided with choices in the types of materials they can use and the types of learning activities they can engage in.

Play is a natural activity for young children and an important medium for children's emotional (e.g., Seja & Russ, 1999) and social learning (e.g., McAloney & Stagnitti, 2009). Developmentally appropriate kindergarten classrooms offer learning activities that are play-based providing a context where children can naturally practice self-regulation. Through play, children learn how to monitor their attention and emotions in order to get along with their peers and to resolve conflicts in constructive ways (Bodrova & Leong, 2008; Diamond,

et al., 2007; Shonkoff & Phillips, 2000). The most commonly researched type of play associated with the development of self-regulation is pretend play (Bodrova & Leong 2003; Bodrova, Germeroth & Leong, 2013; Savina, 2014). In pretend play, children have assigned roles and use props to play out a particular scene. In this type of play, the "rules" (i.e., scene, roles, props) produce optimal levels of arousal, allowing children to practice self-regulation (Bodrova & Leong, 2007; Willis & Dinehart, 2014). For example, children must remember the particular scene and their role in the scene (working memory), they must constantly monitor others' behaviors (flexible attention) in order to respond appropriately to how the scene is playing out while inhibiting potential impulsive behaviors (inhibitory control) that might interfere with the play (Bodrova & Leong 2003; Bodrova, et al., 2013; Savina, 2014; Willis & Dinehart, 2014). Therefore, when children rely on the rules involved in play, they experience optimal levels of external emotional arousal, allowing them to practice self-regulation.

Another element of the classroom environment contributing to optimal external emotional arousal is a developmentally appropriate classroom structure (Nissen & Hawkins, 2010). In such classrooms, expectations of children's behavior as reflected in the rules and routines in the classroom are developmentally appropriate to support children's self-regulation (Florez, 2011; Nissen & Hawkins, 2010). Emotional arousal is thus minimized as children can rely on classroom supports (i.e., classroom rules and routines) to regulate their attention and emotions, enabling them to practice top down processes of self-regulation to respond to the situation appropriately (Ursache, et al., 2012). For example, children learn to regulate their attention and emotional arousal when they are overcome by the urge to call out an answer during circle time. In this way, the classroom rule (raising your hand and waiting

your turn to speak) reduces emotional arousal allowing children to regulate their attention and emotions, producing optimal levels for facilitating top down processes. In turn, these cognitive components of self-regulation enable children to inhibit their prepotent behavior (calling out) allowing them to choose the appropriate response instead (raising their hand and waiting their turn) (Ursache, et al., 2012). Moreover, as practice through these experiences enables children to conform to rules and to behave appropriately in the classroom, it also provides a healthy foundation for the development of positive relationships with their teachers and peers (Neuenschwander, et al., 2013).

In fact, in addition to relying on rules and routines, children can also rely on their teachers as a classroom support to help facilitate the healthy development of self-regulation leading to more adaptive behavior in the classroom (Florez, 2011; Nissen & Hawkins, 2010; Ursache, et al., 2012). Teachers play an important role in contributing to a classroom environment with optimal levels of emotional arousal by serving as an external source of regulation as well as a model for self-regulated behavior for the children in their classroom (Florez, 2011; Nissen & Hawkins, 2010; Singh et al., 2013; Ursache, et al., 2012). When teachers are able to regulate their own emotions and attention, they are able to form positive relationships with children by being responsive to their needs (Ursache, et al., 2012). For example, when a child is involved in a conflict with a peer and experiences heightened levels of internal sources of emotional arousal (i.e., stress), the self-regulated teacher can model and "coach" the child on how to resolve the conflict in an appropriate way. In this way, the positive relationship with the teacher serves as a classroom support enabling children to practice self-regulation, which in turn fosters positive relationships with their peers (Flook, Goldberg, Pinger, Bonus & Davidson, 2013; Florez, 2011; Nissen & Hawkins, 2010;

Shonkoff & Phillips, 2000). In fact, the bidirectional model of self-regulation explains how teachers' own self-regulation influences their relationships with the children in their classroom, which in turn impacts the relationships between the children themselves, creating a classroom that provides optimal levels of arousal for everyone (Ursache, et al., 2012).

Just like the children in their care, teachers need optimal levels of emotional arousal in order to facilitate the integration of both top down and bottom up processes of self-regulation allowing them to cope with the demands of the classroom (Flook, Goldberg, Pinger, Bonus & Davidson, 2013). Moreover, as "[t]eaching young children self-regulation first requires strong teacher self-regulation" (Florez, 2011, p. 51), teachers' stress levels (from both internal and external sources of emotional arousal) play an important role for promoting a classroom environment with optimal levels of external emotional arousal (Flook, et al., 2013). In fact, research suggests that reducing teachers' stress levels enhances their classroom management and has a positive impact on the children in their classroom (Flook, et al., 2013). Indeed, a recent study found that mindfulness training for preschool teachers improved their relationships with the children in their classroom. Moreover, results from observations of children's social interactions with their peers in the classroom showed a significant decrease in negative social interactions (Singh, et al., 2013). This study supports the notion of the interactive effect of teachers, children and the classroom as a whole. That is, when teachers have better self-regulation skills (i.e., can manage their stress levels), they are more likely to form positive relationships with the children in their classroom, which in turn lowers conflict between teachers and children as well as between children and their peers. In turn, low levels of conflict in the classroom benefits everyone as it creates an environment with optimal levels of emotional arousal (Ursache, et al., 2012)

To conclude, the development of children's self-regulation in kindergarten classrooms is supported through the interaction of all the elements in their environment (learning experiences, classroom structure, teachers and peers). Developmentally appropriate kindergarten classrooms create optimal levels of arousal (bottom up processes) that in turn facilitates children's cognitive components of self-regulation (top down processes). Indeed, "[t]hrough this reciprocal pathway, classrooms that set the stage for students to practice self-regulation skills could thus have lasting positive impacts on children's school competence and achievement" (Ursache, et al., 2012 p.126). With this in mind, given the links between practicing mindfulness and self-regulation discussed earlier, I believed that the implementation of an age-appropriate mindfulness-based program in developmentally appropriate kindergarten classrooms (such as Ontario's full-day kindergarten) would complement children's experiences and effectively enhance the development of children's self-regulation.

Overview of the current study

The purpose of this study was to examine changes in children's self-regulation and prosocial and maladaptive behaviors following the implementation of a mindfulness-based program adapted for full-day kindergarten classrooms. Self-regulation and prosocial and maladaptive behaviors were measured for children in the Mindfulness Group before and after the 6-week mindfulness-based program. Self-regulation and prosocial and maladaptive behaviors were also measured with the same time lag for children in the Control Group who did not receive the program. This study had the following objectives: (1) to compare the change in self-regulation in children from the Mindfulness Group to that of the children in

the Control Group. Given that children in the Mindfulness Group had practiced self-regulation through various mindful awareness practices over the six-week period, I hypothesized that the change in self-regulation would be greater for children in the Mindfulness Group compared to the Control Group; (2) to examine change in children's prosocial and maladaptive behaviors as reported by their teachers. Children in the Mindfulness Group learned about, talked about and practiced various ways of behaving prosocially. In addition, given the links between improved self-regulation and adaptive behaviors (such as those related to prosocial behaviors), I expected teachers would report more improvements in children's prosocial behavior compared to the children in the Control Group. I also expected that certain maladaptive behaviors (such as those related to hyperactivity) that were associated with self-regulation would improve more than others. Based on the literature showing that interventions benefit children who need it the most, I expected that children with low baselines of self-regulation would benefit the most from the program. Likewise, I expected children with lower teacher-reported prosocial behaviors and higher teacher-reported hyperactive behaviors would also benefit more from the mindfulness-based program. That is, I expected to see more change for children who were less self-regulated, less prosocial and more hyperactive than children who were average or higher functioning in those areas to begin with.

METHOD

Participants

The sample consisted of children attending full-day kindergarten (FDK) at three public schools in Toronto. All classes were Junior Kindergarten (JK) and Senior Kindergarten (SK) split classrooms. The total number of students housed in School 1 and School 2 from JK to Grade 6 was 219 students and 288 students respectively. School 3 housed students from JK to Grade 8, with 423 students in total. In School 1 the percentage of students whose primary language was other than English was 82%. In School 2 it was 43% and in School 3, 49%. All three schools that participated in this study were in the top 200 of the Learning Opportunities Index (LOI). The LOI is a measure used to rank all 474 elementary schools in the Toronto District School Board (TDSB). Ranking is based on measures of external challenges (e.g., parents' education and income, poverty and proportion of lone-parent families) that are known to impact student achievement. At the time of the study (2012), the rankings for the schools in this study were 183, 180 and 115 for Schools 1, 2 and 3 respectively. Therefore, all three schools in this study experienced somewhat higher levels of external challenges affecting student success than the general population of schools in the TDSB.

Schools 1 and 3 had three participating classrooms and School 2 had four. To have an equal number of classrooms participating in the study from each school, for both schools with an odd number of classrooms, I randomly assigned one classroom to the Mindfulness Group and one classroom to a Control Group. The third classrooms in both these schools did not participate in the study; however, the mindfulness-based program was delivered in those classrooms following the intervention period. For School 2 I randomly assigned two

classrooms to the Mindfulness Group and the other two classrooms to the Control Group. Thus, I had one classroom in the Mindfulness Group and one in the Control Group in two schools and two classrooms in the Mindfulness Group and two classrooms in the Control Group in the other school for a total of four classrooms in the Mindfulness Group and four classrooms in the Control Group. As all teachers had initially expressed interest in having the program delivered in their classroom, I implemented the mindfulness-based program to the four classrooms in the Control Group after the study was completed.

Participant recruitment was initiated in mid-March and information about the study was sent to parents of all JK and SK children in the eight classrooms from the three participating schools. Parents of 141 children agreed that their children could participate in the study (64% of all eligible children in the eight participating classrooms). Of these children, 59% were boys and 41% were girls. Seventy-nine children (58% boys, 42% girls) were in the Mindfulness Group (68% of all eligible children from the four classrooms assigned to Mindfulness Group) and 62 children (60% boys, 40% girls) were in the Control Group (58% of all eligible children from the four classrooms assigned to Control Group). One girl from the Mindfulness Group and 4 children (3 boys, 1 girl) from the Control Group were excluded from the study as they refused to do the HTKS task at Time 1. At Time 2, 6 more children (5 boys, 1 girl) from the Mindfulness Group and 3 more children (1 boy, 2 girls) from the Control Group were also excluded from the data analysis for both measures (HTKS and SDQ) as they were no longer at the school and thus no Time 2 data were collected for either measures. Consequently, data from 127 children (58% boys, 42% girls) were included in the present study. Seventy-two children were in the Mindfulness Group (57% boys, 43% girls) and 55 children were in the Control Group (60% boys, 40% girls).

Twenty-nine children were from School 1 (19 in the Mindfulness Group and 10 in the Control Group); 28 children were from School 2 (15 in the Mindfulness Group and 13 in the Control Group) and 70 children were from School 3 (38 in the Mindfulness Group and 32 in the Control Group). At Time 1, participants in both the Mindfulness Group and the Control Group were between the ages of 4 years, 3 months and 6 years, 3 months (Mean age in months = 62.32, *SD* = 7.5 months for the Mindfulness Group and 61.36, *SD* = 7.1 months for the Control Group).

Measures

Self-regulation in children: The Head-Toes-Knees-Shoulders task (HTKS) was developed by Cameron Ponitz, et al. (2008) to measure behavioral aspects of self-regulation including controlling and directing actions, inhibitory control, paying attention, and remembering instructions for children ages 3 ½ to 6 ½ years. The HTKS task is introduced as a game and has 3 parts with the same instructions and scoring. The first part begins with two paired rules: "touch your head" and "touch your toes". The child is instructed to switch the rules by responding the opposite way. Two points are scored for following the instructions correctly (i.e., child touches their toes when told to touch their head), 1 point is scored for "self-correcting" (i.e., child makes any motion toward the incorrect response but then makes the correct response instead) and 0 points are scored if the child touches the incorrect body part (i.e., either the child does not touch the correct body part at all or he/she touches the named part rather than the opposite one). The child needs to score at least 4 points to move on to the next part. The second part has the same instructions but with different paired rules; "touch your knees" and "touch your shoulders". Once again, the child needs to score at least

4 points to move onto the third and final part, which includes all four paired rules with the same instructions. Each of the 3 parts has 10 commands (with a range of 0-20 points per part) therefore the HTKS task's scores range from 0 to 60.

The HTKS was chosen for this study as previous research indicates that the HTKS is valid, shows high inter-rater reliability ($\varkappa >. 90$), and demonstrates variability in children's scores (McClelland & Cameron, 2012; Schmitt, Pratt, & McClelland, 2014; von Suchodoletz, et al., 2013). In addition, depending on how many parts the child is able to complete, the HTKS task typically requires no more than 10 minutes to administer.

Prosocial and maladaptive behaviors in children: The Strengths and Difficulties Questionnaire is a brief behavioral screening questionnaire developed by Goodman (1997) used to measure prosocial and maladaptive behaviors in children. The SDQ consists of 25 items that are divided equally between 5 scales: Prosocial Behavior, Hyperactivity, Conduct Problems, Emotional Symptoms and Peer Problems (Goodman, 1997). Informants (i.e., teachers, parents) rate how closely the target child fits with each attribute on a 3-point scale as "Not true", "Somewhat true" or "Certainly true". Scores range from 0-2 for each item and scores can be averaged out to generate a score for each scale with a total of 10 points. A Total Difficulties score can be generated by adding up scores for all 4 scales related to the maladaptive behaviors (0-40).

The SDQ was chosen for this study as it is widely used and shows satisfactory reliability, including inter-rater reliability, test-retest reliability and internal consistency (mean Cronbach $\alpha = .73$) (Goodman, 2001). In addition, studies have shown that the SDQ is highly correlated with other parent and teacher questionnaires measuring children's behavior such as the Child Behavior Checklist (CBCL) and is even better at detecting maladaptive

behaviors related to hyperactivity (Klasen, et al., 2000; Goodman & Scott, 1999). Moreover, the SDQ was chosen as it is brief (approximately one fifth of the length of the CBCL), requiring approximately 5 minutes to complete (Goodman & Scott, 1999).

Language

To ensure that the language used in the HTKS task was not interfering with what the task was meant to measure, information about children's language status was requested from the classroom teachers. Based on their knowledge of their students, teachers assigned each child participating in the study to one of three language groups; native English speakers, English Language Learners or bilingual children (speaks two languages fluently).

Procedures

At both Time 1 and Time 2 the HTKS task was individually administered to each child participating in the study. Data collectors at Time 2 were unaware of the Group status of the participants. Likewise, at both Time 1 and Time 2, teachers were asked to fill out the SDQ for each child participating in the study. Between Time 1 and Time 2, a mindfulness-based program was implemented in the four classrooms that had been randomly assigned to the Mindfulness Group. I selected a program that was developed by an organization called Mindful Schools as the program was research based and the organization was a pioneer in integrating mindfulness into education. I was trained and certified to implement the program and received permission from the developers to use it for this study. Note that to minimize any conflict of interest, I did not participate in any data collection at Time 2.

The program consisted of 18 twenty-minute lessons, delivered three times a week for a total of six weeks. The lessons in the program provided a good balance between various "external" and "internal" experiential mindful awareness practices. For example, children practiced focusing their attention on breathing (internal) as well as walking, eating and seeing (external) (see Appendices 1 & 2 for sample lessons). Another valuable component of this program is the inclusion of lessons on "Heartfulness". These lessons explored themes such as kindness and caring through various experiential mindful awareness practices, for example by having children practice developing kind and caring thoughts toward themselves and others (see Appendix 3 for a sample "Heartfulness" lesson). Following each lesson, children were asked to write or draw in their "Mindfulness Journals" relating to the new mindful awareness practice they learned that day. As no explicit instructions were given to teachers about children's reflections in their "Mindfulness Journals", only some teachers chose to have an adult (e.g., the Registered Early Childhood Educator, student teacher, parent volunteer) record what children represented with their drawings. Children were also encouraged to practice what they learned and to teach their family members at home. Children were asked to share about these experiences at the beginning of each session. As mentioned earlier, the first mindful awareness practice introduced to the children was the "external" practice of mindful listening. Bells are used as their sound offers a concrete "target" that children can focus on as it fades into silence. Moreover, children are instructed to raise their hand once they can no longer hear the sound of the bells, giving them a concrete "task" associated with their experience (see Appendix 1). The second lesson introduces the "internal" practice of mindful breathing. As focusing on breath may be too abstract for some children, they are instructed to place their hand on their belly providing a concrete "target" to

focus on, connecting the movement of their hand to their in and out breath (see Appendix 2).

Each of the following sessions began with a mindful breathing practice ending with the

ringing of the bells, providing children practice with both mindful breathing and mindful

listening. At the end of the second week, each of the four teachers were given bells and were

asked to use them each day to practice mindful breathing and mindful listening with the

children in the same way.

I implemented the mindfulness-based program in all four participating classrooms. I

delivered the program using a whole group context as constraints around the teachers'

schedules and around the space needed to deliver the program without the disruption of the

other children did not allow for small group instruction. With a Master's of Arts degree in

Child Study and Education and 4 years experience teaching kindergarten, my knowledge of

and experience with children at this developmental stage allowed me to make appropriate

adaptations to the mindfulness-based program. For example, all mindful awareness practices

were brief so that children did not become restless and distracted. Saltzman and Goldin

(2008) provide an overview of an adapted version of the MBSR program designed for

children in grades 4-6 and recommend shortening the practices based on the attention span of

the children participating in the program. Also, based on research examining the importance

of using picture books with young children (Cooper, 2007; Ganea, Pickard & DeLoache,

2008) as well as on my own experience of observing how using children's books with

illustrations helps reinforce topics or ideas explored in lessons, I also added several

children's books on the various topics (such as kindness and acceptance) and practices (such

as mindful breathing and mindful walking) explored in some of the lessons. Moreover, as the

original Mindful Schools program included some lessons that were not appropriate for

children in kindergarten (e.g., Lesson 14-"Mindful Test Taking") and since some of the

additions (e.g., children's book, activities) required more time, a few of the lessons were

spread out over 2 sessions (see Appendix 4 for a list of adaptations, changes and additions

made to the program).

Data analysis

The dependent variables in this study were the HTKS scores and the scores on the

SDQ scales. The HTKS scores ranged from 0-60 and were normally distributed. Although

each individual SDQ score ranged from 0-2 points, each scale consisted of 5 items and

therefore, a potential range of scores has 10 points. A variable with such a range would

typically be considered continuous in statistical analyses. However, as the scale for prosocial

behaviors (Prosocial Behavior scale) would typically be negatively skewed (i.e., indicating

that most children exhibit a higher level of prosocial behaviors), while the other four scales

measuring maladaptive behaviors (Hyperactivity, Conduct Problems, Emotional Symptoms

and Peer Problems), are typically positively skewed (i.e., indicating that fewer children

exhibit a high level of maladaptive behaviors), these variables cannot be assumed as

normally distributed for statistical analyses. The nature and distributional properties of these

variables dictated the choice of statistical tools for the analyses in this study. As such,

parametric statistical tests were considered for addressing the questions related to HTKS

scores and nonparametric statistical tests were selected for investigating the questions related

to the scores from the SDQ scales.

Before running statistical analyses addressing the research questions in this study, the

equivalence of the baseline scores across the two conditions was examined. This was an

important step considering that the sampling for this study was performed on the classroom level, which could result to non-equivalence of the samples between the two conditions. In addition, the average baseline scores were compared across the classrooms in each condition to evaluate whether the children across the classrooms within each condition were randomly equivalent. The average HTKS scores were similar between the two conditions indicating that the average level of self-regulation was similar in the two groups at Time 1.[1] Differences in SDQ scores found between the two conditions at Time 1 for one of the five SDQ scales. This is discussed in the following section. Also, I investigated whether language group (English speakers, English Language Learners and bilingual children) and age should be considered in the analyses as covariates. A covariate variable should meet two statistical conditions: 1) it has to be related to the outcome variable; and 2) the intervention and control groups should have different means on a covariate. If one of these conditions is not met, then the variable should not be considered as a covariate in the analysis. Since these two conditions were not met for either HTKS or SDQ scores for the language group and age variables, these variables were not considered in further analyses.[2]

An ANCOVA was performed to investigate whether change in HTKS scores between Time 1 and Time 2 was different in the Mindfulness Group and the Control Group. Since the SDQ scores were expected to (and did in fact) have skewed distributions, nonparametric tests were adopted to address the similar question for each of the scales of this questionnaire. There is no nonparametric method similar to ANCOVA; therefore, these analyses had to be conducted in two steps: 1) comparing the distributions of the SDQ scores between the Mindfulness Group and the Control Group at Time 1 to establish the group equivalence; and 2) comparing the distributions of the SDQ scores at Time 2 to evaluate the difference in

change of the SDQ scores between the two groups. Both steps were performed using Mann-Whitney U tests.

To explore whether the HTKS and the SDQ scores at Time 1 were related to the amount of change the children in the Mindfulness Group experienced between Time 1 and Time 2, correlation analyses between Time 1 scores and change scores between Time 1 and Time 2 were computed.

RESULTS

HTKS

To investigate whether the post-intervention scores on the self-regulation measures were different in the Mindfulness Group and the Control Group, an ANCOVA was conducted. HTKS scores at Time 2 served as a dependent variable in this analysis, HTKS scores at Time 1 were included as a covariate and the grouping variable (Mindfulness vs. Control) was used as a between factor. Change in HTKS scores for both groups over time are depicted in Figure 1. The results of the ANCOVA indicated a significant difference in the adjusted means of the Mindfulness Group and the Control Group, $F (1, 124) = 10.70$, $p = .001$, $\eta_p^2 = .079$. The Mindfulness Group had a higher adjusted mean at post-test ($M = 35.83$, $SE = 1.37$) than the Control Group ($M = 29.00$, $SE = 1.57$) indicating that controlling for Time 1 performance, the Mindfulness Group exhibited better self-regulatory abilities at Time 2 than the Control Group.

Pearson correlations between children's HTKS scores at Time 1 and Time 2 were computed within the Mindfulness Group and the Control Group to test whether the change in means observed in each group reflect a pattern that is consistent for all children. The relationship between HTKS scores at Time 1 and Time 2 was strong for the Mindfulness Group ($r =. 73$, $p < .001$) and moderate for the Control Group ($r = .68$, $p < .001$). The results indicate that individual children in each group experienced a similar amount of change in their self-regulation scores across the two time points.

SDQ scales

A Mann-Whitney U test for each of the five scales of the SDQ was conducted to determine whether there were any differences in prosocial and maladaptive behaviors between the Mindfulness Group and the Control Group at Time 1. Since the analyses of SDQ scores relied on nonparametric statistical methods, mean ranks were used for computations. However, since the mean ranks are not intuitive to understand, the mean scores for the SDQ scales are reported as well (see Table 1 for the descriptive statistics for mean SDQ scores for both groups at Time 1 and Time 2). Only the Prosocial Behavior scale was significant, $z = -2.606$, $p = .009$. Specifically, the Mindfulness Group had a mean rank of 56.25, while the Control Group had a mean rank of 73.17 at Time 1. Thus, at the beginning of the study, children in the Control Group exhibited significantly higher levels of prosocial behavior compared to children in the Mindfulness Group. Since this difference does not favor the Mindfulness Group, we can confidently compare the conditions at Time 2 without the risk of overestimating the results. The implications in terms of possible underestimation effects that could result of this difference will be discussed in the following section.

Mann-Whitney U tests were conducted to evaluate whether the total change scores for each of the 5 scales of the SDQ were different in the Mindfulness Group compared to the Control Group at Time 2. The results of the test were significant for the Prosocial Behavior scale ($z = -4.152$, $p < .001$); the Mindfulness Group had a mean rank of 74.81, while the Control Group had a mean rank of 48.42 and for the Hyperactivity scale ($z = -3.377$, $p = .001$); the Mindfulness Group had a mean rank of 54.26, while the Control Group had a mean rank of 75.82. Note that as multiple comparisons were made (one for each of the five scales of the SDQ), to reduce the likelihood that findings were significant only by chance, an

adjusted alpha of .01 was considered as significant. Change in SDQ Prosocial Behavior scores for both groups over time are depicted in Figure 2 and change in SDQ Hyperactivity scores for both groups over time are depicted in Figure 3. The difference between the two groups was not significant for the other three scales.

Effects of a mindfulness-based program on children who struggle with self-regulation, prosocial behavior and hyperactivity

To investigate whether HTKS scores at Time 1 were associated with gains at Time 2 in the Mindfulness Group, a Spearman correlation was computed with Time 1 scores and change scores. The results showed moderately significant results, rho = -.551, p < .001. Based on these results we can conclude that children who started off with lower self-regulation scores on the HTKS benefited more from the mindfulness-based program than children who were average or higher functioning prior to participating in the program (see Figure 4 for scatterplot depiction of these results).

A Spearman correlation was also computed to investigate whether teachers' perceptions of Prosocial Behavior and Hyperactivity SDQ scores at Time 1 were associated with gains at Time 2. The results showed moderate to strong significant negative relationship for both scales of the SDQ (rho = -.69, p < .001 and rho = -.39, p < .001 correspondingly). Therefore, we can conclude that children with lower scores on the Prosocial Behavior scale and children with higher scores on the Hyperactive scale benefited more from the mindfulness-based program (see Figure 5 and 6 for a scatterplot depictions of these results).

DISCUSSION

The present study was designed to examine the effects of a mindfulness-based program for children in early childhood. Mindfulness-based programs are known to improve individuals' psychological health. With respect to children, mindfulness-based programs offer a variety of benefits for the healthy development of skills related to success in the classroom. In this study, I measured changes in children's self-regulation and behaviors related to social and emotional competence after implementing an adapted mindfulness-based program for children in full-day kindergarten classrooms. In the sections that follow, I review the findings for each of the three objectives of this study.

1. A mindfulness-based program for children and improving self-regulation

The first objective was to determine if a 6-week mindfulness-based program would improve children's self-regulation. As self-regulation is developing for children in this age group, I first wanted to determine whether children's self-regulation would significantly improve from Time 1 to Time 2. Thus, using the HTKS, I measured the difference in children's self-regulation between both time points for children in the Mindfulness Group and in the Control Group. At Time 1, the HTKS scores were similar across the two groups. The average HTKS score ($M = 25.29$, $SD = 17.87$) for this sample ($n = 127$) was similar to reports for other samples of similar aged children. For example, Schmitt, et al. (2014) reported an HTKS mean of 23.03 ($SD = 18.61$) for a sample of children 247 children of similar ages. Despite showing similar levels of self-regulation prior to the intervention, the children in classrooms that received the mindfulness-based program demonstrated significantly greater self-regulation than the Control Group at post-test. The magnitude effect

is $\eta_p^2 = .079$ which is interpreted as a medium effect size. That is, the proportion of variance in HTKS scores at Time 2 is attributable to the intervention by approximately 8% when controlling for HTKS scores at Time 1 for both groups. These findings also suggest that the implementation of a mindfulness-based program over a relatively short period of time has the potential to improve the development of self-regulation in young children.

Overall, my findings are similar to those reported by Flook, et al.'s (2010) whose sample was comprised of an older group of children (ages 7-9 years). Their results showed that changes in aspects of self-regulation for children in classrooms receiving a mindfulness-based program were greater than for children in a control group. This evidence also confirms that participating in programs that explicitly engage children in tasks that foster self-regulation improves this skill over time and is consistent with evidence from studies looking at the success of programs aimed to improve self-regulation (e.g., Diamond & Lee, 2011).

2. A mindfulness-based program for children; increasing prosocial behaviors and reducing maladaptive behaviors

The second objective was to determine if a 6-week mindfulness-based program would improve children's prosocial and maladaptive behaviors. The teacher version of the Strengths and Difficulties Questionnaire was used. This questionnaire captures teachers' perceptions of children's prosocial and maladaptive behaviors related to each of the 5 scales on the questionnaire; (1) Prosocial Behavior, (2) Hyperactivity, (3) Conduct Problems, (4) Emotional Symptoms and (5) Peer Problems. To determine if improvements in each area were greater for children who received the mindfulness-based program, I compared the

overall change from Time 1 to Time 2 in each of the 5 scales for children in the Mindfulness Group to children in the Control Group.

Consistent with my hypothesis, children in classrooms that received the mindfulness-based program improved more in teacher ratings of their prosocial behavior when compared to children in classrooms who did not receive the program. The scores of children in the Mindfulness Group increased on all five items that make up the Prosocial Behavior scale suggesting that the mindfulness-based program made children more (1) considerate, (2) helpful and (3) caring as well as more likely (4) to share and (5) to be kind to younger children. This finding supports research showing that mindful awareness practices such as those included in the mindfulness-based program promote prosocial behavior (i.e., Kemeny, et al., 2012).

Also consistent with my hypothesis, scores of children in the Mindfulness Group increased more on all five items that make up the Hyperactivity scale compared to children in the Control Group. Reid, et al. (2005) found that children who exhibit symptoms related to hyperactivity benefit from self-regulation interventions. Therefore, it seems feasible to conclude that the strengthening of these skills may be responsible for children's reduction of maladaptive behaviors related to the Hyperactivity scale. The 5 items of the Hyperactivity scale are meant to tap behaviors related to impulsiveness (1 item), inattention (2 items) and hyperactivity (2 items) (Goodman, 2001). It is believed that teaching children mindfulness can improve impulse-control and decrease emotional reactivity (Thompson & Gauntlett-Gilbert, 2008). Therefore, it is not surprising that most children improved on the item related to impulsiveness "thinks things through before acting". Children who are characterized as being impulsive appear to lack inhibitory control (Schachar & Tannock, 1993). Therefore,

this finding is consistent with research showing the association between mindfulness and inhibitory control in children (Oberle, et al., 2012) and extends preliminary research showing that mindfulness reduces impulsivity in youth (Rynczak, 2012). Also, most children improved in the two items related to inattention "sees task through/good attention span" and "easily distracted, concentration wanders". These findings are consistent with research showing that children practicing mindfulness show a reduction in attention problems (Semple, 2010) and that children engaging in exercises involving internal attention such as meditation increases their capacity to regulate attention (Rani & Rao, 1996). In fact, as reported earlier, Napoli, et al. (2005) found that elementary school children participating in a mindfulness-based program performed better on a computer task designed to measure selective attention than children in a control group. Finally, improvement with regard to the behaviors related to hyperactivity showed that the mindfulness-based program helped children become less restless, less overactive and better at staying still and helped them fidget and squirm less. A possible explanation for these results may be that by practicing being still (such as with mindful breathing and listening) or doing things slowly (such as with mindful walking and eating), children developed increased control over their urges to move and fidget (Thompson & Gauntlett-Gilbert, 2008).

To help with interpreting the findings related to the SDQ scores for the Prosocial Behavior scale and the Hyperactivity scale, children's baseline scores on these scales from this sample were compared to North American children's normative scores ($n = 2779$) on these two scales from a similar age-group (ages 4-7) (www.sdqinfo.org). Results from a chi-squared test of independence showed that children from this sample had significantly lower scores on the Prosocial Behavior scale (lower scores means less prosocial) and significantly

higher scores on the Hyperactivity scale (higher scores means more hyperactive) (χ^2 (10) = 129.95, $p < .01$; χ^2 (10) = 44.89, $p < .01$). This indicates that children in this sample were less prosocial and more hyperactive than children of a similar age group from the general population. Although differences were not found between this sample and norms reported for a similar age group for HTKS scores (as reported earlier), there are several different explanations for the differences found in SDQ scores between this sample and norms reported elsewhere. It is possible that the children in the study exhibited more maladaptive behaviors because they came from schools found to be facing higher levels of external challenges (as measured by the LOI reported earlier). Another possible explanation is that these findings may be related to the large number of children and the low adult-child ratios in these classrooms. There were two adults (one certified teacher and one Registered Early Childhood Educator) in the 7 classrooms with over 26 children in each one. The smaller classroom mentioned earlier with less than 20 children had only one certified teacher. As the proposed requirement as outlined by the Ontario Regulations for 4-6 year-olds is 1:13, with a maximum of 26 children in one classroom, these adult-child ratios are quite low (www.childcarecanada.org). Research shows that children in early childhood classrooms with low adult-child ratios show more negative behavior (e.g., aggression with peers) and that higher adult-child ratios increases positive behaviors in children (Smith, McMillan, Kennedy & Ratcliffe, 1988). Furthermore, it is possible that teachers were overwhelmed by these class sizes, which may have resulted in teachers viewing children more negatively. However, since the improvements were significant in this sample, baseline scores do not affect the interpretation of the results. Before moving onto my third objective of the current study, I will address the non-significant results of the three other scales of the SDQ.

Teachers perceived children's maladaptive behaviors related to Conduct Problems, Emotional Symptoms and Peer Problems as remaining stable over the course of this study. These results were consistent with my hypothesis that the intervention was too brief to expect observable changes in these maladaptive behaviors. Most of the items included on the SDQ for these scales seem to be more chronic in nature and thus less likely to be susceptible to change over a 6-week period. For example, a child who has "many fears, easily scared" (item from the Emotional Symptoms scale) may need more time to overcome this tendency. Another example to support this interpretation can be seen in the items related to the Peer Problems scale. Although children were perceived to exhibit more prosocial behaviors, more time would likely be needed in order to resolve any existing problems they have with peers (e.g., "picked on or bullied by other children"). Furthermore, some of the items from these scales occur less frequently (e.g., the "steals from home, school or elsewhere", item from the Conduct Problems scale) providing teachers with fewer opportunities to observe changes. Therefore future research could design a longer intervention period to investigate the impact of mindfulness-based programs on children's more chronic and less frequently occurring maladaptive behaviors. Alternatively, future research could simply extend the period for collecting data following the implementation of the intervention to allow time for changes in behavior to be observed.

3. Benefits of a mindfulness-based program for children who struggle with self-regulation, prosocial behavior and hyperactivity

The third objective was to determine if children with difficulties in self-regulation and maladaptive behaviors would benefit more from a 6-week mindfulness-based program than

children without difficulties. The findings are consistent with my hypothesis; children in the

Mindfulness Group with lower self-regulation and with more difficulties in prosocial

behaviors and maladaptive behaviors related to hyperactivity at Time 1 showed greater

improvements in these areas after the mindfulness-based program (Time 2) than children

who were average or higher functioning in those areas. The findings with respect to self-

regulation are consistent with Flook, et al. (2010) who also found that a mindfulness-based

program proved to be most beneficial for children with low baselines of self-regulation.

These findings further support the idea that children with difficulties in certain key

developmental skills benefit the most from interventions that include activities, exercises

and/or games designed to improve self-regulation (Diamond, 2012; Tominey & McClelland,

2011). Furthermore, as self-regulation and prosocial behavior are known to predict school

success (Blair, 2002; Blair & Razza, 2007), programs introduced in early childhood

classrooms aimed at improving these skills are important for narrowing the existing disparity

amongst children at that age, allowing for a more leveled playing field (Diamond, 2012;

Riggs, et al., 2006).

Conclusions and limitations

The evidence from this study adds to the growing body of research investigating the

relationship between mindfulness-based programs, self-regulation and prosocial and

maladaptive behaviors in young children. Riggs, et al.'s (2006) reviewed interventions aimed

to promote children's prosocial behavior and stressed the importance of addressing self-

regulation skills in such programs. The mindfulness-based program used in this study

incorporated several age-appropriate practices designed to foster young children's

developing self-regulation and prosocial behavior. In turn, gains in self-regulation helped decrease children's maladaptive behaviors related to hyperactivity. The evidence from this study supports the view that programs that promote skills related to emotion regulation and self-awareness (bottom up) enhance the cognitive components (top down) of self-regulation (Ursache, et al., 2012). In addition, results from this study also demonstrate the efficacy and feasibility of implementing a relatively brief, age-appropriate mindfulness-based program in early childhood classrooms (Burke, 2010; Greenberg & Harris, 2012; Zelazo & Lyons, 2012).

The present study found that children in the Mindfulness Group improved on the Prosocial Behavior scale and the Hyperactivity scale on the Strengths and Difficulties Questionnaire for teachers. Teachers are a great source of knowledge about the children in their classrooms, however, for logistical reasons, it was not possible to have teachers be blind to the condition of their classrooms. The teachers in the Mindfulness Group were thus aware of the goals of the program, which may have influenced their reports on their students' prosocial and maladaptive behaviors at Time 2. Future research should therefore use direct performance-based tasks administered by researchers who are blind to the conditions of the classrooms to determine the impact of mindfulness-based programs on children's prosocial behavior and hyperactivity. However, it is worth noting that the findings based on teacher reports were consistent with those from the externally measured HTKS task, suggesting that it is not simply a reporting bias.

Another important potential bias to consider is researcher bias. As I was the primary researcher in this study and thus had expectations for the outcomes of the implementation of the mindfulness-based program, it was imperative that I was not involved in any data

collection at Time 2. Moreover, as mentioned, I also ensured that research assistants administering the HTKS at Time 2 were unaware of the group status of the children.

While children in the two groups were very similar at baseline, it is important to note that they differed in one significant way. As mentioned earlier, at Time 1, the children in the Mindfulness Group were significantly less prosocial as measured by the SDQ compared to the children in the Control Group. As research shows that children with behavioral difficulties benefit the most from intervention programs, it is possible that the Mindfulness Group was especially responsive to the mindfulness-based program and that the program would not have the same effect in a different group.

The small number of schools and classrooms participating in this study are another limitation of the current study. A larger sample may also have eliminated the gender imbalance in the sample (58% boys vs. 42% girls). Although these differences impact the generalizability of the study's findings, it should be noted that the gender imbalance was similar in both conditions. Also, the number of children participating in each condition was different; there were fewer children participating in the Control Group (55 children) than children participating in the Mindfulness Group (72 children). This is likely, at least in part due to the fact that one classroom was significantly smaller than the others and it was randomly assigned to the Control Group. However, the consent rate was also lower in the Control Group (58%) compared to the Mindfulness Group (68%). In fact, the consent rate for children in classrooms randomly assigned to be in the Mindfulness Group ranged from 63% to 75% while the consent rate for children in classrooms assigned to be in the Control Group ranged from 45% to 85%. These differences may simply be a reflection of randomly assigning a small number of classrooms to each condition, with some classrooms having

more children than others. Or, perhaps the teachers who were randomly assigned to receive the intervention immediately showed more initial interest in the study and therefore facilitated participant recruitment.

To address these issues, future research should include a measure of teachers' interest, understanding and motivation to participate and contribute to the study. All observations made with respect to teachers' engagement and embracing of the program came from informal conversations with the teachers as well as observations of the classroom environment (for example, seeing "Did you remember to practice mindful breathing last night?" written on the white board as the 'morning message'). In fact, luckily, all four teachers in the classrooms who were in the Mindfulness Group seemed to realize the benefits of the mindfulness-based program for their students and became very interested in incorporating aspects of the mindfulness-based program into their program. They all participated in the lessons and reported various mindfulness activities they practiced with the children beyond the lessons that were presented as part of the intervention. Collecting data about "up-take" by teachers throughout the duration of the program and beyond would shed light on possible "spill over" into the whole day and would help explain how mindfulness can be beneficial in early childhood classrooms.

Regarding the teacher's role, it has been proposed that one key aspect of mindfulness-based programs is that they are delivered and led by someone who has received mindfulness training and has their own personal practice (Burke, 2010; Meiklejohn, et al., 2012; Saltzman & Goldin, 2008). In support of this notion, Kabat-Zinn (2003) states that mindfulness "cannot be taught to others in an authentic way without the instructor's practicing it in his or her own life" (p.149). Although I delivered all the lessons from the mindfulness-based

program and had received training and also have a personal practice, the teachers in this study had no prior experience with mindfulness. However, their interest and motivation to learn led to changes in their program (including various mindfulness practices throughout the day), which allowed children to have more practice with mindfulness. Moreover, as the duration of the program used in the study was relatively short (6 weeks), the fact that significant changes were found is promising for future research exploring the benefits of mindfulness-based program interventions in classrooms.

As practice is a well-established aspect of mindfulness-based programs, some research studies have explored the relationship between individuals' reported home practice time and the positive outcomes they experienced from the program (e.g., Carmody & Baer, 2008; Huppert & Johnson, 2010 & Carson, Carson, Gil, & Baucom, 2004). For example, Huppert and Johnson (2010) implemented a twelve-lesson mindfulness-based program to adolescents in a classroom setting over a four-week period and found a positive correlation between the amount of individuals' reported home practice and improvements in their overall well-being. As with most mindfulness-based programs designed for children in classroom settings, the program used in this study simply encouraged children to practice the various mindful awareness practices as they learned them. However the amount of practice children actually did was not measured. Additionally, the various "extra" aspects included as part of the program to help reinforce lessons such as in-class journaling and daily mindful breathing and listening practice with their classroom teachers were also not measured in this study. Future research might add a measure of practice, whether in class or at home.

Finally, another consideration should be made regarding potential "spillover" effects. With the implementation of full-day kindergarten programs came the expectation of frequent

kindergarten team meetings (with all FDK teachers and ECEs in the school). In such meetings, teachers and ECEs engage in program planning and thus there is a possibility that discussion around the mindfulness-based program being implemented in some of the classrooms (Mindfulness Group) could have inspired teams from the classrooms in the Control Group to use some of the lessons in their own classrooms. However, given that the intervention period was short (6-weeks) it is unlikely that this "spillover" would happen, and if it did, it would likely not have a significant impact. Moreover, the classrooms in the Control Group knew that they would be receiving the program following the intervention period. Therefore, it is likely that teachers and ECEs from those classrooms would have been more comfortable waiting for the actual mindfulness-based program to be delivered by me before they attempted to introduce it in their classrooms based on their inexperienced colleagues' instructions.

Despite these limitations, the current study bodes well for the potential efficacy of implementing mindfulness-based programs in early childhood classrooms. The mindfulness-based program used in this study was designed for grades K-6 with enough structure to allow for consistent implementation while allowing room for small adaptations to be made in order to meet the developmental needs of the particular age group of the children participating in the program. This study successfully implemented this program for young children in full-day kindergarten classrooms by making minor adaptations without compromising the essence of the program. The findings of this study support the proposition made by Masicampo and Baumeister (2007) that general increases in self-regulation "may be the causal link between mindfulness interventions and the benefits that have been associated with them" (p. 255). Moreover, the findings of this study demonstrate the benefits of introducing mindfulness to

children in early childhood and open the door to future researchers looking to better understand the factors involved in implementing programs aimed to improve children's self-regulation and behavior in early childhood classrooms. Examination of the various aspects involved in mindfulness-based programs would greatly assist the development of and refinements to the design of such programs while providing invaluable information about how these programs benefit young children in early childhood classrooms. Lastly, if teachers learn to embrace the ideas and practices in mindfulness-based programs they could continue to infuse mindfulness into their existing program. In turn, not only would their students benefit from the effects reported in this study, but their ongoing supported practice beyond the 20-minute lessons and the 6-week period, could potentially reap those benefits in a lasting and sustainable way.

Table 1

Mean SDQ Scores at T1 and T2 for Control Group and Mindfulness Group

| | Control Group | | | | Mindfulness Group | | | |
| | T1 | | T2 | | T1 | | T2 | |
Scale	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Prosocial Behavior Scale	1.55[a]*	.42	1.59	.47	1.26[ab]	.61	1.54[b]*	.46
Hyperactivity Scale	.70	.65	.69	.67	.78[a]	.66	.52[a]*	.60
Emotional Symptoms Scale	.27	.34	.18	.31	.40	.49	.25	.39
Conduct Problems Scale	.32	.44	.26	.45	.33	.40	.18	.31
Peer Problems Scale	.25	.37	.17	.37	.22	.33	.15	.35

*p < .01

Figure 1

Change in Self-Regulation from Time 1 to Time 2
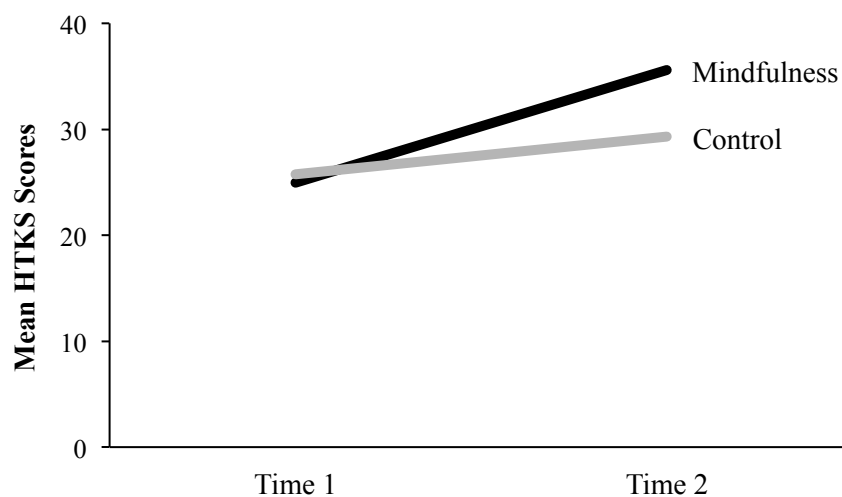
Figure 2

Change in Prosocial Behavior from Time 1 to Time 2
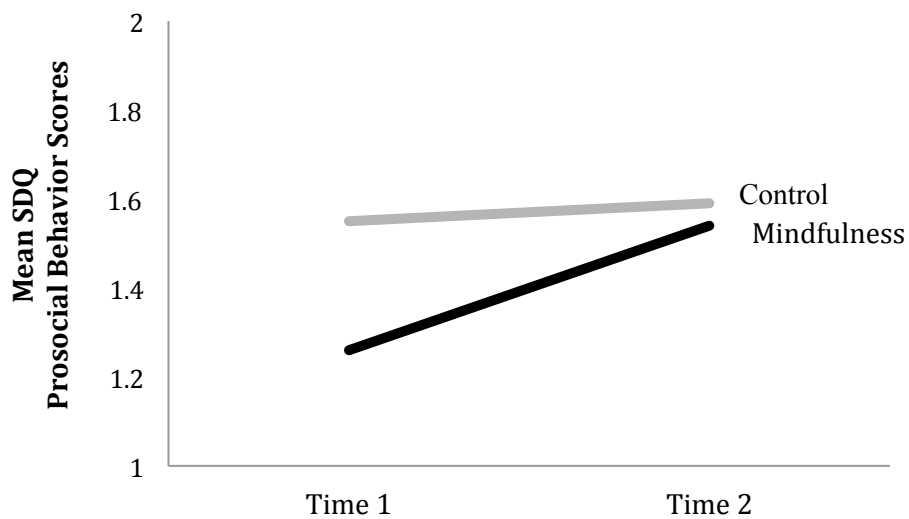

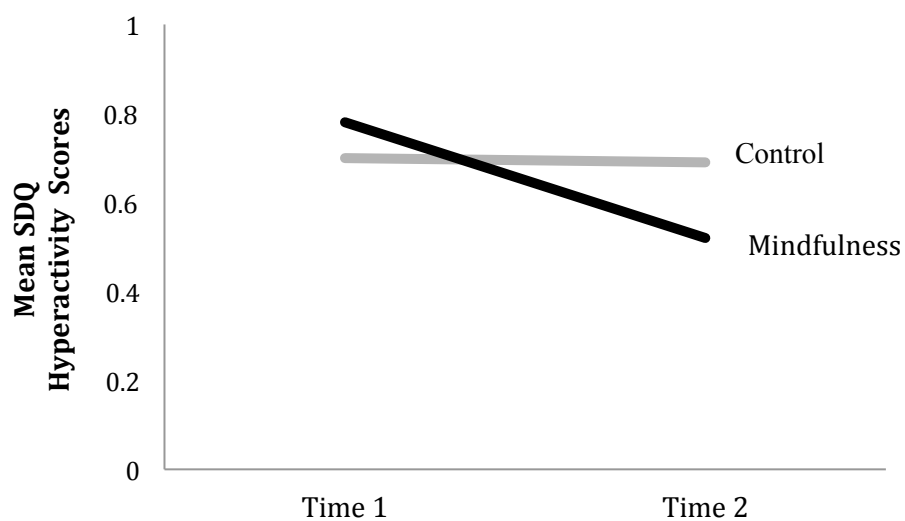Figure 3

Change in Hyperactivity from Time 1 to Time 2

Figure 4

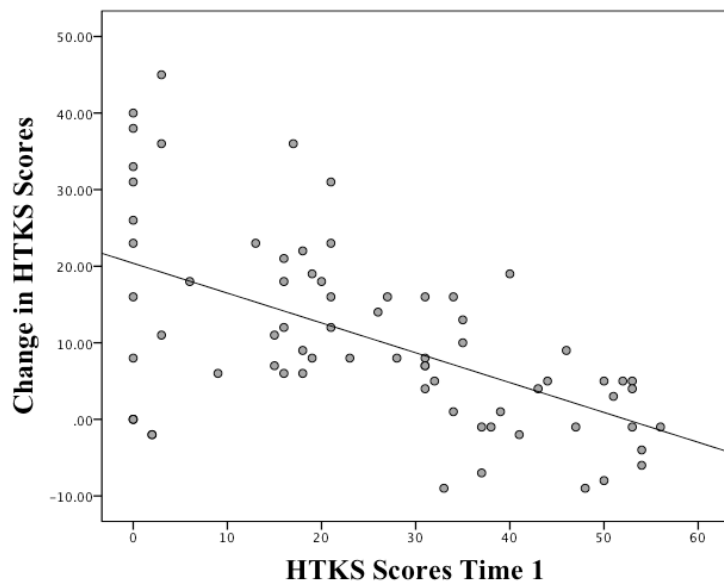Change HTKS scores for Mindfulness Group from Time 1 to Time 2

Figure 5

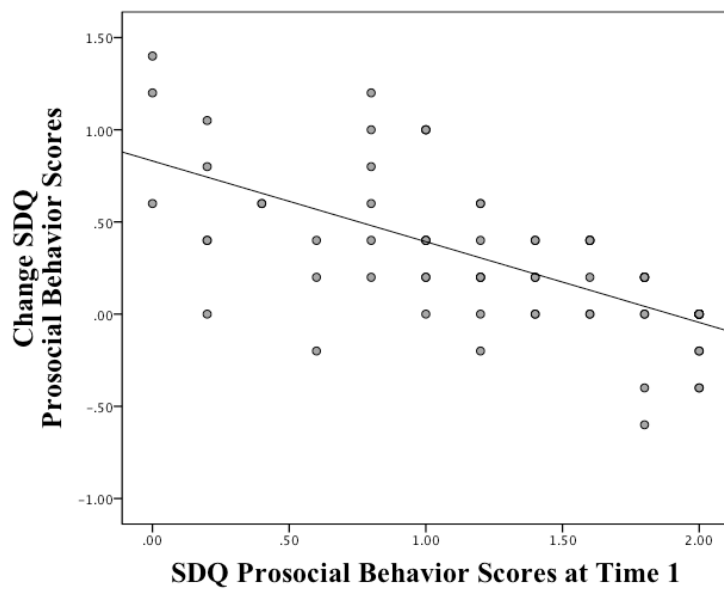Change SDQ Prosocial Behavior scores for Mindfulness Group from Time 1 to Time 2

Figure 6

Change SDQ Hyperactivity scores for Mindfulness Group from Time 1 to Time 2
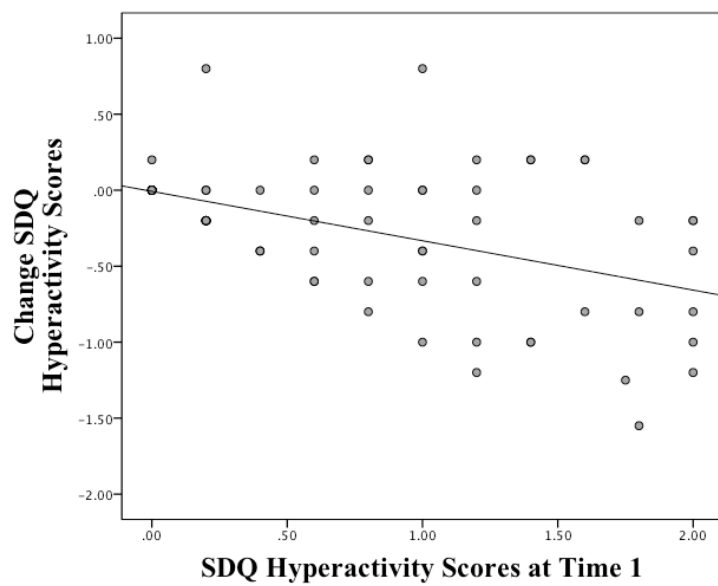
Endnotes

[1] An independent samples t-test with HTKS scores was conducted to determine whether there were any differences in self-regulation between the Mindfulness Group and the Control Group at Time 1. Results showed no significant difference between the two conditions, t (125) = -.25, p = .804.

[2] A one-way ANOVA analysis was conducted to investigate whether there were any differences in HTKS scores between children who were native English speakers, English Language Learners and bilingual children. The result of this analysis was not significant, F (2, 90) .79, p = .458.

Pearson correlation was computed with HTKS scores and age at Time 1 to explore whether I needed to control for the potentially covarying effects of age with developing self-regulation. A negative significant but weak relationship was found, r = -.29, p = .001. However, the average age was not significantly different across the two conditions, t (125) = 1.45, p = .149. To investigate whether language group is related to SDQ scores at Time 1, Kruskal-Wallis tests were conducted. The only significant result was for the SDQ Hyperactivity scale, χ^2 (2) = 10.05, p = .007. However, the distribution of the language groups was similar across the two conditions, χ^2 (2) = 4.72, p = .094. Therefore, language group should not be considered as a covariate in the SDQ analyses. In addition, the relationship between age and the SDQ scale scores at Time 1 was investigated using Spearman correlations. None of the relationships were significant, indicating that age does not have to be used as a covariate in the SDQ analyses. Based on these results, language group and age were not considered covariates in the analyses addressing the research questions in the study.

STUDY #2

A mindfulness-based program in early childhood classrooms:

Exploring sharing and empathy

ABSTRACT

The effects of a mindfulness-based program on children's sharing behavior and empathy were examined in a randomized-controlled study of 129 children (ages 4-6) in 8 full-day kindergarten (FDK) classrooms. Four classrooms ($n = 71$) were randomly assigned to the Mindfulness Group, while the other four ($n = 58$) were assigned to a Control Group. The program consisted of 20-minute lessons, delivered 3 times a week, for 6 weeks. Following the 6-week period, an exploratory sharing task was administered to both groups that involved giving children 10 stickers and telling them that they could share them all, keep them all, or share some and keep some. Children could choose to share with; a *friend*, a *nonfriend*, a *stranger* and a *sick stranger*. No statistically significant differences in general sharing behavior or reasons for sharing (i.e., reasons related to Characteristics of the Recipient or to Wanting to Behave Prosocially) were found between the two groups. However, more children from the Mindfulness Group shared with the *sick stranger* suggesting that they may be more empathic towards people in distress following the intervention. The sticker sharing task shows some promise as a quick way to assess sharing directly as children's reasons for sharing provide insights into why children share, regardless of this study's conditions.

A mindfulness-based program in early childhood classrooms:

Exploring sharing and empathy

Mindfulness refers to nonjudgmental awareness of what arises in the present moment (Kabat-Zinn, 1994). Mindfulness-based programs include various experiential lessons designed to practice paying attention to one's thoughts, emotions and sensations as they arise each moment without judging them as good or bad. Through these practices, mindfulness-based programs intend to cultivate prosocial characteristics such as kindness, caring and empathy (Greenberg & Harris, 2012; Kabat-Zinn, 1994; Meiklejohn, et al., 2012). The education system recognizes the importance of teaching the whole child (i.e., Miller, 2010; Rempel, 2012), which involves incorporating social and emotional learning into the school curriculum to foster the healthy development of prosocial characteristics and prosocial behaviors in children (Jennings & Greenberg, 2009). Recognizing the importance of this approach, the Ontario government launched the Character Development Initiative. The *Finding Common Ground: Character Development in Ontario Schools, K–12* (2008) document states that: "A quality education is not only geared towards the intellect, but also towards attitudes, behaviors, dispositions and sensibilities. It emphasizes all aspects of the self and domains of learning – the cognitive, affective, attitudinal and behavioral. It is about the education of the whole person." (p. 10). As mindfulness-based programs adapted for children offer the social and emotional learning needed to go beyond academic learning they are becoming increasingly prevalent in educational settings (Greenberg & Harris, 2012; Humphrey, et al., 2010; Meiklejohn, et al., 2012; Zelazo & Lyons, 2011).

When young children enter school, they must develop social and emotional competence to exhibit prosocial behavior (Humphrey, et al., 2010). Prosocial behaviors are

actions children engage in to benefit another person without an expectation of personal reward. These behaviors include helping, cooperating and sharing (e.g., Eisenberg, et al., 2006; Paulus & Moore, 2011). Prosocial behavior plays an important role in young children's development of social skills and predicts future social adjustments (Eisenberg, et al., 1996; for a review, see Eisenberg & Fabes, 1998; Schonert-Reichl & Oberle, 2011) and later academic achievement (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000). Empathy is an emotion that motivates prosocial behaviors and plays an important role in children's social and emotional development in early childhood (Rieffe, et al., 2010; Robinson, 2008). In fact, the relationship between empathy and positive developmental outcomes has propelled discussion into how research on empathy can inform the creation and implementation of programs to promote empathy in educational settings (Schonert-Reichl & Oberle, 2011).

Social and emotional learning programs involve developing competency in the following five areas: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (Collaborative for Academic, Social, and Emotional Learning, 2005). Through the prosocial characteristics cultivated in mindfulness-based programs, children learn to develop competencies in key social and emotional learning areas. With the proliferation of research exploring the benefits of social and emotional learning in schools, studies looking at mindfulness-based programs for children are beginning to emerge. From the small number of studies in this area, benefits found for implementing mindfulness-based programs in classrooms include improved social skills and increased emotional regulation and overall wellbeing (Beauchemin, et al., 2008; Broderick & Metz, 2009; Schonert-Reichl & Lawlor, 2010). However, to date and to my knowledge, only one study

has looked at gains in social and emotional skills with school-age children participating in a mindfulness-based program. Schonert-Reichl and Lawlor, 2010 conducted a randomized-controlled study with children in grades 4-7 with six of the 12 classrooms participating in a mindfulness-based study once a week for 10 weeks while the other six classrooms were on a wait list. Results from pre and post teacher-reports revealed significant increases in children's social and emotional competence. The experimental design, large sample size ($n =$ 246) and use of pre and post measures contribute to the strengths of this study however, results are based on teacher reports which could be biased by their perceptions and attitudes.

Given the benefits of mindfulness-based programs in classrooms with school-age children, it is important to explore the implementation of such programs in early childhood classrooms (such as kindergarten) to support the education of the whole child by promoting young children's developing social and emotional competencies. Although research in this area is still in its infancy, a recent study showed that children in kindergarten experienced improvements in skills related to social and emotional competence such as increased self-regulation, decreased maladaptive behaviors related to hyperactivity and increased behaviors related to prosocial behavior following the implementation of a 6-week mindfulness-based program adapted for early childhood classrooms (see Study #1). Given the link between self-regulation and adaptive behaviors related to social and emotional competence (e.g., Allan & Lonigan, 2014), mindfulness-based programs implemented in classrooms have the potential to address the social and emotional learning needed for teaching the whole child.

The current study is part of a larger study in which I reported quantitative evidence of improvements in children's self-regulation following the implementation of a mindfulness-based program. The association between the gains in self-regulation and the quantitative

evidence for decreases in maladaptive behaviors related to hyperactivity as well as increases in prosocial behaviors for children participating in the mindfulness-based program was also presented (see Study #1). In the current study, I extend these findings and explore prosocial behavior directly through a sharing task to measure whether the gains in self-regulation and improvements in teacher reported prosocial behaviors and decreases in hyperactivity from the mindfulness-based program increased children's sharing behavior and empathy. I chose these abilities because of the links between self-regulation and prosocial behaviors and maladaptive behaviors. In fact, research shows that children with difficulties regulating attention also have difficulties in exhibiting prosocial behavior and that self-regulation allows children to show empathy by facilitating their responsiveness to others' needs (Eisenberg, et al., 2006). Also, non-empathic responses are associated with hyperactivity (Braaten & Rosén, 2000). Therefore, given that sharing is a prosocial behavior that requires children to have empathy and young children are developing both sharing behavior and empathy during the kindergarten period (Brownell, Svetlova & Nichols, 2009), I was interested in investigating the effect of mindfulness-based programs on children's sharing behavior and empathy in kindergarten. To complement this investigation, I also explored children's reasons for sharing to better understand what motives underlie this prosocial behavior in kindergarten.

In the sections that follow, I review the literature on how social and emotional learning programs designed to increase prosocial behaviors (i.e., helping, sharing, cooperating) and foster prosocial characteristics (i.e., showing empathy, caring for others, being kind) have contributed to our understanding of the importance of social and emotional learning in educational settings. I then draw on the literature of sharing and empathy in early childhood to make inferences about how the implementation of a mindfulness-based program

in early childhood classrooms could improve children's sharing behavior by fostering their development of empathy.

Social and emotional learning

Parents, educators and policy makers agree that education should not just focus on academics but should include a social and emotional component as well (Elias, 2006; Greenberg et. al., 2003). Social and emotional learning has been defined as "the process of acquiring the skills to recognize and manage emotions, develop caring and concern for others, establish positive relationships, make responsible decisions, and handle challenging situations effectively" (Devaney, et al., 2005, p.109). There is a variety of different models of social and emotional learning programs designed for classrooms (see Durlak, Weissberg, Dymnicki, Taylor & Schellinger, 2011 for a review) and research continues to show the effectiveness of such interventions that specifically target children's prosocial behaviors (Schonert-Reichl, Smith, Zaidman-Zait & Hertzman, 2012). In fact, benefits of such interventions include both social and emotional and academic competence (Durlak, et al., 2011). Moreover, there is growing evidence that starting at a young age and using a developmentally appropriate sequence of lessons that build on children's social and emotional skills throughout their school years results in increased academic success (O'Brien, et al., 2003).

The current study complements these findings by exploring how a mindfulness-based program adapted for kindergarten classrooms may contribute to children's social and emotional learning in early childhood. The lessons included in the program offer opportunities for children to engage in individual formal guided experiential practices,

whole-group discussions about the practices and the themes explored as well as time for reflection and for practice outside beyond the session. Several lessons in the program specifically target prosocial characteristics and themes such as kindness, caring, empathy and generosity. Each lesson is adapted to meet the developmental needs of 4-6 year old children in early childhood classrooms.

Sharing in early childhood

Sharing is a prosocial behavior that begins to develop in the second year of life (Brownell, et al., 2009). Studies examining sharing behavior in early childhood have shown that it is difficult for young children to share and instances of spontaneous sharing occur much less frequently than other prosocial behaviors such as helping and cooperating (Brownell, et al., 2009; Eisenberg, 2005; Grusec, 1991). Some researchers have examined young children's sharing behavior by using tasks designed to investigate whether children will share a valued resource when it comes at a cost to them. For example, Thompson, Barresi and Moore (1997) presented 3- and 5- year-old children with different trials where they could choose to share stickers (valued resource) with an adult experimenter. In the prosocial trial (sharing at no cost), children could choose one sticker for themselves and no sticker for the adult or they could choose one sticker for themselves and one for the adult (i.e., the prosocial option). In the sharing trial (sharing at a cost), children could choose to keep two stickers for themselves and no sticker for the adult or they could keep one sticker for themselves and give the other to the adult (i.e., the prosocial option). Although children were less likely to choose the prosocial option in the sharing trial, children acted prosocially in the majority of trials. These results indicate that young children are willing to share even

when it comes at a cost to them. A study by Fehr, Bernhard and Rockenbach (2008) used a similar prosocial and sharing trials task but manipulated the identity of the person the children could choose to share with. Rather than having the option to share with an adult experimenter, children could choose to share with an ingroup member (a child from their class or school) or an outgroup member (a child from another class or school). Consistent with research showing a preference for a member of one's own social group, children in both age groups (3-4 year-old children and 7-8 year-old children) acted prosocially with the ingroup member in the prosocial trials (Fehr, et al., 2008). In fact, further research has supported the notion that sharing behavior in early childhood is sensitive to the characteristics of the recipient (Moore, 2009).

The current study builds on these findings by using a similar task for examining young children's sharing behavior with different recipients[1]. For the purpose of this study, I focus on the reasoning that underlies 4-6 year-old children's sharing behavior with the different recipients in the task. Also, in my adaptation of this task, to explore how empathy drives children's sharing behavior, one of the recipients children could choose to share with was a child who is sick in the hospital.

Empathy and mindfulness-based programs in early childhood

Empathy has been defined as "an emotional state triggered by another's emotional state or situation, in which one feels what the other feels or would normally be expected to feel in his situation" (Hoffman, 2008, p. 440). However, children must first develop the necessary cognitive skills to allow them to be aware of their being empathic. That is, they must understand themselves as separate beings possessing their own inner states (feelings,

thoughts, perceptions) in order to understand that the distress they experience from the distress of others is a response to the other's feelings and not their own. This metacognitive awareness emerges around the age of four and is also responsible for young children's ability to understand what they or what others might feel in the victim's situation (Hoffman, 2008). In turn, children begin to understand the other's needs and are able to respond to the other's distress by acting in prosocial ways (Decety & Jackson, 2004; Hoffman, 1987; Hoffman, 2001). Moreover, research shows that between the ages of 2 and 8 (early childhood), this increasing awareness of others' feelings allows children to experience empathic responses, even when the other person is not physically present (Hoffman, 2001).

Although empathy typically develops naturally as children interact with the world around them, it has also been shown to be a malleable characteristic that can be learned (i.e., with specific training/intervention) (Block-Lerner, Plumb, Rhatigan, & Orsillo, 2007; Hoffman, 2001; see Lam, Kolomitro & Alamparambil, 2011 for a review). Children participating in mindfulness-based programs engage in a series of experiential practices requiring them to focus and sustain their attention on a particular experience (e.g., breath, emotions and sounds) without judgment. As empathy requires an awareness and understanding of one's own thoughts and emotions, it has been hypothesized that increases in empathy would result from practicing nonjudgmental present moment awareness of one's emotions (Block-Lerner, et al., 2007).

Moreover, the prosocial characteristics explored throughout the mindfulness-based programs both complement and add value to the social and emotional competence children gain from the mindfulness practices and offer opportunities for children to learn about the various prosocial characteristics as well as the various ways to behave prosocially (Davidson,

et al., 2012; Meiklejohn, et al., 2012; Zelazo & Lyons, 2011). For example, one of the lessons included in the intervention program in this study focused on generosity by exploring all the different ways we can practice giving (from sharing a snack to giving someone a smile). Through a guided mindful awareness exercise, children are invited to reflect on different scenarios of acts of generosity by being mindful of the emotions and feelings that they experience (e.g., "Imagine that you say something very kind to someone. Notice how that feels."). Guiding children through this experiential exercise helps children make the connection between acts of generosity and kindness to how it makes them feel. Following this practice, children are encouraged to share what they noticed (e.g., that it made them feel good/happy). This lesson is reinforced by asking children to write or draw in their "Mindfulness Journals" about something generous that someone has done for them and things that they can give that do not cost money, like smiles. In addition, children are encouraged to practice generous acts and to collect them as a class so that they can be shared at the beginning of the following session. These four aspects of the lessons; experiential exercise, whole-group discussion, individual reflection and instructions for practice are aspects of the structure of each lesson in the program and contribute to the learning of prosocial characteristics and of ways to behave prosocially that children experience in the mindfulness-based program.

Research studies examining the benefits of mindfulness-based programs in classrooms have focused on the skills children need to experience success in school. Social and emotional competence and prosocial behavior are significant predictors of school success (i.e., O'Brien, et al., 2003) and researchers are beginning to explore these outcomes in studies investigating the benefits of mindfulness-based programs in classrooms with older children

(Broderick & Metz, 2009; Schonert-Reichl & Lawlor, 2010). However, to date and to my knowledge, the only studies examining the relationship between mindfulness-based programs in classrooms and gains related to social and emotional competence and prosocial behavior have used teacher reports. Although teachers provide valuable information about their students, they can be biased by perceptions and attitudes. This is especially problematic in intervention studies set in classrooms where it is impossible for teachers to be blind to whether or not students received the intervention. As this study is part of a larger study that reported increases in prosocial behavior from teacher reports, in the current study, I wanted to build on these findings by further investigating the relationship between mindfulness-based programs and prosocial behavior. Therefore, I used a task designed to measure sharing behavior and empathy directly with children following the implementation of the mindfulness-based program.

Given that children's empathic understanding and prosocial behaviors are developing in early childhood, I hypothesized that implementation of an age-appropriate mindfulness-based program in full-day kindergarten classrooms that focuses on practicing prosocial behaviors and cultivating prosocial characteristics would increase sharing behavior and empathy.

Overview of the current study

The purpose of the study was to determine whether children who received a mindfulness-based program (Mindfulness Group) would exhibit more sharing behavior and show more empathy than children who did not participate in the program (Control Group). Following the implementation of a 6-week mindfulness-based program adapted for early

childhood classrooms with 4-6 year-olds, all children participating in the study were given stickers with the option to keep them all, share them all or keep some and share some. One of the four recipients with whom children could choose to share with was a sex/age-matched child who was sick in the hospital. This recipient was included to trigger children's developing empathic responses. Sharing behavior from children in the Mindfulness Group was compared to sharing behavior from children in the Control Group. Reasons for sharing from children in both groups were also explored. This study had the following objectives: (1) to compare general sharing behavior from the children in the Mindfulness Group to the children in the Control Group. Given that children in the Mindfulness Group had practiced and learned about various prosocial behaviors and prosocial characteristics over the six-week period, I hypothesized that children in the Mindfulness Group would share more than children in the Control Group; (2) to compare the number of children from the Mindfulness Group who chose to share with the *sick stranger* to the number of children who chose to share with the *sick stranger* from the Control Group. Given that children in the Mindfulness Group learned about emotions and engaged in practices designed to cultivate empathy, I expected more children from the Mindfulness Group would have an empathic response to the *sick stranger* and in turn share with him/her more often than children from the Control Group; (3) to examine the reasons children gave for sharing. I also expected that children's reasons would differ based on the characteristics of the recipient they chose to share with and that children from the Mindfulness Group would cite wanting to behave prosocially more frequently than children in the Control Group.

METHOD

Participants

The sample consisted of Junior Kindergarten (JK) and Senior Kindergarten (SK) children attending split JK/SK full-day kindergarten (FDK) at three public schools in the Toronto District School Board (TDSB) in Toronto, Ontario. All three FDK classes were JK/SK split classrooms. Schools 1 and 2 housed students from JK to Grade 6, with 219 students and 288 students respectively. School 3 housed 423 students from JK to Grade 8. The percentage of students whose primary language was other than English in School 1 was 82%, in School 2, 43% and in School 3, 49%. All three schools that participated in this study shared similar levels of external challenges affecting student success as measured by the Learning Opportunities Index (LOI). The LOI is a measure used by the TDSB to rank all 474 elementary schools from the board based on external challenges affecting student achievement such as parents' education and income, poverty and proportion of lone-parent families. At the time of the study (2012), all three participating schools were in the top 200 of the LOI; School 1 was 183, School 2, 180 and School 3, 115. This indicates that the schools in this study were considered to experience somewhat higher levels of external challenges affecting student success than the general population of schools in the TDSB.

School 1 and School 3 had three participating classrooms and School 2 had four. To have an equal number of classrooms participating in the study from all three schools, I randomly assigned one classroom to the Mindfulness Group and one classroom to a Control Group while the third classroom in both schools did not participate in the study. However, following the intervention period, the mindfulness-based program was delivered in those 2

classrooms. As School 2 had even number of classrooms, I randomly assigned half the classrooms to the Mindfulness Group and the other half to the Control Group. Thus, there were two classrooms in the Mindfulness Group and two classrooms in the Control Group in one school and one classroom in the Mindfulness Group and one in the Control Group in two schools for a total of four classrooms in the Mindfulness Group and four classrooms in the Control Group. Furthermore, the four classrooms in the Control Group received the mindfulness-based program after the study was completed as all teachers had initially expressed interest in having the program delivered in their classroom.

In March participant recruitment was initiated and information about the study was sent to all parents of the JK and SK children in the eight participating classrooms from the three schools. One hundred and forty one children's parents agreed for them to participate in the study, representing 64% of all eligible children in the eight participating classrooms. However, 8 children from the Mindfulness Group were not included in the study as 6 children (5 boys, 1 girl) had moved and were no longer at the school and 2 children (1 boy, 1 girl) refused to complete the task. From the Control Group, 4 children (2 boys, 2 girls) were excluded from the study as 1 child (boy) was not verbal and could not complete the task and 3 children (1 boy, 2 girls) had changed schools. Consequently, data from 129 children (75 boys, 54 girls) were included in the present study; 71 children in the Mindfulness Group and 58 children in the Control Group. Twenty-eight children were from School 1 (17 in the Mindfulness Group and 11 in the Control Group); 28 children were from School 2 (15 in the Mindfulness Group and 13 in the Control Group) and 73 children were from School 3 (39 in the Mindfulness Group and 34 in the Control Group). At the time when data was collected

following the intervention period, participants were between the ages of 4 years, 4 months and 6 years, 4 months (Mean age in months = 62.85, *SD* = 7.3 months).

Procedure

Intervention: A mindfulness-based program was implemented in the four classrooms that had been randomly assigned to the Mindfulness Group. The research-based program that I selected was developed by an organization called Mindful Schools. I chose the program from this organization as it was a pioneer in integrating mindfulness into education. I received training and certification from Mindful Schools to implement the program and received permission from the developers to use it for this study. Note that to minimize any conflict of interest, I did not participate in any data collection at Time 2.

The curriculum consisted of twenty-minute lessons, delivered three times a week for a period of six weeks. Another reason for choosing this program was that the lessons in the curriculum provided a good balance between various "external" and "internal" experiential mindful awareness practices appropriate for children. For example, children practiced focusing their attention on internal sensations such as breathing as well as on external sensation such as eating and seeing (see Appendices 1 & 2 for sample lessons). In addition, the inclusion of lessons on "Heartfulness" was another valuable component of this curriculum. Through various experiential mindful awareness practices, "Heartfulness" lessons explored themes such as kindness and caring. For example by having children engage in practices involving developing kind and caring thoughts toward themselves and others (see Appendix 3 for a sample lesson). Following each of the 18 lessons, children were instructed to write or draw about the new mindful awareness practice they learned that day in their

"Mindfulness Journals". Practice of what they learned was encouraged by asking children to teach their family members at home. Each session began with time for children to discuss and share these experiences. At the end of the second week, the four teachers received bells and were asked to use them each day to practice mindful listening and mindful breathing with the children.

I implemented the mindfulness-based program in all four participating classrooms. Given the constraints of the teachers' schedules and needing space available to deliver the program without the disruption of the other half of the children, I delivered the program using a whole group context. Having 4 years of experience teaching kindergarten as well as a Master's of Arts degree in Child Studies and Education, I used my experience with and knowledge of children at this developmental stage to make appropriate adaptations to the mindfulness-based program. For example, coinciding with my own experience with young children's short attention span during circle time, Saltzman and Goldin (2008) provide an overview of an adapted version of a MBSR program designed for children in grades 4-6 and recommend shortening the practices based on the attention span of the children participating in the program. Therefore, I ensured that all mindful awareness practices were brief so that children did not become distracted and restless. Also based on my experience using children's books with illustrations to help reinforce topics or concepts explored in lessons as well as on research examining the importance of using picture books with young children (Cooper, 2007; Ganea, et al., 2008), I added several children's books on the various topics and practices explored in a few of the lessons. Moreover, as the original Mindful Schools curriculum included some lessons that were not appropriate for children in kindergarten (e.g., Lesson 14-"Mindful Test Taking") and since some of the additions (e.g., children's book)

required more time, a few of the lessons were spread out over 2 sessions (see Appendix 4 for a list of adaptations, changes and additions made to the curriculum).

Measure

Ten-Sticker Sharing Task: Following the 6-week period, the Ten-Sticker Sharing Task was individually administered to each child who participated in the study outside the classroom and was approximately 10 minutes in length. This task was an adaptation of a one-shot resource-allocation measure designed to quantify and compare children's prosocial behavior (sharing at no cost, with or without a delay) and sharing behavior (sharing at a cost, with or without a delay) through several trials with three different absent recipients (*friend, nonfriend* and *stranger*) (Moore, 2009). The original task was also administered which I called the "Empathy Task" as I added a fourth recipient (*sick stranger*) to explore children's empathy however, results are not reported on because of concern that the design of the task did not meet the goals of the current study[1]. For the purpose of this study, I chose to modify the task to focus on children's qualitative responses to analyze their reasons for sharing.

Children were invited to play a choosing game involving stickers. I used brightly colored stickers that have been shown to be highly motivating for young children and have been used successfully in other studies (e.g., Benenson, Pascoe & Radmore, 2007; Thompson, et al., 1997). Children were given a sheet of paper to place in front of them and were told that it was their "sticker sheet" where they can put the stickers that they choose to keep. Children were then presented with pictures of their classmates and asked to choose someone that they play with a lot (*friend*) and someone that they don't really play with (*nonfriend*). They were then shown a picture of a sex-matched child stranger who was

introduced as "Sam/Sarah, a boy/girl who is the same age as you but who goes to a different school." They were also shown a picture of a different sex-matched child stranger lying in a bed and who was introduced as "Leo/Julie, a boy/girl who is the same age as you but who is sick and in the hospital." Each picture was attached to a small clear plastic bag and placed in front of them above their "sticker sheet." Children were told that if they chose to share stickers, they would go inside the bag and would be given to the child whose picture was attached to it. The researcher then gave each child 10 stickers and explained: "Here are 10 stickers that you can do whatever you want with. You can keep all of them, share all of them or you can keep some and share some. Tell me what you would like to do and why."

Coding and analysis of quantitative data

Sharing behavior: To simplify the comparison of children's general sharing behavior between the Mindfulness Group and the Control Group, two groups were formed for children who shared at least 1 sticker: 1) Mostly Shared and 2) Mostly Kept. Children who shared half or more (5 to 10 stickers) were placed in the "Mostly Shared" group and children who shared less than half (1 to 4 stickers) were placed in the "Mostly Kept" group. The number of children exhibiting the two types of sharing behavior in the Mindfulness Group was compared to the Control Group using the chi-squared test of independence.

Sharing with sick stranger: The number of stickers children shared with each recipient was recorded. To isolate the number of children who shared stickers with the *sick stranger*, two groups were formed. Groups were formed with children who shared with (1) A Sick Stranger and those who shared with (2) Others (*friend*, *nonfriend* and *stranger*). Comparisons of the number of children who shared stickers with the Sick Stranger were

made between the Mindfulness Group and the Control Group using the chi-squared test of independence.

Coding of qualitative data

All children's responses were audio recorded and transcribed for analysis. The creation of categories was analyzed based on a thematic analytic approach (Aronson, 1994). First, two researchers reviewed the transcripts to look for common themes in children's responses to create tentative coding categories (Constas, 1992). Once the tentative categories were formed, both researchers coded all children's responses separately. The next step involved reviewing the tentative categories to determine if any of the categories could be collapsed to create broader categories. This ensured that the categories reflected a common theme rather than a specific response from individual children. Finally, the new categories were described and agreed upon and all transcripts were coded using the revised coding categories. Thirty percent of responses were double coded and inter-rater reliability was high at 90%.

Reasons for keeping or sharing stickers: As children were choosing what they wanted to do with the stickers, the researchers asked questions to encourage them to explain their reasons for sharing or keeping the stickers. Prompts from the researchers differed for each child as the objective was to gather as much information as possible about the reasons underlying their choices to keep or share the stickers. For example, while children were allocating or keeping the stickers, researchers would ask questions such as "can you tell me why you are sharing all the stickers?," "why did you decide to share with Julie and Sara?" or

"can you tell me why you want to keep them all?". Children's responses were audio recorded, coded and analyzed.

Reasons for keeping stickers: The reasons children provided for keeping all 10 stickers were coded in the following 2 categories: 1) Liking Stickers (e.g., "because I like stickers") and 2) Wanting More (e.g., "because then I can have more"). Note that these two categories were not mutually exclusive.

Reasons for sharing: When children chose to share one or more stickers their reasons for doing so were coded in the following 2 categories: 1) Characteristics of the Recipient and 2) Wanting to Behave Prosocially. Reasons coded in the first category included any reference made to characteristics of the recipient. For example, any mention of friendship with the child they shared with ("because he's my best friend"), or mentioning liking them ("cause I like him"), or referring to friendship behaviors ("because every day he plays with me"), was coded in this category. Also included in this category were any references to sharing with the *sick stranger* "because he/she is sick" or "because he/she is in the hospital." The second category included reasons related to the children wanting to behave prosocially. Any mention of wanting to be nice ("because I want to be nice"), wanting to share ("I just wanted to share") or wanting to make the child they are sharing with happy ("because I want to make them happy") was coded in this category. Note that these two categories were not mutually exclusive. To examine whether the prevalence of the two types of reasons was different in the Mindfulness and Control Groups a chi-squared test of independence was performed.

RESULTS

Descriptive statistics for sharing behavior: Mostly shared vs. mostly kept

To examine differences in general sharing behavior between the Mindfulness Group and the Control Group, all children who exhibited sharing behavior (i.e., shared at least one sticker) were placed in one of two groups. Twenty-eight children in the Mindfulness Group and 18 children in the Control Group "Mostly Shared" (64% vs. 56% of children who shared) while 16 children in the Mindfulness Group and 14 children in the Control Group "Mostly Kept" (36% vs. 44% of children who shared). A chi-squared test of independence was conducted to compare the number of children who Mostly Shared to the number of children who Mostly Kept between the two groups. The results of the test were not significant, χ^2 (1) = 2.21, p = .14, indicating no significant difference in general sharing behavior between the two groups in this sample. See Figure 1 for the distribution of children's sharing behavior between the Mindfulness Group and the Control Group.

Descriptive statistics for sharing with sick stranger

To investigate whether children who received the mindfulness-based program experienced more empathy for the *sick stranger*, comparisons were made between the number of children who shared with the Sick Stranger between the two groups. In the Mindfulness Group, 35 children (80% of the children who shared) shared stickers with the Sick Stranger. In the Control Group, 17 children (53% of the children who shared) shared stickers with the Sick Stranger. A chi-square test of independence was significant with a

small effect size, χ^2 (1) = 5.99, p = .014, Cramer's V= .28, indicating that more children in the Mindfulness Group shared with the *sick stranger.*

Descriptive statistics for reasons for keeping and sharing stickers

Forty-seven percent of children from both groups did not give a reason for keeping all the stickers. However, 53% of children from both groups gave reasons for keeping all of the stickers related to Liking Stickers and/or Wanting More (see Table 1). As noted earlier, these two groups were not mutually exclusive. Three children made references to both categories (two children from the Mindfulness Group and one child from the Control Group).

Seventy-eight percent of children from both groups gave reasons for sharing stickers related to Characteristics of the Recipient and/or related to Wanting to Behave Prosocially. The other 32% of children either did not give a reason or their reason was unrelated to the two categories that emerged from the thematic analysis (e.g., "because I want to"). As such, these responses were grouped together as "Other/No Reason" (see Table 2). As noted earlier, these two categories were not mutually exclusive. Seven children gave responses that were coded in both categories (four children from the Mindfulness Group and three children from the Control Group).

Children's reasons for keeping or sharing stickers

A chi-squared test of independence was performed to compare the prevalence of the two reasons for sharing the stickers in the Mindfulness and Control groups. Despite a pattern whereby a higher proportion of children in the Mindfulness Group, compared to the Control Group cited Characteristics of Recipient (60% vs. 47%) and Wanting to Behave Prosocially

(30% vs. 16%) as their reasons for sharing, the results of the test were non-significant, χ^2 (1) = 1.99, p = .159, indicating that similar proportions of children in the two groups gave the two types of reason. Given this similarity, I discuss specific reasons together for the two groups together.

Reasons for keeping stickers: Since almost half of the children in this study chose to keep all ten stickers, understanding their reasons for choosing not to share offers insight into how children feel about sharing and about how they feel about stickers.

Liking stickers and wanting more: The main reason children gave for wanting to keep stickers referred to how much they like stickers (Liking Stickers). For example a common response (34%) to the question "Why did you choose to keep them all?" was "Because I really like stickers." Anecdotally it was observed that many children became very excited about the option to keep all ten stickers. For example, one child said "Do I get to keep them all?...This is the best day of my life!" and another child said after sticking all ten stickers on his sticker sheet: "I'm the king of stickers!"

Given the high value that stickers seem to have for children, it seems reasonable to assume that children who chose to keep all ten stickers felt that the more stickers they had, the better (Wanting More). The following response illustrates that connection "I like stickers…and I like to have lots and lots and lots of them!" Most children however made references to wanting more without the explanation that they like stickers, perhaps because they felt it was a given. For example, "Because then I can have more" or "Because I can put them in my collection."

Reasons for sharing: Knowing that stickers hold a high value for children, it is interesting to analyze the reasons children gave for sharing. In fact, children who chose to

share 1 or more of the ten stickers often gave similar themed reasons to explain their sharing behavior. Upon closer examination of children's responses, patterns in the reasons children gave for sharing emerged. These patterns in their responses were categorized and provided an understanding of children's motives for sharing with one or more of the four recipients in the task.

Characteristics of the recipient: Analysis of children's responses to why they chose to share some or all of their stickers revealed that the most common reason involved making a specific reference to characteristics of the recipient. The majority of references were to sharing with their *friend* and with the *sick stranger*. Specifically, 34% of children who shared in this study related sharing behavior to friendship (e.g., "Cause we're friends"). Also, children made references to behaviors associated with friendship to explain why they chose to share with their friend (e.g., "He invited me to his birthday party"). The other recipient that children made specific reference to was the *sick stranger* (Julie/Leo). Of the 52 children who shared with the *sick stranger*, 14 children (27%) made reference to his/her health in their responses (e.g., "Because he/she is sick").

Wanting to behave prosocially: The other frequent (24%) reason children gave for why they chose to share some or all of their stickers involved making references related to wanting to behave in a prosocial way. As such, responses coded in this category included reasons that showed an understanding of how sharing relates to behaving prosocially. For example, children's responses expressing associations between sharing and caring (e.g., "Cause I just like to care for other people.") and between sharing and kindness (e.g., "Cause I want to be kind.") were coded in this category. Other reasons coded in this category included references children made related to wanting to behave prosocially that demonstrated a belief

that sharing their stickers would make the recipient happy (e. g., "Because I wanted to make them happy"). All associations that exemplified positive, prosocial behavior were coded in this category.

DISCUSSION

The present study was designed to examine the effects of a mindfulness-based program on children's social and emotional learning in early childhood. Such programs are important given the growing body of research exploring the importance of teaching the whole child (i.e., Elias, 2006; Greenberg et. al., 2003). Mindfulness-based programs are known to include practices and themes related to prosocial behaviors and prosocial characteristics. With respect to children, mindfulness-based programs are thought to offer a variety of benefits for the healthy development of social and emotional competence related to success in the classroom (i.e., Schonert-Reichl, et al., 2012). In this study, I explored children's sharing behavior, empathy and reasons for sharing after implementing an adapted mindfulness-based program for children in full-day kindergarten classrooms. In the sections that follow, I review the findings for each of the three objectives of this paper.

1. Mindfulness-based programs and sharing behavior

The first objective was to determine if a 6-week mindfulness-based program would improve children's sharing behavior. Sharing involves prosocial characteristics such as kindness, caring and generosity. As the children participating in the mindfulness-based program learned and practiced these prosocial characteristics throughout the program, I chose to compare sharing behavior between children in the Mindfulness Group and in the Control Group. There were no statistical differences in the amount of sharing exhibited by children in the two groups in this sample. However, it is worth noting that while the results of the comparison of children from the Mindfulness Group and the Control Group who Mostly Shared and Mostly Kept were not statistically significant, the pattern was consistent with my

hypothesis. Specifically, a higher proportion of children in the Mindfulness Group "Mostly Shared" (32% vs. 21%) while a higher proportion of children in the Control Group "Mostly Kept" (79% vs. 68%) at Time 2. The small sample size may explain the lack of statistical significance of these differences.

These findings are inconsistent with my hypothesis and with research showing that children who participate in programs aimed to foster social and emotional competence are more likely to demonstrate prosocial behaviors (Schonert-Reichl, et al., 2012). These findings are also inconsistent with research showing that mindfulness practices such as those included in the mindfulness-based program promote prosocial behavior (i.e., Kemeny, et al., 2012). One reason for this discrepancy could be attributed to the measure used in this study. Typically studies investigating increases in children's prosocial behavior post-interventions designed to promote prosocial behavior, are based solely on informant reports which could be biased by informants' perceptions and attitudes. Also, as mentioned, sharing is a prosocial behavior believed to be more difficult for young children and is thought to develop later than other prosocial behaviors (i.e., comforting or helping) (Brownell, et al., 2009; Eisenberg, 2005; Grusec, 1991). In fact, approximately 40% of children in this study did not share any stickers. While the percentage of "non-sharers" in each condition was in keeping with my hypothesis (38% from the Mindfulness Group and 45% from the Control Group) it was not statistically significantly different. Thus, it appears that a 6-week intervention is insufficient to change children's overall rates of sharing when it incurs a cost to them. Further research would benefit from use of direct measures of other prosocial behaviors (e.g., comforting or helping) to assess the impact of mindfulness-based programs on young children's prosocial behaviors. Also, understanding the reasons and motives that underlie children's sharing

behavior would assist in creating programs that could be effective in increasing this behavior, even if the program is relatively brief.

2. Mindfulness-based programs and empathy

The second objective was to determine if a 6-week mindfulness-based program would increase children's empathy. Mindfulness practices have often been theorized as a means for cultivating empathy (Andersen, 2005; Fulton, 2005; Martin, 1997; Morgan & Morgan, 2005; Shapiro & Izett, 2008; Walsh & Shapiro, 2006). In fact, research has confirmed positive correlations between empathy and mindfulness constructs (Beitel, et al., 2005). To trigger children's empathic response and thus measure empathy, I included a same sex/age child who was "sick and in the hospital" as one of the recipients children could choose to share stickers with. To determine if children who participated in the mindfulness-based program showed more empathy, I compared the number of children who shared with the *sick stranger* from the Mindfulness Group to the number of children who shared with the *sick stranger* from the Control Group. As expected, I found that more children who had participated in the mindfulness-based program shared stickers with the *sick stranger* (80% vs. 53%), with a small effect size of .28. This finding builds on research looking at young children's sharing and prosocial behavior across different absent recipients and provides insights into the development of empathy and how it relates to sharing. Moreover, the adapted task used in this study with the added *sick stranger* recipient could be used in future research examining the connection between children's empathy and sharing behavior by examining children's empathic response to a child "in distress" or suffering.

3. Young children's motives for sharing

The third objective was to explore young children's reasons for sharing. As statistically significant differences in sharing behavior were not found between the two conditions in this study, I collapsed the two groups and explored reasons for sharing for all children who chose to share. As sharing is a difficult prosocial behavior for young children, I expected that children who were willing to share would express distinct motives for their choices. To understand the context of children's feelings around sharing, I first explored the reasons behind children's decision not to share. By analyzing children's responses, it became clear that indeed sharing is difficult for children but also, children place a high value on stickers and therefore want more of them. This is consistent with other studies successfully using stickers as a valued resource (i.e., Benenson, et al., 2007)

In fact, it seemed that although most children recognized sharing as an act of kindness and prosocial behavior, it was difficult for them to do. This is consistent with prior studies showing that although prosocial behaviors emerge around the same period, sharing occurs less frequently than other prosocial behaviors (Brownell, et al., 2009; Eisenberg, 2005; Grusec, 1991). The following two responses come from children who were asked why they decided to keep all the stickers and demonstrate both children's feelings about sharing and about stickers; "I like to give people things and keep some things"; "Well I do like to share and I also really like stickers." Consider the following response as an example of the internal struggle for one child when describing what he would like to do with the 10 stickers; "I'm…I'm…uh…keep all of them and share all of them. Both." (note that this child ended up keeping all 10 stickers for himself). Therefore, the two distinct reasons that emerge from

their responses ("Liking Stickers" and "Wanting More") provided evidence to explain why so many children chose to keep all the stickers in the task.

Consistent with past research (Moore, 2009), when children chose to share one or more of the stickers, most of the reasons they gave made reference to the recipient that they were sharing with. Of the four recipients that children could choose to share with (*friend, nonfriend, stranger* and *sick stranger*), not surprisingly, the *friend* was the recipient children most commonly made specific reference to. Children made associations between sharing and friendship expressed by simple statements such as "Because friends get stickers!" or by explaining a friendship behavior (i.e., playing together) that entitles them to be shared with such as, for example, "Because he plays with me all day."

Surprisingly only a small proportion (27%) of children who chose to share with the *sick stranger* said anything about the child. Of these children the majority simply stated "Because he/she's sick" or "Because he/she's in the hospital" and did not offer more information that would clarify their thinking around sharing with someone who is "in distress" or suffering. The only responses that offered a little more information showed that there was a belief that the *sick stranger* should be treated well since he/she is sick. For example, "I should treat Leo nicely because he is in the hospital…" Moreover, one child expressed an assumption that if the child is sick, then he/she must be nice, "I think she's sick, so she's really nice," as the basis for sharing stickers with the sick child. In fact, a few children felt that the *sick stranger* deserved to be treated better than the other recipients, by wanting to give the *sick stranger* a "special sticker." For example, one girl stated, "Let's give her (Julie) a special one" and one boy said, "I think he went to the hospital and this sticker is really special, so this one goes to him." Although only a few children gave

responses that went beyond "because he's sick/in the hospital", it seems reasonable to conclude that children who chose to share with the *sick stranger* were making that choice because they felt that sharing stickers with them would be kind and/or helpful in some way.

Interestingly, the few children who made references to sharing with the *stranger* gave reasons related to the stranger's appearance. For example, one girl said "Because she's wearing a pretty shirt" and another girl said "Because she's got a happy face." Finally, one child's reason for sharing with the *stranger* clearly understood the prosocial nature of sharing and perhaps felt that it would be an appropriate behavior for meeting new people; "Because I don't know them and it's good to meet people by giving them stickers."

To summarize these qualitative responses referring to characteristics of the recipient, the following response from one child illustrates the common reasons underlying most of the children's reasons for sharing with particular recipients; "I gave some to Leo (*sick stranger*) because he's in the hospital. I gave some to Sam (*stranger*) because he's cute. I gave some to Clea (*nonfriend*) so we can be friends, and to Noah (*friend*) because we already are friends."

Finally, children also gave reasons related to wanting to behave prosocially. Children who gave these reasons seemed to have a more evolved understanding of the nature of sharing. Their responses linked sharing to prosocial characteristics such as kindness and caring by expressing an interest in wanting to possess those characteristics. Also, some children expressed that sharing would make the recipient happy. This finding supports research showing that young children have the ability to perceive another person's current desire for stickers (Thompson, Barresi & Moore, 1997).

Conclusions and limitations

The evidence from this study adds to the growing body of research looking at the relationship between mindfulness-based programs and social and emotional skills such as prosocial behavior. The mindfulness-based program used in this study incorporated several age-appropriate practices designed to promote young children's prosocial behaviors and cultivate prosocial characteristics. This study provides preliminary evidence of the possible impact of the program on children's empathy and opens the door for future research to look further into how teaching children mindfulness has the potential to contribute to teaching the whole child.

As mentioned, this study was part of a larger study where children's prosocial behavior was measured before and after the implementation of the study. The two groups were highly similar to one another with one noteworthy difference: children in the Control Group were more prosocial (as measured by teachers on the Prosocial Behavior scale of the SDQ) than children in the Mindfulness Group. However, as this study found that prosocial behavior increased for children in the Mindfulness Group following the intervention period, children from both groups were equally likely to share at Time 2 when the Ten-Sticker Sharing Task was administered (see Study #1). However, the SDQ relies on teacher-report and is thus subject to reporting bias. Future research should use a direct measure, such as the Ten-Sticker Sharing Task, both before and after the implementation of the intervention to ensure that comparisons of sharing behavior and empathy are not a product of initial group differences. In addition, future research should also include direct observational methods for measuring sharing behavior to determine whether mindfulness-based programs impact children's behavior in the real-world.

In addition to the Ten-Sticker Sharing Task having only been administered post intervention, other aspects of the task contribute to the limitations of this study. For example, as mentioned, as we administered the 10-sticker task in an exploratory way, data collectors used a range of prompts to elicit children's reasons for sharing and/or keeping stickers. Future research could use a pre-set range of prompts to examine whether different prompts lead to different responses. Also, the ethnicity and names of the *stranger* and *sick stranger* were not culturally diverse. It would be interesting to explore whether matching sticker recipient ethnicity to children's ethnicity would influence children's sharing behavior. However, as the Ten-Sticker Sharing Task provided qualitative information beyond performance-based and informant-based assessments, it proved to be a valuable addition to the overall results of this study. In addition, as I was the primary researcher in this study and was involved in analyzing the data, it is possible that my expectations of the outcomes may have influenced the coding of the data. An important step for minimizing this bias was to ensure that all qualitative data was double-coded. As mentioned, 30% of children's qualitative responses were double-coded and inter-rater reliability was high at 90%.

Another limitation is the small number of children participating in this study. This might be the reason why only one statistically significant finding emerged from this study. In fact, the only statistically significant finding in the present study is that more children from the Mindfulness Group shared with a *sick stranger* than children in the Control Group. This finding supports the notion that practices included in the mindfulness-based program used in this study were effective at cultivating children's empathy for a stranger who is "in distress" and suffering (sick and in the hospital). That is, children in the Mindfulness Group had an empathic response and engaged in sharing behavior with the *sick stranger* more often than

children in the Control Group. While none of the other comparisons were statistically

significant, overall the pattern of results confirmed with my hypothesis. For example, 30% of

children from the Mindfulness Group gave reasons related to Wanting to Behave Prosocially

when asked why they chose to share, compared to only 16% of children from the Control

Group. As noted above, the lack of statistical significance of this encouraging pattern of

results may reflect the sample size. Or it may reflect other study characteristics such as the

sensitivity of the measures employed in this study to capture small group differences.

Finally, another limitation to consider is the potential "spillover" effects between the

Mindfulness and Control Groups. Teachers and ECEs in full-day kindergarten classrooms are

encouraged to meet regularly to plan their programs. Therefore, it is possible that teachers

and ECEs in classrooms who were receiving the mindfulness-based program could have been

discussing the lessons with their colleagues. This could have resulted in teachers and ECEs

from classrooms in the Control Group to attempt to implement these lessons. Such

"spillover" would have reduced the difference between the two conditions thereby leading us

to underestimate the magnitude of the impact of the effect. However, as the intervention

period was short, it is unlikely that any "spillover" would have a significant effect.

Despite these limitations, this study successfully implemented this program for young

children in full-day kindergarten classrooms and the findings suggest that introducing

mindfulness to young children may yield potential benefits on their social and emotional

competence. With the growing interest in addressing children's social and emotional skills in

the education system it will be important to conduct research that explores new and efficient

ways to measure sharing and other prosocial behaviours. Future researchers should continue

to explore how mindfulness-based programs can promote prosocial behavior and empathy in

early childhood settings. Indeed, the various aspects involved in mindfulness-based programs relate to the five key areas (i.e., self-awareness, self-management, social awareness, relationship skills, and responsible decision-making) addressed in social and emotional learning programs (Collaborative for Academic, Social, and Emotional Learning, 2005). Therefore, examination of how mindfulness relates to these areas would allow for a refined design of mindfulness-based programs to further demonstrate how they address the social and emotional learning component that have proven to be so important in our education system today. Infusing mindfulness in schools appears to be a feasible and effective way to ensure that we are teaching the whole child.

Table 1

Descriptive Statistics for Reasons for Keeping All Stickers

| | | Reasons For Keeping All Stickers | | | | | |
| | Total | Liking Stickers | | Wanting More | | No Reason | |
	n	*n*	%	*n*	%	*n*	%
Mindfulness Group	27	8	30%	5	19%	16	60%
Control Group	26	10	38%	5	19%	12	46%
Total	53	18	34%	10	19%	28	53%

Note: Liking Stickers and Wanting More were not mutually exclusive which is why numbers do not add up to the number in each group.

Table 2

Descriptive Statistics for Reasons for Sharing Some Stickers

	Reasons For Sharing Some Stickers						
	Total	Characteristics of Recipient		Wanting to Behave Prosocially		Other/ No Reason	
	n	*n*	%	*n*	%	*n*	%
Mindfulness Group	44	26	60%	13	30%	9	20%
Control Group	32	15	47%	5	16%	15	47%
Total	76	41	54%	18	24%	24	32%

Note: Characteristics of Recipient and Wanting to Behave Prosocially were not mutually exclusive which is why numbers do not add up to the number in each group.

Figure 1

Distribution of Children's Sharing Behavior
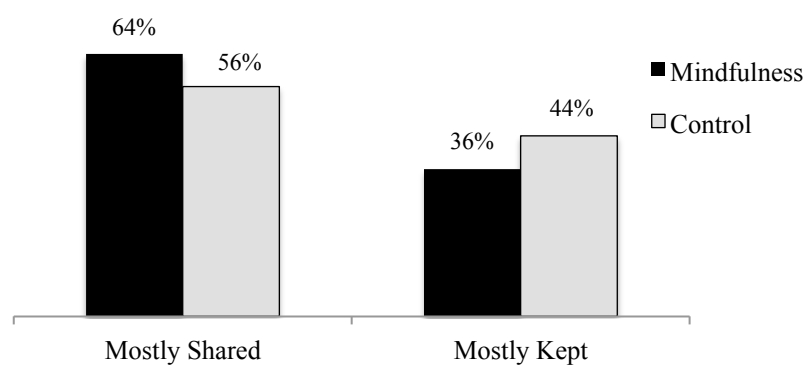
Endnotes

[1]*Empathy Task*

The Empathy Task was the initial adaptation of Moore's (2009) one-shot resource-allocation task. Moore's (2009) task used two different trials (prosocial and sharing trials) and three different recipients (*friend*, *nonfriend* and *stranger*). In the prosocial trials, the only cost for children choosing to allocate a sticker to the recipient is a delay in receiving one for themselves (sharing at no cost, with or without a delay). In the sharing trials, in addition to the delay, children choosing to allocate a sticker to the recipient also only get one sticker instead of two (sharing at a cost, with or without a delay). I added the *sick stranger* recipient to capture whether empathy played a role in children's sticker allocation.

Administering the Empathy Task at baseline raised concerns that the design of this measure did not meet the goals of this study. For example, for each of the two trials (prosocial and sharing), children were given two options for allocating stickers to each of the four recipients, generating quantitative results only. After the initial administration of this measure it was decided that this study called for a measure designed to elicit children's reasons for choosing one option over the other as well as offering insight into how the characteristics of each of the four recipients influenced children's sticker-allocation choices. In fact, the Moore (2009) task was not designed to be a pre and post measure making it difficult to interpret the results. To maintain consistency in the protocol following the intervention period, I administered the Empathy Task again. However, the design of the Empathy Task had a total of eight questions (i.e., one for each of the four recipients for both trials) which was not conducive to eliciting responses about general sharing behaviour. Therefore, following the Empathy Task, I added the second modified task (i.e., the Ten-

Sticker Sharing Task). This served the more qualitative goals of this study by encouraging children to provide reasons for their choices to share (or not) with each recipient without burdening children by asking them to explain their reasons eight times.

As a check of sample comparability I analyzed the data from the Moore (2009) task and found that there were no group differences at either time points nor were there any significant changes in scores on this measure in either groups over this period. For these reasons, only the results of the Ten-Sticker Sharing Task were included in this paper. However, it is possible that the order in which the tasks were administered impacted children's responses. For example, since children had already received at least a few stickers during the Empathy Task, some children may have felt more comfortable sharing some of the ten stickers they got from the new game. Researchers interested in quantitatively comparing children's resource-allocation based on sharing at a cost or at no cost with different recipients should use the Moore (2009) task. However, the "open-ended" design of the Ten-Sticker Sharing Task proved to be an important addition to the study as it provided important insights into children's reasons for sharing, as discussed in this paper.

Concluding Statement

The study of the effects of mindfulness-based programs in kindergarten classrooms offers a new approach for teachers to address the healthy development of social and emotional skills in children in early childhood. As self-regulation and social and emotional competencies go hand in hand (Liew, 2012), a theoretical model of self-regulation is presented to understand the benefits experienced by children in this study (see Figures 1-3).

The first study showed that children from classrooms that had participated in a mindfulness-based program showed significant gains in self-regulation and became more prosocial and less hyperactive. Moreover, children who showed difficulties in those areas benefited the most from the implementation of the program. The second study revealed no significant differences in children's general sharing behavior between children in classrooms that had participated in the mindfulness-based program and children in classrooms that had not participated in the program. However, children in classrooms that had participated in the mindfulness-based program showed more empathy towards an unknown child their age who was suffering (sick and in the hospital). This was demonstrated by more of them sharing with him/her than children in classrooms that did not participate in the program. Regardless of condition, analyses of reasons children gave for sharing revealed that children have two distinct motives for sharing. Specifically, young children in kindergarten share for reasons related to characteristics of the specific recipient they are sharing with and/or for reasons related to wanting to behave prosocially.

Examining the effects of mindfulness-based programs on children's self-regulation using a direct performance-based measure validated the significant changes seen in teacher

reports of prosocial behaviors and maladaptive behaviors related to hyperactivity. The first paper contributed information about the link between self-regulation and social and emotional competence; specifically it was found that the positive impact of the mindfulness-based program on children's self-regulation related to children's improvements in prosocial behaviors. Moreover, the mindfulness-based program also showed an impact on children's maladaptive behaviors related to difficulties in self-regulation (i.e., hyperactivity). These findings are consistent with research showing improvements in children's behavior after participating in mindfulness-based programs (e.g., Semple, et al., 2009). The second paper used a direct measure of children's social and emotional competence, investigating empathy and prosocial behavior (i.e., sharing). The task used in this study allowed for both quantitative information (how many stickers shared/how many stickers shared with each recipient) as well as qualitative responses (reasons for sharing/keeping stickers). As such, the second paper relied on children's behaviors and explanations of their prosocial behavior rather than solely relying on teacher reports of the sort presented in the first paper. Thus the information gathered from the second paper complemented the quantitative results from the first paper.

The results from this study supports the theoretical model of self-regulation contributing to the understanding of the mechanism underlying how mindfulness-based programs in early childhood produce benefits for children in kindergarten classrooms. However, there are many unanswered questions regarding the different aspects of the program that impact the various benefits found in this dissertation. For example, how much practice (both in and out of the classroom) is needed to show gains in the different areas; can a classroom teacher without mindfulness training implement a mindfulness-based program

with similar results; and are there "follow-up" measures to be taken following the program in order to maintain the improvements found.

Also, it is important to consider the quality of the classrooms receiving the mindfulness-based program. As mentioned, in this study, seven of the eight kindergarten classrooms had one certified teacher and one registered early childhood educator (RECE). The intention behind this team is for the RECE who has knowledge of child development to work with the classroom teacher to design a developmentally appropriate classroom and thus creating a developmentally appropriate classroom. However, the quality of the full-day kindergarten programs of the classrooms participating in this study was not measured. Future research should include a measure of program quality to ensure that the results of implementing a mindfulness-based program are not confounded by the quality of the existing program.

However, the fact that an intervention as brief as the one used in this study had any impact seems encouraging. As schools provide access to all children on a consistent basis over their formative years, policy makers recognize that schools are the major setting where intervention programs such as the one used in this study should be implemented (Schonert-Reichl & Oberle, 2011). As children entering school are just beginning their trajectory in the education system, programs geared to the development of social and emotional skills should ideally start in kindergarten.

Therefore, this dissertation represents a starting point for researchers to study the various aspects incorporated in mindfulness-based programs in early childhood classrooms to identify how mindfulness contributes to social and emotional learning. Also, given the importance of teachers' own behavior as a model for children's developing self-regulation

and mindfulness skills (Zelazo & Lyons, 2012), building on preliminary research showing

the positive effect of mindfulness-based programs for teachers on the children in their early

childhood classroom (Singh, et al., 2013), future research should also incorporate a

mindfulness-based program for teachers to measure this effect. In turn, understanding how

mindfulness can be woven into the curriculum offers teachers in early childhood settings an

opportunity to foster the healthy development of the whole child right from the start.

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Appendix 1

Class One: Introduction - Mindful Bodies & Listening

Key Points

- This first class is very important. If you set them up to view mindfulness as a special time and they know how to be prepared when you come in, every class will go better. Do not move on until they understand the instructions and activities of this first day.

- When introducing mindfulness, be simple, especially for the youngest classes. Too much talking will not be effective. However, older students benefit from hearing how mindfulness will be relevant to their lives.

- Set the bar high. After introducing "mindful bodies", see if they can sit with mindful bodies and closed eyes for 1 min. Same for mindful listening. Increase the time each day if they can do it. If they don't make it, then reduce it.

Introduction

I am here today to teach you something called mindfulness. Has anyone ever heard the word Mindfulness? Mindfulness is paying attention to what is happening in the present moment. Mindfulness can help us learn to pay close attention to many things. It can also help us calm down when we are angry, sad, frustrated, or have any difficult emotion. Mindfulness can help us feel happy too. It can also help us focus and do well in school, sports or music.

I am going to visit your class for a few weeks, for just 15 minutes at a time. Every time, I will teach you something new about mindfulness.

Mindful Bodies

There are a couple very important things that help us be mindful.

If students are at their desks, have them all move their chairs away from their desks and turn them toward the front of the room. Explain that they can do this each time you come in. Remind them each time until it is a habit.

The first thing that will help us during mindfulness is to keep our bodies very still… let's try that?

The second thing automatically happens when we get still… what is the noise like in here right now, when you get still?

Yes, it gets very quiet.

Now we have still bodies and quiet bodies. That's what I call our mindful bodies. Now, let's close our eyes and just sit like that for one minute.

You did a great job at your first practice of a mindful body. Was that easy or hard?

We won't have to be this still and quiet all the time, but often I will remind you to get your mindful bodies on and this is what you can do.

Mindful Listening

There are a lot of things that we can learn to be mindful of. Today we are going to practice being mindful of sound.

I brought something to help us with that. Bring out bell.

Would you like to hear what this sounds like? Ok, but we have to get our mindful bodies on.

Demonstrate a mindful body again and let them get ready. Make sure they are as still and quiet as you think that class is capable of.

Ring bell.

Great job. Would you like to hear it again? Ok, but this time, get your mindful ears on. That means you listen very carefully, the whole time. So, see if you can pay attention from the very first moment you hear the bell all the way to the end. Raise your hand when the sound is gone.

Ring bell.

Since you are so good at this, let's try it one more time with our eyes closed. Let your eyes close. Listen just like you did before to the entire sound and raise your hand when the sound is gone for you.

Ring bell.

We can also listen this carefully to any sound. There are lots of sounds around you all the time. If you listen very carefully, you might hear things you don't normally hear. Let's keep our mindful bodies on, with our eyes closed, and listen to the sounds around us. You might hear sounds in the classroom or outside, or even in your own body.

Mindful listening for about one minute.

Raise your hand if you would like to share some sounds that you noticed.

Comment on the quieter sounds and how quiet it had to be to hear them.

You have just learned how to pay attention better. In mindfulness, we learn how to focus and pay close attention to many things. Do you think it's important to be able to focus? Why? When could you use mindful listening?

Wrap-Up

I will see you again on _____. When you see me come in next time, you will know it's time for mindfulness and you can just get ready in your mindful bodies. I might not even say anything. I'll just come in, sit down, wait for your mindful bodies and ring the bell. We will listen to the bell every day I come to start and end the class. It will be our way of saying "hello" and "good-bye."

Now that you've learned mindful listening, see if you can remember to listen to sounds between now and the next time I see you. You might stop and listen while you are on the playground, or in the classroom, or at home. And you can tell me what you heard next time I come.

Journals

I also brought you all your own mindfulness journals. Today when I leave, you will get a journal and you can write about what we did today and how you felt. These journals are just for you. You don't need to worry about punctuation or spelling. You will not be graded. No one will grade it or read it unless you want us to. But your teacher might ask to see it just to make sure you are doing it.

Ring bell.

Appendix 2

Class Two: Mindfulness of Breathing - Finding your Base

Key Points

- If the first day was difficult, try moving the students. Change the energetic dynamic; make sure their chairs are all facing you, move them to the carpet, get them to come in closer or give each other space. Beginning today, you can ring the bell as a way of beginning class, before "hello." If you prepared them last time, they will remember to get in their mindful bodies when they see you come in.

- Beginning today, ask students if they remembered to practice the mindfulness you taught them last time. Time permitting, let a few students share. This is valuable for two reasons: 1. Many younger students are eager to share. 2. When other students hear what is happening for their peers, they are reminded what they can do.

- The anchor analogy seems to work best with third grade and up. But feel free to try it with the younger grades. Just make it simple. Also, make sure that you clearly pronounce anchor so that they don't get confused with anger.

- Check if anyone is having trouble finding their breath in their belly. Ask if they feel it somewhere else. You can direct them to their chest or nose too. Make sure they know wherever they notice their breath is fine.

- Suggest that they choose the spot that is most obvious to focus on whenever they do mindful breathing.

Check In

Ring bell.

Hello. Do you remember what I teach? Did anyone notice sound since I saw you last?

Breathing

Last time we learned to be mindful of sound. Today we are going to learn how to be mindful of something new. What am I doing right now?

Take an obvious inhale and exhale; let them identify that you are breathing.

Yes, today we are going to learn to be mindful of that. We are always breathing. We don't need to learn how to breathe, but we are learning how to pay attention to our breath. Even though we are always breathing, we usually don't notice it.

Let's try it and see how we feel. Get your mindful bodies on.

Take a few obvious deep breaths with them.

Now let's just breathe normally like we usually breathe.

Keep breathing like that and let your eyes close. Just feel your breath; pay attention to your breath while you are breathing in and breathing out. Continue this in silence as long as they are calm, quiet and participating.

Now, put one hand in the air. Good, now take that hand and put it on your belly. Now take some of those slow, normal, quiet breaths. What happens to your belly when you breathe in and out? Yes, it goes up and down (or in and out). When we are mindful of our breath, that's what we pay attention to; every time we breathe in and out, we notice that movement in our belly.

Anchor

Our breath right here is going to be our anchor. What is an anchor? What does it do for a boat? Yes, an anchor helps keep the boat where it is. If the boat starts to drift away, the anchor pulls it back in. Well, that is what our breath is doing for our mind. Sometime when you try to focus on your breath, you might find that your mind starts thinking instead of focusing on your breath. When our mind wanders away from our breath or starts to think about things; we can notice it and bring it right back to our anchor.

Practice

Let's try one minute. Get your mindful bodies on and let your eyes close. Let's focus on our breath for one minute and feel that movement in our belly, our chest or at our nose every time we breathe in and every time we breathe out.

How did that feel to focus on your breath?

Allow many answers if you sense they really did feel calm. If the class comments are "calm, relaxed, happy," etc., point that out. Identifying it for them allows them to be mindful of that feeling. "Notice how you feel right now." Also, point out that they became calm/relaxed/happy in just a few seconds.

Wrap-up

Now you have learned how to be mindful of sound and mindful of breathing. You can try being mindful of breathing between now and the next time I see you. Since you are always breathing, you can try any time! You can practice mindful breathing while you are sitting at your desk, walking in the hallway, on the playground, even when you are trying to fall asleep at night. Raise your hand if sometimes it's hard for you to fall asleep. Well, if that happens tonight or tomorrow night, you can practice your mindful breathing and see if it helps you fall asleep.

Journals

The journal questions for today are:

> When you breathe, where do you feel it in your body?
>
> How did you feel when you practiced mindful breathing?
>
> When do you think you can try mindful breathing again today?

Close with bell & three mindful breaths.

Appendix 3

Class Three: Heartfulness - Sending Kind Thoughts

Key Points

- Beginning today, you will practice mindful breathing at the beginning of each class. You can use a time challenge as a way to show them how they are improving. "Last time we practiced mindful breathing for one minute. Let's try a minute and a half today. Do you think we can do it?"

- Begin directing them regularly to notice how they are feeling right now. "Notice how you feel right now" will be included in the initial practice each day, but you are encouraged to make that suggestion whenever it comes to mind.

- It is important that you prep this lesson carefully. Guide students toward choosing someone they see regularly. If you don't prep this clearly, students may choose someone who has passed away and they will end up sad. It is, of course, totally okay to experience sadness, but in 15 minutes you don't have the time to process that with them. Your role in this lesson is to introduce them to kind thoughts in a way that will leave them feeling uplifted.

Practice

Ring bell. One minute of mindful breathing.

You can conclude each practice time by saying: Take a moment to notice how you are feeling right now. There's no right or wrong answer. In mindfulness, we're just noticing what's happening.

Check-In

Hello. How are you? Did anyone remember to try mindful breathing since I saw you?

Kind Thoughts for Another

Are you ready to learn something new today? Today we are going to learn about Heartfulness or sending kind thoughts to ourselves and others.

Let's try. Let's get our mindful bodies on. Raise your hand and instead of putting it on your belly, today we're going to put it on our heart. Now, let your eyes close and

imagine/visualize/picture someone who you see almost everyday who makes you very happy every time you see them.

Imagine that person is healthy and strong.

Imagine they are very happy, with a smile on their face. Maybe they are doing something they really enjoy.

Imagine that they are surrounded by calm and peaceful things, and that their heart is calm and peaceful.

Now, we are going to send kind thoughts to that person. First, let your heart fill up with kindness, so full that it's about to burst. Now, take all that kindness and let's send the thoughts together - you can repeat after me.

Pausing between each one:

May you be healthy and strong.

May you be happy.

May you be peaceful.

Now, I am going to be quiet for a few seconds and you can continue to let those kind thoughts flow from your heart to theirs.

Raise your hand if you want to say who you chose and how it felt to send that person kind thoughts.

Often, they will comment that they feel happy, calm, relaxed, wonderful, etc. If there is a strong feeling of happiness in the room, point out that it only took one minute for them to get that feeling.

Kind Thoughts for Yourself

Time permitting, or incorporate on a different day:

You can also send kind thoughts to yourself!

For younger students, try a self-hug. For that we need both hands. Put both hands in the air. Now take them and wrap them gently around yourself for a good self-hug.

For all: Let your eyes close and let's send those same thoughts to ourselves. You can repeat after me again.

Pausing between each one:

May I be healthy and strong.

May I be happy.

May I be peaceful.

You can have them give a self-hug briefly each time you see them as a welcome or as a closing.

K Modification

When sending kind thoughts to someone, asking K to imagine someone can sometimes be too abstract. They might understand it better if they can send it directly to someone they see in the moment.

Have them turn to the student next to them. Get them in their mindful bodies. Have them say the phrases to each other at the same time. Ask them how it feels when someone says something nice to them. How does it feel to say these things to someone else?

Now we're going to say these same sentences to our selves.

Raise your hand. Good. Now put your hand on your heart. We are going to say the same things but this time we'll send them right to our heart.

Have them repeat the phrases.

Ask again how that felt. Explain that they can do this whenever they need to feel better.

Wrap-up

Just like you can be mindful of sounds or your breathing anytime, you can send these kind thoughts anytime. Some people noticed that kind thoughts made them feel good. So, you can send kind thoughts when you want to feel good, or when you are not feeling great, you can use this tool.

Journals

The journal questions for today are:

Who did you send kind thoughts to?

How did it feel?

Will you try sending kind thoughts to someone again?

Close with bell & three mindful breaths.

Appendix 4

Adaptations, Changes and Additions to Mindful Schools Curriculum

Week 1	**Session 1:** *Introduction-Mindful Bodies & Listening* No significant adaptations, changes or additions
	Session 2: *Mindfulness of Breathing-Finding your Base (Part 1)* *Additions:* Read "Peaceful Piggy Meditation" by Kerry Lee MacLean to introduce mindful breathing (i.e., mindfulness meditation)
	Session 3: *Mindfulness of Breathing-Finding your Base (Part 2)* *Adaptations and Changes:* Simplified some of the language from the document and continued talking about "finding your base" and provided more time for practice and for discussion.
Week 2	**Session 4:** *Heartfulness-Sending Kind Thoughts (Part 1)* *Changes:* This lesson had two parts in the document meant to be done in one session. The first part focused on sending kind thoughts to another person and the second part focused on sending kind thoughts to yourself. To allow enough time for children to discuss this exercise, I decided to save the second part for the following session.
	Session 5: *Heartfulness-Sending Kind Thoughts (Part 2)* *Changes:* This lesson was the second half of the previous lesson where I focused on sending kind thoughts to yourself.
	Session 6: *Body Awareness* *Additions:* Read "Take the Time: Mindfulness for Kids" by Maud Roegiers to reinforce the connection between mindfulness and sensations in the body that this book touches upon in a simple and age-appropriate way.
Week 3	**Session 7:** *Mindfulness of Breathing-Staying at your Base* No significant adaptations, changes or additions
	Session 8: *Heartfulness-Generosity* *Adaptations:* Simplified the language and adapted some of the scenarios presented in the document to make them more relevant to children in kindergarten. For example, instead of "Imagine you are at your desk and the person who sits next to you accidently drops a box of pens an pencils. You reach down and help to pick them up. Notice how that feels.", I created a similar scenario "Imagine you are playing with blocks and the person playing next to you is building a tower with the blocks and they accidently knock over the tower. You go over and help him or her build their tower again. Notice how that feels".
	Session 9: *Thoughts* *Adaptations:* This lesson includes modification in the document that is geared toward children in K-2 called "First Thought". I used this exercise for this session. *Additions:* Read "Mindful Monkey, Happy Panda" by Lauren Alderfer to reinforce the idea of the "wandering mind".

Week 4	**Session 10:** *Mindful Seeing* No significant adaptations, changes or additions
	Session 11: *Heartfulness-Kind and Caring on the Playground* *Adaptations:* This lesson had children explore two "Playground Scenarios". I chose to only use "Scenario 2" because it was simpler and more relevant to what children in kindergarten would experience on the playground. I also wanted to have time to connect their discussion on difficult emotions to the story that I read (see below). *Additions:* Read "Anh's Anger" by Gail Silver to help children understand ways to deal with difficult emotions.
	Session 12: *Emotions-Creating Space or Show Me, Tell Me (part 1)* *Adaptations:* This lesson includes a modification in the document that is geared toward children in K-2 called "Show Me, Tell Me". I used this exercise for this lesson.
Week 5	**Session 13:** *Emotions-Creating Space or Show Me, Tell Me (part 2)* *Additions:* Read "Moody Cow Meditates" by Kerry Lee McLean to continue the discussion on emotions and feelings from the previous lesson. I also had children participate in the "Mind Jar" activity that can be found at the end of the book.
	Session 14: *Slow Motion* No significant adaptations, changes or additions
	Session 15: *Gratitude-Looking for the Good* No significant adaptations, changes or additions
Week 6	**Session 16:** *Gratitude-Balloon* *Changes:* This lesson was part of the "extras" at the end of the document. I included it here as it related to the previous lesson on gratitude and had a K-2 modification that I followed.
	Session 17: *Walking* No significant adaptations, changes or additions
	Session 18: *Mindful Eating* No significant adaptations, changes or additions