School-Based Emotion Regulation Intervention: Evaluating the Effects on Social, Family, and Academic Success of Students at High-Risk of School Failure

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Abstract

Students with borderline intelligence are at higher-risk for school failure than their typically developing peers. These students often exhibit maladaptive emotion regulation strategies leading to social, familial, and academic troubles. The use of adaptive emotion regulation in youth improves adaptive functioning for this population of learners. A large body of research suggests that adaptive emotion regulation influences students' adaptation to school demands and their overall academic success. The effective control of variations in emotional arousal required by emotional regulation has been shown to affect children's social relationships by facilitating engagement and disengagement from the environment. Additionally, the role of students' emotion regulation and its impact on parent-child relationships has also been hypothesized. The present study examined the effects of a school-based emotion regulation intervention on students' social abilities, the parent-child relationship, and academic outcomes. The sample consisted of 24 primary school students with borderline intelligence between the ages of 9 and 12 (M = 10.75). The findings suggested that there was no significant change in social abilities and parenting stress. However, results showed that there was a statistically significant increase in academic achievement following the intervention. These results highlight the importance of adaptive emotion regulation in improving students' school performance. Implications for future research involving similar interventions for at-risk youth and discussion of ways school psychologists and teachers can benefit from strategies used in the intervention will also be described. Practical implications of implementing an intervention of this nature are explored. Finally, study limitations and avenues for future research will be addressed.

Key Words: borderline intellectual functioning, emotion regulation, intervention, social competence, parenting stress, academic achievement

Resumé

Les élèves avec une intelligence limite sont reconnus comme ayant un plus grand risque d'échec scolaire comparé à leurs pairs dont le développement est normal. Ces élèves ont souvent des stratégies d'ajustement émotionnel maladaptées, ce qui entraine des problèmes sociaux, familiaux, et académiques. Il est reconnu que l'utilisation de techniques adaptées pour l'ajustement émotionnel aide à améliorer le fonctionnement adaptatif de ce groupe d'élèves. Un vaste corpus de recherche suggère que l'ajustement émotionnel adaptatif influence l'adaptation des élèves aux demandes du milieu scolaire, ainsi que leur succès académique en général. Il a été démontré qu'en facilitant l'engagement et le désengagement de l'environnement, le contrôle efficace des variations dans les réactions émotionnelles requis pour l'ajustement émotionnel ont un impact sur les relations sociales des enfants. De plus, le rôle de l'ajustement émotionnel des élèves et son impact sur les relations entre les enfants et leurs parents a aussi été investigué. Cette étude examine une intervention scolaire portant sur l'ajustement émotionnel et ses effets sur les capacités sociales des élèves, la relation parents-enfants, et les résultats académiques. L'échantillon fut composé de 24 élèves du primaire entre l'âge de 9 et 12 ans (M = 10.75) avec une intelligence limite. Les conclusions suggèrent qu'il n'y a pas eu de changement significatif dans les capacités sociales des élèves et le stress parental. Cependant, les résultats démontrent une amélioration statistiquement significative dans la réussite scolaire de ces élèves suite à l'intervention. Ces résultats soulignent l'importance d'un ajustement émotionnel adaptatif pour l'amélioration de la performance académique des élèves. L'article décrira aussi les implications possibles de l'étude pour toute recherche future portant sur des interventions similaires pour les jeunes à risque, ainsi que les façons dont les psychologistes scolaires et les enseignants peuvent bénéficier des stratégies utilisées en intervention. Les implications pratiques de l'implémentation

d’une intervention de ce genre sont aussi explorées. Enfin, les limites de l’étude et les pistes à explorer pour des recherches futures seront examinées.

Mots clés: fonctionnement intellectuel limite, ajustement émotionnel, intervention, compétences sociales, stress parental, réussite scolaire

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CHAPTER 1

Introduction

Students with borderline intellectual functioning are a unique risk population (Fenning, Baker, Baker, & Crnic, 2007). These students form a large population of learners at-risk for school problems such a low academic achievement (Bocsa, 2003; Harrison & Holmes, 2013), grade retention (Jankowska, Bogdanowicz, & Shaw, 2012), behavioural difficulties (Fenning et al., 2007), and dropout (Shaw, 2008). This population of students obtain intelligent scores ranging from 71 to 84 and are more likely than students in the average intelligence range to fall between the cracks of general and special education systems (American Psychiatric Association, 2013; Harrison & Holmes, 2013; Shaw, 2008). Although there is increase awareness in regard to improving the educational opportunities provided to students with diverse learning needs, there is still a lack of supportive educational services made available for this population at large (Jankowska et al., 2012). For this reason, there is a need for developing effective instructional practices and interventions to help foster skills, build academic resilience, and improve the important, but often overlooked, risk factors associated with students with borderline intellectual functioning.

There has been an increasing interest in emotion regulation research and the social psychological factors that contribute to success in school and in life (Gross & Thompson, 2007). Calkins and Marcovitch (2010) posit that effectively coping with our emotions represents an important interrelated skill throughout development and is critical to adaptive functioning such as academic achievement, social competence, and mental health. Students with borderline intelligence often struggle with achieving school success by exhibiting maladaptive emotion

regulation strategies to help them cope with school demands (Veenman & Verhej, 2001). Developing adaptive emotion regulation strategies is important for various reasons. Mashburn and Pianta (2006) suggest that non-academic protective factors such as adaptive emotion regulation can have positive effects on academic competence including grades, social behaviour within the classroom, and study skills, among other abilities. Given their sub-average IQ and learning difficulties, lower school performance and subsequent school failure are common for this group of diverse learners (APA, 2013; Shaw, 2008). Recent studies indicate that the ability to effectively regulate one's emotions is critical for well-being and school success (Calkins & Marcovitch, 2010; Gross & Thompson, 2007).

Additionally, social maladjustments and lower quality relationship with caregivers as experienced by this population of students are common and especially problematic (e.g., Fenning et al., 2007; Guralnick, 1997). Positive social interactions among youth, caregivers, and the wider environments they live in are reinforced and maintained through the use of adaptive emotion regulation strategies in difficult situations (Porges, 2003). In some cases, the emotional difficulties and increased conflicts with caregivers often reported by youth (Laursen, Coy, & Collins, 1998) may also be the result of a limited knowledge or understanding of positive emotion regulation strategies (Zimmermannn & Iwanski, 2014).

The present study explores the role and efficacy of a school-based emotion regulation intervention at improving students' social abilities and academic outcomes as well as parenting stress in a sample of primary school students with borderline intellectual functioning. As teachers and school psychologists are expanding their role and are interested in implementing school-based interventions as a way to combat a host of risk factors affecting students at-risk for school failure, results from this study can inform practice and give them tools in the form of strategies

that can be easily implemented in the classroom to improve the overall academic and social success of their students. In order to gain a comprehensive understanding of this subset of diverse learners, it is important to explore their unique social, family, and academic challenges in more detail.

Literature Review

Students described as having borderline intellectual functioning (BIF) comprise 14% of the population nationwide and though this may not seem like a sizable number at first glance, it is still more than the total students in all special education categories combined (Shaw, 1999). Student with BIF do not qualify for a diagnosis of Intellectual Disability (IQ score at or below 70), however, they exhibit evidence of substantial impairment in adaptive functioning (Harrison & Holmes, 2013). Although these students obtain intelligence test scores that fall between -2 and -1 standard deviations (*SD*), and often experience difficulty acquiring academic skills, they often do not meet eligibility criteria for special education services (Kaznowski, 2004). Therefore, students with borderline intelligence are usually taught in regular classrooms with typically developing same-age peers and are exposed to academic instruction that is inadequate for their level of intellectual ability (Kaznowski, 2004; Lacéne, 2008). Consequently, students with borderline intelligence often experience learning difficulties and lower than average IQ which put them at higher risk of school failure (Shaw, 2008). Students with borderline intellectual functioning often experience significant deficits in attention and social, speech, and language skills (Lynam, Moffitt, & Stouthamer-Loeber, 1993; Shaw, 2000). Overall, the struggle these students face between being ineligible for special education services and their difficulty to perform at the same level academically as their higher-ability peers makes it challenging for

them to navigate the general education system and experience educational success (MacMillan, Gresham, Siperstein, & Bocian, 1996).

For students having borderline intelligence, the situation in Quebec is somewhat similar. These students also experience difficulties when integrating into the general schooling system. Even when demonstrated that their level of cognitive functioning is lower than average, their condition is not identified as a mental impairment and therefore, do not qualify for special educational services or institutions (Jankowska, Bogdanowicz, & Takagi, 2014). In instances where students are identified with a specific learning disability, they will qualify for an Individualized Education Program (IEP), which is tailored to respond to the unique needs of each student by changing or modifying the curriculum (Quebec Education Act, 2015). On the other hand, students with borderline intelligence do not meet the diagnostic criteria for specific learning disability, their difficulties are often dismissed, and appropriate accommodations and services for these students are not available (Kaznowski, 2004). Knowing that students with borderline intelligence are a population that is often overlooked, there is a significant need to study this population as well as provide educational support to foster learning and positive school outcomes for these students.

Students with borderline intelligence face myriad of challenges. One of those challenges is their ongoing difficulty coping with the school demands. The ability to adjust to the school demands has important implications for children's long-tern behavioural adjustment, social engagement at school, and subsequent academic success (Einsenhower, Baker, & Blacher, 2007). Little research, however, has examined the mechanisms that elementary school children with borderline intellectual disability use to adapt to the school environment and demands that are difficult for them. By definition, children with intellectual disability have more limited cognitive

and adaptive skills than typically developing children which may put them at a disadvantage academically (Graziano, Reavis, Keane, & Calkins, 2007). Children who demonstrate early academic and learning difficulties not only display lower school performance, but are also at risk for developing later peer rejection as well as emotional and behavioural disorders (Bennett, Brown, Boyle, Racine, & Offord, 2003; Ladd, 1990; Risi, Gerhardstein, & Kistner, 2003). Sociocultural, school, familial, and individual factors contribute to children's school achievement. Among the individual factors associated with school success, emotion regulation is an important component in the adaptive academic functioning of children (Graziano et al., 2007). Results from this study support that parents' reports of their children's emotion regulation positively predicted academic success and productivity in the classroom. The authors' findings suggest that children who have difficulty regulating their emotions have trouble learning and are less productive and accurate when completing classroom assignments.

Children's ability to regulate their emotions facilitates their ability to acquire academic information and aids in performance of cognitive tasks. Blair (2002) suggests that inefficient emotion regulation may inhibit a child's use of higher order cognitive processes including working memory, attention, and planning. In addition, children's emotion regulation skills may lead to academic success through behavioural control in the classroom. Students with deficits in behavioural control (e.g., aggression and antisocial behaviour) are more likely to experience academic difficulties than students without deficits in this area (Masten et al., 2005; Risi et al., 2003). The deficits in behavioural control may hinder students' ability to pay attention to classroom instruction and to complete school related tasks or assignments. Most of these studies, however, have focused on typically developing students, while research on children with borderline intelligence remains largely unexplored. There are numerous ways in which emotion

regulation may affect students' academic achievement, social competence, and the parent-child relationship, which will be explored in the next few sections.

Academic Achievement

Children with borderline intellectual functioning often struggle with the academic curriculum by exhibiting maladaptive emotional regulation strategies (Veenman & Verhej, 2001). Whereas many factors influence children's school adjustment in the early school years, the development of adaptive emotion regulation has emerged as an important predictor of children's long-term adjustment in school (Graziano et al., 2007). Emotion regulation is an individual factor that influences the way students navigate and adapt to the school demands. It has been defined in various ways throughout the literature, however most researchers agree that emotion regulation involves efforts to modulate emotional arousal in a way that facilitates adaptive functioning (e.g., Calkins, 1997; Keenan & Shaw, 2003). According to the literature, adaptive emotion regulation helps students develop the cognitive capacity to regulate their emotions in response to life experiences, events, and academic stressors (Graziano et al., 2007). Effective use of adaptive emotion regulation strategies are important in developing positive student-teacher relationships, independent learning behaviour, and setting goals and striving for their attainment, all of which are important for school success (Nota, Soresi, & Zimmerman, 2004). Prior research by Howse and colleagues (2003) found that children who display better emotion regulation skills experienced greater academic success in the classroom as well as on standardized tests. However, little research has investigated the role of emotion regulation interventions for children with borderline intellectual functioning at the primary school level and the effects on academic outcomes.

Peer Relationships and Social Abilities

Gresham and colleagues (2011) posit that children who exhibit fewer social skills are more likely to develop school, mental health, and behaviour problems later on in life. Difficulties with social skills are characteristic of individuals with a range of disabilities, including emotional and behavioral disorders (Gresham, Cook, Crews, & Kern, 2004), specific learning disabilities (Gresham, 1992), and mild intellectual disability (Gresham & Reschly, 1987). Children with borderline intelligence are at high risk for maladaptive outcomes, including significant social difficulties (Guralnick, 1997). Students with borderline intellectual functioning may struggle when taking part in social interactions that may elicit negative interactions from peers.

The variation of arousal required by emotional regulation has been hypothesized to affect children's social relationships by facilitating engagement and disengagement from the environment (Porges, 2003). The development of positive relationships requires aspects of social competence such as social skills (e.g., appropriate eye contact, knowing when to start and stop a conversation) as well as the ability to inhibit negative behaviours (e.g., aggression which is maladaptive). Children with better emotion regulation skills display greater social competence, better social skills, and peer acceptance (Fabes, Eisenberg, Jones, Smith, Guthrie, Poulin, et al., 1999). On the other hand, students with poor emotion regulation skills are more likely to exhibit poor interpersonal skills and externalizing problems such as defiance, hyperactivity, and fighting behaviour (Rydell, Berlin, & Bohlin, 2003).

In light of previous research reporting the difficulties with social interactions experienced by children due to a lack of use of adaptive emotion regulation strategies (Guralnick, 1997), it is important to consider the possible positive interpersonal outcomes as a consequence of children's

participation in an emotion regulation skills intervention. It is clear that children with borderline intellectual functioning often have poor social skills and interpersonal relationships (Guralnick, 1997). Therefore, this study aims to examine the impact of an emotion regulation intervention at improving social outcomes for these students.

Distress within the Parent-Child Relationship

Another challenge that children with borderline intellectual functioning face is that of experiencing lower quality parent-child relationships (Fenning et al., 2007). Previous research on the quality of parent-child interactions suggests that a supportive parent-child relationship positively predicts students' motivation, self-esteem, adaptive social-emotional skills development, and academic outcomes (Bean, Bush, McKenry, & Wilson, 2003). Consistent, high-quality parent-child interactions promote optimal developmental outcomes for children (Burchinal, Roberts, Zeisel, Hennon, & Hooper, 2006; Mokrova, 2012). Fenning and collaborators (2007) investigated the relation between children's IQ status and observed parenting, with a focus on the quality of mother-child interaction. The sample of interest were children of cognitive limitations that impair functioning but are not considered severe enough to merit a specific disability diagnosis (i.e., referred to as children with borderline intellectual functioning). The authors highlighted that mothers of children with BIF were significantly less positive and less sensitive than mothers of typically developing children. Mothers of children with BIF were also least likely to display a style of positive engagement. The study's authors concluded that a lack of maternal positive engagement may result in a higher risk of emotional and behavioural dysregulation and social functioning difficulties in children with BIF (Fenning et al., 2007). However, the literature is scarce about whether improvements in emotional

regulation skills in children with BIF lead to a more positive and supportive parent-child relationship.

Although there is substantial research focusing on families of typically developing children (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000), relatively little is known about the quality of parenting among families of children with borderline intellectual functioning (Valliant & Davis, 2000). These children at are at heightened risk for maladaptive outcomes and school problems, therefore the quality of parent-child interactions may be more important for children with developmental delays (Fenning et al., 2007). Authors have agreed on the crucial role that parenting can play in fostering adaptive and socioemotional development in this population (e.g., Baker, 1996; Guralnick, 1997). We also know that higher levels of parenting stress can lead to poorer parental and child outcomes (Graziano, McNamara, Geffken, & Reid, 2011). This study sought to explore the possible influence of a school-based emotion regulation intervention at improving the distress within the parent-child relationship (parental stress).

Present Study

Theoretical Background

Graziano and colleagues (2007) propose nine emotion regulation strategies, five adaptive strategies (i.e., acceptance, positive refocusing, positive reappraisal, put into perspective, and refocus on planning) and four maladaptive strategies (i.e., rumination, catastrophizing, self-blame, and other-blame), we use to regulate our emotions in our daily lives. Graziano's recent work has focused on children diagnosed with Attention-Deficit/ Hyperactivity Disorder (ADHD). He investigated the way in which core symptoms of ADHD can directly impact social

functioning via self-regulation and executive functioning deficits which then negatively influence social interactions (Graziano, Geffken, & McNamara, 2011). Further research is needed to explore emotion regulation and self-regulatory processes in relation to students with borderline intelligence and intellectual disability.

Garnefski and colleagues (2001) refer to emotion regulation as "a wide range of biological, social, behavioural as well as conscious and unconscious cognitive processes" that help individuals regulate their emotions during or following the experience of a negative life event (p. 1312). For this study, we focus on the self-regulatory, conscious, and cognitive components or coping strategies used to help manage our emotions. Processes involved in effective emotion regulation include controlling which emotions are experienced and managing how and when emotions are felt and expressed (Gross, 1998; Gross & Thompson, 2007). Dennis (2006) argues that emotion regulation plays a crucial role in children's social-emotional development. As such, emotion regulation encompasses the regulation of feelings by monitoring, evaluating, and adapting behaviour as we engage with the world and interact with others (Carlson & Wang, 2007; Cole, Michel, & Teti, 1994; Thompson, 1994).

The intervention program used for this study was developed on the basis of the theoretical construct of cognitive emotion regulation and research information on best practices to support emotional regulation in youth (Garnefski et al., 2001; Shaw, 2008).The notion of emotion regulation is introduced to primary school students with borderline intellectual functioning via a school-based emotion regulation intervention consisting of weekly or bi-weekly lessons. Each lesson presents an adaptive or maladaptive strategy for coping with our emotions in stressful and difficult situations. The intervention aims to reduce the use of maladaptive strategies while promoting the practice of adaptive strategies. It consists of a series

of 11 sessions or lesson plans, each focusing on a specific strategy, including an introductory and concluding session (details about the intervention will be further discussed in the method section).

Research Aims and Hypotheses

The aim of the present study is to examine the change in academic achievement, parenting stress, and social outcomes of students with borderline intellectual functioning in response to the emotion regulation intervention in order to assess their current and unique social, family, and academic challenges. Additionally, the efficacy of the intervention to improve students' social competence, academic achievement, and reduce parenting stress will also be evaluated.

Implications for the study include efforts to add to our knowledge regarding the impact of teaching emotion regulation strategies to young students with borderline intelligence. The goal is also to improve our understanding of a school-based intervention at improving social skills and reducing distress within the parent-child relationship in families of children with borderline intellectual functioning. Additionally, this study will evaluate the effectiveness and value of an intervention of this nature at increasing academic achievement and subsequent school success. Finally, the outcomes from this study will be evaluated and the possibility of implementing similar interventions with other at-risk populations will be further addressed. The following hypotheses were supported by the present study:

1. *There will be a significant change in students' self-report of social abilities from Time 1 (prior to the intervention) to Time 2 (following the intervention), whereby Time 2 mean scale scores will be greater compared to Time 1 scores.*

2. *Students' academic achievement will significantly improve following their participation in the intervention (T2).*

3. *Finally, parenting stress will significantly decrease post-intervention (T2), in all domain areas but primarily the Parent-Child Dysfunctional Interaction (P-CDI) and Difficult Child (DC) domains.*

CHAPTER 2

Method

Participants and Setting

The current study was part of an ongoing research project investigating the role of school-based interventions at improving the academic achievement, social adaptation, and emotional well-being among primary school students.

Two teachers designated to teach identified classes of students with borderline intellectual abilities (BIF) participated in the study. Students in these two classes were eligible to participate. The two teachers are adults with a minimum education of a bachelor's degree in education. These teachers were involved in implementing a school-based intervention developed to improve students' emotion regulation. The sample of students come from a French-language primary school in Montreal, Quebec and included 9 girls and 15 boys who ranged in age from 9 to 12 (M = 10.75, SD = .989). The context of these classrooms is similar to that of the typically developing students, except there are lower number of students per class. For some students, the curriculum may be modified.

A total of 24 parents (either mother or father) also agreed to participate in the current study. Given the difficulty of collecting data from parents which resulted in a limited sample of parents who returned the completed demographic form and parent questionnaire even after multiple reminders, we only obtained demographic information for only 13 of the 24 total students in our sample. Data from the limited sample of respondents (n =12) indicated country of origin as Canada (41.67%), nearly two-fifths are from Haiti (33%), and a quarter of the sample

reported Algeria (8.33%), Cambodia (8.33%), and Congo (8.33%). Please refer to Table 1 below for a detailed summary of participant demographic characteristics.

Table 1

Descriptive Statistics for Participant Demographic Variables

Variable	Category	*n* (*N*=24)	%	Mean (*SD*)
Age (years)	9	3	12.5	10.75
	10	6	25.0	(.989)
	11	9	37.5	
	12	6	25.0	
Gender	Male	15	62.5	N/A
	Female	9	37.5	
	Other	0	0	
		n (*N*=13) unknown *n* =11	%	
Annual	≤ $39,000	10	76.9	N/A
Family	$40,000 — $49,000	1	7.69	
Income	$50,000 — $59,000	1	7.69	
	≥ $60,000	1	7.69	
Parent	Married	5	38.46	N/A
Marital	Common law union	1	7.69	
Status	Widowed	1	7.69	
	Separated	2	15.38	
	Divorced	2	15.38	
	Single	2	15.38	
Maternal	Some years of secondary	4	30.77	N/A
Education	Secondary diploma	2	15.38	
	Some college/ technical degree	1	7.69	
	Some university credits	1	7.69	
	Bachelor’s degree	2	15.38	
	Specialized degree (e.g., MD, DDS)	1	7.69	
	Did not respond	2	15.38	
Paternal	Some years of secondary	3	23.08	N/A
Education	Secondary diploma	5	38.46	
	Some college/ technical degree	0		

College diploma	1	7.69
Some university credits	2	15.38
Bachelor's degree	0	
Specialized degree (e.g., MD, DDS)	0	
Did not respond	2	15.38

Note. SD = standard deviation. MD = diploma in medicine, DDS = diploma in dentistry.

Measures

The primary objective was to examine the effectiveness of the emotion regulation intervention in decreasing parenting stress and improving students' social competence and academic achievement. French language versions of all questionnaires were used for this study.

Descriptives. Demographic information was obtained via the *Demographic Survey* developed by the researcher. This questionnaire was designed to collect demographic information such as students' age, gender, mother tongue, ethnicity, family structure, and socio-economic status (as assessed by family income and parental education). Frequency analyses were performed in order to obtain general information on the percentage of respondents who endorsed certain statements.

Parenting stress. The *Indice de Stress Parental*, French translated form of the *Parenting Stress Index- Short Form* (PSI-4-SF; Abidin, 2012), was used to assess the distress within parent-child relationship (parenting stress). The French version of this questionnaire was translated and validated by the publishing company Psychological Assessment Resources, Inc. (PAR, FL). The PSI-4-SF is an abbreviated version of the full-length PSI-4.This 36-item parent self-report questionnaire designed to evaluate the magnitude of stress in the parent-child system and focuses on three domains of stressors or subscales: Parental Distress (PD), Parent-Child Dysfunctional Interaction (P-CDI), and Difficult Child (DC). The Total Stress scale score is obtained by

summing the three subscale raw scores. Each subscale consists of 12 items rated on a 5-point Likert scale with responses ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). The questionnaire was completed by one of the parents, either the student's mother or father. High scores on a subscale and total scale score indicate greater levels of stress. The Parental Distress subscale reflects a parent's perception of child-rearing competence, conflict with his or her spouse or partner, social support, and stress associated with the restrictions placed on other life roles. The Parent-Child Dysfunctional Interaction subscale assesses a parent's perception that the child does not meet expectations and that interactions with the child are not reinforcing. Finally, the Difficult Child subscale surveys the parent's view of the child's temperament, defiance, noncompliance, and demandingness.

The PSI full-length and short form are commonly used as a screening tool for evaluating the parenting system and identifying issues that may lead to problems in the child or parent's behaviour. This information may be used for designing a treatment plan, for setting priorities for intervention, and for follow-up evaluation (e.g., Browne & Talmi, 2005). Both forms of the PSI have been subjected to a number of factor analyses that demonstrate the stability and validity of the factor structure of the measures (e.g., Fedele, Grant, Wolfe-Christensen, Mullins, & Ryan, 2010; Reitman, Currier, & Stickle, 2002). These studies involved a variety of populations, including Chinese, Portuguese, French Canadian, and inner-city African-American populations, among others. Coefficient alphas for the three domain scales and total stress scale range from .78-.90 (Roggman, Moe, Hart, & Forthun, 1994).

Social abilities. The 50-item self-report questionnaire developed by Arsenault and Loranger (1986) called *Le questionnaire d'autoévaluation des habilites sociales* (referred to in

English as the Social Abilities Self-report Questionnaire (SASQ) throughout this paper) was used to assess students' social abilities. This questionnaire has been used in a study investigating the development of social abilities of primary school students in Quebec (Levesque, 1993). The questions from this measure can be regrouped into six categories or subscales of social behaviour including: 1) basic social skills; 2) advanced social skills; 3) ability to deal with feelings; 4) skills when faced with aggression; 5) ability to cope with stress; and 6) planning skills (see Appendix A for further description of skills assessed by the individual scales). A total scale score was obtained by summing the six subscale raw scores. Each item is rated on a 5-point Likert scale ranging from 1 (*never*) to 5 (*always*). Higher scores indicate higher levels of social competence. This measure allows for the assessment of students' (girls and boys) perceptions of social skills. Each separate category provides information on one set of social skills likely to occur in class, and these contribute to a better understanding of social behaviour. A reliability analysis was performed on the total scale items resulting in a Cronbach's alpha of .84 indicating a high level of internal consistency (DeVellis, 2003).

Academic achievement. Official report card or transcript grades were collected in order to obtain numeric grade information for the core classes of French, Math, and Science. Scores on these subjects were used to assess students' overall academic achievement. Grades were collected at two times points, prior to (T1) and following the intervention (T2), in order to examine the change in academic achievement as a result of the intervention. The total academic achievement score was obtained by calculating the average value of the three subject scores (Math, French, and Science transcript grades).

Procedure

Following approval from the McGill University Research Ethics Board, both parental consent and student verbal assent were required to participate in the current study. All students who received parental consent chose to provide verbal assent. Teachers involved in the study also provided consent prior to beginning the study. The parents, teachers, and students were under no obligation and had the right to withdraw from the study at any moment. There was no compensation for teachers, students and their families for participating in this study. In addition, there was no charge or fees associated with the intervention.

Prior to implementing the intervention, the teachers participated in a training session led by the principal investigator and two other graduate students regarding the content and delivery process. Throughout the training session, a detailed description of each lesson included in the intervention was provided and any questions or concerns were also addressed.

In early January, the principal investigator and her research assistants visited each classroom on a different day to collect the first round of data (pre-test data, T1). From January to mid-February, teachers delivered the Emotion Regulation Intervention (consistent with the structure and guidelines within each lesson plan) over the course of six weeks. All sessions were scheduled during the regular school day, usually in the morning. Post-data collection was conducted upon completion of the Emotion Regulation Intervention. Students received certificates (Diplome du Jeune Scientifique) as a token of appreciation for their participation in the study.

Assessment procedure. Data was collected before (in January) and after (in May) the intervention program. The pre- and post-intervention assessment consisted of the *Indice de*

Stress Parental (completed by parents) and *Le questionnaire d'autoévaluation des habilites sociales* (completed by students). The *Demographics Survey* was completed by a parent or caregiver one time before the start of the intervention.

Questionnaires for parents were left (and recovered) in schools by research assistants. Teachers sent the questionnaires home to the parents with their students, who then returned them in sealed envelopes. Pre-test and post-test assessments were completed by students in their classroom during a class period. Data for this study were only collected from students from whom both parental consent and student's verbal assent was obtained.

Intervention

The Emotion Regulation Intervention consists of 11 lessons. These lessons were led by the two teachers, in their separate classrooms. The intervention was implemented over the course of six weeks, with one or two sessions a week during which a new emotion regulation strategy was introduced (see Appendix B for a description of the skills developed in each lesson). Each lesson lasted about forty-five minutes to an hour and was designed to be interactive in nature. The goal is to engage both teachers and students in a positive discussion about strategies one can use to better cope with our emotions in difficult situations.

The intervention is aimed at teaching students emotion regulation skills consisting of nine components: five adaptive strategies (i.e., acceptance, positive refocusing, positive reappraisal, put into perspective, and refocus on planning) and four maladaptive strategies (i.e., rumination, catastrophizing, self-blame, and other-blame). The first lesson consists of an introductory session where all the main concepts are introduced. The following lessons (each one covering one of the

nine components of emotion regulation) are taught separately or in combination of two lessons (a negative strategy paired with a positive strategy). During each weekly session the teacher reviews the strategy or strategies that will be covered on that day, propose activities in the form of worksheets, role-plays, personal examples, and storytelling, in order to engage the students in learning to recognize the stressful event and the accompanying emotion regulation strategy used. At the end of each session, the students learn to think and act more positively when faced with a stressful situation because they have learned to apply a positive strategy in order to regulate their emotions more adaptively. The concluding session (final lesson) serves as a review period where all the nine strategies learned over the course of the intervention are briefly revisited and a review activity is completed along with the students. Students are also welcomed to share their knowledge of these skills with their peers throughout this lesson.

The third chapter covers the presentation and analysis of results from data obtained on all measures used in this study. Prior to presenting the results of this study, we first examine the methodology used for data analysis.

CHAPTER 3

Analyses

First, descriptive statistics, including means and standard deviations, were calculated for demographic and outcome variables. Next, a series of paired-samples *t*-tests (repeated measures analyses) were performed to identify statistically significant differences among mean scores of the outcome variables (continuous dependent variables) for participants assessed before and after the intervention (categorical independent variable, two levels: *Time 1/ Time 2*). Preliminary analyses were performed to ensure no violation of assumptions. The data was checked for possible outliers and the steps followed to investigate these data points further and resolutions will be further explained in sections to follow. Further, missing values were substituted using the Expectation Maximization (EM) method before conducting the analyses (Tabachnick & Fidell, 2007).

Twenty-four (24) primary school students with borderline intellectual functioning were assessed on their level of social competence before (pre-test/baseline) and after (post-test) undergoing the emotion regulation intervention. In order to specify which domains of social abilities were most influenced by the intervention, the six subscale scores of social abilities were included. In order to evaluate the change in students' academic achievement prior to and following the intervention, scores on Mathematics, English, and French were also analyzed.

A sample of parents (15) was assessed on the parenting stress measure (consisting of three scale scores and total scale score) in order to evaluate the change in parental stress as a result of the intervention.

Results

To address the multipurpose aim and effectiveness of the emotion regulation intervention, students' academic achievement, social competence, and parenting stress were analyzed. The following sections review the main results of this study.

Social Abilities

A paired-samples *t*-test was conducted to test the effects of the intervention on students' level of social abilities as measured by a self-report measure. First, analysis of the descriptive statistics indicated that the data contained two outliers and the distribution of scores was not normally distributed as assessed by Shapiro-Wilk's test ($p = .006$). Data from one case was removed from the analysis due to non-available data at post-test. The data were then transformed by applying a reflect and square root transformation, recommended for when data are moderately negatively skewed. The data were then analyzed to test the normality assumption and a non-significant Shapiro-Wilk's test result ($p = .220$) suggested normality in the distribution of scores. One case was identified as an outlier; however, it did not have a strong influence on the scale mean and was thus kept in future analyses.

The results from the repeated-measures analysis revealed that there was no statistically significant difference in the total social abilities scores from Time 1 to Time 2. Overall, our hypothesis was not supported and we can conclude that the sample of participants who received the intervention did not report significantly higher levels of social abilities (total scale score), $t(22) = 1.060$, $p = .301$ (two-tailed), at Time 2 (after the intervention) compared to Time 1 (prior to the intervention).

Academic Achievement

Prior to conducting the analysis, descriptive statistics were analyzed. We identified five missing values (4 at pre-test, 1 at post-test). Little's MCAR test was conducted in order to determine if missing values were missing at random. Analysis of the results, $\chi^2(7) = 3.47$, $p = .839$, suggests that the data are probably missing at random. Missing values were substituted using the Expectation Maximization (EM) method in SPSS. One outlier was detected (more than 1.5 box-lengths), although inspection of its value did not reveal a strong influence on the scale mean and was kept in the analysis. The differences between the students' total academic achievement scores obtained before and after the intervention were normally distributed, as assessed by Shapiro-Wilk's test of normality ($p = .067$). The paired-samples *t*-test results confirmed our initial hypothesis indicating that there was a statistically significant increase in total academic achievement scores from Time 1 ($M = 54.75$, $SD = 7.14$) to Time 2 ($M = 66.35$, $SD = 7.73$), $t(23) = 16.32$, $p < .00005$ (two-tailed). The mean increase in total academic achievement scores was 11.60 with a 95% confidence interval ranging from 10.12 to 13.06. The eta squared statistic (.92) indicated a large effect size (Cohen, 1988), with a substantial difference in the total academic achievement scores obtained prior to and following the emotion regulation intervention. Figure 1 below illustrates the change in mean grade scores of students prior to and following the intervention.

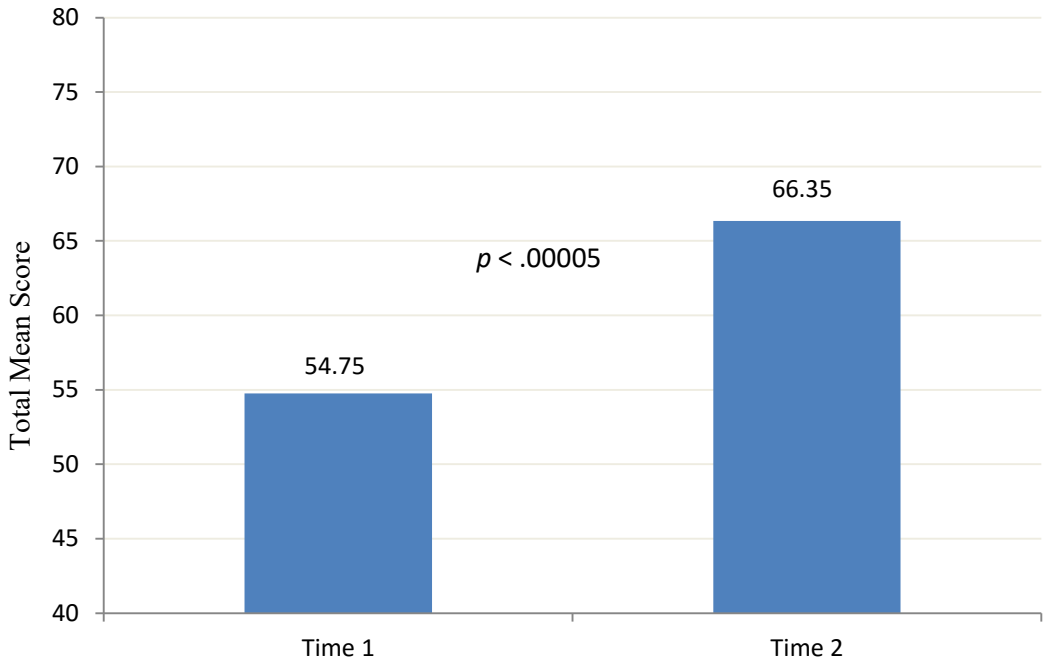

Figure 1. Change in Academic Achievement from Time 1 to Time 2

Parenting Stress

Last, we examined the possible benefits of the intervention at reducing parenting stress. A test of Little's MCAR suggested that missing values on this measure were missing at random; therefore missing values were replaced using the EM method. The data was further analyzed to determine whether it met certain assumptions prior to conducting the paired-samples *t*-test analysis. There were no outliers identified in our data, as assessed by inspection of a boxplot for values greater than 1.5 box-lengths. The differences between the total parenting stress index scores at Time 1 and Time 2 were normally distributed, as assessed by Shapiro-Wilk's test of normality (p = .482). A repeated-measures analysis showed that, contrary to our hypothesis, there was no significant decrease in self-reported parenting stress, $t(14) = -1.305$, p = .213 (two-

tailed), following students participation in the intervention, indicating no change in parental stress throughout the course of the emotion regulation intervention.

CHAPTER 4

Discussion

Overall Findings

This study was designed to evaluate the potential social, family, and academic outcomes resulting from the teaching of adaptive emotion regulation strategies to a high-risk population of students. Our findings revealed that there were no significant change in students' overall social competence and parenting stress over the course of the emotion regulation intervention carried out by teachers. Given previous research suggesting the positive impact of adaptive emotion regulation on students' social relationships and the parent-child relationship, further research is needed to continue to explore the influence of learning adaptive emotion regulation skills on students' social abilities and parenting stress, especially in regard to students with borderline intelligence. A few recommendations are described in the limitations section.

Research evidence suggests that social competence requires being able to adaptively regulate one's emotions and behaviour (Fabes et al., 1999). Children who experience high levels of negative emotions and who struggle to manage them in an adaptive manner tend to react more impulsively and engage more frequently in negative social behaviours (e.g., aggression) than those with lower levels of negative emotions (Eisenberg, Fabes, Bernzweig, & Karbon, 1993). These children are also less likely to participate in prosocial behaviours (e.g., empathy; Rothbart, Ahadi, & Hershey, 1994). Thus, given the importance of emotion regulation in the development of adaptive social behaviour, it is important for research to continue in this area especially in regards to children with borderline intelligence.

Moreover, the role of children's adaptive emotion regulation on parental stress should be further explored. More research is needed to investigate the factors that contribute to parenting stress in order to improve childhood outcomes. Evidence shows that parents who report higher levels of parenting stress are more likely, than those who do not, to use an authoritarian and negative parenting style (Deater-Deckard & Scarr, 1996) and are less involved in their children's lives (Fagan, Schmitz, & Lloyd, 2007). Further, greater emotional and social support from family members and friends appear to be associated with lower levels of parenting stress (Budd, Holdsworth, & HoganBruen, 2006). Research by Benzies and colleagues (2004) show that parenting stress levels predict later behaviour problems in children. Given the above research evidence, future investment in studies examining the specific behaviours of children with borderline intelligence that parents find most challenging in order to develop appropriate intervention and support.

Additionally, our study explored the impact of an emotion regulation intervention at increasing students' academic achievement. Similar to our hypothesis and in line with previous research by Graziano and colleagues (2007), these results suggest that learning adaptive emotion regulation strategies results in better school grades for students at highest-risk for academic failure. This is because students who know how to effectively regulate their emotions develop positive student-teacher relationships, independent learning behaviour, and are more likely to set goals and make every effort to meet these goals than students who use maladaptive emotion regulation strategies (Nota et al., 2004). These are all important predictors for school success. The use of adaptive emotion regulation strategies helps students develop the cognitive capacity to regulate their emotions in response to life experiences, events, and academic stressors such as obtaining a lower than expected grade in an exam or learning new and more challenging course

material (Graziano et al., 2007). Effective use of adaptive emotion regulation strategies are therefore conducive to school achievement, and therefore students who display better emotion regulation skills experience greater academic success (Howse et al., 2003). These strategies may be particularly helpful for students at higher risk for school failure such as those with borderline intellectual functioning.

Study Limitations

This study has some limiting aspects that should be considered in the interpretation and generalization of the results. Given the limited timeline for this study we were only able to obtain data from a limited number of students. Thus, the results of the study should be interpreted with caution when making generalizations to other students with borderline intelligence and other at-risk populations. The student sample was not chosen randomly from a population of students with BIF and thus reflects a convenience sample. Although the sample size was small, an informative aspect of this study was that these participants are students who usually struggle with academic, social, and family problems. The researcher hypothesized that results would inform teachers and educators on the influence of an emotion regulation intervention at improving these issues. The researcher also recognizes that the majority of the sample reported a family income of 39, 000 $ or less. In future research, it is important to evaluate the impact of socio-economic status on the variables of interest among families with children with borderline intelligence.

Further, at the beginning of the study the students' parents accepted to answer the parent questionnaire prior to and following the intervention. However, due to the difficulty of obtaining parent data, parents had difficulty completing and returning the completed questionnaires to school, therefore reducing our overall parent sample.

Another limitation of this study is found in the nature of the intervention in regard to the length of time it took to deliver it (6-weeks). Perhaps extending the length of time of future emotion regulation interventions implemented with this population (from 6 weeks to one lesson a week throughout the entire academic year) would prove more beneficial and improve outcomes for these students. The time of day during which the intervention is implemented (at the beginning vs. end of the school year) could also be explored. Six weeks may not have been enough time for these children to internalize, generalize, and apply the material they had just learned in order to adopt the true social benefits of the intervention. Further research is needed to evaluate the impact of emotion regulation interventions on a comparable student population where similar social and family relationship outcomes are addressed.

In a similar vein, the results showed no significant change in parenting stress perhaps because students and parents rarely communicated about what students learned in the classroom in regard to the intervention and the content of the lessons. Future research should explore this avenue and develop an intervention where the concepts and strategies that students learn throughout the course of the intervention in the classroom setting can be generalized to the home environment. A final consideration is that the results presented for this study come from students with BIF living in a western, industrialized country and results may not necessarily generalize to students with BIF in other countries or cultures.

Conclusions and Future Directions

The primary purpose of this study was to examine the influence of an emotion regulation school-based intervention in improving students' social competence, academic achievement and reducing parenting stress. Results from this study show that ER interventions show distinct

promise for improving the academic performance of students with borderline intelligence at the primary school level. Despite the study's limitations, the findings from our study support past research evidence that suggests that educating students on adaptive ways of regulating their emotions while learning methods to put these skills into practice can improve academic achievement (Howse et al., 2003).

Overall, the aim of this study was to bring attention to the social, family, and academic challenges of students with borderline intellectual functioning and encourage schools to put in place educational services and interventions to improve social development and build academic resilience leading to students' school success.

Students with borderline intellectual functioning experience greater difficulty in school compared to typically developing peers. Although a majority of these students find themselves in regular classrooms, they are still at-risk for school problems. Due to their limited access to special education services, students with borderline intellectual functioning do not receive the help that they need to improve their school performance and experience academic success (MacMillan et al., 1996). Studies revealed that these students often exhibit maladaptive emotion regulation strategies which may put them at risk for academic problems (Veenman & Verhej, 2001). Helping students with borderline intelligence learn adaptive emotion regulation strategies that are critical to improving their performance in school is an important undertaking that will lead to the overall school success of these students, including improvement in grades, social behaviour within the classroom, and study skills (DiPerna & Elliott, 2000). School psychologists and teachers can benefit from this research by learning about an evidence-based school intervention that provides teachers with tools and strategies that can be easily implemented in their classroom both essential to students' school success and complementary to effective

instruction. Further, school psychologists can benefit from the strategies included in these lessons to plan interventions similar to this one with other population of students at risk for academic troubles.

Given that students with BIF are a population that is often overlooked, the purpose of this study was to shed light on and improve our understanding of the academic, social, and family adjustment issues common to this population of students. In this way, teachers can become more aware of the needs of this specific category of students in order to provide the best possible interventions and educational support that can foster learning and positive school outcomes for these children. Finally, the outcomes of this study will have implications for evaluating the outcomes of future interventions of this nature with other at-risk youth populations experiencing difficulty in school.

Although this study shows positive academic outcomes resulting from the implementation of an ER intervention, there are still questions that need to be addressed. In general, more rigorous research is needed to better understand the relationship between emotion regulation and social abilities and parent-child relationships among primary school students. Most important, more random assignment studies of programs designed to improve social skills and parenting stress is needed to examine any significant improvements in these areas, mainly for study with borderline intelligence. A closer look into the diversity of emotion regulation interventions and a more nuanced understanding of the mechanisms behind intervention effectiveness is needed to gain greater insights into the potential for emotion regulation strategies and skills to improve outcomes for children and youth at-risk for academic failure. The framework of these interventions can be examined to evaluate which parts of the intervention would be most effective for students and simpler for teachers to implement in the classroom of

students with diverse learning needs, specifically students with borderline intellectual functioning. Future research can explore these avenues and begin to improve implementation science research to provide teachers with more effective tools and strategies and improve the way in which emotion regulation interventions are applied in schools and other settings.

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APPENDIX A

Categories of social abilities as measured by the Social Abilities Self-report Questionnaire

Categories/ Scale	Skills Assessed
Basic social skills	Listen, Transition between conversations, Small talk, Ask a question, Introduce yourself, Present others, Give a compliment
Advanced social skills	Ask for help, Join a group, Give instructions, Follow instructions, Convince others
Ability to deal with feelings	Knowing our feelings, Expressing our feelings, Understand the feelings of others, Dealing with the anger of others, Expressing affection, Dealing with fear
Skills when faced with aggression	Request permission, Help others, Negotiate, Exerting control in difficult situations, Asserting ones rights ,Dealing with teasing, Avoid trouble
Ability to cope with stress	Make a complaint, Respond to complaints, Conquer shyness, Dealing with rejection, Defend a friend, Reacting to persuasion, Responding to failure, Dealing with conflicting information, Dealing with group pressure.
Planning skills	Make a decision, Finding the cause to a problem, Setting goals, Estimating your abilities, Gather information, Establish the order of priority for certain problems, Focus on a task

APPENDIX B

Overview of the Emotion Regulation Intervention strategies and skills developed

Introduction	
1. Emotion regulation strategies	
Adaptive strategies	**Skills developed during the lesson**
2. Acceptance	Take responsibility for actions Learn how to move on from a situation
3. Positive refocusing	Healthy distractions (e.g., favourite music) Acknowledge negative event once calmer
4. Positive reappraisal	Attribute meaning to negative events Think of how best to tackle a problem
5. Put into perspective	Show gratitude (e.g., for family, health) Acknowledge unique hardships of others
6. Refocus on planning	Learn to develop steps to dealing with difficult situations Having an action plan helps alleviate stress and reduce anxiety
Maladaptive strategies	**Skills developed during the lesson**
7. Rumination	Learn how worry can impair performance Acknowledge that healthy worry motivates goal
8. Catastrophizing	Differentiate small problems vs. disasters Learn how to calm down when feeling unnerved
9. Self-blame	Differentiate self-blame vs. personal responsibility Learn how self-blame impairs self-esteem
10. Other-blame	Learn how other-blame can increase hostility Review empathy and theory of mind skills
Conclusions	
11. Summary	

Note. Lesson topics (strategies) are not necessarily listed in the same order as implemented in the classrooms.