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Timothy C. Johnston

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SELF-CONCEPTS AND SOCIOEMOTIONAL FUNCTIONING OF CHILDREN
WITH MILD INTELLECTUAL DISABILITY (MID) AND PARENTS'
ATTRIBUTIONS FOR THEIR
CHILDREN'S ACADEMIC STRUGGLES

by

Timothy C. Johnston

A Dissertation
Submitted to the Faculty of Graduate Studies
through the Department of Psychology
in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy at the
University of Windsor

Windsor, Ontario, Canada

2012

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Self-Concepts and Socioemotional Functioning of Children with Mild Intellectual Disability (MID) and Parents' Attributions for Their Children's Academic Struggles

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AUTHOR'S DECLARATION OF ORIGINALITY

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ABSTRACT

The present study investigated the academic self-concepts and socioemotional functioning of children with Mild Intellectual Disability (MID; IQs of 70-85) and also explored how parents interpret and respond to these children's academic difficulties. Previous research has shown that children with MID are likely to underachieve academically (e.g., Karande et al., 2008). Frequent experiences of academic difficulty may relate to the development of negative academic self-perceptions, especially amongst children with MID attending full-time regular education classes who are forced to compare themselves to higher achieving peers, as well as socioemotional dysfunction. Moreover, because children with MID may lack a formal cognitive diagnosis, their parents may often be unaware of their intellectual limitations. Unaware parents may erroneously attribute academic difficulties to motivational factors and subsequently respond with more negative/ less positive parenting behaviours. Misattributions may be particularly common amongst lower functioning parents with problem-solving difficulties. Study hypotheses were addressed through administration of child self-concept/socioemotional functioning and parent attribution/behaviour measures to a convenience sample of 96 school-aged children (ages 6-13) and their parents with estimated Full Scale IQs (IQ) broadly falling in the MID range or higher. Analyses revealed a positive relationship between child IQ and academic self-concept that was not moderated by full-time regular classroom placement. Moreover, an inverse relationship was uncovered between receipt of special education services and academic self-concept, suggesting the need for sensitive delivery of academic interventions to children with MID in the regular classroom. Socioemotionally, children with MID demonstrated higher levels of externalizing and overall dysfunction than did children with higher IQs. While

low child IQ did not predict the tendency for parents to attribute instances of academic difficulty to motivational factors, it did inversely predict parents' degree of cognitive stimulation on a challenging academic task; these findings suggested that parents may often be aware of the cognitive limitations of their children with MID. Finally, lower functioning parents of children with MID evidenced a somewhat uninvolved style of parenting when interacting with their children on a difficult academic task, thus highlighting the need for interventions aimed at optimizing parents' contributions to the academic/psychosocial development of children with MID.

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CHAPTER I

Introduction

Overview of the Context and Goals of the Current Study

It can be predicted from a standard normal distribution curve that approximately 23% of individuals have Full Scale IQs (i.e., IQs) in the Borderline to Low Average range (i.e., IQs between 70 and 89). In the Province of Ontario, individuals with IQs falling within this range are often classified for educational purposes as having a Mild Intellectual Disability (MID; e.g., Ontario Ministry of Education, 2001). The intellectual difficulties faced by individuals with MID may often be substantial enough to interfere with their academic attainment, financial stability, social functioning, and mental health (e.g., Hassiotis et al., 2008; MacMillan, Gresham, Bocian, & Lambros, 1998). However, because individuals with MID may lack a diagnosis indicating cognitive limitations and usually display few, if any, physical signs of intellectual impairment relative to their same-aged peers, their cognitive difficulties may be overlooked by others. In the absence of definitive evidence of intellectual impairment, it may be assumed that individuals with MID are capable of performing at an age-appropriate level. Consequently, individuals with MID may not qualify for special education services at school, or meet criteria for community living and work-related services. Without access to these services, individuals with MID are likely to experience frequent difficulty as they struggle to live up to the unrealistically high standards placed on them by society. Indeed, research has shown that children with MID experience heightened levels of school-related difficulty (e.g., Karande et al., 2008). Frequent school-related difficulties may lead children with MID to develop negative self-perceptions regarding their academic abilities. In addition, low self-perceptions of academic competence may place children with MID at risk for the

development of various forms of social, emotional, and behavioural (i.e., socioemotional) dysfunction (Cole, Martin, & Powers, 1997; Garaigordobil, Durá, & Pérez, 2005; Marsh, Parada, Yeung, & Healey, 2001). The first goal of the present study is to investigate the academic self-perceptions and socioemotional functioning of children with MID.

Also of interest in the present study is how parents interpret and respond to the academic difficulties of their children with MID. In the absence of a psychological diagnosis indicating cognitive limitations or overt evidence of physical impairment in the child, parents are more likely to attribute child academic difficulties to motivational factors. Because parents who attribute their child's problem behaviours to motivational factors are likely to respond to these problem behaviours with negative parenting techniques (Dix, Ruble, Grusec, & Nixon, 1986; Dix, Ruble, & Zambarano, 1989; Geller & Johnston, 1995; Slep & O'Leary, 1998), it is also probable that parents who attribute their child's academic difficulties to motivational factors are likely to respond to these academic difficulties with negative parenting behaviours. Misattributions may be particularly prevalent when the parents themselves have intellectual limitations. Because parent IQ and child IQ are moderately correlated (Bouchard & McGue, 1981; Meador et al., 2011), it is likely the case that parents of children with MID have increased prevalence of cognitive limitations that may limit their parenting effectiveness.

Structure of the Literature Review

The current study's literature review will begin with a definition of Borderline to Low Average intellectual functioning and a brief discussion of the prevalence and key clinical features of children with Mild Intellectual Disability (i.e., MID). Research examining the academic difficulties experienced by children with MID will then be reviewed. Next, the research pertaining to the self-concepts of children with MID will be

reviewed. In particular, this section will focus on the relationship between academic difficulty and low academic self-concept, and the potential influence of upward social comparisons on this relationship. The review will then examine the socioemotional (i.e., social, emotional, and behavioural) functioning of children with MID. The focus of the review will then turn to the parenting of children with MID. In this section, particular emphasis will be placed on parents' misinterpretations of the causes of the problem behaviours of their children with MID and parental Borderline to Low Average intellectual functioning as possible factors undermining parents' ability to demonstrate warmth and responsiveness in interactions with their children with MID.

Borderline to Low Average Intellectual Functioning: Definition, Prevalence, and Clinical Features

The Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV; Wechsler, 2003) and Wechsler Adult Intelligence Scale, Fourth Edition (WAIS-IV; Wechsler, 2008) categorize individuals with IQs between 70 and 79 and between 80 and 89 as falling in the Borderline and Low Average ranges, respectively. Statistically, it can be predicted from a normal distribution curve that approximately 23% of the population have Borderline to Low Average IQs. The prevalence of individuals with IQs between 70 and 84 is approximately ten times greater than the prevalence of individuals with schizophrenia (Shean, as cited in Shaw, Grimes, & Bulman, 2005), and approximately two times greater than the prevalence of individuals with Attention Deficit/ Hyperactivity Disorder (Shaw et al., 2005). Furthermore, the prevalence of school-age children with IQs between 70 and 84 is similar to the prevalence of children enrolled in special education programs in the USA, excluding children who receive speech language services (MacMillan, Gresham, Siperstein, & Bocian, as cited in Shaw et al., 2005). Despite the

considerable prevalence of individuals with Borderline to Low Average IQs, this population remains grossly understudied. Moreover, existing research on individuals with Borderline to Low Average IQs is often confusing and contradictory as a result of the use of varying terminologies (e.g., mild intellectual disability, borderline intellectual functioning, slow learner, low-achiever, gray-area child) and sample selection criteria (e.g., low academic achievement rather than IQ, differing IQ ranges). In the present study, individuals with Borderline to Low Average IQs will be referred to as having Mild Intellectual Disability (MID).

One of the primary reasons for the scarcity of research on individuals with MID is that this population does not constitute a discrete disability group. Indeed, psychiatric diagnostic systems (e.g., DSM-IV) do not include formal diagnoses for individuals with IQs in the Borderline to Low Average range. In fact, in some jurisdictions individuals may be excluded from disability designations (e.g., Mental Retardation, Learning Disability) on the basis of their Borderline or even Low Average IQs (Corkum, Stephenson, Lowe-Pearce, & Baert, 2012; Williams, 1989). However, individuals with MID have not always fallen through the cracks of diagnostic systems. Indeed, between the years of 1959 and 1973, individuals with IQs between 68 and 84 who exhibited adaptive behaviour deficits (i.e., independent living skill difficulties) were eligible for a diagnosis of Borderline Mental Retardation (BMR), according to the popularly accepted criteria of the American Association on Intellectual and Developmental Disabilities (AAIDD). However, this BMR diagnosis elicited considerable controversy. Primarily, it was argued that the standardization of popular IQ tests on Caucasian, middle-class samples meant that ethnic minorities were likely to underperform on these tests and therefore to be overrepresented amongst the population of individuals with BMR (Luick

& Snef, 1979; Williams, 1989). In response to the aforementioned controversy, the AAIDD eliminated the BMR designation in their updated definition of Mental Retardation (MR), published in 1973. One effect of the re-definition of MR was to leave many individuals with MID without a diagnosis or access to important services.

Clinical studies suggest that individuals with MID experience difficulty with reasoning; meta-cognition; task planning, initiation, and completion; verbal communication; attention; and motivation (Karnes, 1970; Masi, Marcheschi, & Pfanner, 1998). Many of these difficulties are consistent with a deficit or delay in the acquisition of concrete and formal operational thought, as defined by Piaget's model of normal cognitive development (Masi et al., 1998). The intellectual difficulties that are experienced by individuals with MID are likely to become increasingly apparent in late childhood and early adolescence, as a result of the growing emphasis placed on higher-order cognitive skills at school (Masi et al., 1998).

Academic Difficulties of Children with Mild Intellectual Disability (MID)

The intellectual difficulties faced by children with MID are likely to impair their performance across a wide range of academic areas. MacMillan et al. (1998) compared the performances of children with MID (i.e., IQs between 71 and 84) and students with normal IQs (i.e., IQs ≥ 85) between the ages of 7 and 12 on several measures of academic achievement. The researchers found that students with MID underperformed relative to their peers with normal IQs on reading, arithmetic, and spelling tasks. Because of the pervasive academic difficulty experienced by students with MID, regular classroom teachers may struggle to implement effective remedial strategies for these students (MacMillan et al., 1998).

Although academically underachieving children with MID may sometimes be referred by their teachers for special education services, whether they actually receive these services could depend on the regional jurisdiction. In some jurisdictions, these children's IQs may be too low to qualify them for Learning Disability-related services, and too high to qualify them for Mental Retardation-related services (Corkum et al., 2012; Williams, 1989). In other jurisdictions (e.g., the Province of Ontario), legislation may qualify children with MID for special education services, or individual schools or school boards may have the authority to provide these children with special education services or placements. However, receipt of these services may still be conditional on the age or grade level of the student. Moreover, research findings are inconsistent regarding whether children with MID actually benefit from the individualized special education interventions they receive (e.g., Krishnakumar et al., 2006; Kaznowski, 2004).

Regardless of the possible effectiveness of special education services, children with MID, as a group, remain at considerable risk for experiencing pervasive academic difficulty at school. Indeed, in a study conducted by Karande et al. (2008), 48 out of 55 eight- to sixteen-year-old Indian school children with MID (i.e., IQs of 71 to 85) experienced failure on their school examinations, and 30 of these failing children also had histories of grade retention. In a related study, Shaw (as cited in Shaw et al., 2005) found that only six percent of 142 children with MID (i.e., IQs of 70 to 85) were able to pass an achievement test administered to public school students in the state of South Carolina.

The experience of frequent academic difficulty may place children with MID at heightened risk for school drop-out. In one study, Crocker, Côté, Toupin, and St-Onge (2007) compared the educational backgrounds of adults with MID (i.e., IQs between 71 and 85; $n = 84$) and adults with normal IQs (i.e., IQs ≥ 86 ; $n = 144$) who were being

detained prior to trial and found that only 20.2% of individuals in the MID group had completed high school, versus 43.8% individuals in the normal IQ group. In another study, Pratinidhi, Kurulkar, Garad, and Dalal (1992) investigated the abilities of 172 seven- to fifteen-year-old Indian students who had either dropped out of primary or secondary school, or had stopped attending classes for a period of at least three months (it was not until 2002 that the Indian constitution was updated to make school attendance mandatory for children between the ages of 6 and 14; Constitution [Eighty-sixth amendment] Act, as cited in Sripati & Thiruvengadam, 2004). The most common explanation given by students for dropping out was economic hardship (43%); however, a large proportion of the remaining students indicated that they had dropped out because they found school difficult (25%) or uninteresting (31%). Irrespective of reason for withdrawal, the majority of drop outs (82.5%) were found to exhibit below average ability (defined as scores below the 50th percentile) in at least one of five domains (cognitive, academic, or social) on a psychological screening measure. While the findings of the latter study do not pertain directly to children with MID, they are nevertheless suggestive of the presence of an elevated risk for school dropout amongst children with mild intellectual impairments.

Importantly, children with MID may experience frequent academic difficulty and school drop-out as a result of the unrealistically high expectations placed on them by teachers and parents who are unaware of their intellectual limitations relative to same-age peers. Indeed, children with MID are unlikely to carry a diagnosis that would alert teachers and parents to the presence of cognitive limitations. In addition, children with MID are unlikely to evidence the physical characteristics typically associated with more severe forms of intellectual impairment (Karande et al., 2008). In the absence of a

diagnostic label or physical evidence of cognitive limitation, children with MID may be viewed by their teachers and parents as *capable* of achieving at the level of their peers with normal IQs but as *unwilling* to do so. Consequently, teachers and parents may not feel the need to adjust their expectations for children with MID. Of interest in the present study is how academic difficulty in the context of unrealistic expectations and misattributions may be related to self-concept in children with MID.

Self-Concepts of Children with MID

Development of Self-Concept

Self-concept can be defined as a collection of “domain-specific self-perceptions” (Cosden, Brown, & Elliott, 2002, p. 34). Two such domains include academic and social self-concept. Self-concept is to be distinguished from self-esteem, or an “overall sense of self-worth” (Cosden et al., 2002, p. 34). Individuals’ self-concepts differ along structural and content dimensions. The *structural* dimension refers to the degree of organization and integration of an individual’s self-perceptions (Evans, 1998). The *content* dimension refers to the sophistication of the descriptions that comprise an individual’s self-perceptions (Evans, 1998). It is ordinarily the case that both the structure and content of individuals’ self-concepts increase in sophistication over the course of their cognitive development.

The ability to form self-perceptions emerges during the preschool years. These perceptions are global and undifferentiated (Evans, 1998). In other words, preschoolers are likely to hold a single, all encompassing view of themselves that applies across all aspects of their lives. Indeed, according to Harter (1983), “the young child who thinks he or she is good at drawing will also tend to think he or she is good at puzzles; good at knowing the alphabet, numbers, colors; good at climbing, running, singing, and so on” (p.

307). Preschoolers' self perceptions are also more concrete than abstract (Evans, 1998). For example, preschoolers are more likely to see themselves as “strong” or “big” than “nice” or “smart”. In addition, preschoolers' self-perceptions are often inaccurate and unrealistic, possibly as a result of their poorly developed reasoning abilities (Evans, 1998). Indeed, preschoolers tend to overestimate their abilities and competencies, such that their self-perceptions are more reflective of their ideal selves than their real selves (Evans, 1998). This tendency to overestimate their competencies is actually adaptive, as it provides preschoolers with the necessary self-confidence to approach novel tasks and learn skills (Berk, 1996; Evans, 1998).

During the school age years, children's self-perceptions become more differentiated and less global (Evans, 1998). In other words, school age children are able to see themselves as strong in certain areas of their lives and weak in others. Indeed, school-aged children may see themselves as good sports players but bad students. This increased differentiation of the self-concept is reflective of school-aged children's enhanced reasoning abilities. School-aged children's self-concepts are also more accurate and realistic than preschoolers' self-concepts (Evans, 1998; Harter, 1983). As such, school-aged children are less likely than preschoolers to overestimate their abilities. The more realistic self-perceptions of school-aged children may result in part from their newfound ability to compare their own performances to those of their peers (Evans, 1998).

The final stage of the development of self-concept usually occurs in adolescence. In adolescence, individuals develop the ability to weave the many aspects of their self concepts into a single identity (Erikson, 1968; Evans, 1998). In addition, adolescents are able to simultaneously hold views about their real selves and ideal selves as a result of

their well-developed abstract reasoning abilities (Evans, 1998). For instance, adolescents may accurately view themselves as poor at sports but also hold “ideal” images of themselves as good sports players.

In general, research findings suggest that individuals with intellectual impairments (i.e., Mental Retardation) progress through the same “stages” of self-concept development as do their peers with normal IQs (Evans, 1998). However, their progress through these stages is delayed as a result of their cognitive difficulties. In other words, the self-concepts of individuals with Mental Retardation (MR) are under-developed relative to peers of the same *physical* age, but similarly developed relative to peers of the same *mental* age (Evans, 1998). Indeed, school age children with MR appear to be as inaccurate at estimating their abilities as are normally developing preschoolers of the same mental age (Evans, 1998). In addition, it is not until early adolescence that many individuals with MR evidence the realistic self-concepts seen in normally developing school-age children of the same mental age (Evans, 1998). If self-concept development is related to mental age, then it might be expected that children with MID would develop realistic self-concepts at an earlier age than individuals with MR, but at a later age than individuals with normal IQs. Once children with MID develop the ability to form realistic self-concepts, they may begin to view themselves as incompetent as a result of their frequent experience of academic difficulty.

Self-Concept and Academic Difficulty

Research examining the self-concepts of children with academic difficulties has yielded mixed results; some researchers have identified affected children as having poor self-concepts in comparison to their normally achieving peers (e.g., Coleman, 1983; Kavale & Forness, 1996; Jones, 1985), whereas other researchers have been unable to

substantiate these findings (e.g., Grolnick & Ryan, 1990; Hansford & Hattie, 1982; Vaughn, Haager, Hogan, & Kouzekanani, 1992). Still other researchers have suggested that, due to the multidimensional nature of self-concept, it is necessary to look at specific domains within the construct in order to determine whether academically struggling children differ from their normally achieving peers (Harter & Pike, 1984).

A number of studies have found that academically struggling children have lower *academic* self-concepts than their normally achieving peers (Jones, 1985; Gadeyne, Ghesquiere, & Onghena, 2004; Pickar & Tori, 1986). In one such study, Jones (1985) compared the academic self-concepts of 30 Grade 5 regular classroom students and 30 ten- to thirteen-year-old special education students (e.g., Learning Disabled, Educable Mentally Retarded, Speech/ Language Impaired) and found that the three groups of special education students had lower academic self-concepts than did the group of regular classroom students. Grolnick and Ryan (1990) compared the general self-concepts of third to sixth grade LD students, IQ-matched non-LD students, and low achieving (overall academic achievement < 25th percentile) students. They found that the three groups did not differ in terms of general self-concepts. However, the LD and low achieving students had lower cognitive self-concepts (i.e., self-perceptions of school-specific academic *and* cognitive ability; Harter, 1982) than did the non-LD children with IQs that matched the LD students, who presumably experienced less academic difficulty.

An interesting question concerns the direction of the relationship between academic self-concept and academic achievement. According to self-enhancement theory, academic self-concept would be expected to influence academic achievement (Kurtz-Costes & Schneider, 1994). Students who believe they are academically incompetent may tend to give up easily, put little effort into their schoolwork, or get overly anxious at the

prospect of having to complete an assignment or test. These types of factors would be expected to inhibit students' school performance. On the other hand, the skill development theory suggests that academic achievement directly influences academic self-concept (Kurtz-Costes & Schneider, 1994). Indeed, academically struggling students are likely to experience repeated failure on school assignments, tests, and exams. Over time, these repeated failures would be expected to engender within struggling students a sense of inadequacy and low academic self-concept. Studies reviewed by Kurtz-Costes and Schneider (1994) on the directionality of the relationship between academic achievement and self-concept are equivocal in their support of the skill development theory (e.g., Marsh, 1987; Song & Hattie, 1984) and self-enhancement theory (e.g., Newman, 1984). Moreover, Kurtz-Costes and Schneider's own findings are supportive of a bidirectional relationship between academic achievement and self-concept. A shortage of well-designed longitudinal studies likely hampers researchers' efforts to establish the directionality or bi-directionality of the relationship between academic achievement and academic self-concept (Kurtz-Costes & Schneider, 1994; Marsh, 1990).

Peer-reviewed journal studies have yet to specifically examine the self-concepts of children with Borderline to Low Average IQs. On the basis of the aforementioned findings, however, it might be predicted that children with MID, given their pervasive pattern of academic difficulty at school, would experience lower academic self-concepts than would children with normal IQs. However, the likelihood of children with MID experiencing lower academic self-concepts may depend on a number of additional factors, including the frequency of their exposure to higher achieving peers.

Self-Concept and the Influence of Social Comparisons

Although a statistically significant relationship is often reported between academic self-concept and academic achievement, the strength of this relationship is far from perfect and its directionality is hotly debated (Hansford & Hattie, 1982; Kurtz-Costes & Schneider, 1994). A possible contributor to the less-than-perfect relationship is the fact that in many studies self-concept is treated as a *static trait* rather than as a *state* that is contingent on the social setting (Rogers, Smith, & Coleman, 1978). Indeed, some researchers argue that the relationship between self-concept and academic achievement is best understood when it is examined through the interpretive lens of social comparison theory (Rogers et al., 1978; Strang, Smith, & Rogers, 1978). Social comparison theory posits that people form beliefs about their competencies by comparing their own performances to the performances of others in their social environment (Festinger, 1954). Applied to the school setting, social comparison theory suggests that children who are surrounded by peers whom they perceive as academically superior would have poorer academic self-concepts than children who are surrounded by peers whom they perceive as their academic equals or as academically inferior (Strang et al., 1978). One method of addressing this hypothesis is to compare the academic self-concepts of students with academic difficulties attending full-time special education classes and students with academic difficulties attending full-time regular classes (e.g., Coleman, 1983). Students with academic difficulties attending full-time special education classes generally share their learning environments with similarly functioning peers, whereas students with academic difficulties attending full-time regular classes generally share their learning environments with higher functioning peers. As such, in accordance with social comparison theory, students with academic difficulties attending full-time special

education classes would have higher academic self-concepts than would students with academic difficulties attending full-time regular classes.

In order to test the latter hypothesis, Coleman (1983) conducted a study comparing the academic self-concepts of 138 normally achieving Grade 4 through 6 students attending full-time regular classes, 46 special education students (primarily referred for academic difficulties) of the same age attending full-time special education classrooms, and 46 academically underachieving students of the same age attending full-time regular classes. Notably, membership in the latter group was determined through teacher nomination. Coleman found that academic self-concept ratings were less positive for the academically underachieving full-time regular classroom students than for the other two groups of students. The tendency for academically underachieving full-time regular classroom students to evidence the lowest academic self-concept ratings is consistent with social comparison theory insofar as these students are most likely to be surrounded by primarily higher achieving peers.

An interesting question concerns the self-concepts of students who spend part of their time in special education classes and part of their time in regular classes (i.e., part-time special education students). Coleman (1983) also investigated the academic self-concepts of academically underachieving students receiving part-time special education instruction (i.e., part-time removal from the regular classroom). He compared the academic self-concepts of the three groups of students described earlier (i.e., 138 normally achieving full-time regular classroom students, 46 academically underachieving full-time regular classroom students, and 46 full-time special education classroom students) to the academic self-concepts of 138 part-time special education students assigned to one of two conditions: one hour of resource room attendance ($n = 46$) or two

hours of resource room attendance ($n = 46$). Coleman found that the three groups of special education students (full time, one hour part-time, and two hours part-time) did not differ significantly in terms of their academic self-concept ratings. Moreover, no significant differences were observed between the academic self-concept ratings of the three groups of special education students and the full-time normally achieving regular classroom students. However, the academic self-concepts of the academically underachieving regular classroom students were lower than the academic self-concepts of all the other groups of students. Overall, Coleman's findings suggest that struggling students' academic self-concepts do not differ from the academic self-concepts of their regular classroom peers so long as they are afforded the opportunity to spend at least some time (even as little as one hour) in a learning environment where they are able to compare themselves to their similarly achieving peers (Strang et al., 1978).

In a related study, Strang et al. (1978) randomly assigned 20 eight- to eleven-year-old "academically handicapped" students attending part-time special education classes to experimental and comparison groups. Both groups of students completed an academic self-concept questionnaire. However, in filling out this questionnaire, only students in the experimental group were explicitly instructed to compare themselves to their regular classroom peers. The researchers found that students in the experimental group had lower academic self-concepts than children in the comparison group. On the basis of this finding, Strang et al. posited that students in the experimental group evidenced lower academic self-concepts because they had been forced to compare themselves to their higher achieving regular classroom peers (as is the case for underachieving students who attend full-time regular classes), and that children in the comparison group evidenced higher academic self-concepts because they were free to compare themselves to their

similarly achieving special education classroom peers (as is the case for underachieving students who attend part-time special education classes). Overall, the findings of Strang et al. provide indirect support for the contention that academically struggling students who are able to compare themselves to similarly achieving peers at least some of the time at school (i.e., part-time special education students) are likely to evidence higher academic self-concepts than academically struggling students who are able to compare themselves to only higher achieving peers at school (i.e., academically struggling full-time regular classroom students).

The previously reviewed research suggests that social comparisons may negatively influence the academic self-concepts of many children with MID. In the absence of a diagnosis warranting special education intervention, children with MID are likely to attend full-time regular classes, where they are surrounded by higher achieving peers. On the basis of social comparison theory, it would therefore be predicted that students with MID who attend full-time regular classes would exhibit lower academic self-concepts than would students with normal IQs who attend full-time regular classes. However, it would also be predicted on the basis of social comparison theory that even minimal exposure to similarly achieving peers in resource rooms or special education classes would preserve the academic self-concepts of children with MID, relative to their peers with normal IQs.

Issues Pertaining to the Measurement of Self-Concept

In investigating the relationship between self-concept and academic difficulty, it is important to take into account the possible inaccuracy of children's responses on measures of self concept (i.e., questionnaires, interviews). Children's self-concept ratings may be influenced by their tendency to acquiesce (i.e., agree more often than disagree)

and desire to present themselves in the best possible light (Klesges et al., 2004; Moriguchi, Okanda, & Itakura, 2008; Peterson, Dowden, & Tobin, 1999; Rigby, 1987). These test-taking tendencies may be accentuated in children with intellectual impairments. Indeed, as a group, children with intellectual impairments have been shown to frequently acquiesce in their responses to yes/ no questions (Sigelman, Budd, Spanhel, & Schoenrock, 1981). However, children with milder forms of intellectual impairment seem less prone to acquiescing on these types of questions than their more severely affected peers (Sigelman et al., 1980, 1981).

Importantly, the language limitations of young children could affect their ability to respond accurately to measures of self-concept. In the absence of adequate receptive and expressive language skills, young children may experience difficulty comprehending questionnaire items and formulating verbal responses in interviews. Children with intellectual impairments, because of their compromised vocabulary and verbal reasoning skills, may also find it difficult to accurately interpret questionnaire items and respond to interview questions.

In order to address the aforementioned types of difficulties, popular measures of self-concept often include validity scales as indicators of the likelihood that children are responding accurately. For instance, the Piers-Harris Children's Self-Concept Scale, Second Edition (PHCSC-2; Piers & Herzberg, 2002) is a popular measure of self-concept that includes two validity scales measuring the tendency for children to respond in a biased (e.g., answering "yes" or "no" to an unusually disproportionate number of items) or random manner. In addition, instruction manuals for popular self-concept questionnaires usually specify the minimum reading level required for children to be able

to respond accurately to test items. For instance, the PHCSC-2 requires that respondents be able to read at the Grade 2 level.

Social Comparisons and the Measurement of Self-Concept

Also pertinent to the measurement of self-concept is the question of when in their cognitive development children acquire the ability to make social comparisons. The findings of two studies by Ruble, Boggiano, Feldman, and Loebel (1980) serve to address this question. The first study's sample consisted of 52 children in Grade 1 and 52 children in Grade 2, whereas the second study's sample consisted of 90 children in Kindergarten, Grade 2, and Grade 4. In each of the two studies, participants were asked to perform a particular task (e.g., arranging a set of pictures to create a story). Following the task, students were informed of (a) their accuracy on the task (i.e., extent to which they performed the task correctly) and (b) their task performance in comparison to their peers. After receiving this feedback, students were asked to rate themselves on a measure of task competency. The researchers found that, for children from all grades, competency ratings were related to task accuracy. However, only the fourth grade children's competency ratings were significantly related to how they performed relative to their peers. On the basis of these findings, Ruble et al. (1980) argued that the ability to incorporate social comparisons into one's self-concept ratings does not appear to develop until at least age seven or eight. Prior to this age, children appear to be more concerned with answering problems correctly than with outperforming their peers.

In another study, Ruble, Feldman, and Boggiano (1976) investigated the social comparison abilities of 96 children in Kindergarten, Grade 1, and Grade 2. In this study, pairs of children completed a speeded task. During the speeded task, children had the option of pressing a button to reveal a visual image of their partner's progress on the task.

Importantly, visual images were manipulated to give children the impression that they were progressing through the task at a slower rate than their partner. The researchers found that the number of times children checked their partners' progress throughout the task increased as a function of their age. However, even Kindergarten children were found to check their partner's progress several times throughout the task. This latter finding suggests, in contrast to the findings of Ruble et al. (1980), that even young children (i.e., children in kindergarten) are motivated to make social comparisons.

In attempting to integrate the seemingly discrepant findings regarding the age at which children develop the ability to engage in social comparisons, it is important to consider that social comparisons are complex processes with multiple sub-processes that may develop at different rates (Ruble et al., 1980). Ruble et al. (1980) suggest that whether children engage in social comparisons may depend on such factors such as their level of motivation to obtain information about others' performance, their ability to form strategies for seeking out information about others' performances, their ability to see superior performance relative to others as a reward, and their understanding that social comparisons are important sources of information to take into account when planning out future behaviours. In addition, the age at which children develop the ability to engage in social comparisons may depend on such environmental variables as the extent to which competition is encouraged by teachers at school and the degree to which children are presented with information regarding their peers' performances (Ruble et al., 1980). Another possibility not mentioned by Ruble et al. (1980) is that young children may be able to make social comparisons at a very early age, but may not develop the ability to integrate these social comparisons into their self-concepts until they are much older.

Assuming the equivalence of chronological and mental age in normally developing children, it can be conservatively estimated (based on the findings of Ruble et al., 1980) that a minimum mental age of 7 years is required for a child to be able to engage in social comparisons. Because their mental ages increase at a slower rate than their chronological ages, children with intellectual difficulties are likely to be delayed in their development of the ability to engage in social comparisons. Indeed, estimated chronological ages corresponding to the aforementioned minimum mental age of seven years are eight to nine years for individuals with MID with IQs between 71 and 87, 10 to 12 years for individuals with mild MR (i.e., IQs between 55 to 70), 12 to 17 years for individuals with moderate MR (i.e., IQs of 40 to 54), and 17 to 28 years for individuals with severe MR (i.e., IQs of 25 to 39).

The aforementioned research suggests that, once children with MID acquire the ability to engage in social comparisons at around the age of eight or nine, their continued full-time placement in regular education classrooms is likely to lead to frequent self-perceptions of academic incompetency. Negative perceptions about their academic abilities may in turn place children with MID at risk for the development of various forms of social, emotional, and behavioural dysfunction.

Socioemotional Dysfunction in Children with MID

Most of the research on the socioemotional functioning of children with intellectual difficulties has focused on children with MR, rather than on children with less severe intellectual difficulties (e.g., children with MID). Studies place the prevalence of socioemotional dysfunction at 32-64% for children with MR (Dekker, Koot, van der Ende, & Verhulst, 2002; Gillberg, Persson, Grufman, & Themner, 1986; Linna et al., 1999) and at 8% (Emerson, 2003) or 18% (Dekker et al., 2002) for children with normal

IQs. On the basis of these findings, it can be concluded that psychopathology is more common in children with MR than in children with normal IQs. Some controversy exists over the relationship between severity of intellectual impairment and prevalence of socioemotional dysfunction in children with MR; while certain researchers argue that individuals with severe forms of intellectual impairment evidence higher rates of socioemotional dysfunction than do individuals with mild forms of intellectual impairment (Eaton & Menolascino, 1982; Rutter, Tizard, & Whitmore, 1970), other investigators suggest that the opposite is true (Bouras & Drummond, 1992; Iverson & Fox, 1989). A possible explanation for the discrepant findings across studies is that children with mild and severe forms of MR do not differ consistently in prevalence of *overall* socioemotional dysfunction, but rather in terms of prevalence of *specific* forms of socioemotional dysfunction. Children with severe intellectual impairments seem more likely to exhibit self-harmful, stereotypic, hyperactive, and socially isolative behaviours (e.g., Ando & Yoshimura, 1978), whereas children with mild intellectual impairments are more likely to engage in conduct-disordered and antisocial behaviours, and to develop feelings of depression (Einfeld & Tonge, 1996; Gilberg et al., 1986).

Few studies have investigated the possibility that children with MID evidence elevated levels of socioemotional dysfunction. In a recent investigation, Karande et al. (2008) examined the socioemotional functioning of a sample of 55 eight- to sixteen-year-old children with MID (i.e., IQs between 71 and 84). The children had originally been referred for psychological testing to address their school-related difficulties. Overall, the researchers found that 58.2% of children were experiencing some form of socioemotional dysfunction. Specific socioemotional difficulties included aggression (40%), anxiety (18.2%), social withdrawal (12.7%), and depression (5.5%). Moreover, histories of

distractibility and hyperactivity at school were reported for 16.4 and 18.2% of children, respectively (Artigas-Pallares, Rigau-Ratera, & Garcia-Nonell, as cited in Karande et al., 2008). Karande et al. speculated that the children's socioemotional difficulties may have emerged during the lengthy period of time (three years on average) that they were experiencing academic difficulty, prior to their referral for psychological services. However, the researchers also acknowledged that the cross-sectional nature of the study precluded any definitive conclusions regarding the direction of the relationship between children's academic difficulties and socioemotional problems.

An anecdotal study by Masi et al. (1998) offers some additional insight into the types of socioemotional difficulties experienced by children with MID (i.e., IQs between 71 and 84). On the basis of their clinical observations, Masi et al. classified children with MID (i.e., children with IQs between 71 and 84) into two general subtypes: "inhibited" and "excited." The researchers described children in the "excited" subtype as often experiencing difficulty with the regulation of their emotional and behavioural responses. For instance, these children were depicted as being particularly likely to exhibit inattention and hyperactivity, as well as emotional instability. Children comprising the "inhibited" subtype, on the other hand, were described as tending to exhibit low self-esteem and social withdrawal. Masi et al. described the two behavioural patterns exhibited by children with MID as divergent manifestations of the same underlying psychological process: a weak cognitive self (discussed below).

Ralston, Fuerst, and Rourke (2003) also attempted to delineate the specific types of socioemotional difficulty experienced by children with MID. The researchers administered the Personality Inventory for Children (PIC; Wirt, Lachar, Klinedinst, & Seat, 1977), a measure of social, emotional, and behavioural functioning, to the

caregivers of 101 seven- to fourteen-year-old children with Below Average IQs (BAIQ; IQs of 60 to 85) who had been referred for neuropsychological assessment to address their learning problems. Children were divided into groups, or subtypes, on the basis of their PIC scale scores using Q-Factor Analysis. Q-Factor Analysis involves the classification of individuals into groups on the basis of the similarity of their scores on a dependent measure. In all, the researchers were able to classify 71 of the 101 children with BAIQ into five subtypes (i.e., groups): Normal, Mild Hyperactive, Somatic Concern, Mild Anxiety/ Depression, and Internalized Psychopathology. By calculating the mean PIC profiles for each of the five subtypes, the researchers determined that 79% of classified children with BAIQ exhibited some form of socioemotional dysfunction (as evidenced by the presence of at least one elevation on the clinically-oriented scales of the PIC). Of these children, 63% exhibited mild internalizing and/ or externalizing problems (as evidenced by a limited number of elevations on the internalizing and/ or externalizing scales of the PIC), and 38% exhibited severe internalizing problems (as evidenced by an extensive number of elevations on the internalizing scales of the PIC). Although the Ralston et al. study included not only children with MID but also children with IQs at the upper end of the mild MR range, the study's findings nevertheless suggest that children with MID could be at heightened risk for the development of mild internalizing and/ or externalizing and severe internalizing forms of socioemotional dysfunction.

Few studies have directly compared the socioemotional functioning of children with MID, children with IQs in the MR range, and children with normal IQs. In one such study, Fenning, Baker, Baker, and Crnic (2007) examined mothers' ratings of the behaviour functioning of their five-year-old children with MID ($n = 29$; IQs of 71 to 84), mild MR ($n = 46$; IQs ≤ 70), and normal IQs ($n = 142$; IQs ≥ 85). Behaviour functioning

was measured using the Externalizing Problems composite of the CBCL/ 6-18. The researchers found that children with MID and mild MR exhibited higher levels of externalizing psychopathology than did children with normal IQs. Notably, this finding suggests that children with MID and children with MR may evidence more socioemotional dysfunction than typically developing children by five years of age. In another study, MacMillan et al. (1998) investigated teacher ratings of the social, emotional, and behavioural functioning of 150 students in Grades 2 through 4 with MID (IQs of 71 to 84), MR (IQs ≤ 70), and normal IQs (IQs ≥ 85) using the Social Skills Rating System-Teacher (Gresham & Elliott, 1990) and Critical Events Index of the Systematic Screening for Behavior Disorders (Walker & Severson, 1992). The researchers found no significant differences between groups on either measure. Inconsistent findings across the two aforementioned studies could be attributable to a number of methodological factors, including differences in raters, participant age, and measures used.

According to Masi et al. (1998), the heightened levels of socioemotional dysfunction experienced by children with MID (i.e., IQs between 71 and 84) may result from these children's weak cognitive selves, or "perception[s]... of [their] ability to comprehend, integrate, and control internal and external experiences" (Masi et al., 1998, p. 419). As such, Masi et al.'s (1998) conceptualization of the weak cognitive self appears to encapsulate the aforementioned negative self-concept construct. Masi et al. posit that a weak cognitive self can lead children with MID to see themselves as unable to influence future outcomes, thereby placing them at risk for the development of clinical depression. In addition, a weak cognitive self may cause children with MID to see themselves as

incapable of exerting control over their impulses, thereby increasing their susceptibility to the development of acting out behaviours (Masi et al., 1998).

It is important to note that the previously reviewed studies all relied on referred samples of children with MID. As such, the findings of these studies may overestimate the level of socioemotional dysfunction present in the overall population of children with MID. Nevertheless, if the persistent academic difficulty experiences of these children often result in their referral for psychological assessment services, then the aforementioned findings are likely to apply to a large number of children with MID.

The experience of frequent academic difficulty may weaken the cognitive selves of children with MID, thus placing them at risk for the development of socioemotional dysfunction. Because children with MID are likely to experience a more pervasive pattern of academic difficulty than are children with normal IQs (due in part to the unrealistic demands placed on children with MID by parents and teachers who are unaware of their cognitive difficulties), it may be the case that children with MID are at heightened risk for the development of socioemotional dysfunction, relative to their peers with normal IQs.

The Parenting of Children with MID

Also of interest in the present study is the parenting of children with MID. Parents of children with intellectual impairment (including children with MID) may face additional parenting challenges as their children struggle with age-appropriate tasks. This section of the literature review examines relations between child cognitive impairment and parenting practices.

Guralnick, Neville, Hammond, and Connor (2008) investigated the parenting behaviours of 63 mothers with Preschool- to Kindergarten- aged children with IQs ranging from 50 to 80. Mother-child dyads were observed as they engaged in free play

and collaborative tasks in a lab-based setting. In the collaborative task, mothers were instructed to assist their child in arranging objects to match a model. For both tasks, mothers' communicative acts were coded as either verbal or nonverbal. Verbal and nonverbal communicative acts were also coded according to whether they reflected descriptions (i.e., the statements of facts), queries, or directives. Finally, mothers' degree of compliance with their children's verbal and nonverbal requests was also rated.

The researchers found that mothers engaged in more communicative acts in general, and more directive acts in particular, with their children on the challenge task than on the free play task. In addition, mothers engaged in more communicative acts in general, and more directive acts in particular, with their lower functioning than with their higher functioning children. The aforementioned findings suggest that mothers were highly sensitive to their children's needs insofar as they adjusted the degree of their communicative involvement according to the complexity of the task at hand and the extent of their children's developmental limitations (Guralnick et al., 2008; Marfo, 1990). The researchers also found that mothers' degree of compliance with their children's requests was high (75% compliance) on both the free play and challenge tasks. This finding suggests that mothers were highly responsive to the needs of their children with intellectual impairments. The researchers noted that although mothers engaged in a substantial number of directive communications overall, these communications were often offered in the form of suggestions with options for the child to choose from.

A limitation of the Guralnick et al. (2008) study is that it did not include a comparison group of parents of children with normal IQs. Cielinski, Vaughn, Seifer, and Contreras (1995) addressed this limitation in a study that compared the parenting behaviours of 33 mothers of 28- to 80-month-old children with Down's Syndrome (DS)

and 39 mothers of 18- to 36-month-old children without DS. Mothers' behaviours while interacting with their children in a controlled setting were coded on dimensions of response contingency (e.g., degree to which mothers modified their behaviour to accommodate the needs of their children), directiveness (e.g., degree to which mothers tried to guide their children's behaviour), intrusiveness (e.g., degree to which mothers redirected their children's attention away from a particular task), and facilitation (e.g., degree to which mothers allowed their children to direct their own behaviours). The researchers found that the two groups of mothers were similar in terms of their levels of response contingency and facilitation. This finding supports the contention that the parents of children with intellectual difficulties are as sensitive and responsive to the needs of their children as are the parents of children with normal IQs. Notably, however, mothers of children with DS were significantly more intrusive than were mothers of children without DS. Mothers of children with DS were also more directive than were mothers of children without DS, although this data trend did not reach statistical significance. In interpreting the findings of the Cielinski et al. study, it is important to note that mothers of children with DS were likely aware of their children's cognitive limitations (given that their children had DS diagnoses and would have evidenced obvious physical abnormalities). Mothers' sensitivity to the cognitive limitations of their children with DS may have served to explain their high degree of directiveness in interactions with their children (Marfo, 1990) and, to a certain extent, may also have served to explain mothers' heightened levels of intrusiveness during parent-child interactions. Overall, the findings of Grulnick et al. and Cielinski et al. suggest that, relative to parents of children with normal IQs, parents of children with intellectual

difficulties may display similar levels of sensitivity and responsiveness to their children's needs but higher levels of directiveness and intrusiveness.

Fenning et al. (2007) are the only researchers to have formally compared the behaviours of parents of children with MID to those of parents of children with MR and normal IQs. In their study, the mothers of five-year-old children with MID ($n = 29$; IQs of 71 to 84), mild MR ($n = 46$; IQs ≤ 70), and normal IQs ($n = 142$; IQs ≥ 85) were observed interacting with their children at home. Mothers' behaviours were recorded by trained observers and later coded on six dimensions: positivity (i.e., mothers' verbal or nonverbal display of warmth), negativity (i.e., mothers' verbal or nonverbal display of negative emotion), sensitivity (i.e., mothers' attention to their child's developmental needs), intrusiveness (i.e., mothers' overcontrol or overstimulation of child), stimulation of cognition (i.e., mothers' efforts to provide their child with learning opportunities that are well-suited to the child's intellectual capabilities) and detachment (i.e., lack of responsiveness to child). The researchers found that mothers of children with MID displayed significantly fewer positive and sensitive parenting behaviours than did mothers of children with MR or normal IQs. Factor analysis of parents' scores on the aforementioned six dimensions revealed two factors, which the researchers labeled Positive Engagement (consisting of mothers' positivity, sensitivity, and detachment scores) and Negative Engagement (consisting of mothers' negativity and intrusiveness scores). The researchers determined that mothers of children with MID did not differ from the other two groups of mothers on the Negative Engagement factor. However, mothers of children with MID scored significantly lower on the Positive Engagement factor than did mothers of children with normal IQs or MR. On the basis of these findings, Fenning et al. concluded that parents of children with MID are likely to

demonstrate lower levels of warmth and sensitivity in their interactions with their children than are parents of children with normal IQs or MR.

Notably, in the Fenning et al. (2007) study, children with MID and children with MR were rated by their parents as exhibiting similarly elevated levels of problem behaviours. As such, the tendency for parents of children with MID to demonstrate lower levels of warmth and sensitivity than parents of children with MR cannot be explained by differences between the two groups of parents in their perceptions of the severities of their children's problem behaviours. An alternate explanation for the discrepant levels of warmth and sensitivity exhibited by parents of children with MID and children with MR may be these parents' differing perceptions of the *causes*, rather than the severities, of their children's problematic behaviours.

Parental Attributions Regarding Child Problem Behaviours

Attributions can be defined as people's perceptions of the causes of their own and others' behaviours (Bryan, 1998). Attributions are typically measured along a number of dimensions, including internal locus/external locus, stable/unstable, global/specific, controllable/uncontrollable, and intentional/unintentional. The first dimension, internal locus/external locus, describes whether an action is seen as caused by factors internal to the self (e.g., ability) or external to the self (e.g., good luck or chance). The second dimension, stable/unstable, describes whether an action is viewed as caused by factors that are consistent or intermittent over time. The third dimension, global/specific, indicates whether an action is seen as caused by factors relevant to a specific situation or all situations. The fourth dimension, controllable/uncontrollable, describes whether an action is viewed as caused by factors under the individual's control or outside of the individual's control. Finally, the fifth dimension, intentional/unintentional, describes

whether an action is seen as intentionally or unintentionally caused. All of the aforementioned attributional dimensions can be applied to parents' attempts to understand the causes of their children's behaviours. For instance, children's misbehaviour may be viewed by their parents as controllable and intentional, and as caused by psychological processes that persist across place and time (i.e., internal locus, stable, global, controllable, and intentional attributions). Alternatively, children's misbehaviour may be seen as uncontrollable and unintentional, and as caused by environmental contingencies that are present only at particular times and in particular situations (external locus, unstable, specific, uncontrollable, and unintentional attributions).

Dix et al. (1986) were among the first researchers to investigate the possible influence of parents' perceptions of the causes of their child's behaviours on their subsequent parenting behaviours. The researchers theorized that parents respond to their child's behaviours only after first determining whether the child's behaviours are caused by internal, controllable, and intentional factors. In other words, how parents respond depends on whether the child is seen as *responsible* for his or her behaviours. According to Dix et al.'s (1986) theory, children who misbehave are likely to elicit negative reactions from their parents when the cause of their misbehaviour is seen as internal, controllable, and intentional. Dix et al. (1986) further hypothesized that young children would be less likely than older children to be seen by their parents as responsible for their actions, in light of their developmental limitations.

In a study designed to test the aforementioned theory, Dix et al. (1986) presented 46 mothers of 4- to 12-year-olds with descriptions of children engaging in various forms of problem behaviour or altruistic behaviour. For each description, parents were asked to rate the extent to which they believed the child's behaviours were caused by internal,

controllable, and intentional factors. Parents also rated the extent to which they would be likely to respond with anger to the child's behaviours. The researchers found that attributions of controllability and intentionality for one form of misbehaviour – failing to engage in altruistic acts – were associated with parents' heightened negative emotional responses. Internal locus attributions for children's conduct disordered behaviours and failures to engage in altruistic acts were also associated with parents' negative emotional reactions. Internal locus, controllability, and intentionality attributions pertaining to children's altruistic behaviours were not related to parents' emotional reactions. The aforementioned findings suggest that internal locus, controllability, and intentionality attributions may mediate the link between child misbehaviour and negative parental response, but not the link between child prosocial behaviour and positive parental response. Notably, Dix et al. (1986) also found that parents perceived the behaviours of older children as caused by more internal, controllable, and intentional factors than the behaviours of younger children. The latter finding suggests that parents' knowledge of the developmental limitations of younger children may cause them to see these young children as not responsible for many of their actions.

Geller and Johnston (1995) further examined how parents' perceptions about the causes of their children's misbehaviours may influence their subsequent reactions to these misbehaviours. Mothers ($n = 181$) of children between the ages of 6 and 10 read several descriptions of children engaging in disobedient acts. Mothers were instructed to imagine themselves and their children as the characters in these descriptions. For each description, mothers rated the extent to which they would see their child's disobedience as caused by internal, global, stable, and controllable factors. Mothers also rated their anticipated reactions to their child's disobedience on two parental response dimensions: likelihood of

an angry reaction and likelihood of a behavioural response. Factor analysis of parents' attributional ratings revealed an optimal two factor solution. The researchers labeled the two factors Internality/ Controllability (with higher scores corresponding to greater internal locus and controllability ratings) and Globality/ Stability (with higher scores corresponding to greater globality and stability ratings). Parents' likelihood of an angry reaction and likelihood of a behaviour response scores were combined to form a single parental reaction composite score. A multiple regression analysis revealed that higher Internality/ Controllability factor scores predicted higher parental reaction scores. This finding suggests that parents who view their child's disobedience as caused by the child and as under the child's control are likely to react with anger or to engage in some form of negative behavioural response. Notably, Globality/ Stability factor scores did not predict parental reaction scores. The latter finding suggests that parents' reactions are less related to their beliefs about the globality and stability of their child's misbehaviours than to their beliefs about the controllability of their child's misbehaviours (Geller & Johnston, 1995).

It is unclear from the aforementioned correlational data whether parents' beliefs about the internal, controllable, and intentional nature of their children's misbehaviours influence their parenting behaviours, or vice versa. Dix et al. (1989) were among the first researchers to investigate, experimentally, the directionality of the relationship between parental attributions and parenting behaviours. One hundred and seventeen mothers of children in Kindergarten through Grade 2 were read descriptions of children engaging in different forms of misbehaviour. The descriptions varied slightly depending on whether mothers were assigned to intent, no intent, or unknown intent conditions. Mothers assigned to the intent condition were told that the children in the descriptions were aware

of the inappropriateness of their actions. Mothers assigned to the no intent condition were told that the children in the descriptions were unaware of the inappropriateness of their actions. Finally, mothers assigned to the unknown intent condition were not told whether the children in the descriptions were aware of the inappropriateness of their actions.

After listening to each description, mothers rated how likely they would be, if they were faced with a similar situation, to respond with negative affect (i.e. extent to which the parents would be upset by the misbehaviour), calm induction (i.e., extent to which parents would calmly talk to children about the consequences of their behaviour), stern induction (i.e., extent to which parents would sternly talk to children about the consequences of their behaviour), calm punishment (i.e., extent to which parents would calmly tell children which rule they had violated and deliver a small punishment), and stern punishment (i.e., extent to which parents would sternly tell children which rule they had violated and deliver a small punishment).

Dix et al. (1989) found that mothers assigned to the intent condition were more likely than mothers assigned to the no intent or unknown intent conditions to report that they would likely react with negative emotion to instances of child misbehaviour. In addition, mothers assigned to the intent condition were just as likely to report that they would use punishment techniques as inductive techniques, whereas mothers assigned to the no intent or unknown intent conditions were more likely to report that they would use inductive techniques rather than punishment techniques. Finally, mothers assigned to the intent condition were more likely to report that they would use stern than calm forms of punishment or induction, whereas the reverse was true for mothers assigned to the no intent condition. Overall, the findings of Dix et al. (1989) are supportive of the presence of a causal link between attributions of intentionality and negative parenting behaviours,

such that mothers who see their child's misbehaviours as intentional are likely to react with more negative emotion and harsher forms of discipline than mothers who see their children's misbehaviours as unintentional.

Slep and O'Leary (1998) investigated the influence of responsibility-related parental attributions on parenting behaviours. Mothers ($n = 44$) of 24- to 42-month-old children were randomly assigned to one of two groups: child-responsible and child-not-responsible. Both groups of mothers engaged in a taped 30-minute interaction with their child in a controlled lab setting. Prior to the interaction, both groups of mothers were warned that their child would likely misbehave; however, the two groups of mothers were provided with different information regarding the anticipated causes of their child's misbehaviour. Mothers assigned to the child-responsible group were provided with information to suggest that their children would be responsible for their misbehaviour, whereas mothers assigned to the child-not-responsible group were provided with information to suggest that their children would not be responsible for their misbehaviour. Following the 30-minute interaction, mothers reviewed video footage of two instances where their children had engaged in noncompliant behaviour. For each video segment, mothers rated the degree to which they perceived their children's noncompliant behaviour to be under their control and intentional. Mothers also rated how angry they felt in response to their children's noncompliant behaviour. Finally, trained observers rated the degree to which the mothers exhibited overreactive (angry maternal reaction), lax (overly accommodating or inconsistent maternal reaction), and verbose (too much verbal communication) behaviours during the 30-minute mother-child interaction.

The researchers found that mothers in the child-responsible group were more likely than mothers in the child-not-responsible group to see their children as responsible

for their misbehaviour (as evidenced by a greater number of attributions of controllability and intentionality), consistent with the experimental manipulation. In addition, mothers in the child-responsible group demonstrated more overreactive parenting behaviours in response to their children's noncompliance than mothers in the child-not-responsible group. Finally, mothers in the child-responsible group were more likely to report feeling angry in response to their children's noncompliance, although this finding did not reach statistical significance. Overall, the findings of Slep and O'Leary's investigation suggest that the degree to which parents see their children as responsible for their problem behaviours causally influences how they respond to these problem behaviours.

The influence of responsibility-related attributions on parenting behaviours has also been explored in studies of parents of children with ADHD. Johnston and Patenaude (1994) investigated whether parents of children with ADHD would see their children as having little control over their inattentive and hyperactive behaviours, given the neurological basis of their disorder, and, if so, whether parents of children with ADHD would respond less negatively to instances of inattention and hyperactivity than to instances of other types of problem behaviour. The researchers presented 43 mothers and fathers of children with ADHD with a series of hypothetical scenarios that described their children as engaging in inattentive/hyperactive or oppositional behaviours. For each scenario, parents rated the degree to which they believed their child's behaviour to be caused by internal, controllable, and stable factors. Parents also rated the degree to which they would see their child's behaviour as problematic, unacceptable, and upsetting. Johnston and Patenaude found that parents who attributed their child's behaviours to internal and controllable causes also viewed their child's behaviours as problematic, upsetting, and unacceptable. The researchers also found that parents tended to respond

more negatively to their child's oppositional behaviours than to their child's inattentive and hyperactive behaviours. Together, these findings suggest that parents of children with ADHD respond more negatively to misbehaviours that they perceive as under their child's control (i.e., oppositionality) than to misbehaviours that they perceive as outside of their child's control (i.e., inattention, hyperactivity).

Chavira, López, Blacher, and Shapiro (2000) investigated the influence of responsibility-related attributions on the parenting behaviours of 149 Latino mothers of 3- to 19-year-old children with moderate to severe MR. Mothers rated the degree to which they perceived their children as responsible for their problem behaviours and the degree to which they perceived their children's problem behaviours as intentional and controllable. These ratings were combined to form an overall responsibility rating for each parent. Mothers were also questioned regarding their typical emotional and behavioural reactions to their children's problem behaviours. Mothers' emotional reactions were classified as positive, negative, or neutral, and mothers' behavioural reactions were rated on a five point scale that varied according to harshness of response. The researchers found that mothers who viewed their children as highly responsible for their problem behaviours were likely to react with more negative emotion and harsher discipline than mothers who viewed their children as less responsible for their problem behaviours. The latter finding is supportive of the influence of responsibility-related attributions on the parenting behaviours of mothers of children with MR. Notably, Chavira et al. reported a mean responsibility rating of 0.52 out of 2.00 (where 0.00 = not responsible and 2.00 = fully responsible) for the overall sample of mothers of children with MR. Although the study did not include a comparison sample of mothers of children without MR, the aforementioned mean responsibility rating seems quite low. Potentially,

knowledge of their children's cognitive difficulties may lead parents to see their children as not responsible for many of their problem behaviours. This perception could reduce the incidence of negative parenting behaviours in parents of children with MR.

A single study has investigated the possible influence of responsibility-related attributions on parents' reactions to the misbehaviours of their children with MID. Fenning et al. (2007) compared the parenting behaviours of six mothers with knowledge of the cognitive difficulties of their children with MID (i.e., IQs between 71 and 84) and 22 mothers without knowledge of the cognitive difficulties of their children with MID. The five-year-old children with MID, as a group, exhibited elevated levels of externalizing behaviour relative to a comparison group of their normally developing peers ($n = 142$). The researchers predicted that mothers with knowledge of their children's cognitive difficulties would see their children as less responsible for their problem behaviours and would therefore engage in fewer negative interactions with their children than mothers without knowledge of their children's cognitive difficulties. Mothers were observed in interactions with their children and rated in terms of their positivity, negativity, sensitivity, intrusiveness, stimulation, and detachment. Although sample size restrictions prevented statistical analysis of study data, visual inspection of the mean parenting scores of the two groups of mothers revealed that mothers with knowledge of their children's cognitive difficulties engaged in more positive and sensitive parenting behaviours than did mothers without knowledge of their children's cognitive difficulties. Thus, the findings of Fenning et al. suggest that parents who see their children with MID as responsible for their problem behaviours are likely to respond with fewer positive parenting behaviours than parents who do not see their children with MID as responsible for their problem behaviours.

Particularly problematic for children with MID is their tendency to experience pervasive difficulty on academic tasks. As such, the present study will investigate parents' perceptions of the causes of the academic difficulties of children with MID and their subsequent reactions to these academic difficulties. Parents of children with MID may be largely unaware of their children's intellectual limitations because of their children's lack of a cognitive diagnosis and unremarkable physical appearance. In the absence of evidence of child cognitive limitation, these parents may incorrectly perceive their children as fully responsible for their academic difficulties, and may subsequently respond to these difficulties with low levels of positivity or high levels of negativity. Because children with normal IQs typically do well at school, their parents have little information upon which to develop a pattern of blaming their children for instances of scholastic underperformance. As a result, parents of children with normal IQs may be less likely than parents of children with MID to see their children as responsible for their academic difficulties and to react to these difficulties with low levels of positivity or high levels of negativity.

Parents of children with MID rely on their own problem-solving abilities to accurately identify the causes of their children's academic difficulties. As such, parents with cognitive impairments would seem particularly vulnerable to misinterpreting the causes of the academic difficulties of their children with MID.

Parenting of Children with MID by Adults with MID

A moderate association appears to exist between parental IQ and child IQ, such that lower parental IQ is related to lower child IQ (Bouchard & McGue, 1981; Meador et al., 2011). As such, it seems likely that many children with MID would have parents who themselves have MID. The cognitive difficulties experienced by parents with MID may

interfere with their parenting abilities, and, ultimately, threaten the prosocial development of their children with MID. To date, little evidence exists pertaining specifically to the parenting behaviours of individuals with MID. However, the quality of the parenting behaviours of individuals with MID may be inferred in part from studies investigating the parenting behaviours of groups of individuals with MR or combined MR and MID (MR/MID) samples.

Feldman et al. (1986) compared the parenting behaviours of a combined MR/MID group of eight mothers (i.e., IQs < 85) to a group of eight mothers with normal IQs (i.e., IQs \geq 85) as they interacted with their 6- to 25-month-old children. Mothers' behaviours were coded on a number of dimensions, including degree of maternal imitation, verbal communication, and prompting. An overall parent interaction score was calculated for each mother based on the average of their scores across the aforementioned dimensions. The researchers found that the overall parent interaction scores of the combined MR/MID group of mothers were lower than those of mothers with normal IQs. Moreover, mothers belonging to the combined MR/MID group were significantly less likely than mothers with normal IQs to praise or imitate their children. In a related study, Peterson, Robinson, and Littman (1983) examined the verbal communication patterns of six parents with MR as they interacted with their preschool age children. Parents' verbal communications were coded as descriptive statements (e.g., "you're making a cake"), reflective statements (e.g., "I like baking"), unlabeled forms of praise (e.g., "great job"), labeled forms of praise (e.g., "I like how your cake looks"), indirect commands (e.g., "How about we try another activity?"), or direct commands (e.g., "Put the baking materials away"). Peterson et al. found that the verbal communications of parents with MR were often characterized by direct commands and rarely characterized by praise. Overall, the findings of Feldman

et al. and Peterson et al. suggest that parents with intellectual impairments may struggle to demonstrate appropriate levels of warmth, responsiveness and sensitivity in their interactions with their children. However, the generalizability of these findings to the total population of parents with intellectual difficulties is limited by the small sample size of these two studies.

Notwithstanding sample size concerns, it might be expected, on the basis of these findings, that parents with MID would experience difficulty demonstrating appropriate levels of warmth, sensitivity, and responsiveness in interactions with their children with MID. Indeed, parents with MID may lack the necessary problem-solving and reasoning abilities to successfully navigate complex caregiving situations. For instance, parents with MID may lack the necessary problem-solving skills to accurately identify the causes of the problem behaviours of their children with MID, especially in situations in which these causes are not obvious. For example, parents with MID may overlook subtle signs of intellectual impairment in their children with MID when attempting to identify the cause of their children's frequent difficulty on academic tasks. In overlooking the presence of an ability deficit, parents with MID may attribute more responsibility to their children with MID for their academic difficulties than is appropriate, and therefore react to these academic difficulties with inappropriately low levels of positive parenting behaviours or inappropriately high levels of negative parenting behaviours. How parents with MID interpret and respond to the academic difficulties of their children with MID will be investigated in the present study.

Heightened levels of parenting stress may also affect how parents with MID behave in interactions with their children with MID. Indeed, considerable research supports the presence of an inverse relationship between parenting stress and quality of

parenting (Deater-Deckard, 1998; Deater-Deckard & Scarr, 1996; Rodgers, 1993). A number of studies have shown that parents of children with intellectual impairments (i.e., MR) evidence higher levels of stress than do parents of children with normal IQs (Margalit, Shulman, & Stuchiner, 1989; Roach, Orsmond, & Barratt, 1999). Parents of children with intellectual impairments may experience high levels of stress as a result of their having to devote extra time and resources to their children's special needs. However, it is important to note that not all parents of children with intellectual impairments experience elevated levels of parenting stress. Whether parents experience parenting stress in response to their children's intellectual impairments is likely to depend in part on the extent of their coping resources (e.g., Margalit et al., 1989). Adult caregivers with MID may be particularly susceptible to experiencing parenting stress, as a result of their limited access to financial and social support resources.

In terms of their financial resources, adults with MID with IQs between 71 and 84 earn considerably less income than do their peers with normal IQs (Hassiotis et al., 2008). These adults may have to work long hours at low paying jobs, which in turn may limit their sensitivity and responsiveness to the physical and emotional needs of their children with MID. Floyd and Saitzyk (1992) investigated the possible impact of financial disadvantage on the parenting behaviours of mothers and fathers of children with mild to moderate MR ($n = 171$). They found that socioeconomically disadvantaged parents were more likely than socioeconomically advantaged parents to issue verbal commands to their children and engage in negative behaviours (i.e., criticism, anger, physical discipline). Moreover, socioeconomically disadvantaged parents were less likely than socioeconomically advantaged parents to praise their children and to reciprocate the prosocial behaviours of their children. The research findings suggest that, because of their

increased susceptibility to financial disadvantage, adults with MID may demonstrate high levels of negative parenting behaviours and low levels of positive parenting behaviours in interactions with their children with MID.

In terms of their social support resources, adults with MID (i.e., IQs between 71 and 84) are less likely to have a close friend or as many close friends as adults with normal IQs, and are less likely than adults with normal IQs to be cohabiting with a romantic partner (Hassiotis et al., 2008). Adults with MID may have little time to devote to social relationships with friends or romantic partners because of the multiple jobs and long hours they work. Notably, inadequate levels of social support may limit the ability of adults with MID to effectively parent their children with MID. Floyd and Phillippe (1993) investigated the influence of social support on the parenting behaviours of 53 mothers and fathers of 6- to 18-year-old children with MR and found that low levels of social support were related to heightened levels of behaviour management problems, greater use of coercion, and fewer positive parenting behaviours. In another study, Bradley, Rock, Caldwell, and Brisby (1989) examined the relationship between social support and parenting quality in a sample of 261 parents of six-month-old to twelve-year-old children with MR and/or one or more physical impairments and found that level of social support was moderately and positively correlated with parents' scores on a number of parenting quality dimensions, including responsiveness, cognitive stimulation, warmth, and involvement. These findings suggest that, because of their limited social support networks, adults with MID may demonstrate poor quality parenting behaviours in interactions with their children with MID.

Possibly as a result of their high degree of financial hardship and low level of social support, adults with MID (i.e., IQs between 71 and 84) are at heightened risk for the

development of depression (Hassiotis et al., 2008). Elevated levels of depression are likely to affect the parenting abilities of adults with MID. Indeed, as a group, mothers with depression appear to be less responsive to their children's needs and less involved in interactions with their children than are mothers without depression (Cox, Puckering, Pound, & Mills, 1987; Field, Healy, Goldstein, & Guthertz, 1990). When mothers with depression do interact with their children, they may be more likely than mothers without depression to make critical remarks (Webster-Stratton & Hammond, 1988). Finally, mothers with depression appear to display more negative emotion and less positive emotion in interactions with their children than do mothers without depression (Hops et al., 1987). Overall, it appears that heightened levels of depression in adults with MID may negatively affect their ability to sensitively parent their children with MID.

In summary, the previously reviewed studies suggest that parents with MID are likely to struggle to effectively parent their children with MID, not only as a result of their own intellectual difficulties, but also because of associated problems, such as limited access to financial and social support resources and susceptibility to depression.

Significance and Objectives of the Current Study

Children with MID experience persistent academic underachievement, and are at elevated risk for grade retention and school drop-out. Despite their tendency to experience academic difficulty, children with MID may not qualify for the types of disability services offered to children with more severe intellectual impairments (i.e., individuals with MR). Without access to these services, children with MID are likely to continue to experience frequent academic difficulty as they struggle to meet the unrealistically high standards that may be placed on them by their teachers and parents.

The frequent academic difficulties of children with MID may negatively affect their perceptions of their academic competency (i.e., academic self-concepts). The present investigation seeks to investigate this relationship through the interpretive lens of social comparison theory. According to social comparison theory, individuals form beliefs about their competencies through comparing their own abilities to those of others in their social environment. Because they lack a diagnosis indicative of more serious generalized cognitive impairment (i.e., MR), children with MID may often be placed in full-time regular classrooms at school, where they are consistently exposed to higher achieving students. With only these students available for social comparisons, children with MID are likely to see themselves as at least somewhat academically incompetent relative to their peers. In contrast, children with normal IQs are likely to spend all of their time surrounded by *similarly achieving* peers in regular classrooms. Because these children are able to compare themselves to similarly achieving students, they are likely to view themselves as academically competent relative to their peers. Importantly, children with MID who attend resource rooms or special education classrooms for at least part of the day are also likely to demonstrate feelings of academic competence relative to their peers, given the availability of similarly achieving students for social comparisons.

Frequent exposure to academic situations in which they feel incompetent could serve to strain the already limited coping resources of children with MID, thereby placing them at risk for the development of various forms of socioemotional dysfunction. The present study will investigate whether socioemotional dysfunction is more common in children with MID than in children with normal IQs.

The present study will also explore parents' interpretations of the causes of the academic difficulties of their children with MID and the nature of their behavioural

reactions to these academic difficulties. Parents may overlook ability-related explanations (i.e., internal, uncontrollable, and unintentional factors) for the academic difficulties of their children with MID because their children lack a diagnosis indicating cognitive limitations and usually do not display physical signs of intellectual impairment. In the absence of formal evidence of an intellectual impairment in their children, these parents may be more likely to attribute their children's frequent academic difficulties to motivational (i.e., internal, controllable, and intentional) factors. In other words, parents of children with MID may view their children as largely responsible for their academic difficulties. In contrast, parents of children with normal IQs are less likely to slip into the same pattern of attributing their children's academic difficulties to motivational factors because their children's difficulties are less pervasive over time and across situations. Importantly, research suggests that parents who perceive their children as responsible for their problem behaviours respond to these behaviours with reduced levels of positive or heightened levels of negative parenting behaviours (Chavira et al., 2000; Dix et al., 1986, 1989; Geller & Johnston, 1995; Slep & O'Leary, 1998). Because parents of children with MID are more likely to view their children as responsible for their academic difficulties, they are also more likely to respond to these difficulties with reduced levels of positive or heightened levels of negative parenting behaviours. Similarly, because parents of children with normal IQs are less likely to see their children as responsible for their academic difficulties, then they are also less likely to respond to these academic difficulties with reduced levels of positive or heightened levels of negative parenting behaviours.

A related issue to be investigated for the first time in the present study concerns how parents who themselves have MID interpret and respond to the academic difficulties of their children with MID. The intellectual deficits faced by parents with MID could

make it difficult for them to accurately interpret the causes of the academic difficulties of their children with MID. As such, parents with MID may be especially prone to attributing the academic difficulties of their children with MID to motivational deficits rather than ability deficits, and prone to responding to these academic difficulties with reduced levels of positive or heightened levels of negative parenting behaviours.

Study Hypotheses

Hypothesis 1: Children's Academic Self-Concepts

It was predicted that children with MID attending full-time regular education classes (without in-class support from a special education teacher) would demonstrate more negative academic self-concepts than would children with MID receiving out-of-class special education services (i.e., resource room placements, part- or full- time special education classes) and children with normal IQs attending full-time regular education classes.

Hypothesis 2: Children's Socioemotional Functioning

It was expected that children with MID would demonstrate more frequent or severe overall, internalizing, and externalizing socioemotional dysfunction than would children with normal IQs.

Hypothesis 3: Parents' Explanations for the Academic Difficulties of their Children

Hypothesis 3A: Parents of children with normal IQs versus MID. It was anticipated that parents of children with MID would be more likely than parents of children with normal IQs to attribute their child's academic difficulties to internal, controllable, and intentional factors.

Hypothesis 3B: Lower versus higher functioning parents of children with MID. It was expected that parents with MID would be more likely than parents with normal IQs

to attribute the academic difficulties of their children with MID to internal, controllable, and intentional factors.

Hypothesis 4: Parents' Responses to the Academic Difficulties of their Children

Hypothesis 4A: Parents of children with normal IQs versus MID. It was predicted that parents of children with MID would display reduced levels of warmth, sensitivity, and cognitive stimulation, and/or heightened levels of negative affect, intrusiveness, and detachment in response to their children's academic difficulties, relative to parents of children with normal IQs.

Hypothesis 4B: Lower versus higher functioning parents of children with MID. It was expected that parents with MID would display reduced levels of warmth, sensitivity, and cognitive stimulation, and/or heightened levels of negative affect, intrusiveness, and detachment in response to the academic difficulties of their children with MID, relative to parents with normal IQs.

Hypothesis 5: Relationship between Parents' Explanations for, and Parents' Responses to, the Academic Difficulties of their Children

It was anticipated that parental attributions of internality, controllability, and intentionality regarding children's academic difficulties would be negatively correlated with level of parental warmth and sensitivity, and/or positively correlated with level of parental negative affect, intrusiveness, and detachment.

CHAPTER II

Method

Participants

The present study included a convenience sample of 96 children and their parents or caregivers living in Windsor-Essex County, Ontario, Canada. Parent-child dyads were recruited through the University of Windsor psychology participant pool as well as through advertisements placed at a variety of community agencies (e.g., community centres; learning and parenting centres; mental health agencies and psychologists' private practices; libraries), in a local parenting magazine and learning disability newsletter, and on regional internet marketplace sites. The study was also advertised on one occasion through a popular local news and talk radio broadcast.

Children and their parents or caregivers ranged in age from 6 to 13 years ($M = 9.39$, $SD = 1.76$) and from 27 to 66 years ($M = 38.41$, $SD = 6.38$), respectively. The child sample included approximately one and a half times as many boys ($n = 57$) as girls ($n = 39$), while female parents ($n = 86$) outnumbered male parents ($n = 10$) by a ratio of approximately 8.5:1.

Measures

Parent and Child Demographic Information: Background Information Questionnaire.

A questionnaire was administered to parents in order to gather demographic information (see Appendix A for a copy of the questionnaire). Demographic information collected included parent sex, age, race/ ethnicity, income, level of education, longest period of employment, number of hours worked per week, relationship and marital status, perceived size and quality of social support network, number of weekly social events, use of community-based and mental health services, perceived usefulness of community-

based and mental health services, and mental disorders and conditions; and child sex, age, race/ ethnicity, psychiatric diagnoses and special education designations, special education services, and school performance.

Child Cognitive Functioning: Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV; Wechsler, 2003).

The WISC-IV has enjoyed widespread use as a measure of cognitive functioning. Its standardization sample consists of 2, 200 children between the ages of 6 and 16, and represents a range of geographic regions, ethnicities, and socioeconomic statuses. The WISC-IV features an overall measure of intelligence, the Full Scale IQ (FSIQ) composite, that is calculated from individuals' scores on 10 core subtests. The composite scale has a mean of 100 and a standard deviation of 15. Full Scale IQ internal reliabilities across age groups range from .96 to .97, and the overall test-retest reliability of the FSIQ is .89 (Sattler & Dumont, 2004). The WISC-IV's construct validity is well established (Sattler & Dumont, 2004; Watkins, Wilson, Kotz, Carbone, & Babula, 2006).

In the present study, a four-subtest short form of the WISC-IV was used to estimate child FSIQ. The short form consisted of the most reliable and valid combination of subtests representing all four Indices of the WISC-IV (i.e., Block Design, Similarities, Digit Span, Coding), as determined by Sattler and Dumont (2004). Sattler and Dumont report reliability and validity coefficients of .93 and .91, respectively, for this four-subtest short form. Estimates of children's FSIQs were calculated from the sum of the four subtests' scale scores using Tellegen and Brigg's (1967) transformational procedure. Notably, subtest administration errors resulted in the use of a three-subtest short form of the WISC-IV for one child (i.e., the aforementioned four-subtest short form minus the Coding subtest).

Parent Cognitive Functioning: Wechsler Adult Intelligence Scale, Fourth Edition (WAIS-IV; Wechsler, 2008).

The WAIS-IV is the updated version of the well-respected Wechsler Adult Intelligence Scale, Third Edition (WAIS-III; Wechsler, 1997), a measure of cognitive functioning. Its standardization sample consists of 2, 200 adults between the ages of 16 and 90, and represents a range of geographic regions, ethnicities, and socioeconomic statuses. The test's standardization sample also includes subpopulations of adults with Borderline IQs and Mild Mental Retardation. The WAIS-IV features an overall measure of intelligence, the Full Scale IQ (FSIQ) composite, that is calculated from individuals' scores on 10 core subtests. The composite scale has a mean of 100 and a standard deviation of 15. The internal reliability of the FSIQ across age groups is .98, and the test-retest reliability of the FSIQ across age groups is .95 (Wechsler, 2008). The mean correlation between the FSIQs of the WAIS-IV and the WAIS-III is .94 (Wechsler, 2008), suggesting that the two instruments measure similar underlying constructs. The construct validity of the WAIS-III is well established (Grégoire, 2004; Sattler, 2001; van der Heijden & Donders, 2003).

In the present study, a four-subtest short form of the WAIS-IV was used to estimate parent FSIQ. The short form consisted of the most reliable and valid combination of subtests representing all four Indices of WAIS-IV (i.e., Vocabulary, Visual Puzzles, Digit Span, Coding), as determined by Sattler and Ryan (2009). Sattler and Ryan report reliability and validity coefficients of .96 and .94 for this four-subtest short form. Estimates of parents' FSIQs were calculated from the sum of the four subtests' scale scores using Tellegen and Brigg's (1967) transformational procedure. Notably, subtest administration errors resulted in the use of a three-subtest short form of

the WAIS-IV for one parent (i.e., the aforementioned four-subtest short form minus the Coding subtest).

Reading and Mathematics Ability: Wechsler Individual Achievement Test, Second Edition (WIAT-II; The Psychological Corporation, 2002a).

The WIAT-II is a popular measure of academic achievement consisting of child and adult standardization samples. The child standardization sample consists of an age-based subsample of 2,950 children between the ages of 4 and 19 and a grade-based subsample of 3,600 children in pre-Kindergarten through Grade 12. The adult standardization sample consists of an age-based subsample of 500 adults between the ages of 17 and 89 years, and a grade-based subsample of 707 adults in Grades 13 through 16. The standardization samples and subsamples represent a range of geographic regions, ethnicities, and socioeconomic statuses. The Word Reading subtest of the WIAT-II, which requires test takers to read words presented out of context, was used in the present study as an estimate of children's reading ability. For individuals between the ages of 4 and 19 years, the Word Reading subtest's average split half reliability is .97 (The Psychological Corporation, 2002b). In addition, the Numerical Operations subtest of the WIAT-II, which requires test takers to quickly and accurately perform arithmetic calculations in their heads, was used in the present study as an estimate of children's mathematics ability. For individuals between the ages of 4 and 19 years, the Numerical Operations subtest's average split half reliability is .91 (The Psychological Corporation, 2002b). The construct and criterion validities of the WIAT-II are well established (The Psychological Corporation, 2002b).

Parent Attributions: Adapted Version of the Parental Attributions Coding System (PACS; Slep, 1997).

The PACS was originally designed to examine parents' attributions regarding the causes of child misbehaviour. In the original procedures used when the measure was developed, parents watched videos of themselves interacting with their own child or of unfamiliar parents interacting with their own child. Parental attributions regarding the causes of the child misbehaviours seen on the tapes were elicited through an indirect probe and a direct probe. The indirect probe took the form of a request that parents write down any thoughts that they experienced while watching the videotaped instances of child misbehaviour. The direct probe took the form of a request that parents speculate as to the possible cause(s) of the videotaped instances of child misbehaviour. Two important modifications were made to the original PACS procedures in the present study. Firstly, the PACS was used to investigate parents' explanations for their child's academic difficulties, rather than parents' explanations for their child's misbehaviours. In addition, instead of watching videotaped footage of their children's academic difficulties, parents were asked to recall these difficulties from memory. Modifications made to the original PACS procedures were approved by the test author (A. Slep, personal communication, September 18, 22, 2009; see Appendix B).

Once data are obtained using the aforementioned PACS procedures, four levels of coding are completed in sequence. The first level of coding involves dividing up parent utterances into units of meaning. The second level of coding involves identifying which units of meaning are attributions. The third level of coding features the identification of attributions made by parents as either child-centered (e.g., "my boy is acting out because he is bored"), mother-centered (e.g., "my boy is acting out because I am boring him"), or

situational (e.g., “my boy is acting out because the activity is boring”). The fourth level of coding involves the rating of attributions along three six-point responsibility-related scales and three six-point causality-related scales. Responsibility scales include Voluntariness (i.e., the degree to which children’s actions were under their control), Intentionality (i.e., the degree to which children intended to influence others or their relationships with others through their actions), and Valence of Intent (i.e., whether children’s intent was positive, negative, or neutral in nature). Causal scales include Trait/State (i.e., Trait; degree to which actions are attributed to aspects of children’s personalities), Globality (i.e., degree to which actions occur across situations), and Stability (i.e., degree to which actions occur across time). For all of the responsibility and causal scales except for the valence of intent scale, higher scale scores correspond to greater amounts of the construct under investigation. For the Valence of Intent scale, lower scores correspond to more negative intentionality and higher scores correspond to more positive intentionality.

Adaptations were made to the PACS data coding manual by the principal investigator so that the content of the manual better matched the goals of the study (i.e., adapted PACS; manual available upon request). Important manual adaptations included (a) replacing the “mother-centred” locus with an “other-centred” locus to capture the possible causal influences of a wider range of individuals (e.g., fathers, siblings, friends, and teachers), (b) modifying the globality scale to allow for more precise coding of the extent to which the cause of an academic difficulty was present across different contexts or situations, and (c) replacing original coding examples included in the manual with a handout of coding examples more pertinent to the topic of child academic difficulty.

Slep and O'Leary (1998) report an inter-rater reliability kappa of .96 for accuracy of categorization of attributions as child-centered, mother-centered, or situational. Moreover, the same researchers report intraclass correlations across raters of .98 for child-centered causal attributions, .99 for child-centered responsibility attributions, .99 for mother-centered causal attributions, and .97 for mother-centered responsibility attributions. With respect to validity, the PACS has been used to show that parents who see their children as responsible for their misbehaviour respond more angrily and with harsher discipline than parents who do not attribute responsibility to their children for their misbehaviour (Slep & O'Leary, 1998).

In the current investigation, the proportion of parents' child-centred (i.e., internal locus) attributions was derived, and parents' internal locus attributions were rated on each of the responsibility and causal scales of the PACS.

Parenting Behaviours: Adapted Version of the Parent-Child Interaction Rating System (PCIRS; Belsky, Woodworth, & Crnic, 1998).

The PCIRS was developed in part to measure a wide range of positive and negative parenting behaviours. Parenting behaviours are coded on six dimensions using five-point scales: Positive Affect (i.e., verbal or nonverbal display of warmth), Negative Affect (i.e., verbal or nonverbal display of negative emotion), Sensitivity (i.e., attention to child's developmental needs), Intrusive Interaction (i.e., overcontrol or overstimulation of child), Detached Manner (i.e., lack of responsiveness to child), and Parent Stimulation of Cognitive Development (i.e., Cognitive Stimulation; mothers' efforts to involve child in learning-related experiences).

An adapted version of the PCIRS coding manual was developed by the principal investigator for the purposes of the present study (i.e., adapted PCIRS; manual available

upon request). Important modifications included (a) deletion of portions of the coding system pertaining to the coding of child and “dyadic relations” variables, (b) the rewording of parent behaviour scale descriptions to better reflect the ages of child participants and the topic under investigation in the present study (i.e., child academic difficulty rather than child misbehaviour), and (c) the inclusion of examples of behavioural responses to child academic difficulty for each coding scale.

Inter-rater reliability kappas for each of the aforementioned categories of the PCIRS range from .64 to .97 (Aber, Belsky, Slade, & Crnic, 1999; Crnic, Gaze, & Hoffman, 2005; Belsky et al., 1995). With respect to the observational system’s validity, factor analyses of the parenting variables measured by the coding system have yielded theoretically consistent positive and negative parenting factor solutions (Aber et al., 1999; Fenning et al., 2007). In addition, mothers’ negative parenting behaviours during interactions with their 15- to 33-month-old children, as measured by the PCIRS, have been shown to predict externalizing behaviours in the same children at age three (Belsky, Hsieh, & Crnic, 1998). The coding system has also been used to differentiate between the parenting behaviours of mothers of Borderline to Low Average IQ, MR, and normal IQ five-year-old children (Fenning et al., 2007).

In the present study, the six dimensions of the adapted PCIRS were used to measure (a) parents’ general pattern of behaviour while interacting with their child in an academic context (i.e., parents’ general behaviour in an academic setting; GBAS) and (b) parents’ specific behavioural response(s) to a specific instance of child academic difficulty (i.e., parents’ behavioural response to academic difficulty; BRAD).

Child Self-Concept: Piers-Harris Children's Self-Concept Scale, Second Edition (PHCSC-2; Piers & Herzberg, 2002).

The PHCSC-2 is a self-report measure of the individual's general and domain-specific self-concepts. Its normative sample consists of 1,387 children and adolescents between the ages of 7 and 18 years, and represents a range of geographic regions, ethnicities, and socioeconomic statuses. The measure consists of 60 yes-no items that contribute to two validity scales, a total self-concept scale (TOT; $\alpha = .91$), and six domain-specific self-concept scales. The six domain-specific self-concept scales include Behavioral Adjustment (BEH; $\alpha = .81$, 14 items), Physical Appearance and Attributes (PHY; $\alpha = .75$, 11 items), Freedom From Anxiety (FRE; $\alpha = .81$, 14 items), Popularity (POP; $\alpha = .74$, 12 items), Intellectual and School Status (INT; $\alpha = .95$, 16 items), and Happiness and Satisfaction (HAP; $\alpha = .77$, 10 items). Total and domain-specific self-concept scale *T*-scores less than 40 reflect "Low" self-concept in the area under investigation (Piers & Herzberg, 2002). Accurate comprehension of PHCSC-2 items requires a Grade 2 reading level (Piers & Herzberg, 2002).

A factor analysis conducted by the test authors supports the construct validity of the PHCSC-2 (Piers & Herzberg, 2002). In addition, the negative correlations reported by the test authors between self-concept, as measured by the PHCSC-2, and severity of anger, aggression, and Post-Traumatic Stress Disorder symptomatology support the convergent validity of the PHCSC-2 (Piers & Herzberg, 2002). The predecessor of the PHCSC-2, the PHCSC (Piers, 1969), has received considerable empirical validation. For instance, the construct validity of the PHCSC is well supported by the findings of a number factor analytic studies (e.g., Alexopoulos & Foudoulaki, 2002). Pertinent to the present investigation, Rich, Barcikowski, and Witmer (1979) were able to replicate the

factor structure of the PHCSC using the self-concept ratings of 177 eight- to twelve-year-old children with a school designation of Educable Mentally Retarded. Given the significant correlations between the scale scores of the PHCSC and PHCSC-2, it can be assumed that the two measures are assessing similar constructs and that validity research for the PHCSC can be applied to the PHCSC-2.

In the present study, the INT and TOT scales were used to measure children's academic and total self-concepts, respectively. Children reading below the second grade level (as measured by the WIAT-II Word Reading subtest) were verbally administered the PHCSC-2.

Socioemotional Adjustment: Child Behavior Checklist for Ages 6 to 18 (CBCL/6-18; Achenbach & Rescorla, 2001).

The CBCL/6-18 is a 112 item parent-report measure of social, emotional, and behavioural functioning. Its normative sample consists of 1, 753 children and adolescents between the ages of 6 and 18 years, and represents a range of geographic regions, ethnicities, and socioeconomic statuses. The measure consists of 112 items that contribute to Total Problem, Internalizing, and Externalizing composite scales; eight syndrome scales; and six DSM scales. Scale *T*-scores between 60 and 69 reflect "Borderline Clinical" levels of maladjustment, while scale *T*-scores greater than 70 reflect "Clinical" levels of maladjustment.

Internal consistency alphas for the Total Problems, Internalizing, and Externalizing composite scales are .97, .90, and .94, respectively (Sattler & Hoge, 2006). Test-retest reliabilities over an 8 week period for the Total Problems, Internalizing, and Externalizing composite scales are .94, .91, and .92, respectively (Sattler & Hoge, 2006). The construct and criterion validities of the CBCL/6-18 are well established. With respect

to construct validity, parents' ratings on the CBCL/6-18 are moderately-to-highly correlated with parents' ratings on the Revised Conners' Parent Rating Scale (CPRS-R; Conners, 1997), another measure of child social, emotional, and behavioural functioning (Achenbach & Rescorla, 2001). In terms of criterion validity, the CBCL/6-18 can distinguish between referred and nonreferred children (Achenbach & Rescorla, 2001).

In the present study, the Total Problems, Internalizing, and Externalizing composite scales of the CBCL/6-18 were used to measure children's social, emotional, and behavioural (i.e., socioemotional) functioning.

Procedures

Training of Graduate-Level Data Collectors

A total of 17 graduate-level research assistants with formal training in psychometric assessment were involved in the data collection process over the course of a two year period (each for varying amounts of time). All graduate-level research assistants were trained in the study procedures through the use of a data collection manual developed by the principal investigator (manual available upon request).

Data Collection Procedures

Data collection commenced once the study's procedures had been approved by the University of Windsor Research Ethics Board. Parent-child dyads attended a single testing session, lasting approximately two hours, at the University of Windsor's Child Study Centre. Data collection sessions were run by either (a) the principal investigator and a graduate-level research assistant or (b) two graduate-level research assistants. At the start of the session, parents and their children signed informed consent and assent forms, respectively, authorizing their participation in the study (see Appendix C for a copy of the child assent form and copies of the parent consent and information forms).

The testing session consisted of child-only activities, parent-only activities, and an interactive parent-child activity.

The child-only and parent-only activities were administered simultaneously in separate rooms. Children were first administered a four-subtest short-form of the Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV; Wechsler, 2003) in order to measure their intellectual functioning. Children were then administered the Word Reading and Numerical Operations subtests of the Wechsler Individual Achievement Test, Second Edition (WIAT-II; The Psychological Corporation, 2002a) in order to measure their letter/word reading and mathematics abilities, respectively. Notably, one child had been administered the WISC-IV and WIAT-II on a prior occasion within six months of his participation in the study; this child's test scores from the prior administration of the WISC-IV and WIAT-II were obtained with the permission of his parent and used in the present study's data analysis. Finally, children's academic self-perceptions were assessed using the Piers-Harris Children's Self-Concept Scale, Second Edition (PHCSC-2; Piers & Herzberg, 2002). As the PHCSC-2 requires a minimum grade two reading level, children who received a grade-equivalent score of less than 2.0 on the Word Reading subtest of the WIAT-II were orally administered the PHCSC-2.

With respect to the parent-only measures, parents were first administered a four-subtest short-form of the Wechsler Adult Intelligence Scale, Fourth Edition (WAIS-IV; Wechsler, 2008) in order to measure their intellectual functioning. Parents then underwent an audiotaped interview (see Appendix D for a copy of the interview script) that was designed to elicit attributions regarding the cause(s) of their child's academic difficulties. Parents were first asked to identify a specific instance when their child underperformed on an academic task in the last three months (e.g., difficulty on an in-

class activity, homework assignment, quiz, test, or examination). Parents who could not recall an instance of academic difficulty were asked to identify a learning-related difficulty instead (e.g., difficulty reading a word). Once they had identified an academic (or learning) difficulty, parents were then asked to write down thoughts or feelings relating to this academic difficulty, using a Thought Listing form (see Appendix D for a copy of the Thought Listing form). The purpose of the Thought Listing form was to indirectly elicit parents' attributions regarding the cause(s) of an academic difficulty. After filling out the Thought Listing form, parents were asked to identify (verbally) what they believed had caused their child to experience the academic difficulty. These interview procedures were repeated for each instance of academic difficulty mentioned by parents, up to a maximum of five academic difficulties. Following the interview, parents were administered the present study's Background Information Questionnaire in order to gather parent and child demographic information. Finally, parents were administered the Child Behavior Checklist for Ages 6 to 18 (CBCL/6-18; Achenbach & Rescorla, 2001) in order to measure their child's social, emotional, and behavioural (i.e., socioemotional) functioning.

Once all child-only and parent-only measures had been administered, parent-child dyads were videotaped for 15 minutes as they played a challenging math game (see Appendix E for copies of selected math game materials). The math game required the child to solve a series of arithmetic questions developed by the principal investigator using the Ontario Ministry of Education's mathematics curriculum guidelines for Kindergarten through Grade 8 (Ontario Ministry of Education, 2005). All children were first administered two Kindergarten-level math questions to give them a success experience prior to being exposed to more difficult math questions. The difficulty of

subsequent math questions depended on children's current grade level at school and their standard score on the Numerical Operations subtest of the WIAT-II. Following administration of the Kindergarten-level math questions, children with standard scores more than one standard deviation below the mean were provided with math questions two to three grade levels below their current grade at school; children with standard scores within one standard deviation of the mean were provided with math questions one grade level below their current grade at school; and children with standard scores more than one standard deviation above the mean were provided with math questions corresponding to their current grade level at school. Children advanced from one difficulty level (i.e., grade level) to the next whenever they (a) ran out of math questions to answer at a particular difficulty level or (b) answered two questions correctly at a particular difficulty level. The overall goal of the math game was to present children with an assortment of math questions that were challenging enough to cause them to struggle so that parents' behavioural responses could be measured. Prior to the commencement of the observational period, parents received explicit and detailed instructions on how to play the math game. During this instructional period, parents were told that it was up to them how much or how little help they gave their children during the math game.

Upon completion of the observational period, children were rewarded with one or more small prizes and given the opportunity to engage in free play with developmentally appropriate toys while their parents were debriefed about the goals and rationale of the study (see Appendix F for a copy of the debriefing form). During the study debriefing, parents received lists of (a) academic resources for their children, (b) parenting resources for themselves, and (c) community mental health resources and psychological assessment services for themselves or their children. Although parents were offered the opportunity

to withdraw themselves or their children from the study after the debriefing, none of the parents chose to do so. Parents indicated their preference to remain in the study with their children by signing a Final Consent to Participate in Research form (see Appendix G).

At the end of the data collection session, interested parents were provided with verbal feedback regarding their own and/or their child's test scores on the WISC-IV, WIAT-II, and/or WAIS-IV. The same parents received written feedback in the form of parent and child psychological screening reports (see Appendix H for templates of the parent and child psychological screening reports) that were mailed to, or picked up by, the parents at a later date.

Parent Interview Coding Procedures

Parents' audiotaped interview responses were transcribed by the principal investigator (comments made by the interviewer or parent during administration of the Thought Listing forms were usually not transcribed). The transcribed parent interviews and accompanying Thought Listings were segmented (i.e., parent utterances were split into units of meaning) by the principal investigator and then coded by a team of three trained undergraduate research assistants using the adapted version of the Parental Attributions Coding System (adapted PACS; available upon request). Data coders read each parent interview transcript and coded parent responses to variations of the interviewer prompt, "What do you think caused your child to experience difficulty on that academic task."

The three undergraduate data coders received training in the use of the coding system over the course of a five month period. Training consisted of weekly group meetings and individual take-home practice exercises. The training meetings featured in-depth discussion of the coding manual, the completion of group-based coding exercises,

and the resolution of discrepancies between coders on previously assigned take-home practice exercises. Initially, group meetings occurred once per week for two hours. However, an extra one-hour meeting per week was added midway through the training period in order to speed up trainee's progression through the training materials. Data coders initially received training on the implementation of the original version of the PACS using real data provided by the author of the coding system. After gaining familiarity with the original version of the PACS, data coders were then introduced to the adapted PACS. As part of their training in the use of the adapted PACS, data coders were exposed to ten practice exercises featuring either (a) fictitious parent interview data generated by the principal investigator ($n = 5$) or (b) real interview data collected from a small sample of parents who were not formally participating in the present study ($n = 5$).

Inter-coder reliability data were calculated for two consecutive practice exercises involving real parent interviews. The kappa (k) statistic was chosen to assess inter-coder reliability for the categorical data associated with the presence/ absence of an attribution and the locus of an attribution because, unlike the percent agreement statistic, kappa takes into account chance agreement between raters. Inter-coder reliability for ratings associated with the six dimensional scales of the adapted PACS was assessed using Finn's r (Finn, 1970, as cited in Whitehurst, 1984). Finn's r is a relative of the intraclass coefficient that is less sensitive to violations of normality in the distribution of individual coders' ratings across decision points (A. Slep, personal communication, March 26, 2012). Kappa and Finn's r values below .40, between .40 and .75, and above .75 were taken as evidence for "poor", "fair-to-good", and "excellent" inter-coder reliability (Fleiss, 1981, 1986). Mean kappa for the two consecutive practice exercises fell in the fair-to-good range for the identification of attributions ($\kappa = .597$ for the total group of

coders, $\kappa = .498 - .651$ across pairs of coders) and their loci ($\kappa = .627$ for the total group of coders, $\kappa = .568 - .662$ for individual pairs of coders). Mean inter-coder reliabilities for the dimensional scales were either fair-to-good or excellent (see Table 1). Inter-rater reliabilities were not calculated for the valence of intent scale because of the small number of data points (this scale is not coded in situations where a low score is assigned on the intentionality scale).

Following training, parent interview materials collected in the present study were divided into five batches (i.e., Batch 1 = 10 cases, Batch 2 = 33 cases, Batch 3 = 27 cases, Batch 4 = 15 cases, Batch 5 = 10 cases) and coded over a period of approximately three months (missing codes from any given batch were obtained when possible at the end of the data coding period). Cases could not be randomized to batches because data were still being collected at the start of the data coding period. After independently completing each of the first two assigned levels of coding (i.e., determining the presence/ absence of an attribution and the locus of each attribution), the undergraduate data coders met to resolve any coding discrepancies before proceeding to the next level. With respect to the final assigned level of coding (i.e., the rating of each attribution along six dimensional scales), the six causal and responsibility-related scales were divided amongst pairs of coders, such that pairs of coders were only responsible for rating parents' attributions across a subset of the total number of scales. The pair of coders with the highest inter-coder reliability score for a given scale across the aforementioned two training exercises (see Table 1) was assigned that scale for the coding of Batch 1 through 5 data. One coder from the pair assigned to a particular scale was responsible for rating each case on that scale. This "primary" coder's scores were used in the present study's data analysis. The other member of the coding pair was responsible for coding a randomly selected subset of cases

Table 1

*Mean Adapted PACS Dimensional Parent Attribution Scale Inter-Coder Reliabilities
Across Two Practice Exercises*

Coders	Adapted PACS Dimensional Parent Attribution Scales				
	Trait	Stability	Globality	Volunt.	Intent.
Pairs of Coders					
Coders 1 & 2	.89	.80	.71	.86	.94
Coders 1 & 3	.92	.92	.89	.64	.74
Coders 2 & 3	.97	.77	.55	.75	.78
All Coders ($n = 3$)	.93	.83	.72	.75	.82

Note. PACS: Parental Attributions Coding System (Slep, 1997); *Volunt.:* Voluntariness scale; *Intent.:* Intentionality scale.

(approximately 20 percent) from each batch. This coder's scores were compared to those of the "primary" coder as a means of evaluating inter-coder reliability for the scale in question.

Across batches, mean inter-coder reliabilities were fair-to-good or excellent for determining the presence/ absence of an attribution ($\kappa = .661 - .779$ for individual pairs of coders) and the locus of each attribution ($\kappa = .624 - .709$ for individual pairs of coders). A single inter-coder reliability statistic could not be calculated for each of the dimensional scales due to the large number of data points involved. Instead, the data points for each scale were split into two subsets and separate inter-coder reliability analyses were conducted on each subset of data. Mean inter-coder reliabilities (as measured by Finn's r) were excellent for four out of five scales (Trait: $r = .877 - .903$; Stability: $r = .802 - .795$; Voluntariness: $r = .841 - .884$; Intentionality: $r = .778 - .903$) and fair-to-good for one scale (globality: $r = .684 - .738$). Inter-coder reliability was not calculated for the valence of intent scale due to the small number of data points.

Parent-Child Interaction Coding Procedures

Videotaped parent-child interactions were coded by a separate team of three undergraduate research assistants using the adapted version of the Parent-Child Interaction Rating System (adapted PCIRS; available upon request). Two sets of data were coded for each video recording: parents' "general behaviour in an academic setting" (i.e., GBAS) and parents' "behavioural response to academic difficulty" (i.e., BRAD). In coding the parent's GBAS, coders were instructed to watch the entire 15 minute videotape of a parent-child interaction and then evaluate the degree to which parents demonstrated positive affect, negative affect, sensitivity, intrusiveness, detachment, and cognitive stimulation (corresponding to the Positive Affect, Negative Affect, Sensitivity,

Intrusive Interaction, Detached Manner, and Cognitive Stimulation scales of the adapted PCIRS, respectively). Data coders took into account all of the parent's behaviours in coding the GBAS, regardless of whether the behaviours occurred in direct response to an instance of academic difficulty experienced by their child. As such, the coders' GBAS ratings were meant to characterize *general patterns of behaviour* displayed by parents while interacting with their child in a learning-related context.

Once coders had rated a parent's GBAS, they began the process of evaluating the same parent's BRAD. Coders were instructed to reverse the videotape to the point in time when the parent's child first experienced an instance of academic difficulty while playing the math game. The point in time characterizing the child's first instance of academic difficulty was pre-determined by the principal investigator. An academic difficulty was defined as an instance when a child (a) incorrectly answered a math problem; (b) incorrectly responded to a clearly articulated math-related query made by his or her parent while attempting to solve a math question; (c) clearly implemented the wrong strategy for solving a math problem; (d) indicated that he or she was confused about a math question, did not know the answer to a math question, or found a math question difficult; (e) asked for guidance regarding how to solve a math question; or (f) looked puzzled or exhibited signs of shock, frustration, anger, sadness, stress, or anxiety after being presented with a math question. Brief periods of academic struggle that were very closely proceeded by a successful outcome (i.e., a correct answer) were not counted as instances of academic difficulty. The data coders were instructed to watch the video from the point in time when the child experienced the academic difficulty to the point in time when the child ended his or her turn (i.e., stopped working on a particular math question) by spinning the game wheel. Coders then rated the degree to which parents demonstrated

positive affect, negative affect, sensitivity, intrusiveness, detachment, and cognitive stimulation in response to the academic difficulty experienced by their child (i.e., the parent's BRAD).

Before coding data for the present study, the three undergraduate research assistants received three months of training in the use of the adapted PCIRS. Training consisted of weekly two-hour group meetings and individual practice exercises. Training meetings featured in-depth discussions of the coding system, the completion of group coding activities, and the resolution of discrepancies between coders on previously assigned practice exercises. Over the course of the training period, data coders were exposed to increasingly realistic individual practice videos. The first six videos featured parent-child interactions that were role-played by adult actors. In these videos, the actor playing the parent role was instructed by the principal investigator to exhibit elevated levels of positivity, negativity, sensitivity, intrusiveness, detachment, or cognitive stimulation (two behaviour categories were assigned to each actor). The next five videos featured parent-child interactions that were role-played by adult actors. In these videos, the actor playing the role of parent was instructed to behave naturally. The following three videos featured interactions between actual parent-child dyads who were not formally participating in the present study. The final three training videos featured actual parent-child dyads from the present study whose videotaped interactions could not be counted as data due to their brief duration or poor sound quality. Inter-coder reliability data, as measured by Finn's r , were calculated for the set of practice videos featuring actual parent-child dyads ($n = 6$). Mean inter-coder reliabilities for the parent GBAS and BRAD conditions were mostly fair-to-good or excellent (See Table 2).

Table 2

Mean Adapted PCIRS Scale Inter-Coder Reliabilities for the GBAS and BRAD Conditions across Six Practice Exercises

Adapted PCIRS Scales and GBAS/ BRAD Condition												
Coders	PA/ GBAS	PA/ BRAD	NA/ GBAS	NA/ BRAD	Sens/ GBAS	Sens/ BRAD	Int/ GBAS	Int/ BRAD	Detach/ GBAS	Detach/ BRAD	Cog S/ GBAS	Cog S/ BRAD
Pairs of Coders:												
Coders 1 & 2	.64	.56	.93	.63	.93	.73	.86	.83	.83	.93	.53	.56
Coders 1 & 3	.70	.73	.83	.86	.80	.13	.90	.96	.93	.63	.56	.93
Coders 2 & 3	.53	.63	.83	.36	.83	.26	.56	.63	.70	.73	.66	.63
Total Group of Coders ($n = 3$)	.66	.64	.87	.62	.85	.37	.77	.81	.82	.77	.58	.71

Note. PCIRS: Parent-Child Interaction Rating System (Belsky, Woodworth, et al., 1998); PA: Positive Affect scale; NA: Negative Affect scale; Sens: Sensitivity scale; Int: Intrusive Interaction scale; Detach: Detached Manner scale; Cog S: Cognitive Stimulation scale; GBAS: Parents' general behaviour in an academic setting; BRAD: Parents' behavioural response to academic difficulty.

Following training, videotapes of parent-child interactions included in the present study were divided into three batches of 30 cases and coded over a period of approximately one and a half months (missing codes from any given batch were obtained at the end of the data coding period). Cases could not be randomized to batches because data were still being collected at the start of the data coding period; however, within each batch, case numbers were randomized to provide some protection against order effects. Notably, the six scales comprising the adapted PCIRS were divided amongst pairs of coders, so that each pair of coders were only responsible for rating parents' GBAS and BRAD across a subset of the total number of scales. The pair of coders with the most reliable ratings for a given scale across the six previously described training exercises (see Table 2) featuring real parents and their children (taking into account the combination of coders' GBAS and BRAD ratings) were assigned that scale for coding of all three batches of cases. One coder from the pair assigned to a particular scale was responsible for coding every case on that scale. This "primary" coder's ratings were used in the present study's data analysis. The other member of the coding pair was responsible for coding a randomly selected subset of cases (approximately 20% of cases) from each batch (separate random samples of cases were generated for the GBAS and BRAD coding conditions). This coder's scores were compared to the scores of the "primary" coder as a means of determining inter-coder reliability for the scale in question. Inter-coder reliabilities (as measured by Finn's r) were excellent for coders' GBAS ratings (Positive Affect: $r = .853$; Negative Affect: $r = .853$; Sensitivity: $r = .758$; Intrusive Interaction: $r = .876$; Detached Manner: $r = .986$; Cognitive Stimulation: $r = .798$). With respect to coders' BRAD ratings, mean inter-rater reliabilities were fair-to-good (Positive Affect:

$r = .719$; Sensitivity: $r = .712$; Cognitive Stimulation: $r = .602$) or excellent (Negative Affect: $r = .945$; Intrusive Interaction: $r = .837$; Detached Manner: $r = .986$).

Assignment of Study Participants to IQ and Classroom Placement Groups

Parents included in the present investigation were classified into one of two groups on the basis of their FSIQ scores: MID (i.e., FSIQs ≤ 85 ; $n = 21$) or normal IQ (i.e., FSIQ ≥ 86 ; $n = 74$). Similarly, child participants were classified into one of two groups on the basis of their FSIQ scores: MID (i.e., FSIQs ≤ 85 ; $n = 23$) or normal IQ (i.e., FSIQ ≥ 86 ; $n = 73$).

In addition, children were assigned to one of two “classroom placement” groups based on information provided by parents in the background information questionnaire: regular classroom placement (regular; $n = 72$) or mixed regular and special education classroom placement (mixed; $n = 16$). Children classified into the regular group attended full-time regular classes and did not receive support from a special education teacher. Full-time regular classroom students who were receiving in-class support from a special education teacher ($n = 8$) were excluded from the regular group, given the potentially confounding influence of special education support on the relationship between full-time classroom placement and child self-concept. Children classified into the mixed group attended regular education classes but also received some out-of-class special education support (i.e., resource room support or part-time special education classroom placement).

CHAPTER III

Results

Overview

IQ-related and demographic characteristics of the overall sample were investigated in detail. Data cleaning procedures were then conducted to address threats to the validity of the present study, and preliminary analyses were run to determine whether the child and parent IQ groups or child classroom placement groups differed on any one of a selection of demographic variables. Once the relevant statistical assumptions had been carefully evaluated, a total of eight primary analyses were conducted. Five analyses addressed study hypotheses and three analyses were exploratory in nature.

Characteristics of the Sample

IQ-related characteristics (see Table 3) and demographic characteristics (see Table 4) of the overall sample are presented in detail below. IQ-related characteristics were obtained through parent and child cognitive testing, and demographic characteristics were derived from parents' background information questionnaire responses.

Child and Parent IQ

The mean estimated Full Scale IQs (i.e., FSIQs) of the child and parent samples were 96.26 ($SD = 15.69$) and 97.85 ($SD = 15.01$), respectively. The FSIQs for children ranged from 54.10 to 134.00, while the FSIQs for parents ranged from 55.00 to 137.80. Six children and four parents had estimated FSIQs less than 70.00.

Child/ Parent Age and Gender

As reported in Chapter II, children and their parents or caregivers ranged in age from 6 to 13 years ($M = 9.39$, $SD = 1.76$) and from 27 to 66 years ($M = 38.41$, $SD = 6.38$), respectively. The child sample included approximately one and a half times as

Table 3

Mean WISC-IV and WAIS-IV Full Scale IQs for the (a) Child IQ Group, (b) Parent IQ Group, (b) Parent IQ x Child IQ Groups, and (c) Total Sample

Group	WISC-IV Full Scale IQ		WAIS-IV Full Scale IQ	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Child IQ				
Normal IQ (<i>n</i> = 73)	102.52	11.62	-	-
MID (<i>n</i> = 23)	76.42	8.90	-	-
Parent IQ				
Normal IQ (<i>n</i> = 74)	-	-	103.64	10.92
MID (<i>n</i> = 21)	-	-	77.46	7.90
Child IQ x Parent IQ				
CN-PN (<i>n</i> = 58)	103.31	12.47	104.66	10.94
CN-PMID (<i>n</i> = 14)	99.64	7.22	78.14	8.20
CMID-PN (<i>n</i> = 16)	78.01	8.66	99.96	10.34
CMID-PMID (<i>n</i> = 7)	72.80	9.00	76.09	7.69
Total Sample				
Child (<i>N</i> = 96)	96.26	15.69	-	-
Parent (<i>N</i> = 95)	-	-	97.85	15.01

Note. WISC-IV: Wechsler Intelligence Scale for Children, Fourth Edition (Wechsler, 2003); WAIS-IV: Wechsler Adult Intelligence Scale, Fourth Edition (Wechsler, 2008); CN-PN: Child with normal IQ - Parent with normal IQ; CN - PSL: Child with normal IQ - Parent with MID; CSL-PN: Child with MID - Parent with normal IQ; CSL-PSL: Child with MID - Parent with MID.

Table 4

Demographic Variable Descriptive Statistics for the (a) Total Sample and (b) Parent/ Child IQ Groups.

Demographic Variable	Total Sample	Parent IQ Groups		Child IQ Groups	
		Normal IQ	MID	Normal IQ	MID
Gender (<i>n</i> Male: <i>n</i> Female)					
Parent	10:86	8:66	2:19	8:65	2:21
Child	57:39	41:33	15:06	44:29	13:10
Age (<i>M</i>)					
Parent	38.41	39.22	35.10	38.40	38.43
Child	9.39	9.34	9.43	9.26	9.78
Ethnicity (% Caucasian)					
Parent	77.10	85.10	47.60	78.10	73.90
Child	70.80	79.70	38.10	74.00	60.90
Child Grade (<i>Mdn</i>)	4	4	4	4	5
Household Income (<i>M</i>)	\$50-79 000	\$50-79 000	\$30-39 000	\$50-79 000	\$40-49 000
(<i>Mode</i>)	\$100 000+	\$100 000+	\$0-20 000	\$50-79 000, \$100 000+	\$0-20 000
Parent Education (<i>Mdn</i>)	Some University	Some University	Some University	Some University	Some University

many boys ($n = 57$) as girls ($n = 39$), while female parents ($n = 86$) outnumbered male parents ($n = 10$) by a ratio of approximately 8.5:1.

Child Schooling and Special Education Status

Children's median level of education was Grade 4, and children ranged in level of education from Grade 1 to Grade 8. One child had been held back at least one grade, and the parent of another child was unsure if her child had failed a grade. A very large percentage of parents reported that they thought their child could be doing better at school ($n = 72, 75\%$) or that they did not know if their child could be doing better at school ($n = 7, 7.3\%$). More than half of parents indicated that either their child's needs were not being met at school ($n = 35, 37\%$) or that they did not know if their child's needs were being met at school ($n = 20, 21\%$).

One quarter of children were currently receiving special education services at school ($n = 24; 25\%$). Of these children, one third ($n = 8; 33\%$) attended a regular classroom with in-class special education support services and about two thirds ($n = 15; 63\%$) were placed in a regular classroom with out-of-class special education support services (e.g., resource room support). Only one child attended a part-time special education class.

Parent and Child Mental Health

With respect to parent mental health, about one quarter of parents reported having at least one category of mental disorder or condition ($n = 22, 23\%$). Of these parents, roughly two thirds ($n = 14; 64\%$) reported the presence of one category of mental disorder or condition (e.g., Anxiety, Learning Disorder), while approximately one third indicated the presence of two ($n = 7; 32\%$) or three ($n = 1; 5\%$) categories of mental disorders or

conditions. A small number of parents indicated that they did not know if they had a mental disorder or condition ($n = 3$, 3%). Figure 1 depicts the percent representation of various categories of disorders and conditions amongst parents reporting at least one mental health concern.

About one quarter of parents ($n = 26$, 27%) reported that their child had at least one psychiatric diagnosis or special education designation. Of these parents, approximately two thirds ($n = 17$; 65%) reported the presence of one category of psychiatric diagnosis or special education designation (e.g., Anxiety, Learning Disorder), while about one third of parents indicated the presence of two ($n = 8$; 31%) or four ($n = 1$; 4%) categories of psychiatric diagnoses or special education designations. A few parents ($n = 5$; 5%) indicated that they did not know if their child had a psychiatric diagnosis or special education designation. Figure 1 depicts the percent representation of various categories of disorders and conditions amongst children whose parents reported at least one child mental health concern.

Socioeconomic Status and Race/ Ethnicity

Parent-child dyads who participated in the present study appeared to come from primarily middle class socioeconomic backgrounds. The median and modal household incomes were \$50-79 000 and \$100 000+, respectively, while the median parent and caregiver educational level was “some university education” (Figure 2 displays the highest level of education endorsed by parents as a percentage of the total number of parent participants). With respect to employment, approximately one half of parents ($n = 50$; 52.1%) held full or part-time jobs while the other half of parents ($n = 46$; 47.9%) were either unemployed or students without a full or part-time job. The race/ethnicity of two

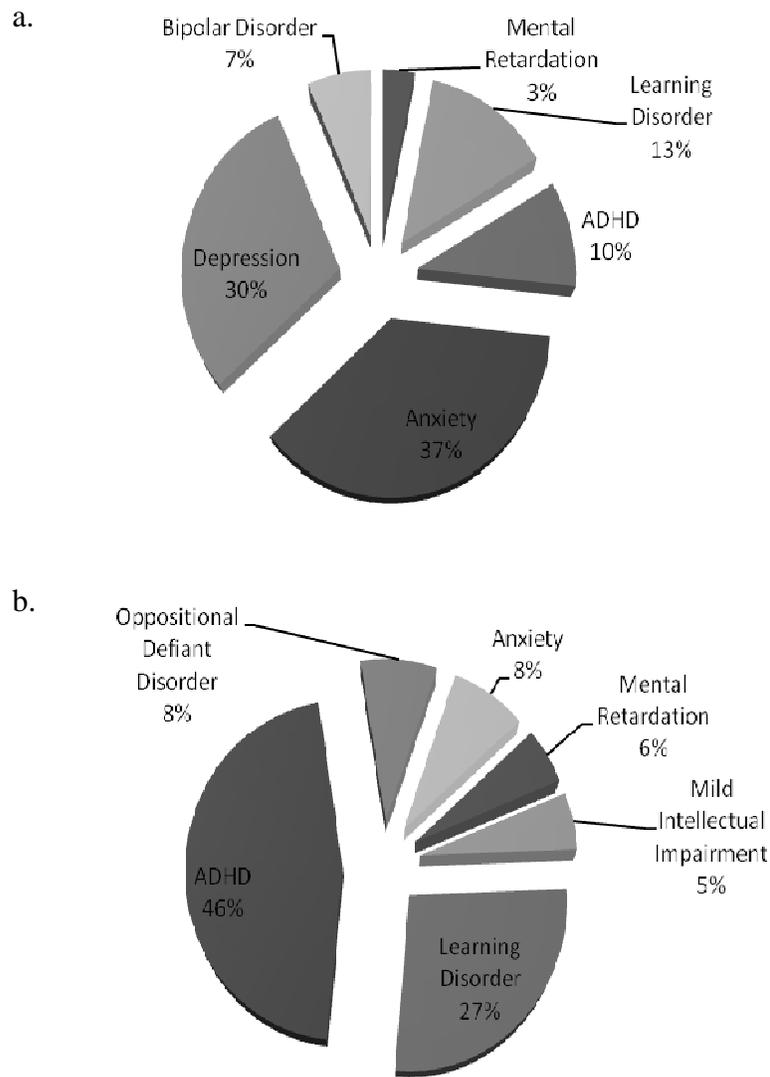


Figure 1. Percent representation of various categories of disorders and conditions amongst (a) parents reporting at least one mental health concern ($N = 22$) and (b) children whose parents reported at least one child mental health concern ($N = 26$).

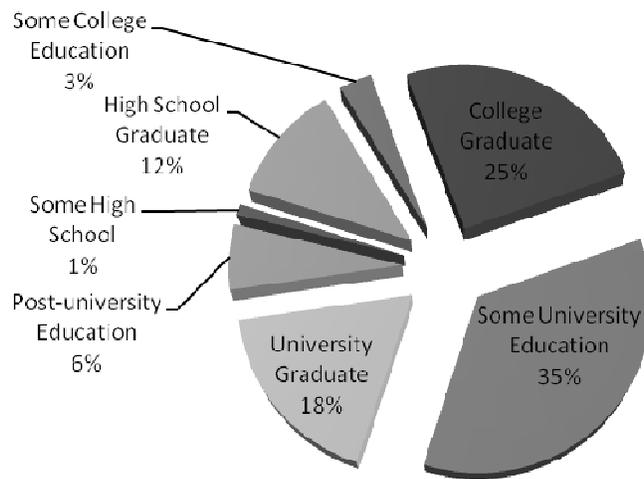


Figure 2. Highest level of education endorsed by parents as a percentage of the total number of parent participants ($N = 96$).

thirds of the child sample ($n = 68, 70.8\%$) and a little more than two thirds of the parent sample ($n = 74, 77.1\%$) was White/Caucasian. Figure 3 depicts the percent representation of various races/ethnicities amongst child and parent participants.

Parent Social Functioning

Two thirds of parents were married ($n = 65, 67.7\%$). Most parents reported that they felt satisfied with the amount of social support they were receiving from friends, family, or romantic partners ($n = 82, 85.4\%$), and the median and modal size of their social support networks (i.e., the number of people they could go to for social support, such as friends, relatives, and romantic partners) was 6 to 10 people. However, most parents reported only engaging in a small number of social activities each week (median and modal number of activities per week = 0-2).

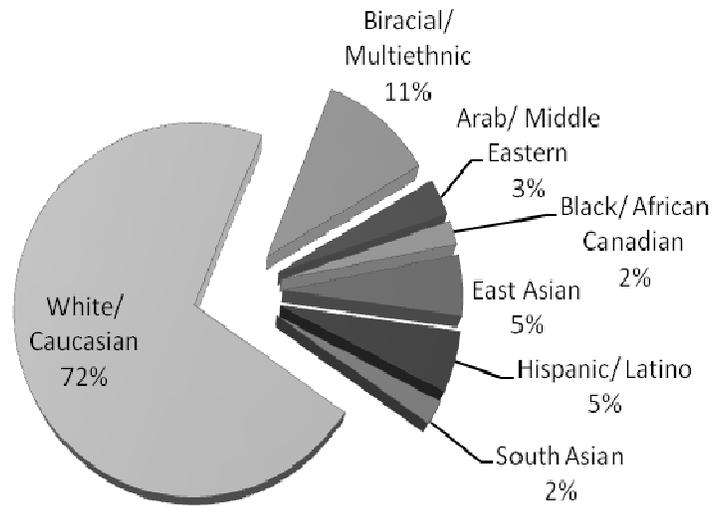
Data Cleaning

Validity of Measures

Phase 1 of the data cleaning process consisted of the removal or modification of data threatening the construct validity of the present study's self- and parent- report questionnaire measures and parent attribution coding scheme.

Validity of self-report and parent-report questionnaire responses. The Piers-Harris Self-Concept Scale, Second Edition (PHCSC-2) child self-report questionnaires were screened for missing individual item responses. According to the authors of the PHCSC-2, children's Intellectual and School Status (INT) scale scores should be interpreted with caution if three or more of the individual item scores contributing to the scale are missing (Piers & Hertzberg, 2002). The test authors further assert that children's

a.



b.

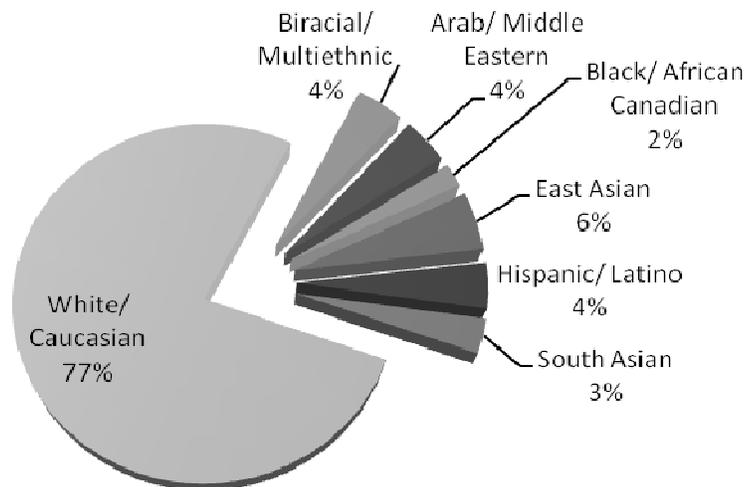


Figure 3. Percent representation of various races/ ethnicities amongst (a) child participants ($N = 95$) and (b) parent participants ($N = 96$).

Total (TOT) self-concept scale scores should be interpreted with caution if more than seven individual item scores are missing (Piers & Hertzberg, 2002). In the present study, the number of missing items for the INT scale never exceeded two, and the number of missing items for the TOT scale never exceeded six.

The validity of children's PHCSC-2 responses was further evaluated through the use of two validity scales: the Inconsistent Responding Index (INC) and the Response Bias Index (RES). The INC scale measures the tendency for children to respond randomly to individual questionnaire items. The authors of the PHCSC-2 indicate that *T*-scores on the INC scale greater than 70 are suggestive of random responding (Piers & Hertzberg, 2002). The PHCSC-2's RES scale measures the tendency for children to either overendorse or underendorse questionnaire items. The authors of the PHCSC-2 indicate that *T*-scores ≥ 70 or ≤ 30 should be interpreted with caution because they reflect a strong tendency for children to overendorse or underendorse questionnaire items, respectively (Piers & Hertzberg, 2002). All participants' INC scale *T*-scores fell below 70, suggesting that child respondents were not responding randomly to questionnaire items. However, five children's RES scale *T*-scores were greater than 70 and one child's RES score was less than 30. These children's TOT and INT scale scores were subsequently excluded from the data analysis.

In addition to using the PHCSC-2's INC and RES scales to identify random and biased response sets, TOT scale *T*-scores can be used to assess the extent to which child participants exaggerate the positive nature of their self-concepts (Piers & Hertzberg, 2002). According to the authors of the PHCSC-2, TOT scale *T*-scores greater than 65 (i.e., 1.5 standard deviations above the mean) are suggestive of possible positive

exaggeration (Piers & Hertzberg, 2002). In the present study, nine children's *T*-scores on the TOT scale were found to be greater than 65. In order to prevent these elevated scores from skewing study findings regarding children's overall (i.e., total) self-concepts, *T*-scores greater than 65 were Winsorized. Winsorization involves replacing the value of an extreme data point with the value of the next lowest or highest acceptable number plus one (where one represents a single unit of measurement). The Winsorization procedure resulted in a maximum *T*-score of 64 for the TOT scale (i.e., the value of the highest acceptable *T*-score plus one).

Parents' Child Behavior Checklist for Ages 6 to 18 (CBCL/6-18) questionnaires were screened for missing data. According to the authors of the CBCL/6-18, questionnaires with more than three missing items may not be interpretable (Achenbach & Rescorla, 2001). Questionnaires completed as part of the present study had no more than two missing items. However, some of the questionnaires contained one or more spoiled items (i.e., individual items with more than one response option circled). To prevent spoiled items from counting as missing data, the decision was made to record a score of "1" (i.e., the middle score) for all spoiled responses where scores of (a) "0" and "1", (b) "1" and "2", and (c) "0", "1", and "2" had been circled by parents. Because the CBCL/6-18 does not include any validity scales, parents' tendency to respond inconsistently, in a biased fashion, or to exaggerate could not be assessed.

Validity of Adapted Parental Attributions Coding System codings. Coded parent interview responses that were considered tangential or irrelevant to the construct of academic difficulty under investigation were removed from the data analysis. Deleted responses included parent descriptions of the causes of (a) nonacademic difficulties

(e.g., attention or behaviour problems; shyness, self-consciousness, separation anxiety or social difficulties), (b) difficulties occurring in nonacademic (i.e., gym, art, drama) or group-based (i.e., group projects or assignments) contexts, and (c) difficulties that were defined in an overly vague manner. Parent responses to spoiled interview questions (e.g., questions that incorrectly specified the nature of an academic difficulty, either as a result of interviewer error or a transcription error) were also deleted.

Statistical Validity Considerations

Phase 2 of the data cleaning process consisted of the removal or modification of variables that threatened the statistical validity of the present study (see the “Statistical Assumptions” section below and Appendix I for a complete description of procedures followed to address analysis-specific threats to the study’s statistical validity), including the deletion of variables with restricted data ranges or limited numbers of data points, outlier removal, and data normalization.

Deletion of variables with restricted data ranges or limited numbers of data points. Interval variables with restricted data ranges were excluded from the present study’s data analysis. Variables were classified as having restricted data ranges if more than 85% of their data points were spread across two consecutive scores. Based on this criterion, the Intentionality scale from the adapted Parental Attributions Coding System (PACS) and the Sensitivity, Negative Affect, Intrusive Interaction, and Detached Manner scales from the adapted Parent-Child Interaction Rating System (PCIRS) were excluded from further analysis. The Valence of Intent scale from the adapted PACS was also excluded from the data analysis because it consisted of only seven (out of a possible 96) data points.

Outlier removal and data normalization. Study variables were screened for the presence of univariate outliers and for violations of statistical normality. Outliers were defined as data points falling three or more standard deviations above or below the variable's mean, while nonnormally distributed variables were defined as those variables with skewness and kurtosis z-scores ≤ -2.0 or ≥ 2.0 . Transformations were conducted on relevant variables in an attempt to reduce the influence of outliers and to normalize data distributions. In certain cases, Winsorization was used to further reduce the influence of outliers. The adapted PACS Trait scale was normalized using a cubic (i.e., y^3) transformation, and two outliers associated with this scale were Winsorized (pre-transformation). Quadratic (i.e., y^2) and y^3 transformations were successfully applied to the adapted PACS Stability and Globality scales, respectively. Notably, the adapted PACS proportion of internal locus attributions variable could not be normalized because a substantial number of data points shared the same extreme value (i.e., a proportion of 1.0). Rather than eliminate this variable from the study, the decision was made to use nonparametric tests in subsequent data analyses involving this variable. The adapted PCIRS Positive Affect scale for the BRAD (i.e., parents' behavioural response to academic difficulty) condition was normalized using a square root (i.e., $y^{1/2}$) transformation. Transformations were unable to fully normalize the PCIRS Cognitive Stimulation scale for the BRAD condition; however, this variable evidenced only a mild degree of kurtosis (i.e., the z-score for kurtosis was 2.43). With respect to parent and child demographic variables, the parent age variable was normalized using a $y^{1/2}$ transformation and a single outlier value was Winsorized (pre-transformation). The

parent income and child age variables were normalized using y^2 transformations. Finally, a $y^{1/2}$ transformation was used to normalize the child grade variable.

Preliminary Analyses

Preliminary analyses were conducted to determine whether children with MID and children with normal IQs could be differentiated on the basis of recruitment source (i.e., University of Windsor participant pool versus community recruitment) or one or more of the following demographic variables: parent gender, parent age, parent education, parent income, child age, child gender, or child grade. Although the two groups did not appear to differ on any of these variables, a statistically significant inverse correlation was noted between child IQ and child age, $r = -.228$, $p = .025$. This inverse correlation could relate to the cumulative effect over time of exposure to various forms of environmental deprivation (e.g., malnutrition, under-stimulating home or school settings, low academic standards set by adults) on children's IQ test scores (Jensen, 1966, 1977). Because prior knowledge is integral to the assimilation of new knowledge, it stands to reason that children who are delayed in their acquisition of particular skills or abilities (e.g., concrete reasoning abilities) as a result of their experience of environmental deprivation would be at a considerable disadvantage relative to same-aged peers when it comes to the acquisition of more advanced forms of these skills or abilities (e.g., abstract reasoning abilities; Jensen, 1966). Over time, affected children would be expected to fall further and further behind their same-aged peers in their skill or ability development (Jensen, 1966). The cumulative impact over time of the experience of environmental deprivation on children's skill or ability development could serve to explain why older child participants in the present study evidenced lower IQ scores than younger child participants. It should

be noted, however, that findings from the present study tend not to support the contention that environmental deprivation was common amongst child participants with lower IQs (e.g., child IQ groups did not differ on a measure of household income). Notably, the inverse child IQ – child age relationship may also be explained by factors relating to brain maturation. For example, neurocognitive development may occur less quickly (independent of environmental factors) in children with lower IQs than in children with higher IQs, which may in turn translate into increasingly discrepant IQ scores between the two groups of children over time (Jensen, 1974, 1977). A final explanation for the inverse correlation between child IQ and child age could be that parents of older children with low IQs were more aware of their children's academic difficulties than parents of younger children with low IQs, and therefore more likely to participate in the present study.

Statistical analyses were also performed to determine whether parents with MID and parents with normal IQs differed on any of the previously mentioned variables. The analyses revealed that parents with normal IQs had higher incomes than parents with MID, $U = 442.500$, $Z = -2.920$, $p = .003$, $abs(r) = .303$, but that the two groups of parents were similarly educated. This finding is consistent with previous research demonstrating a relationship between IQ and socioeconomic status (e.g., Tittle & Rotolo, 2000). In addition, the analyses revealed that parents with normal IQs were older than parents with MID, $t(93) = 2.858$, $p = .005$, $d = .593$. This relationship between parent age and IQ could not be explained by recruitment source; although participants recruited through the University of Windsor psychology participant pool were younger than participants recruited through the community, $t(94) = -2.817$, $p = .006$, $d = .581$, the two groups did not differ significantly in intelligence. The relationship between parent age and parent IQ

could be explained by a tendency for more intelligent parent participants to wait until later in life to have children than less intelligent parent participants, for either personal or professional reasons (of course, this explanation only holds for parents of children without older siblings).

The same analyses were performed to determine whether children belonging to the two classroom placement groups (regular classroom placement, mixed regular and special education classroom placement) differed on any of the aforementioned variables. The analyses did not reveal any statistically significant group differences.

Primary Analyses

Five hypothesis-related and three exploratory analyses were conducted as part of the present study. Because Type 2 error was viewed as a substantial threat to the validity of the study (given the study's small sample size and limited statistical power for group-based analyses), the decision was made to set the per-comparison alpha rate at .10 for each analysis. Relevant statistical assumptions were carefully evaluated prior to running each of the eight primary analyses.

Statistical Assumptions

The statistical procedures followed in the present study's primary analyses included a series of between-groups multi-factorial ANOVAs, independent samples *t*-tests, multiple regressions, Pearson's *r* and Spearman's *rho* correlations, and Mann-Whitney *U* and Kruskal-Wallis *H* tests. The relevant statistical assumptions were evaluated for each of the study's primary analyses, and efforts were made to correct for moderate to severe violations of these assumptions (minor violations were deemed acceptable given the study's small sample size). See Appendix I for descriptions of (a) the

various assumptions underlying each of the present study's statistical procedures and (b) the actions taken (if any) to attempt to correct for violations of statistical assumptions.

Hypothesis 1: Children's Academic Self-Concepts

An analysis was conducted to investigate both (a) the relationship between child IQ and academic self-concept and (b) the influence of classroom placement (i.e., regular, mixed) on this relationship. The analysis addressed the present study's *first hypothesis that children with MID attending full-time regular education classes would demonstrate lower academic self-concepts than children with normal IQs attending the same classrooms and children with MID receiving out-of-class special education services.*

Relationship between child IQ and academic self-concept. The relationship between child IQ and academic self-concept was investigated through conducting a *t*-test with child IQ as the independent variable and academic self-concept (as measured by the INT scale of the PHCSC-2) as the dependent variable (child IQ group means and standard deviations are presented in Table 5). The *t*-test did not reach statistical significance, $t(87) = .967, p = .336, d = 0.207$. Notably, however, the present study's small sample size may have precluded the detection of a difference between child IQ groups from the population under investigation. To address this potential shortcoming, a Pearson's *r* correlation between child IQ and academic self-concept was calculated. The Pearson's *r* correlation was more statistically powerful than the aforementioned *t*-test because child IQ was continuously, rather than dichotomously, defined. The Pearson's *r* correlation revealed a significant positive relationship between child IQ and academic self-concept, $r = .245, p = .020$.

Influence of classroom placement. The possible influence of classroom placement on the relationship between child IQ and academic self-concept was investigated using a between-groups multi-factorial (2x2) ANOVA, with academic self-concept as the dependent variable and both child IQ (normal IQ, MID) and classroom placement (regular, mixed) as independent variables. The ANOVA did not reveal any main effects for child IQ or classroom placement, nor did it indicate the presence of an interaction between child IQ and classroom placement (child IQ and classroom placement group means and standard deviations are displayed in Table 5). However, it is once again important to note that the present study's relatively small sample size may have prevented main or interaction effects from reaching statistical significance.

A multiple regression analysis was run to further explore the inter-relationships between child IQ, classroom placement, and academic self-concept. The regression model under investigation, hereafter referred to as the "child IQ/ classroom placement model," was comprised of three predictor variables: child IQ (a continuous variable from which the present study's child IQ groups were originally derived), classroom placement (a previously defined dichotomous variable), and Child IQ x Classroom Placement (an interaction term representing the product of the classroom placement and child IQ variables). The dependent variable in the analysis was academic self-concept. Importantly, the inclusion of a continuous, rather than dichotomous, child IQ predictor variable made the multiple regression analysis a more statistically powerful procedure than the aforementioned ANOVA analysis. Despite the greater statistical power of the multiple regression analysis, the child IQ/ classroom placement model was unable to account for a significant amount of variance in children's academic self-concepts.

Table 5

Mean PHCSC-2 INT and TOT Scale T-scores for the (a) Child IQ/ Classroom Placement Groups, (b) Child IQ x Classroom Placement Groups, and (c) Total Sample

Group	INT Scale		TOT Scale	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Child IQ				
Normal IQ (<i>n</i> = 70)	52.27	9.71	52.64	8.70
MID (<i>n</i> = 19)	49.95	7.49	49.89	8.18
Classroom Placement				
Regular (<i>n</i> = 66)	53.18	8.89	53.39	8.17
Mixed (<i>n</i> = 16)	48.81	10.46	48.69	10.16
Child IQ x Classroom Placement				
CN-R (<i>n</i> = 59)	53.19	9.15	53.24	8.27
CN-M (<i>n</i> = 7)	48.00	13.76	48.86	13.17
CMID-R (<i>n</i> = 7)	53.14	6.79	54.71	7.72
CMID-M (<i>n</i> = 9)	49.44	7.88	48.56	7.97
Total Sample (<i>N</i> = 89)	51.78	9.29	52.06	8.62

Note. PHCSC-2: Piers-Harris Children's Self-Concept Scale, Second Edition (Piers & Herzberg, 2002); *INT Scale*: Intellectual and school status scale; *TOT Scale*: Total self-concept scale; *Regular*: Regular classroom placement; *Mixed*: Mixed regular/ special education classroom placement; *CN-R*: Child with normal IQ – Regular; *CN-M*: Child with normal IQ – Mixed; *CMID-R*: Child with MID – Regular; *CMID-M*: Child with MID – Mixed.

Influence of special education status. A post-hoc analysis was run to investigate whether children's access to special education services would better moderate the observed relationship between child IQ and academic self-concept than children's exposure to higher achieving peers (i.e., classroom placement). This analysis was justified on the basis of previous longitudinal research showing that (a) receipt of special education services may relate to improvements in children's academic self-concepts (Boersma, Chapman, & Battle, 1979) and (b) improvements in academic achievement (e.g., such as those resulting from receipt of special education services) may lead to increases in children's self-perceptions of academic competency (Newman, 1984; Skaalvik & Hagtvet, 1990). Children were categorized into one of two "special education status" groups based on whether they were receiving special education services at school (regardless of whether these services were received inside or outside of the regular classroom): Special education ($n = 24$) or no special education ($n = 72$).

The previously mentioned ANOVA and multiple regression analyses were repeated with special education status (rather than classroom placement) as one of the independent/ predictor variables. A between-groups multi-factorial (2x2) ANOVA revealed a significant main effect for special education status, $F(1, 89) = 4.252, p = .042, \eta^2 = .048$, suggesting that children receiving special education services had lower academic self-concepts than children who were not receiving special education services (child IQ and special education status group means and standard deviations are displayed in Table 6). A multiple regression analysis was also conducted to examine the effectiveness of the previously described regression model in predicting academic self-concept when special education status (rather than classroom placement) was included as

Table 6

Mean PHCSC-2 INT and TOT Scale T-scores for the (a) Child IQ/ Special Education Status Groups, (b) Child IQ x Special Education Status Groups, and (c) Total Sample

Group	INT Scale		TOT Scale	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Child IQ				
Normal IQ (<i>n</i> = 70)	52.27	9.71	52.64	8.70
MID (<i>n</i> = 19)	49.95	7.49	49.89	8.18
Special Education Status				
No Spec (<i>n</i> = 66)	53.18	8.89	53.39	8.17
Spec (<i>n</i> = 23)	47.74	9.44	48.22	8.91
Child IQ x Special Education Status				
CN-N (<i>n</i> = 59)	53.19	9.15	53.24	8.27
CN-S (<i>n</i> = 11)	47.36	11.56	49.45	10.60
CMID-N (<i>n</i> = 7)	53.14	6.79	54.71	7.72
CMID-S (<i>n</i> = 12)	48.08	7.50	47.08	7.33
Total Sample (<i>N</i> = 89)	51.78	9.29	52.06	8.62

Note. PHCSC-2: Piers-Harris Children's Self-Concept Scale, Second Edition (Piers & Herzberg, 2002); *INT Scale*: Intellectual and school status scale; *TOT Scale*: Total self-concept scale; *No Spec*: No special education services; *Spec*: Special education services; *CN-N*: Child with normal IQ – No Spec; *CN-S*: Child with normal IQ – Spec; *CMID-N*: Child with MID – No Spec; *CMID-S*: Child with MID – Spec.

a predictor variable. The modified regression model, hereafter referred to as the “child IQ/ special education status model,” accounted for a significant amount of the variance in academic self-concept, $Adjusted R^2 = .063$, $F(3,88) = 2.967$, $p = .036$, $f^2 = 0.067$, and model beta weights revealed that the receipt of special education services inversely predicted academic self-concept, $b^* = -.259$, $t(85) = -1.797$, $p = .076$.

Overall, the results of the analysis do not support the present study’s first hypothesis. However, the findings do suggest that (a) children with lower IQs (including children with MID) may exhibit lower academic self-concepts than children with higher IQs and (b) children receiving special education services, as a group, may exhibit lower academic self-concepts than children who do not receive any special education services.

Exploratory Analysis: Children’s Total Self-Concepts

An exploratory analysis was conducted to determine (a) whether child IQ was related to child overall (i.e., total) self-concept and (b) whether this relationship was moderated by classroom placement (i.e., regular, mixed). The same statistical analyses used to investigate child academic self-concept were repeated for child total self-concept (as measured by the TOT scale from the PHCSC-2).

Relationship between child IQ and total self-concept. A *t*-test comparing the total self-concepts (as measured by the TOT scale of the PHCSC-2) of the two child IQ groups (normal IQ, MID) did not reach statistical significance, $t(87) = 1.236$, $p = .220$, $d = 0.265$ (child IQ group means and standard deviations are displayed in Tables 5 and 6).

However, a Pearson’s *r* correlation revealed a significant positive relationship between child IQ (continuously defined) and total self-concept, $r = .259$, $p = .014$.

Influence of classroom placement. A between-groups multi-factorial (2x2) ANOVA with total self-concept as the dependent variable revealed a statistically significant main effect for classroom placement, $F(1, 82) = 3.564$, $p = .063$, $\eta^2 = .044$, with children receiving out-of-class special education services demonstrating lower total self-concepts than children attending full-time regular classrooms (see Table 5 for a summary of child IQ and classroom placement group means and standard deviations). However, in the subsequent multiple regression analysis, the amount of variance in total self-concept accounted for by the child IQ/ classroom placement model did not reach statistical significance. The absence of a significant main effect for classroom placement in the multiple regression analysis may be explained in part by the presence of a certain amount of collinearity (albeit not enough to violate the absence of multicollinearity and singularity assumption) between predictor variables. It is worth noting, however, that classroom placement and child IQ were only moderately correlated ($r = -.49$). As such, discrepant findings across analyses may have had less to do with collinearity and more to do with how the child IQ variable was defined in each analysis (i.e., child IQ was a dichotomous variable in the ANOVA-based analysis but a continuous variable in the multiple regression analysis). Indeed, while the ANOVA-based analysis did not take into account the distances of individual child IQ data points from their group means, coefficient weightings in the multiple regression analysis were influenced by child IQ data point variability.

Influence of special education status. The ANOVA and multiple regression analyses were repeated with special education status (rather than classroom placement) as an independent/ predictor variable. A between-groups multifactorial (2x2) ANOVA with

total self-concept as the dependent variable revealed a statistically significant main effect for special education status, $F(1, 89) = 5.488, p = .021, \eta^2 = .061$, suggesting that children who received special education services had lower total self-concepts than children who did not receive special education services (child IQ and special education status group means and standard deviations are displayed in Table 6). A follow-up multiple regression analysis revealed that the child IQ/ special education status model accounted for a significant amount of variance in total self-concept, $Adjusted R^2 = .058, F(3,88) = 2.819, p = .044, f^2 = 0.062$. However, in this analysis the slopes (i.e., beta weights) of the individual predictor variables did not differ significantly from zero. Potentially, a relatively high degree of shared variance between predictor variables may have served to dilute the unique effect of each individual variable on total self-concept.

Overall, the findings of the analysis do not support the contention that placement in a full-time regular classroom is detrimental to the total self-concepts of children with MID. However, findings do suggest that (a) children with lower IQs (including children with MID) may exhibit lower total self-concepts than children with higher IQs and (b) children who receive special education services may exhibit lower total self-concepts than children who do not receive any special education services.

Hypothesis 2: Children's Socioemotional Functioning

An analysis was run to address the present study's *second hypothesis that children with MID would experience greater socioemotional dysfunction than would children with normal IQs*. Three independent samples *t*-tests were run with total problems, internalizing problems, and externalizing problems (as measured by the Total Problems, Internalizing, and Externalizing scales of the CBCL/6-18, respectively) as dependant variables and

child IQ group (normal IQ, MID) as the independent variable (means and standard deviations for each of the child IQ groups are displayed in Table 7). Children with MID demonstrated significantly higher total problem scores than did children with normal IQs, $t(88) = -2.000, p = .049, d = 0.426$. In addition, children with MID exhibited significantly higher externalizing problem scores than did the group of children with normal IQs, $t(88) = -2.445, p = .016, d = 0.521$. The two groups' internalizing problem scores did not differ.

The findings of the analysis offer partial support for the present study's second hypothesis. While children with MID may demonstrate more frequent or severe levels of overall and externalizing maladjustment than children with normal IQs, the two groups of children do not appear to differ in the frequency or severity of their internalizing problems.

Hypothesis 3: Parents' Responsibility-Related Attributions for Instances of Child Academic Difficulty

Parents' responsibility-related attributions (e.g., internal locus, controllable) for instances of child academic difficulty were analyzed to address the present study's *third hypothesis that these attributions would be more common or extreme amongst parents of children with MID than amongst parents of children with normal IQs (i.e., Hypothesis 3A), and would be more common or extreme amongst lower functioning than higher functioning parents of children with MID (i.e., Hypothesis 3B)*. As a first step towards addressing this hypothesis, two Mann-Whitney *U* tests and a Kruskal-Wallis *H* test were conducted with the proportion of internal locus attributions (versus other-related or situational locus attributions) made by parents serving as the dependent variable. The two Mann-Whitney *U* tests included child IQ (normal IQ, MID) and parent IQ (normal IQ,

Table 7

Mean CBCL/6-18 Internalizing, Externalizing, and Total Problems Scale T-scores for the (a) Child IQ Groups and (b) Total Sample

Group	Internalizing Problem Scale		Externalizing Problem Scale		Total Problem Scale	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Child IQ						
Normal IQ (<i>n</i> = 68)	55.10	10.91	53.07	10.65	55.26	11.23
MID (<i>n</i> = 22)	56.05	13.32	59.55	11.22	60.77	11.22
Total Sample (<i>N</i> = 90)	55.33	11.47	54.66	11.09	56.61	11.42

Note. CBCL/6-18: Child Behavior Checklist for Ages 6 to 18 (Achenbach & Rescorla, 2001)

MID) as independent variables, respectively, and the Kruskal-Wallis H test included “child IQ/ parent IQ” (i.e., a four-category variable measuring combined child IQ and parent IQ group membership) as the independent variable (see Table 8 for a summary of means and standard deviations for the child IQ and parent IQ groups). The three nonparametric tests did not yield any significant group differences in proportion of internal locus attributions made by parents.

The second part of the analysis addressing the present study’s third hypothesis involved determining whether groups of parents differed in the extent to which they viewed internal (i.e., internal locus) causes of academic difficulty to be under their child’s control. A between-groups multi-factorial (2x2) ANOVA was run with parents’ mean controllability scores (as measured by the Voluntariness scale of the adapted PACS) across all internal locus attributions as the dependent variable and both child IQ (normal IQ, MID) and parent IQ (normal IQ, MID) as independent variables (see Table 9 for a summary of means and standard deviations for the child IQ and parent IQ groups). The ANOVA did not reveal any statistically significant main or interactive effects. In an effort to overcome possible statistical constraints relating to sample size, the previously described ANOVA analysis was supplemented by a multiple regression analysis. The multiple regression analysis was more statistically powerful than the aforementioned ANOVA analysis because continuous, rather than discrete, independent/ predictor variables were used. The regression model under investigation in this analysis, hereafter referred to as the “parent/ child IQ model” featured three predictor variables: child IQ (a continuous variable from which the present study’s child IQ groups were defined), parent IQ (a continuous variable from which the present study’s parent IQ groups were defined),

Table 8

Adapted PACS Proportion of Internal Locus Attributions for the (a) Child/ Parent IQ Groups, (b) Child IQ x Parent IQ Groups, and (c) Total Sample

Group	Prop. ILA	Group	Prop. ILA
Child IQ		Child IQ x Parent IQ	
Normal IQ ($n = 72$)		CN-PN ($n = 58$)	
<i>M</i>	.72	<i>M</i>	.75
<i>SD</i>	.31	<i>SD</i>	.30
MID ($n = 23$)		CN-PMID ($n = 14$)	
<i>M</i>	.76	<i>M</i>	.60
<i>SD</i>	.31	<i>SD</i>	.35
Parent IQ		CMID-PN ($n = 16$)	
Normal IQ ($n = 74$)		<i>M</i>	.72
<i>M</i>	.74	<i>SD</i>	.32
<i>SD</i>	.30	CMID-PMID ($n = 7$)	
MID ($n = 21$)		<i>M</i>	.84
<i>M</i>	.68	<i>SD</i>	.28
<i>SD</i>	.34	Total Sample ($N = 95$)	
		<i>M</i>	.73
		<i>SD</i>	.31

Note. PACS: Parental Attributions Coding System (Slep, 1997); *Prop. ILA*: Proportion of Internal Locus Attributions; *CN-PN*: Child with normal IQ - Parent with normal IQ; *CN-PMID*: Child with normal IQ - Parent with MID; *CMID-PN*: Child with MID - Parent with normal IQ; *CMID-PMID*: Child with MID - Parent with MID.

Table 9

Adapted PACS Mean Level 4 Scale Scores for the (a) Child/ Parent IQ Groups, (b) Child IQ x Parent IQ Groups, and (c) Total Sample

Group	Level 4 Scale Scores ^a			
	Trait	Stability	Globality	Voluntariness
Child IQ				
Normal IQ (<i>n</i> = 65)				
<i>M</i>	4.10	3.96	3.67	3.07
<i>SD</i>	0.77	0.87	1.29	0.93
MID (<i>n</i> = 22)				
<i>M</i>	4.24	3.99	3.74	2.98
<i>SD</i>	0.36	0.82	1.13	0.87
Parent IQ				
Normal IQ (<i>n</i> = 68)				
<i>M</i>	4.20	4.02	3.73	3.10
<i>SD</i>	0.59	0.78	1.16	0.89
MID (<i>n</i> = 19)				
<i>M</i>	3.90	3.78	3.53	2.86
<i>SD</i>	0.95	1.07	1.54	0.98

Table 9 (cont'd)

Adapted PACS Level 4 Scale Scores for the (a) Child/ Parent IQ Groups, (b) Child IQ x Parent IQ Groups, and (c) Total Sample

Group	Level 4 Scale Scores ^a			
	Trait	Stability	Globality	Voluntariness
Child IQ x Parent IQ				
CN-PN (<i>n</i> = 53)				
<i>M</i>	4.20	4.01	3.71	3.11
<i>SD</i>	0.63	0.79	1.22	0.88
CN-PMID (<i>n</i> = 12)				
<i>M</i>	3.68	3.73	3.50	2.89
<i>SD</i>	1.13	1.17	1.65	1.13
CMID-PN (<i>n</i> = 15)				
<i>M</i>	4.21	4.05	3.82	3.06
<i>SD</i>	0.40	0.77	0.98	0.94
CMID-PMID (<i>n</i> = 7)				
<i>M</i>	4.29	3.86	3.57	2.80
<i>SD</i>	0.29	0.96	1.47	0.70
Total Sample (<i>N</i> = 87)				
<i>M</i>	4.14	3.96	3.69	3.05
<i>SD</i>	0.69	0.85	1.25	0.91

Note. PACS: Parental Attributions Coding System (Slep, 1997); CN-PN: Child with normal IQ - Parent with normal IQ; CN-PMID: Child with normal IQ - Parent with MID; CMID-PN: Child with MID - Parent with normal IQ; CMID-PMID: Child with MID - Parent with MID.

^aScores ranged from 1 (*not at all*) to 6 (*totally*)

and Parent IQ x Child IQ (an interaction term representing the product of the child IQ and parent IQ variables). The dependent variable in the analysis was parents' mean controllability scores across all internal locus attributions. Consistent with the finding of the ANOVA-based analysis, the parent/ child IQ model was unable to explain a significant amount of the variance in parents' mean controllability scores.

Overall, the findings of the analysis do not support the present study's third hypothesis. However, it is important to note that elements of this hypothesis could not be addressed due to the removal of a study variable with a restricted data range (i.e., the adapted PACS' Intentionality scale) and a study variable with a limited number of data points (i.e., the adapted PACS' Valence of Intent scale).

Exploratory Analysis: Parents' Causal Attributions for Instances of Child Academic Difficulty

An exploratory analysis was conducted to determine whether groups of parents differed in the extent to which they viewed internal (i.e., internal locus) causes of academic difficulty as trait-like (versus state-like) in nature, stable over time, and global across situations (as measured by the Trait, Stability, and Globality scales of the adapted PACS, respectively). Three between-groups multi-factorial (2x2) ANOVAs were run, with child IQ (normal IQ, MID) and parent IQ (normal IQ, MID) serving as the independent variables and parents' mean trait, stability, and globality scores across all internal locus attributions serving as dependent variables (means and standard deviations for the child IQ and parent IQ groups are displayed in Table 9). The ANOVAs did not reveal any significant main effects or interactions.

A series of multiple regressions were run to investigate whether the parent/ child IQ model (as described above) would account for a significant amount of variance in parents' mean trait, stability, and globality scores across all internal locus attributions. The parent/ child IQ model was able to account for a significant amount of variance in parents' mean trait scores, $Adjusted R^2 = .091$, $F(3, 83) = 3.757$, $p = .014$, $f^2 = 0.100$, with child IQ scores inversely predicting the tendency for parents to view the causes of their child's academic difficulties as trait-like in nature, $b^* = -.389$, $t(80) = -3.247$, $p = .002$, and parent IQ scores positively predicting the same tendency, $b^* = .273$, $t(80) = 2.275$, $p = .026$. The parent/ child IQ model also accounted for a significant amount of variance in parents' mean stability scores, $Adjusted R^2 = .092$, $F(3, 85) = 3.863$, $p = .012$, $f^2 = 0.101$, with child IQ scores inversely predicting the tendency for parents to view the causes of their child's academic difficulties as stable over time, $b^* = -.345$, $t(82) = -2.989$, $p = .004$, and parent IQ scores positively predicting the same tendency, $b^* = .249$, $t(82) = 2.148$, $p = .035$. The parent/ child IQ model did not account for a significant amount of variance in parents' mean globality scores.

Overall, the findings of the analysis suggest that child IQ and parent IQ are related to parents' trait and stability attributions for instances of child academic difficulty. Parents of children with lower IQs (including children with MID) may exhibit a greater tendency to attribute academic difficulties to trait-like and stable factors than parents of children with higher IQs, whereas parents with lower IQs (including children with MID) may be less inclined to attribute academic difficulties to trait-like and stable factors than parents with normal IQs.

Hypothesis 4: Parent Behavioural Responses to the Academic Difficulties of their Children

An analysis of parents' behavioural responses to the academic difficulties of their children was conducted to address the present study's *fourth hypothesis that low levels of positive parenting behaviours and high levels of negative parenting behaviours would be more common amongst parents of children with MID than amongst parents of children with normal IQs (i.e., Hypothesis 4A), and more common amongst lower functioning than higher functioning parents of children with MID (i.e., Hypothesis 4B)*. Four between-groups multi-factorial (2x2) ANOVAs were run, with child IQ (normal IQ, MID) and parent IQ (normal IQ, MID) serving as independent variables and parents' positive affect and cognitive stimulation scores (as measured by the Positive Affect and Cognitive Stimulation scales of the adapted PCIRS) for the GBAS (i.e., parents' general behaviour in an academic setting) and BRAD conditions serving as dependant variables (means and standard deviations for the child IQ and parent IQ groups are displayed in Table 10). The ANOVA examining parents' degree of cognitive stimulation for the GBAS condition revealed a significant main effect for parent IQ, $F(1, 89) = 3.729, p = .057, \eta^2 = .042$. The direction of the main effect was for parents with MID to provide their children with less cognitive stimulation in academic contexts than parents with normal IQs. In addition, the ANOVA investigating parents' degree of positive affect for the BRAD condition yielded a significant main effect for parent IQ, $F(1, 89) = 4.995, p = .028, \eta^2 = .056$. However, this main effect was "trumped" by the presence of a significant interaction between child IQ and parent IQ, $F(1, 89) = 3.698, p = .058, \eta^2 = .042$. The nature of this interaction was further investigated through a visual inspection of group means (see Figure 4); a formal

Table 10

Mean Adapted PCIRS Scale GBAS and BRAD Scores for the (a) Child/ Parent IQ Groups, (b) Child IQ x Parent IQ Groups, and (c) Total Sample

Group	Pos ^a / GBAS	Pos ^a / BRAD	Cog Stim ^b / GBAS	Cog Stim ^b / BRAD
Child IQ				
Normal IQ (<i>n</i> = 68)				
<i>M</i>	3.00	2.50	3.00	2.35
<i>SD</i>	0.91	0.92	1.05	1.29
MID (<i>n</i> = 22)				
<i>M</i>	3.09	2.77	3.18	2.91
<i>SD</i>	1.02	1.15	1.18	1.27
Parent IQ				
Normal IQ (<i>n</i> = 70)				
<i>M</i>	3.06	2.64	3.16	2.57
<i>SD</i>	0.92	0.96	1.03	1.30
MID (<i>n</i> = 19)				
<i>M</i>	2.95	2.32	2.63	2.26
<i>SD</i>	1.03	1.06	1.21	1.28

Table 10 (cont'd)

Mean Adapted PCIRS Scale GBAS and BRAD Scores for the (a) Child/ Parent IQ Groups, (b) Child IQ x Parent IQ Groups, and (c) Total Sample

Group	Pos ^a / GBAS	Pos ^a / BRAD	Cog Stim ^b / GBAS	Cog Stim ^b / BRAD
Child IQ x Parent IQ				
CN-PN (<i>n</i> = 54)				
<i>M</i>	3.00	2.52	3.09	2.43
<i>SD</i>	0.93	0.91	1.01	1.30
CN-PMID (<i>n</i> = 13)				
<i>M</i>	3.08	2.46	2.62	2.15
<i>SD</i>	0.86	1.05	1.19	1.28
CMID-PN (<i>n</i> = 16)				
<i>M</i>	3.25	3.06	3.38	3.06
<i>SD</i>	0.86	1.06	1.09	1.24
CMID-PMID (<i>n</i> = 6)				
<i>M</i>	2.67	2.00	2.67	2.50
<i>SD</i>	1.37	1.10	1.37	1.38
Total Sample (<i>N</i> = 89)				
<i>M</i>	3.03	2.57	3.04	2.51
<i>SD</i>	0.94	0.99	1.09	1.30

Table 10 (cont'd)

Note. *PCIRS*: Parent-Child Interaction Rating System (Belsky, Woodworth, et al., 1998);

GBAS: Parent general behaviour in an academic setting; *BRAD*: Parent behavioural

response to academic difficulty; *Pos*: Positive Affect scale; *Cog Stim*: Cognitive

Stimulation scale; *CN-PN*: Child with normal IQ - Parent with normal IQ; *CN-PMID*:

Child with normal IQ - Parent with MID; *CMID-PN*: Child with MID - Parent with

normal IQ; *CMID-PMID*: Child with MID - Parent with MID

^aScores ranged from 1 (*not at all positive*) to 5 (*predominantly positive*)

^bScores ranged from 1 (*non-stimulating*) to 5 (*very stimulating*)

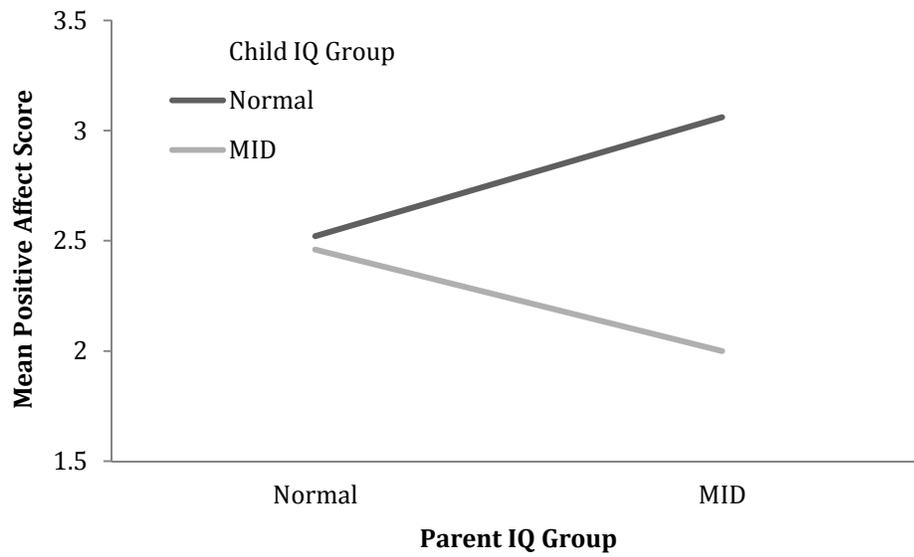


Figure 4. Mean Parent-Child Interaction Rating System (Belsky, Woodworth, et al., 1998) Positive Affect scale scores of parents belonging to each IQ group with children with normal IQs or MID for the behavioural response to academic difficulty (i.e., BRAD) condition.

simple effect analysis was not conducted because each independent variable had only two levels. Lower functioning parents appeared to respond to specific instances of academic difficulty with less positive affect than higher functioning parents when their children had MID, but with similar amounts of positive affect when their children had normal IQs. The remaining ANOVAs investigating parent positive affect for the GBAS condition and parent cognitive stimulation for the BRAD condition did not yield any significant main effects or interactions.

A series of multiple regressions were conducted to further investigate the inter-relationships between child IQ, parent IQ, and parents' behavioural responses to child academic difficulty. This multiple regression analysis was designed to be more statistically powerful than the aforementioned ANOVA analysis because continuous, rather than discrete, independent/ predictor variables were used. The parent/ child IQ model (described previously) was evaluated with parents' positive affect and cognitive stimulation scores for the GBAS and BRAD conditions serving as dependent variables. The model accounted for a significant amount of variance in parents' cognitive stimulation scores for the GBAS condition, $Adjusted R^2 = .075$, $F(3, 85) = 3.303$, $p = .024$, $f^2 = 0.081$, with parent IQ scores positively predicting quantity of parent cognitive stimulation in an academic context, $b^* = .361$, $t(82) = 3.037$, $p = .003$, and child IQ scores inversely predicting the quantity of parent cognitive stimulation in an academic context, $b^* = -.206$, $t(82) = -1.737$, $p = .086$. The parent/ child IQ model was unable to account for a significant amount of variance in parents' positive affect scores for the BRAD condition. Moreover, in contrast to the findings of the ANOVA-based analysis, the interaction between child IQ and parent IQ did not predict parents' positive affect scores

for the BRAD condition. The absence of a significant interaction in the multiple regression analysis may be explained in part by the presence of a certain degree of collinearity between predictor variables (though not enough to violate the absence of multicollinearity and singularity statistical assumption). However, given that child and parent IQ were only moderately correlated ($r = .38$), the discrepancy in findings across analyses is likely more reflective of the differing nature of the independent variables under investigation in each analysis (i.e., categorical independent variables were used in the ANOVA-based analysis whereas continuous predictor variables were used in the multiple regression analysis). Indeed, the ANOVA-based analysis did not take into account individual child IQ and parent IQ data points' distance from their group means, but coefficient weightings from the multiple regression analysis were influenced by individual child and parent IQ data point variability. Finally, the parent/ child IQ model was unable to account for a significant amount of variance in parents' positive affect scores for the GBAS condition or parents' cognitive stimulation scores for the BRAD condition.

Overall, the findings of the analysis do not support Hypothesis 4A. Parents of children with MID do not appear to exhibit less positive affect or provide less cognitive stimulation in academic contexts or in response to specific instances of child academic difficulty than parents of children with normal IQs; in fact, these parents may actually provide *more* cognitive stimulation in academic contexts than parents of children with normal IQs. Some support was found for the present study's hypothesis 4B. Specifically, parents with MID may demonstrate less positive affect when responding to the specific academic difficulties of their children with MID than parents with normal IQs.

Hypothesis 4B was also supported, to a certain extent, by the finding that parents with MID may provide less cognitive stimulation to their children in academic settings than parents with normal IQs. It is important to note that aspects of the present study's hypotheses 4A and 4B could not be addressed due to the removal of a number of variables with restricted data ranges.

Hypothesis 5: Relationship between Parent Responsibility-Related Attributions for Academic Difficulty and Parent Behavioural Responses

An analysis of the relationship between parent responsibility-related attributions for child academic difficulty and parent behavioural responses was conducted to address the present study's *fifth hypothesis that responsibility-related attributions would be inversely related to positive parenting behaviours and positively related to negative parenting behaviours*. Spearman's *rho* correlations were run evaluating the degree to which proportion of internal locus attributions made by parents was related to parents' positive affect and cognitive stimulation scores for the GBAS and BRAD conditions. In addition, Pearson's *r* correlations were conducted to determine the extent to which parents' mean controllability scores across all internal locus attributions were related to the same parent behaviour variables. Correlations are displayed in Tables 11 (Spearman's *rho*) and 12 (Pearson's *r*). The analysis did not reveal any significant relationships between the parent attribution and parent behaviour variables. As such, the findings of this analysis do not support the present study's fifth hypothesis. However, it is important to note that the present study's fifth hypothesis could not be fully evaluated because several parent attribution and parent behaviour variables were missing from the analysis (due to these variables' restricted data ranges or limited number of observations).

Table 11

Spearman's rho Correlations between Adapted PACS Proportion of Internal Locus Attributions and Adapted PCIRS Scale Scores for the GBAS and BRAD Conditions (n = 89)

	Adapted PCIRS Scale Scores			
	Positive / GBAS	Positive / BRAD	Cog Stim / GBAS	Cog Stim / BRAD
Prop. Int Locus Attrib.	-.11	-.13	.09	.02

Note. PACS: Parental Attributions Coding System (Slep, 1997); PCIRS: Parent-Child Interaction Rating System (Belsky, Woodworth, et al., 1998); *Prop. Int Locus Attrib.:* Proportion of internal locus attributions; GBAS: Parent general behaviour in an academic setting; BRAD: Parent behavioural response to academic difficulty; *Positive:* Positive Affect scale; *Cog Stim:* Cognitive Stimulation scale.

Table 12

Pearson's r Correlations between Adapted PACS Level 4 Scale Scores and Adapted PCIRS Scale Scores for the GBAS and BRAD Conditions (n = 81)

Adapted PACS Level 4 Scale	Adapted PCIRS Scale Scores			
	Positive / GBAS	Positive / BRAD	Cog Stim / GBAS	Cog Stim / BRAD
Trait	-.04	-.10	.03	.00
Stability	-.14	-.01	.04	.02
Globality	-.12	-.06	-.13	-.12
Voluntariness	.01	.10	-.14	-.08

Note. PACS: Parental Attributions Coding System (Slep, 1997); PCIRS: Parent – Child Interaction Rating System (Belsky, Woodworth, et al., 1998); GBAS: Parent general behaviour in an academic setting; BRAD: Parent behavioural response to academic difficulty; *Positive*: Positive Affect scale; *Cog Stim*: Cognitive Stimulation scale.

Exploratory Analysis: Relationship between Parents' Causal Attributions for Academic Difficulty and Parents' Behavioural Responses

An exploratory analysis was conducted examining the relationship between parent trait, stability, and globality attributions for children's academic difficulties and parent positive affect and cognitive stimulation. Pearson's r correlations were run evaluating the degree to which parents' mean trait, stability, and globality scores across all internal locus attributions were related to parents' positive affect and cognitive stimulation scores for both the GBAS and BRAD conditions. Correlations are displayed in Table 12. The analysis did not reveal any significant correlations between the variables under investigation.

CHAPTER IV

Discussion

Summary of Findings

Study analyses revealed a positive relationship between child IQ and child academic and total self-concept that was not moderated by full-time classroom placement. Children receiving special education services, as a group, evidenced lower academic and total self-concepts than did children receiving no special education services. Children with MID demonstrated significantly higher degrees of total and externalizing problems than did children with normal IQs, but the two groups of children displayed similar levels of internalizing problems. Parents of children with normal IQs and MID did not differ in terms of their responsibility-related attributions (proportion of internal locus attributions made, mean controllability scores for all internal locus attributions); however, higher levels of trait-like and stable attributions were found to be more characteristic of (a) parents of children with lower IQs and (b) parents with higher IQs. With respect to parenting behaviours, parents of children with lower IQs demonstrated higher levels of cognitive stimulation than did parents of children with higher IQs in a general academic context. Moreover, relative to higher functioning parents, lower functioning parents displayed lower levels of cognitive stimulation when interacting with their child in a general academic context (regardless of child ability level) and lower levels of positive affect when responding to specific instances of academic difficulty experienced by their child with MID. No relation was found between parents' attributions for instances of child academic difficulty and parents' behavioural responses.

Self-Concepts of Children with MID

Study findings suggest that children with lower IQs (including children with MID) may experience lower academic and total self-concepts than children with higher IQs. This finding is consistent with the results of previous research demonstrating the presence of a positive relationship between child IQ and self-concept in grade-school children (Piers & Harris, 1964). In addition, the present investigation's finding is supported by the results of group-based studies showing that children labeled "Educable Mentally Retarded" (i.e., EMR; IQs of 55 to 70) demonstrate lower academic and total self-concepts than do typically developing controls (Jones, 1985; Piers & Harris, 1964).

A pervasive pattern of academic underachievement is likely to characterize many children with lower IQs. As such, it is not surprising that many of these children would exhibit lower self-concepts than those of children with higher IQs. A large number of studies have shown that low achieving students demonstrate lower academic and total self-concepts than their higher achieving peers (e.g., Chapman, 1988; Grolnick & Ryan, 1990; Hansford & Hattie, 1982; Montgomery, 1994; Vaughn et al., 1992). However, the fact that not all low achieving children exhibit lower self-concepts suggests that one or more other factors are likely to mediate or moderate the relationship between academic underachievement/ low IQ and self-perceptions of competency.

In this investigation, social comparison theory (Festinger, 1954) was drawn upon to help explain why certain low achieving students (i.e., children with MID) may be at greater risk for developing lower self-concepts than others. It was theorized that low achieving children spending all of their time in regular education classes at school (as was thought to be the case for many children with MID) would demonstrate lower academic

self-concepts than low achieving children who had at least some access to out-of-class special education services. It was believed that the former group would be forced to compare themselves to higher achieving peers in evaluating their own academic abilities, whereas the latter group would have the opportunity to compare themselves to similarly achieving peers in making the same self-evaluations. The findings of the present study suggest that, contrary to expectation, the academic self-concepts of children with MID do not vary as a function of whether they spend all their time in the regular classroom. Furthermore, although study findings *do* point to the presence of a significant relationship between classroom placement and total self-concept (irrespective of child IQ), the direction of this relationship is for children attending regular classrooms on a full-time basis to evidence *higher* (rather than lower) total self-concepts than children receiving some out-of-class special education support.

Consistent with the results of the present investigation's academic self-concept analysis, Forman (1988) found that groups of children with Learning Disabilities attending (a) full-time regular education classrooms, (b) regular classrooms with some out-of-class resource room support, and (c) full-time special education classes exhibited similar academic self-concepts. Moreover, in a recent meta-analysis of the literature on the self-concepts of children with Learning Disabilities, Elbaum (2002) also failed to uncover any significant differences between the aforementioned three groups of children (it should be noted that Elbaum combined together the findings of studies investigating various domains of self-concept as well as total self-concept when comparing these groups of children). However, Coleman (1983) found that low achieving children

receiving at least some out-of-class special education support had higher academic self-concepts than low achieving children who spent all their time in the regular classroom.

Notably, the findings of the Coleman (1983) study may differ from those of the present investigation as a result of changes over time in policies relating to the education of children with special needs (see page 121 for a detailed discussion of the possible impact of current educational policies on the academic self-concepts of children with MID). For instance, over the past few decades, educational policies in North America and around the world have increasingly advocated for the inclusion of children with special needs in regular classrooms (Cook, Semmel, & Gerber, 1999; Panerai et al., 2009; Peetsma, Vergeer, Roeleveld, & Karsten, 2001). Because contemporary regular classrooms are likely to contain heterogeneous mixes of typically achieving and academically struggling children, low achieving children from the present study (i.e., children with MID) attending these classrooms on a full-time basis are likely to have had greater opportunity to compare themselves to similarly achieving (rather than higher achieving) peers when evaluating their own academic competence than low achieving children from the Coleman study attending more traditional full-time regular classrooms. Importantly, the differing methodologies of the present investigation and the Coleman study could also serve to explain the two studies' divergent findings. Most notably, low achieving children in the Coleman study were selected on the basis of their special education placements or by teacher nomination (in the case of children without access to special education services), rather than on the basis of child IQ. Thus, it is possible that groups of low achieving students in the Coleman study included children with IQs greater than 85 (i.e., the normal IQ group in the present study).

Notably, the present study's finding that children who were receiving special education services of any kind, as a group, had *lower* total self-concepts than children who were not receiving these services suggests that the experience of social stigmatization could serve to mediate the observed relationship between low child IQ and low self-concept. That is, the lower self-concepts evidenced by children receiving special education services in the present study could reflect these children's internalization of the stigma associated with receipt of these services. One study participant provided a fitting description of the social stigmatization associated with her daughter's special education placement and the impact it had on her daughter's self-perceptions of competence:

She doesn't like to be removed from the classroom ... sometimes there are stigma against her ... if she becomes ... stereotyped as a person who's perhaps not keeping up with the other people and she has to go to her special class she doesn't like that ... and they're not removing her as much anymore because she is socially conscious and socially aware now in grade 4 ... so they're keeping her in the class more so she doesn't have to be teased... I can see where she gets frustrated you know ... she almost questions her own capabilities.

Students receiving special education services often carry *formal* labels (e.g., Learning Disability, Intellectual Disability), and those without formal labels nevertheless carry the informal label of being a "special education student." Research has shown that children's perceptions of their labels may affect their feelings of self-worth. Stager, Chassin, and Young (1983) found that students labeled as EMR evidenced low levels of self-esteem when they (a) identified with their label and (b) saw their label as carrying negative

connotations. It is possible that students receiving special education services in the present study were very aware of their special needs status and held negative perceptions about the meaning of their labels.

These negative perceptions may have developed in part through these children's frequent exposure to ostracization or ridicule from peers. Typically achieving children may not wish to associate with peers whom they see as academically inferior to themselves, as evidenced by research showing that students with special education designations are rated lower in likeability or social status than students without designations by their normally achieving peers (e.g., Harter, Whitesell, & Junkin, 1998; Freeman & Alkin, 2000; Gresham, 1982; Kavale & Forness, 1996; Madge, Affleck, & Lowenbraun, 1990; Vaughn, Elbaum, & Schumm, 1996). In addition, teachers with negative attitudes towards students with special needs (e.g., a belief that children with special needs do not belong in the regular classroom) may often engage in actions that communicate to these students their academic inferiority relative to their normally achieving peers (e.g., indicating to students that they should not bother trying to learn a concept because of their special needs status). In summary, socially stigmatizing experiences could lead students receiving special education services, including many children with MID, to identify with, and to develop negative perceptions about, their formal or informal labels. These negative attitudes could include perceptions of academic or overall incompetence relative to same-aged peers.

It is worth noting that findings from the present study's *academic* self-concept analysis were largely replicated in the exploratory *total* self-concept analysis. Children with lower IQs (including children with MID) and children receiving special education

services, as a group, not only experienced lower academic self-concepts, but also lower total self-concepts. The considerable emphasis placed on academic achievement in today's society could make it difficult for these children to see their academic selves as separate from the other aspects of themselves; that is, these children may equate their level of competence in the academic realm with their level of competence in other areas of their lives.

The aforementioned results must be interpreted in the context of children's mean academic and total self-concept scores on the Piers-Harris Self Concept Scale, Second Edition (Piers & Harris, 2002). Importantly, the mean academic and total self-concept scores of the IQ and special education groups of children in the present study fell within the "Average" range, as defined in the test manual (Piers & Hertzberg, 2002). As such, it cannot be concluded that any one group of children evidenced truly *low* levels of self-perceived academic or overall competence.

Educational Policies of Inclusion and Early Intervention in the Province of Ontario and the Academic Self-Concepts of Children with MID

Findings from the present study pertaining to the academic self-concepts of children with MID cannot be interpreted without reference to current educational policies in the Province of Ontario mandating (a) the inclusion of children with exceptionalities (i.e., the term used by the Ontario Ministry of Education to describe children with disabilities or special education designations) in the regular classroom and (b) the early identification of children with exceptionalities.

Inclusion of children with exceptionalities. Over the last few decades, school jurisdictions in North America and around the world have increasingly adopted

inclusionary policies for the education of students with exceptionalities (Cook et al., 1999; Panerai et al., 2009; Peetsma et al., 2001). The overarching goal of these inclusionary policies is to ensure that students of all levels of ability receive most, if not all, of their education in the regular classroom; in inclusive classrooms, children with exceptionalities learn alongside their typically achieving peers. Proponents of inclusive policies argue, or have demonstrated empirically, that children with exceptionalities benefit academically and socially from placement in regular classrooms (e.g., Baker, Wang, & Walberg, 1994-1995; Bunch & Valeo, 2004; Calhoun & Elliott, 1977; Dunn, 1968; Madge et al., 1990; Vaughn, Elbaum, & Boardman, 2001; Waldron & McLeskey, 1998). With respect to academic benefits, the focus on scholastic advancement in the regular classroom could help to instill a healthy desire to learn in many children with exceptionalities (Ruijs, Peetsma, & van der Veen, 2010). Moreover, children with exceptionalities may benefit from exposure to higher achieving peers in the regular classroom who can provide them with extra assistance on difficult academic tasks (Ruijs, Peetsma, et al., 2010). Socioemotionally, placement of students with exceptionalities in regular education classrooms could help to communicate to these students that they are valued constituents of the mainstream learning community (Vaughn et al., 2001). Moreover, students with exceptionalities attending regular classrooms have the opportunity to develop friendships with typically achieving peers (Vaughn et al., 2001) and may be teased or bullied less often by their normally achieving peers than children with exceptionalities who spend most of their time in special education classrooms (e.g., Bunch & Valeo, 2004; it is important to note, however, that findings from the present

study suggest that children with exceptionalities are by no means immune to stigmatization in the regular classroom).

In the Province of Ontario, inclusionary policies are mandated by legislation. Ontario Regulation 181/98 (Ontario Education Act, 1998) stipulates that the default placement for all children attending public schools should be the regular classroom and that only with justification can children be placed in alternate and more restrictive (i.e., greater isolation from typically achieving peers) learning environments (Ontario Ministry of Education, 2009). The inclusive nature of the education system in the Province of Ontario is reflected in the classroom placements of children with MID in the present study. None of the children with MID attended full-time special education classes, and only one child with MID attended a part-time special education class. The vast majority of children with MID were placed in regular education classrooms with either (a) no special education support (43.5%), (b) in-class support from a special education teacher (17.4%), or (c) out-of-class support from a special education teacher (i.e., resource room; 34.8%).

Importantly, in the present study, the academic self-concepts of children with MID may have been influenced by inclusionary policies in place in the Province of Ontario. Because regular classrooms in this province are likely to contain a heterogeneous mix of typically achieving and low achieving students, children with MID attending these classrooms on a full-time basis are likely to have plenty of opportunity to compare themselves to similarly achieving (e.g., children with learning disabilities), or even lower achieving (e.g., children with mild mental retardation), peers when making judgments about their own academic competence (it was originally hypothesized that children with

MID attending full-time regular classrooms would be limited to upward social comparisons with higher achieving peers). The availability of similar achieving peers for social comparisons could explain why the academic self-concepts of children with MID attending full-time regular education classes were not lower than those of children with MID receiving at least some out-of-class special education (the latter group of children would have been placed with similarly achieving peers in their special education placements).

The academic self-concepts of children with MID in the present study may also have been influenced by the social climate of inclusive classrooms in the Province of Ontario. As mentioned previously, proponents of inclusionary policies argue that children with exceptionalities (including children with MID) are likely to benefit socially from attending regular classrooms (e.g., Baker et al., 1994-1995; Dunn, 1968). One of the ways in which these children may benefit socially is through teachers' efforts to provide them with a cooperative, rather than competitive, learning environment (Elbaum, 2002; Slavin, 1983). Students attending inclusive classrooms where cooperation is emphasized may be less motivated to engage in performance (i.e., social) comparisons with their peers than students attending less inclusive and more competitive classrooms. The tendency for students in inclusive classrooms to refrain from engaging in social comparisons could serve to explain why, in the present study, children with MID attending full-time regular education classes (who were exposed to higher achieving peers) did not evidence lower academic self-concepts than children with MID receiving at least some out-of-class special education.

Importantly, the emphasis placed on inclusionary policies in the Province of Ontario may serve to explain why the present study's academic self-concept findings diverge from those of older investigations demonstrating the potentially negative influence of full-time regular classroom placement on the academic self-perceptions of lower achieving students (e.g., Bear, Clever, & Proctor, 1991; Coleman, 1983, Renick & Harter, 1989; Ribner, 1978; Strang et al., 1978). In older studies predating the emergence or popularization of inclusionary policies, lower achieving students (including children with MID) attending regular classrooms on a full-time basis would likely have been exposed to social comparison groups of primarily higher achieving peers. Moreover, in these studies, competitive regular classroom environments may have led lower achieving students to engage in more frequent (upward) social comparisons with other students.

Early identification of learning difficulties. In addition to championing inclusionary policies, school boards in the Province of Ontario also emphasize the early identification of students' academic and learning difficulties. The Ontario Ministry of Education's Policy/ Program Memorandum Number 11 (1982) stipulates that children must be continuously monitored for emerging academic needs from the point in time when they first register for school, or, at the latest, by the beginning of Grade 1, until their graduation. Teachers rely on a variety of informal and formal assessment procedures and measures to continually monitor student progress and to identify students' emerging academic and learning needs. Examples of informal early identification procedures and measures include simple observation of students' learning behaviours, periodic examination of samples of student work, and regular monitoring of student performance on readiness tests (Greater Essex County District School Board, 2005), while examples of

more formal early identification procedures and measures include board-wide cognitive screening (e.g., Canadian Test of Cognitive Skills; Canadian Test Centre, 1992) and province-wide curriculum testing (e.g., the Education Quality and Accountability Office's assessments of Reading, Writing and Mathematics). The emphasis placed on the continuous monitoring of students' academic and learning needs in the Province of Ontario suggests that opportunities exist for the early identification of cognitive limitations in children with MID.

Arguably, the single most influential event leading to the early identification of intellectual limitations in children with MID may be the universal cognitive screening of students attending certain school boards in the Province of Ontario shortly after (i.e., within a few years of) their entry into primary school. In the present study, a large number of child participants were attending a school board where cognitive screening procedures take place around the end of Grade 2. Given the timing of these procedures, it is reasonable to assume that many parents and teachers of children with MID in the present study were at least somewhat aware of these children's intellectual limitations by around the start of Grade 3 (provided that these parents and teachers were knowledgeable of the results of the cognitive screening). Notably, children with MID receiving low scores on the administered cognitive screening measure would likely have been labeled as "at risk" and subsequently referred for more comprehensive psychoeducational testing. The results of this additional testing would likely have served to further heighten parents' and teachers' awareness of affected children's cognitive limitations.

Importantly, once parents and teachers gain an awareness of the intellectual limitations of children with MID through the implementation of early identification

procedures (e.g., cognitive screening), their attitudes towards these children and behavioural responses to instances of academic difficulty may change. For instance, parents and teachers with knowledge of the underlying cause (i.e., cognitive limitations) of these children's academic difficulties may set more realistic academic expectations, demonstrate an increased awareness of the importance of rewarding children for their efforts (Stanovich et al., 1998), show a higher degree of tolerance for these children's school-related difficulties (Stanovich et al., 1998), and provide affected children with more appropriate levels of instruction and guidance. These types of attitudinal and behavioural changes on the part of parents and teachers may have the positive effect of bolstering the academic and overall self-concepts of children with MID. The tendency for parents and teachers who are aware of the cognitive limitations of children with MID (as a result of the implementation of early identification procedures) to set realistic academic expectations and respond with sensitivity to instances of academic difficulty may serve to explain why, in the present study, children with MID, as a group, evidenced self-concepts in the Average range on the PHCSC-2 (Piers & Hertzberg, 2002).

Socioemotional Functioning of Children with MID

Study findings suggesting that children with MID experience more externalizing problems and more overall socioemotional dysfunction than children with normal IQs are largely consistent with the results of similar investigations. For instance, Fenning et al. (2007) compared the externalizing behaviours of five-year-old children with MID (IQs between 71 and 84) and children with normal IQs (IQs ≥ 85), and found that children with MID exhibited significantly higher levels of externalizing problems than the children with normal IQs. In addition, Karande et al. (2008) examined the socioemotional

functioning of a group of 6 to 12 year old children with MID who were referred to a psychological clinic for school-related difficulties. The researchers found that a very large portion of children (58.2%) exhibited some form of socioemotional dysfunction. Histories of distractibility and hyperactivity at school were reported for 16.4% and 18.2% of children, respectively (Artigas-Pallares, Rigau-Ratera, & Garcia-Nonell, as cited in Karande et al., 2008), and aggressive behaviours were demonstrated by 40% of children. In another study, Ralston et al. (2003) found that 56 out of 71 (79%) of clinic-referred children with Below Average IQs (i.e., IQs between 60 and 85; BAIQ) exhibited some form of psychosocial dysfunction (ranging from mild to severe).

The results of a single investigation by MacMillan et al. (1998) appear to contradict the present study's findings concerning the total and externalizing problem behaviours of children with MID. MacMillan et al. (1998) compared the socioemotional functioning of children with Borderline to Low Average IQs (IQs of 71 to 84) and normal IQs (IQs ≥ 85), and did not find any significant differences between groups. Notably, these contradictory findings may be attributed in part to methodological disparities between the present study and the MacMillan et al. investigation. The two studies relied on differing raters (i.e., parents in the present study and teachers in the MacMillan et al. investigation), differing age/grade ranges of children (i.e., ages 6 to 13 in the present study and Grades 2 to 4 in the MacMillan et al. investigation), and differing measures of behaviour functioning. Importantly, the measure of socioemotional dysfunction used by MacMillan et al. consisted of only a small number of items (i.e., 33 items). Moreover, these items were designed to probe for the presence of serious behaviour problems; as

such, children experiencing milder externalizing behaviour problems may not have been adequately identified through the use of this measure.

Mixed support is found in the research literature for the finding that children with MID and children with normal IQs display similar levels of internalizing problems. The results of the MacMillan et al. (1998) support this finding, insofar as students with Borderline to Low Average IQs and students with Normal IQs did not differ in terms of their socioemotional functioning. However, in the previously mentioned study by Ralston et al. (2003), high proportions of children with BAIQ were identified as experiencing mild (35%) or severe (30%) internalizing problems. However, the Ralston et al. study did not include a normal IQ comparison group; as such, conclusions cannot really be drawn from this study regarding the relative frequency or intensity of internalizing problems experienced by children with MID relative to children with normal IQs. It is also important to note that the Ralston et al. study's MID (i.e., BAIQ) group included children with a wider range of IQ scores than did the present study's MID group.

According to Masi et al. (1998), the "weak cognitive selves" of children with MID increase their susceptibility to the development of socioemotional difficulties. These researchers suggest that individuals with weak cognitive selves tend to hold negative perceptions of their cognitive capabilities and to demonstrate maladaptive attributional styles when it comes to explaining the causes of positive or negative outcomes. Masi et al. suggest that one of the possible consequences of possessing a weak cognitive self is for children with MID to see themselves as unable to regulate their impulses, which in turn increases their susceptibility to the development of acting out behaviours. Frequent academic difficulty experiences may contribute to a weakening of the cognitive selves of

children with MID, ultimately leading to the development of various externalizing behaviour problems.

In addition to the experience of frequent academic difficulty at school, a number of other factors (genetic and environmental) are likely to place slow learners at elevated risk for the development of externalizing behaviour problems. In accordance with Developmental Psychopathology theory (e.g., Cummings, Davies, & Campbell, 2000), it is likely the case that multiple genetic (in addition to IQ) and environmental (in addition to experiences of academic difficulty) risk factors interact over time to produce dysfunctional mental processes within the child with MID (e.g., maladaptive attributional styles or negative academic self-concepts), which in turn lead to child socioemotional dysfunction. An important genetic risk factor for the development of behaviour problems may be an active temperament; this risk factor is strongly predictive of externalizing psychopathology in typically developing children (Mesman & Koot, 2000). In addition, parental mental health problems and dysfunctional family relationships are environmental risk factors that are associated with the development of externalizing behaviour difficulties in children with intellectual disabilities (Dekker & Koot, 2003). Children with MID may be at greater risk for the development of behaviour problems than children with normal IQs because they experience a larger number of these genetic and environmental risk factors.

Study findings pertaining to the socioemotional functioning of children with MID and children with normal IQs must be interpreted in the context of the two groups' mean overall, internalizing, and externalizing scores on the CBCL/6-18. Children belonging to the normal IQ group exhibited "Normal" levels of overall, internalizing and externalizing

problems, as defined by the CBCL/6-18 test manual (Achenbach & Rescorla, 2001).

While children belonging to the MID group also exhibited Normal levels of internalizing problems, they demonstrated Borderline Clinical levels of externalizing problems and overall socioemotional dysfunction. Neither group of children demonstrated Clinically Significant levels of socioemotional dysfunction, suggesting that while children with MID may experience elevated levels of externalizing and total problem behaviours relative to children with normal IQs, they do not experience *clinically* elevated levels of psychopathology, *per se*.

The implementation of early identification procedures by school boards in the Province of Ontario could serve to explain, at least in part, why children with MID in the present study, as a group, did not evidence higher (i.e., clinically significant) levels of socioemotional dysfunction on the CBCL/6-18. As described previously, early identification procedures are likely to increase parents' and teachers' awareness of the specific cognitive limitations of children with MID. Teachers who become aware of these children's cognitive difficulties are in a better position to offer (more) effective special education services at school. In addition, through gaining an awareness of the cognitive limitations of children with MID, parents and teachers may begin to set more realistic academic expectations and respond with greater sensitivity to these children's learning difficulties. When children with MID have access to appropriate forms of academic remediation and have parents and teachers who set realistic expectations for them, they may experience less frequent academic difficulty and, in turn, may be at lower risk for the development of clinically significant levels of socioemotional dysfunction. Additionally, parents' and teachers' efforts to respond with sensitivity to instances of academic

difficulty may further protect children with MID from developing serious forms of socioemotional dysfunction.

Parent Attributions for Instances of Child Academic Difficulty

The finding that parent groups viewed their children as similarly responsible for their academic difficulties did not support the present study's third hypothesis. This hypothesis was based on the premise that, unlike parents of children with normal IQs, parents of children with MID would be largely unaware of their children's mild cognitive limitations, and would therefore be more likely to attribute their child's frequent academic underachievement to *motivational* (internal and controllable) factors than to *ability-related* (internal and uncontrollable) factors. Moreover, it was believed that lower functioning parents would be less aware of the cognitive limitations of children with MID than high functioning parents, and would therefore be more likely to attribute instances of academic struggle experienced by children with MID to motivational factors.

At a descriptive level of analysis, the mean controllability score for all internal locus attributions for the group of parents of children with MID (i.e., 2.98 / 6) suggests that these parents may actually be slightly more likely to attribute their children's academic difficulties to ability-related (i.e., internal and controllable) rather than motivational (i.e., internal and uncontrollable) factors. This pattern of scores could reflect the fact that many parents of children with MID are actually aware of their children's mild cognitive difficulties, and may take these difficulties into account when making attributions about the causes of their children's frequent academic underachievement. Research studies support the idea that parents with an awareness of their child's cognitive difficulties are more likely to attribute problems stemming from these difficulties to

uncontrollable factors. For instance, Johnston and Freeman (1997) found that parents of children with ADHD (who necessarily were aware of their children's cognitive difficulties as a result of the ADHD label) were more likely to attribute symptoms of inattention and hyperactivity to uncontrollable factors than parents of children without ADHD. In addition, Chavira et al. (2000) reported a mean child misbehaviour responsibility rating of 0.52 out of 2.00 (where 0.00 = *not responsible* and 2.00 = *fully responsible*) for a sample of mothers of children with MR, suggesting that these mothers' knowledge of their children's cognitive difficulties influenced the degree to which they viewed their children as responsible for their problem behaviours.

No doubt contributing to certain parents' awareness of their child's cognitive difficulties in the present study was the fact that about 20% of children with MID carried learning-related diagnoses or designations (Learning Disability: $n = 3$; Mental Retardation: $n = 1$; Mild Intellectual Impairment: $n = 1$). In addition, 57% of children with MID in the present study were receiving special education services. Parents of children with MID with an awareness of their child's diagnosis, designation or informal "special education" label may have perceived their child as less responsible for instances of academic difficulty, thereby lowering the mean controllability score for the overall group of parents of children with MID.

An important goal of the present study was to compare the attributions of higher and lower functioning parents of children with MID. Study findings pertaining to these two groups of parents suggest that, contrary to expectation, lower functioning and higher functioning parents tend to attribute similar amounts of responsibility to their children with MID for instances of academic difficulty. The lower than anticipated levels of

responsibility attributed to children with MID by their lower functioning parents may reflect these parents' awareness of their children's cognitive limitations. While the previously described learning-related diagnoses or designations and informal special education labels held by many children with MID may have alerted lower functioning (and higher functioning) parents to the presence of cognitive limitations, it is also possible that lower functioning parents were able to use their knowledge of their own cognitive challenges to identify their children's mild intellectual impairments. Namely, lower functioning parents may have recognized the types of academic and learning difficulties experienced by their children as similar to the ones they themselves faced as youngsters. Subsequently, these parents may have come to the realization that their children's academic and learning difficulties, like their own, were related to the presence of underlying cognitive limitations.

Given the considerable number of parents (both higher and lower functioning) who were likely aware of their children's cognitive limitations in the present study, it is perhaps surprising that parents of children with MID did not evidence *lower* levels of responsibility-related attributions than parents of children with normal IQs. Indeed, parents with an awareness of their children's cognitive limitations would be expected to hold their children to a lower academic standard than parents of children without said limitations, and, therefore, to view their children as less responsible for instances of academic difficulty. Methodological confounds relating to the measurement of parent attributions in the present study (e.g., error in the operationalization or coding of attributions) may have served to weaken the relationship between parents' awareness of

child cognitive impairment and their tendency to attribute less responsibility to their children for instances of academic difficulty.

In the present study, parent and child IQ appeared to be more strongly related to parents' causal attributions than to parents' responsibility-related attributions. Specifically, parents of children with lower IQs (including children with MID) appeared to perceive the causes of their children's academic difficulties as more trait-like (versus state-like) and stable over time than parents of children with higher IQs. These findings suggest that parents of children with MID may be very aware of the persistent and enduring nature of their children's academic difficulties. The exploratory analysis also revealed that parents with lower IQs (including parents with MID) appear to be less likely to view their children's academic difficulties as caused by trait-like and stable factors than parents with higher IQs. The latter finding is more difficult to interpret, because the children of parents with lower IQs included both children with MID and children with normal IQs; as such, these children were likely to vary in terms of the pervasiveness of their academic difficulties. However, taken at face value, the finding suggests that parents with lower IQs may perceive (either accurately or inaccurately) their children as experiencing less stable and enduring academic difficulty than do parents with higher IQs.

The study's attribution-related findings should be interpreted in the context of the mean attributional scale scores for the total sample of parents. The mean proportion of internal locus attributions was 0.73. Thus, as a whole, parents appeared to attribute their children's academic difficulties to factors internal to the child. Parents' mean trait, stability, globality, and controllability scores were 4.14, 3.96, 3.69, and 3.05 (1 = *not at*

all, 6 = totally), respectively, suggesting that, overall, parents viewed the internal causes of their children's academic difficulties as somewhat trait-like, unstable, specific, and uncontrollable. Notably, the mean score on the Intentionality scale that was excluded from the present study's analyses due to its restricted data range was 1.08 (1 = *not at all intrusive, 6 = totally intrusive*), indicating that parents did not view their children's performances on academic tasks as motivated by their desire to influence the quality of their relationships with others.

Parents' Behavioural Responses to Child Academic Difficulty

The present study's findings suggest that, in many respects, parents of children with MID and parents of children with normal IQs respond in similar ways to their children's academic difficulties. However, differences may exist in the extent to which these parents provide their children with cognitive stimulation. Parents of children with lower IQs appear to provide more cognitive stimulation to their children over the course of challenging academic tasks than do parents of children with higher IQs. This finding suggests that a large number of parents of children with MID may enter challenging academic contexts with a preexisting awareness of the extent of their children's intellectual limitations, and may attempt to compensate for their limitations by providing greater amounts of instruction and guidance.

A number of studies have demonstrated the possible impact of parents' awareness of their children's limitations on their teaching behaviours. Guralnick et al. (2008) investigated the behaviours of parents of pre-school to kindergarten- aged children with IQs varying from 50 to 80 as they interacted with their child during a free play task and a collaborative task. The researchers observed that the parents provided more directives

(e.g., instructions and suggestions) to their children on the collaborative task than they did during the free play task, and that parents provided more directives to children with lower developmental ages. These findings suggest that parents may have varied the degree of assistance (including teaching) they provided to their child according to their perception of task complexity and their child's intellectual capacity (Guralnick et al., 2008; Marfo, 1990). In another study, Rogoff, Ellis, and Gardner (1984) compared the helping behaviours of parents of younger versus older typically developing children as they completed an academic task. The researchers found that parents of younger children provided more cognitive stimulation (i.e., directives, questions, teaching) than parents of older children on the academic task. As was the case for the Guralnick et al. study, this finding appears to demonstrate that parents vary their degree of cognitive stimulation according to their perception of their child's capabilities (Guralnick et al., 2008; Rogoff et al., 1984).

Two differences were identified in the present study between the parenting behaviours of higher functioning and lower functioning parents. Firstly, parents with MID provided their children with less cognitive stimulation during the present study's math game than did parents with normal IQs. This result is consistent with the finding of another study that mothers with intellectual disabilities struggle to supply their children with cognitively stimulating home environments (Aunos, Feldman, & Goupil, 2008). In the present study, lower functioning parents may have struggled to provide their children with cognitive stimulation during the math game because of their own limited knowledge of particular math facts or concepts, or lack of desire to spend too much time working on math problems.

Secondly, parents with MID responded with less positive affect than parents with normal IQs to specific instances of academic difficulty experienced by children with MID. This finding could reflect the tendency for lower functioning parents to struggle to remain positive (i.e., smiling, positive comments) when faced with a particularly challenging parenting situation. In the case of the present study, the challenging parenting situation was helping a low functioning child to solve a difficult math problem. Low functioning parents with histories of struggling in math may have found it especially difficult to remain positive in the face of this type of parenting situation.

The aforementioned finding may put into context the results of a study investigating the parenting behaviours of mothers of children with MID (Fenning et al., 2007). Fenning et al. (2007) found that parents of children with MID demonstrated significantly less positive affect than parents of children with normal IQs during interactions with their children. Although the researchers did not compare groups of high functioning and low functioning parents, they did allude to the possible influence of parent IQ on parents' displays of positive affect. The present investigation's findings suggest that low functioning parents of children with MID in the Fenning et al. study may indeed have experienced lower levels of positive affect, but only in response to specific and challenging parenting situations.

It is likely the case that a number of child, parent, and environmental factors interact with parent cognitive ability to influence the quality of parenting demonstrated by lower functioning parents in academic situations. For instance, the degree of positive affect and cognitive stimulation provided by low functioning parents in these situations may be influenced by their child's behavioural functioning. Indeed, Nihira, Mink, and

Meyers (1985) found that quantity of cognitive stimulation provided by parents of children with below average intellectual abilities was inversely related to level of child socioemotional dysfunction. The fact that children with MID demonstrated more externalizing problems than children with normal IQs in the present study suggests that low functioning mothers and fathers may find it especially difficult to guide children with MID through academic tasks.

The amount of social support received by low functioning parents may also influence the degree to which these parents display positive affect and provide cognitive stimulation when interacting with their children in academic situations. Aunos et al. (2008) reported a positive relationship (albeit not statistically significant) between quantity of social support and parenting skill for lower functioning individuals. Moreover, Feldman, Varghese, Ramsay, and Rajska (2002) determined that the degree to which low functioning parents were happy with the support they received was positively related to their quality of parenting. In the present investigation, it is worth noting that parents with MID did not differ from parents with normal IQs in terms of the size of their social support networks, and only 14% of low functioning parents were unhappy with the amount of social support they were receiving. Nevertheless, those low functioning parents reporting smaller social support networks or less satisfaction with the amount of social support they were receiving may find it especially difficult to navigate the task of helping their child complete a challenging academic assignment.

Low functioning parents' mental health may also influence their ability to effectively assist their children on academic tasks. Indeed, studies have demonstrated a link between maternal depression and reduced parenting quality (Cox et al., 1987; Field et

al., 1990; Webster-Stratton & Hammond, 1988). For instance, depressed mothers evidence reduced levels of positive emotion versus mothers without depression (Hops et al., 1987). These findings suggest that heightened levels of depression in low functioning individuals may interfere with the quality of their parenting in academic situations.

Relatedly, lower functioning parents of school-age children have been shown to evidence heightened levels of parenting stress (Feldman, Léger, & Walton-Allen, 1997), and degree of parenting stress in low functioning parents has been associated with the quality of their parenting practices (Aunos et al., 2008). High levels of parenting stress amongst lower functioning parents may contribute to these parents' struggles when attempting to help their children with their schoolwork.

A final possible contributor to the parenting quality of low functioning parents in academic situations is socioeconomic status. Research has shown that adults with MID (i.e., IQs between 71 and 84) earn less than adults with normal IQs (Hassiotis et al., 2008). In the present study, parents with MID were also found to earn significantly less than parents with normal IQs. The scarcity of financial resources available to low functioning individuals may interfere with their parenting abilities. Indeed, parents who work long hours for small wages may have little time to actively assist their children with their homework and little energy to respond positively to their children's failed attempts to master difficult academic tasks. Moreover, low functioning parents with low incomes may not be able to afford items or services that would increase their child's exposure to cognitively stimulating environments (e.g., out-of-school educational programs, educational toys).

Findings from the present study's parent behaviour analysis should be interpreted in the context of parents' overall scores on each of the analyzed parenting behaviour scales. For the general behaviour in an academic setting (i.e., GBAS) condition, parents' mean positive affect score was 3.03 / 5 (3 = *moderately positive*) and their mean cognitive stimulation score was 3.04 / 5 (3 = *moderately stimulating*). Thus, as a whole, parents appeared to demonstrate moderate levels of positive affect and cognitive stimulation when interacting with their child in a general academic context. For the behavioural response to academic difficulty (i.e., BRAD) condition, parents' mean positive affect score was 2.57 / 5 (2 = *minimally positive*; 3 = *moderately positive*) and their mean cognitive stimulation score was 2.51 / 5 (2 = *minimally stimulating*; 3 = *moderately stimulating*). These scores suggest that, on average, parents demonstrated minimal to moderate levels of positive affect and cognitive stimulation in response to specific instances of child academic difficulty. Descriptive statistics were also calculated for the parent behaviour scales that were excluded from the present study's analyses due to their restricted data ranges (i.e., Sensitivity, Negative Affect, Intrusive Interaction, Detached Manner). Collapsed across the GBAS and BRAD conditions, parent mean sensitivity, negative affect, intrusive interaction, and detached manner scores were 4.51 (4 = *mostly sensitive/ responsive*; 5 = *highly sensitive/ responsive*), 1.29 (1 = *not at all negative*), 1.27 (1 = *not all intrusive*), and 1.13 (1 = *not at all detached*), respectively, suggesting that parents demonstrated fairly high levels of sensitivity and low levels of negative affect, intrusiveness, and detachment when interacting with their child on a challenging learning-related task.

*Relationship between Parent Attributions for Child Academic Difficulty
and Parent Responses*

In the present investigation, no relation was found between parents' responsibility-related attributions for instances of child academic difficulty and parents' behavioural responses to these instances of difficulty. This null result appears to run contrary to the common finding in the research literature that parent responsibility-related attributions are associated with more negative parenting reactions. For instance, Dix et al. (1989) found that parent attributions of intentionality were causally related to parents' more negative anticipated affective and behavioural responses to the misbehaviours of their typically developing children. Similarly, Chavira et al. (2000) demonstrated that parents of children with MR who attributed less responsibility to their children for their misbehavior were less likely to react negatively to this misbehavior. However, at least one other study has reported the absence of a relationship between parent responsibility-related attributions and parent reactions. Sacco and Murray (2003) found that, amongst a group of parents of children displaying signs of ADHD, parent perceptions of child culpability for instances of misbehaviour were unrelated to parent negative emotional responses.

If a relationship does indeed exist between parent responsibility-related attributions and parent behaviours (as is suggested by the findings of many other research studies), it is important to consider the possibility that this relationship might not be a strong one (Johnston & Ohan, 2005). Given the present study's small sample size, it is possible that a weak relationship between parents' responsibility-related attributions for

child academic difficulty and parents' behavioural responses to child academic difficulty in the population under investigation may have been overlooked.

An alternate, methodological explanation for the absence of an attribution-behaviour relationship in the present study pertains to the differing nature of the academic difficulties used to elicit parent attributions versus parent behavioural responses. Child academic difficulties described by parents over the course of an interview were used to elicit parent attributions, whereas child academic difficulties occurring over the course of a challenging math game were used to elicit parent behavioural responses. The possible non-equivalency of the academic difficulties elicited through the parent interview and math game may have increased the degree of variability in parents' attributional and behavioural scores, thereby lowering the magnitude of the parent attribution- parent behaviour correlations. Greater experimental control over the types of academic difficulties used to elicit parent responses in the present study may, in theory, have increased the magnitude of these correlations; however, forcing parents to discuss or respond to particular instances of academic difficulty rarely (or never) experienced by their child would likely have served to threaten the external validity of the present study's findings.

As was the case for the primary analysis involving parents' responsibility-related attributions, an exploratory analysis also demonstrated that parents' trait, stability, and globality attributions (i.e., causal attributions) were unrelated to parents' reactions to child academic difficulty. This null result coincides with Geller and Johnston (1995)'s finding that parents' perceptions regarding the stability and globality of causes of child misbehavior were unrelated to parent reactions to this misbehavior. In attempting to

explain this finding, Geller and Johnston argued that because stability and globality attributions were more likely to require parents to think beyond the current situation than other types of attributions (i.e., responsibility-related attributions), these attributions were less likely to be associated with parent responses to specific instances of child misbehaviour. In the present study, parent responses may have been influenced more by their perceptions of event-specific causes of their children's academic difficulties than by their more abstract perceptions of the temporal stability and globality of their children's academic difficulties.

Study Limitations and Future Directions

The most notable limitation of the present study was its small sample size. The small sample size may have lowered the likelihood of detection of differences between low and high functioning children and parents in the population under investigation (i.e., Type II errors may have been made). In addition, the small sample size is likely to have contributed to the moderate to high degree of heteroscedasticity of residual terms noted across many of the present study's multiple regression analyses. A related limitation of the present study was the small number of participants comprising the parent and child MID groups. These small groups may not have been completely representative of the populations of children and parents with MID under investigation. It will be important for future studies to attempt to replicate the findings of the present investigation using a large overall sample that is comprised of a greater number of children and parents with MID.

In the present study, variables measuring the degree to which parents viewed their child's academic difficulties as deliberate attempts to influence others (i.e., intentionality) and the degree to which parents viewed their child's intent as positive, negative, or

neutral in nature (i.e., valence of intent) were excluded from the parent attribution-related analyses, and variables investigating the sensitivity and negativity (e.g., negative affect, intrusive interaction, detached manner) of parents' responses to child academic difficulty were excluded from the parent behaviour-related analyses. As a result of the exclusion of these variables, important aspects of the present study's hypotheses could not be addressed. Future research should investigate whether relationships exist between child or parent IQ and (a) the extent to which parents view their child's academic difficulties as intentional and their perception of the valence of their child's intent, and (b) the sensitivity, negative affectivity, intrusiveness, and detachment demonstrated by parents in response to instances of child academic difficulty.

Parents' low scores on the negative behaviour scales (i.e., Negative Affect, Intrusive Interaction, Detached Manner) excluded from the study analyses suggest that these scores may have been influenced by social desirability effects (i.e., the scores were suggestive of the presence of very few, if any, negative parent behaviours). Parents were aware that they were being observed during the math game, and therefore may have consciously reduced their use of negative parenting behaviours (e.g., criticism, intrusiveness). Future studies should attempt to determine whether the tendency for parents to respond negatively to the academic difficulties of their children varies as a function of parent or child IQ. More subtle (e.g., hidden camera) and naturalistic (e.g., home observation) methods of behaviour observation might be used in the future to reduce the influence of parents' social desirability motivations on the frequency and intensity of their negative behavioural responses to instances of child academic difficulty.

In the present study, four-subtest short-forms of the WISC-IV and WAIS-IV were used to measure child and parent IQ, respectively. Although these short-forms were both highly reliable and valid, they yielded only *estimates* of participants' Full Scale IQs. As such, it is possible that certain IQ-related differences and relationships identified in the present study may not be fully representative of those characterizing the population under investigation. Future studies should attempt to replicate the present study's findings using the full (i.e., 10 subtest) versions of the WISC-IV and WAIS-IV to measure child and parent Full Scale IQ, respectively.

No attempt was made in the present study to examine gender effects on each of the variables under investigation. Boys may have rated themselves differently than girls on the study's self-concept measure, and parents may also have reported differing levels of socioemotional dysfunction for boys versus girls. Moreover, the attributions and behaviours of boys' parents may have differed from those of girls' parents, and the attributions and behaviours of male parents may have differed from those of female parents. Because the study's sample included a greater number of boys than girls, and a greater number of female than male parents, findings are likely to apply primarily to male children and their female parents. Gender effects could not be evaluated for parents or children in the present study because of the small sample size. Future research might investigate whether boys and girls with MID differ in terms of their academic self-concepts and socio-emotional functioning. Gender differences in parent attributions for the academic difficulties of their children and in parent responses to these difficulties should also be examined.

An important factor to consider when interpreting the present study's findings is the relatively wide age range of the child sample. Conceivably, younger (e.g., 6-9 years) and older (e.g., 10-13 years) children may have differed in terms of their self-concepts and socio-emotional functioning, and parent attributions and behaviours may have varied as a function of child age. Age-related differences may have been particularly likely amongst children with MID, given the high probability that parents and teachers were more aware of the cognitive limitations of older children (many of whom had presumably undergone cognitive screening procedures through their school board) than younger children. As was the case for gender, age effects were not investigated in the present study due to the study's small sample size. Future studies comparing groups of higher and lower functioning children on the aforementioned dependent variables should include age-based comparisons.

Findings must also be considered in the context of the cross-sectional nature of the present study's design. Cross-sectional designs do not allow for conclusions to be drawn about the directionality of the relationships between study variables. For instance, in the present study, one explanation for the relationship between child IQ and child externalizing problem behaviour is that particular cognitive deficits lead children with MID to experience higher levels of hyperactivity or aggression. However, another possible explanation for this relationship is that aspects of children's behavioural problems (e.g., aggression, impulsivity, noncompliance) serve to compromise their performance on tasks used to measure cognitive ability. Future studies should use longitudinal designs to examine the possible causal influence of child and parent IQ on

child self-concept and socioemotional functioning, as well as on parents' attributions for, and responses to, child academic difficulty.

In this study, a single measure was used to evaluate each of the constructs under investigation. As such, the possibility exists that study findings were influenced to a certain extent by method variance effects. Somewhat different findings may have been obtained had (a) socioemotional functioning been measured using an observational procedure rather than a questionnaire and (b) parent attributions and behaviours been measured using parent-report dimensional rating scales rather than coding schemes. A related limitation of the present study is that questionnaires were completed by single raters (i.e., the child completed the self-concept questionnaire and the parent completed the socioemotional functioning questionnaire). In the case of the socioemotional functioning questionnaire, it was not possible to separate parent perceptions of child behaviour problems from the objective occurrence of the child behaviour problems being evaluated. In order to guard against method variance and rater effects, future research studies seeking to replicate the present investigation's findings might implement multi-method – multi-rater designs, where two or more measures are used to operationalize each of the constructs under investigation, and where each measure is completed by at least two raters.

In the present study, children's academic self-concepts were measured using the INT scale of the PHCSC-2 (Piers & Hertzberg, 2002). Importantly, this scale is described by the authors of the PHCSC-2 as measuring not only academic self-concept but also children's self-perceptions of intellectual ability, happiness at school, future success at school, and the possible impact of cognitive ability on social relations (Piers & Hertzberg,

2002). On the basis of this description, it can be concluded that the INT scale is technically not a “pure” measure of academic self-concept (i.e., other related constructs appear to be measured by the same scale). Study findings regarding the academic self-perceptions of children with MID may have differed had a purer measure of academic self-concept been used. Future research studies should attempt to replicate the findings of the present investigation using a more discrete measure of academic self-concept.

The present investigation consisted of a relatively well-educated overall sample of parents. Moreover, parents with normal IQs and parents with MID were similarly well educated (i.e., the median educational level across parent groups was “some university”). Given how individuals with MID are likely to experience considerable difficulty in school, it is possible that the subsample of low functioning parents used in the present study was not fully representative of the population under investigation, with respect to level of education. Future research might investigate whether low functioning parents’ attributions for, and reactions to, instances of child academic difficulty vary as a function of their level of education.

A considerable number of children with MID in the present study had received a learning-related designation or diagnosis (22%), or were receiving special education services (57%). The large number of children with MID with designations, diagnoses, or access to special education services is perhaps reflective of the progressive nature of the special education system in the Province of Ontario, both in terms of the emphasis placed on the early identification of children’s academic and learning difficulties and the eligibility of students without formal diagnoses or designations for certain special education services (Ontario Ministry of Education, 1982; 2001). Children with MID’s

designations, diagnoses, and special education arrangements may have served to increase parents' awareness of their children's cognitive difficulties. Parents with a greater awareness of their children's cognitive difficulties may have attributed their children's academic problems to more ability-related (rather than motivational) factors. It would be interesting for future research investigations to examine samples of children with MID attending schools in jurisdictions where these children do not qualify for learning-related designations or diagnoses, or for special education services. Parents of these children may be less aware of their children's cognitive difficulties, and therefore more likely to attribute their frequent academic struggles to motivational (rather than ability-related) factors. Future research studies might also investigate the self-concepts and socioemotional functioning of these samples of children, given how they are likely to spend all their time in full-time regular education classes without access to special education services.

An interesting question concerns whether parent-related findings from the present study can be extended to other groups of adults who are integrally involved in the lives of children with MID. For instance, it would be beneficial for future research studies to examine whether teachers differ from parents in how they interpret and respond to the academic difficulties of these children. Teachers may be more aware than parents of the cognitive difficulties experienced by children with MID, due to their exposure to children of many different ability levels and possible training in child development. If this is the case, then teachers may be more likely than parents to attribute instances of child academic difficulty to ability-related factors and to respond positively to these instances of difficulty. However, it is also possible that teachers' large class sizes and heavy

workloads may interfere with their ability to readily identify subtle cognitive difficulties experienced by individual students. If this is the case, then teachers may be more likely than parents to attribute instances of child academic difficulty to more motivational factors and to respond less positively to these instances of difficulty. Finally, it may be the case that parents and teachers are equally aware (or unaware) of the cognitive limitations of children with MID. Parents and teachers may be equally aware of the intellectual limitations of children with MID who undergo cognitive screening or formal psychoeducational testing through their school boards (as was the case for many of the children enrolled in the present study), as both groups of adults are likely to be notified about significant assessment findings. Parents and teachers who are equally aware of the cognitive limitations of children with MID may be expected to interpret and respond to the academic difficulties of children with MID in a similar fashion.

Study Contributions to the Research Literature

The present investigation contributes to research on the self-perceptions and psychological adjustment of children with MID. The study is the first of its kind to investigate how both the academic and overall self-concepts of this group of children differ from those of children with higher IQs. In addition, the present study makes a substantial contribution to the very limited literature on the socioemotional functioning of these children by using multiple summary scales from a gold standard measure of child behaviour functioning (i.e., the CBCL/6-18) to compare the internalizing, externalizing, and overall problem behaviours of children with MID and children with normal IQs.

This study also makes a valuable contribution to research on how parents interpret and respond to the behaviours of their school-age children. While previous research has

thoroughly and comprehensively investigated parent attributions for, and responses to, instances of child *misbehavior*, the present investigation is the first of its kind to extend this research to the study of how parents interpret and respond to the *academic difficulties* of their school-aged children. This extension of previous research into the academic realm has great practical relevance, given how many day-to-day interactions between parents and their school-age children are likely to centre on homework-related tasks. The present study also paves the way for future research investigating the possible influence of child IQ and parent IQ on how parents interpret and respond to instances of child academic difficulty.

Study Implications

Self-Concepts of Children with MID

The findings of the present study suggest that children with MID may be at heightened risk for the development of negative perceptions about their academic abilities. Given their frequent experience of difficulty at school, special education services could help to lower children with MID's risk of experiencing negative self-perceptions. Unfortunately, however, it appears as if many children with MID do not receive special education support; even amongst the present study's sample of children with MID attending schools with seemingly progressive special education policies, only 57% of these children were receiving in-class or out-of-class special education services. The positive relationship identified in the present study between child IQ and total self-concept underscores the importance of acting quickly to preserve the academic self-concepts of children with MID. In today's society, great emphasis is placed on academic

achievement, and, as such, the negative academic self-perceptions of children who struggle at school may easily generalize to other areas of their lives.

Children with MID receiving special education support are likely to experience a greater degree of academic success at school than they would without access to these services. However, the present study's findings suggest that any positive impact of these interventions on the academic self-concepts of children with MID may be offset by the stigma associated with having a special education label. Possibly exacerbating the stigmatizing impact of a special education label on the self-concepts of children with MID is the fact that these children are likely to spend most, if not all, of their time in the regular classroom, where their academic difficulties are readily apparent to their normally achieving peers. In light of the present study's findings, it is important that efforts be made by regular classroom teachers to help prevent the stigmatization of children with MID who receive special education services (these children are referred to simply as "children with MID" in the discussion that follows). Strategies for enhancing or protecting the social status of children with MID in the regular classroom include the implementation of cooperative learning arrangements and peer tutoring techniques, modeling of acceptance behaviours by teachers, and availability of professional development opportunities for teachers. Descriptions of each of these strategies are provided below, along with a brief discussion of how efforts to meet the social needs of children with MID in the regular classroom may impact on the academic attainment of typically developing peers.

Cooperative learning environments. Regular classroom teachers can use cooperative learning environments to foster prosocial relationships between students with

exceptionalities (including children with MID) and their typically achieving peers (Madden & Slavin, 1998). In cooperative learning environments, special education and typically achieving students work together in small groups on academic or nonacademic tasks (Stevens & Slavin, 1995a). Typically, group members either pursue a common task or are each assigned an individual task to complete (Slavin, 1983). Regardless of task format, group members are counted upon to provide each other with assistance on the assigned task(s) (Slavin, 1983). Group members are likely to benefit the most academically from cooperative learning groups when (a) they have an incentive to participate and (b) they are held responsible for the group's success (Slavin, 1983). Incentive structures can include the provision of an individual or group reward when the group achieves a particular grade on an activity or an individual reward for each group members' achievement (Slavin, 1983). Individual responsibility is facilitated through calculating grades for the group based on the mean scores of individual group members, or through assigning every student a task that must be completed for the group to be successful (Slavin, 1983). While the academic progress of individual group members may depend, to a certain extent, on the presence of reward structures and on students' individual responsibility, the social benefits of cooperative learning groups do not seem to rely as much on these variables (Slavin, 1983). In other words, the simple opportunity to learn alongside peers in a collaborative environment is likely to benefit the social functioning of children with MID in the regular classroom. Research has shown that the long-term implementation of a school-based cooperative learning environment is positively related to improvements in the social status of children with exceptionalities from the perspective of their typically developing peers (Stevens & Slavin, 1995b).

Peer tutoring techniques. The social status of children with MID may also be improved in the regular classroom through the implementation of peer tutoring techniques. These techniques usually require students to work in pairs rather than in groups (Fuchs, Fuchs, Mathes, & Martinez, 2002). An example of a specific peer tutoring technique is Peer-Assisted Learning Strategies (PALS). In PALS, higher achieving and lower achieving children work in pairs to complete a series of reading-related exercises (Fuchs et al., 2002). Across exercises, partners help one another assimilate information through alternating between the roles of tutor and tutee (Xu, Gelfer, & Perkins, 2005). Pairs of students are awarded points based on task performance and adherence to protocol (Fuchs et al., 2002). Relevant to the present study, the format of PALS may help to encourage prosocial interactions between lower achieving and higher achieving students. PALS exercises require plenty of collaboration between students (Dion, Fuchs, & Fuchs, 2005). Because partners are so dependent on each other, marginalization of lower achieving students on PALS tasks is unlikely (Dion et al., 2005). Moreover, through PALS, children learn important interpersonal skills (how to reinforce peers' efforts, how to give criticism sensitively) that may benefit them in their relationships with peers outside of the PALS program (Dion et al., 2005). Finally, the fact that students are rotated between partners at four week intervals (Fuchs et al., 2002) affords them the opportunity to engage in prosocial interactions with a variety of classroom peers. Although mixed evidence exists for the effectiveness of the PALS in fostering prosocial relationships between peers (e.g., Dion et al., 2005; Fuchs et al., 2002), the findings of one study suggest that the PALS technique may improve the likeability of students with low social

standing and may decrease children's likelihood of being ignored by peers (Dion et al., 2005).

Teacher modeling of acceptance behaviours. According to social referencing theory (Feinman, 1992), individuals rely on cues from people they trust (e.g., parents, teachers) to make sense of their social environment (Bunch & Valeo, 2004). Applied to the classroom context, it makes sense that typically achieving children's perceptions about children with exceptionalities would be informed by their teachers' interactions with these children (including children with MID; Bunch & Valeo, 2004). For instance, typically achieving peers may develop negative perceptions about students with MID when their teachers engage in behaviours that serve to marginalize the latter group of students (Bunch & Valeo, 2004). These negative perceptions, in turn, could lead to the rejection or ostracization of children with MID by their typically achieving peers (Bunch & Valeo, 2004). In order to guard against the development of negative peer attitudes and behaviours towards children with MID in the regular classroom, teachers should consistently model through their actions an unconditional acceptance of these children. Appropriate actions for teachers to take to foster a climate of acceptance in the regular classroom could be disseminated through professional development seminars and training.

Professional development opportunities for teachers. The successful social functioning of children with MID in the regular classroom is likely to depend in large part on teachers' understanding of these children's strengths and limitations, and knowledge of strategies for minimizing or eliminating these children's exposure to stigmatization and marginalization. Professional development seminars might be run where experts provide

teachers with information about the strengths and needs of children with MID as well as recommendations on how to (a) identify and address their own biases against, and negative attitudes towards, children with MID (Stanovich et al., 1998), (b) identify social skill difficulties in students with MID to be targeted in social skill interventions (Pavri & Manda-Amaya, 2000), (c) involve children with MID in collaborative activities with their typically achieving peers (Whitley, 2008), and (d) know when consultation with a special education teacher about a student with MID is warranted (Hanson et al., 2001). In addition, adults with MID from the community might be invited to speak to teachers about their cognitive difficulties and experiences of stigmatization and marginalization at school and in the community. Schools may also implement “peer coaching” models where teachers are encouraged to observe each other’s classrooms and then make suggestions about improvements that could be made to better meet the social needs of children with MID (Stevens & Slavin, 1995b). Finally, teacher training programs might feature greater amounts of instruction on the strengths and limitations of children with MID, more instruction on strategies for bolstering these children’s social status amongst typically achieving peers in the regular classroom (Stanovich et al., 1998), and greater exposure of teacher candidates to socially inclusive classrooms (Whitley, 2008).

Impact of inclusion of children with MID on typically achieving peers. An interesting question concerns how typically achieving students may be impacted by their teachers’ efforts to accommodate the social needs of children with exceptionalities in the regular classroom. Arguably, regular classroom teachers’ focus on meeting the social needs of children with exceptionalities could threaten the academic progress and growth of typically achieving students (Ruijs, Van der Veen, & Peetsma, 2010). To evaluate this

possibility, Kalambouka, Farrell, Dyson, and Kaplan (2007) conducted a review of the literature on the impact of inclusion of students with exceptionalities in the regular classroom on the academic performance of typically achieving peers. The researchers found that, overall, typically achieving students' learning was not compromised by the inclusion of children with exceptionalities in the regular classroom, and that, in many cases, typically achieving students' academic performance actually improved in the presence of these students (in situations where classroom learning support resources were optimally divided between students with exceptionalities). Kalambouka et al.'s findings are consistent with those of other studies showing that typically achieving students placed in inclusive classrooms fare no worse academically than typically achieving students placed in classes without children with exceptionalities (Adams, Affleck, Lowenbraun, & Madge, 1988; Ruijs, Van der Veen, et al., 2010).

Socioemotional Functioning of Children with MID

Study findings also indicate that children with MID may be at heightened risk for the development of socioemotional dysfunction in general and externalizing behaviour problems in particular. Frequent academic difficulty at school may contribute either directly or indirectly (e.g., through the effect of negative self-perceptions) to the development of socioemotional dysfunction in children with MID; as such, special education services targeting the academic difficulties of these children may be helpful in curtailing the development of acting out behaviours. Notably, however, research has shown that externalizing behaviour problems may already be emerging in children with MID prior to their entry into grade school (Fenning et al., 2007); this finding suggests that interventions targeting nonacademic risk factors are also likely to be beneficial. These

types of interventions might focus on the amelioration of problematic aspects of the parent-child relationship (e.g., low parent involvement) or the navigation of disadvantaging environmental factors (e.g., a chaotic home environment). Longitudinal research is required to identify risk factors associated with the development and maintenance of externalizing behaviour problems in children with MID.

Parenting of Children with MID

The results of the present investigation suggest that lower functioning parents (i.e., parents with MID) may struggle in certain respects to effectively guide their children with MID through difficult academic situations. Relative to higher functioning parents, lower functioning parents appear to provide children with MID with lower levels of cognitive stimulation in academic contexts, and appear to respond with lower levels of positive affect to these children's specific instances of academic difficulty. As such, lower functioning parents may benefit from skill training in the appropriate provision of cognitive stimulation and use of positive reinforcement when interacting with their children with MID in difficult learning-related situations. Several recommendations are made regarding the possible content of a parenting skills program geared towards meeting these goals. First, parents could be taught specific strategies for coaching their children through difficult academic situations; the most beneficial strategies are likely to be those that can be applied across multiple academic areas (e.g., guided questioning). Second, parents could be taught specific learning strategies for them to model for their children (e.g., strategies for studying for tests and memorizing information). Third, parents could be made aware of the types of learning resources available to them in their community, so that they would know where to turn if they were struggling to assist their child with a

specific academic task. Fourth, programs could provide parents with information on how best to use positive reinforcement to facilitate child success on academic tasks. Fifth, parents could learn strategies for how to control their frustration in response to either their own or their child's difficulty on an academic task. Sixth, a cognitive restructuring component might be included to address parents' negative attitudes toward school or self-perceptions of academic incompetency, since these attitudes and perceptions could serve to lower the quantity of cognitive stimulation they provide to their children in academic contexts. Finally, a problem-solving component could be included to help parents circumnavigate possible environmental barriers to effective parenting (e.g., low household income). Given the cognitive difficulties with abstraction experienced by individuals with MID, the format of the parent training program might include the use of concrete methods to teach skills and role-play techniques to solidify knowledge and increase skill generalization. The parent skill training program could be run by educational psychologists or experienced teachers and be offered through schools or local community centres to parents who acknowledge struggling to help their children with their homework and having struggled themselves in school. Of course, any parenting skill training program created to address parenting difficulties in academic contexts would need to be studied longitudinally to determine its effectiveness in improving parents' skill implementation and its long-term impact on child outcomes.

Conclusions

The findings of the present study suggest that the placement of children with MID in full-time regular classrooms is unlikely, in itself, to negatively influence these children's self-perceptions of competency. Of greater importance to the preservation of

the self-concepts of children with MID is likely to be the provision of appropriate special education services, irrespective of the setting in which these interventions take place. Unfortunately, it appears to be the case that many children with MID do not have access to these types of services.

While the provision of special education services to children with MID is likely to be an important first step towards healthy self-concept development, an equally important second step is for these special education services to be delivered in a *sensitive* manner, so that receipt of these services does not impact negatively on these children's social status in the classroom. In situations where academic interventions are not administered sensitively, the positive impact of increased academic success (stemming from these interventions) on the self-concepts of children with MID could be offset by the damaging effects of social ostracization and peer rejection. Children with MID who feel that their academic *and* social needs are being met in the classroom are likely to perceive themselves as competent individuals who are valued by society and, as such, may be at lower risk for the development of poor socioemotional outcomes.

Despite the subtlety of the cognitive difficulties experienced by children with MID, study findings suggest that many parents of these children may possess an accurate understanding of why their child is struggling at school. These parents' awareness of their child's cognitive difficulties is reflected in the heightened levels of instruction and guidance parents of children with lower IQs provide in academic contexts. It is important to note, however, that not all parents appear to be equally adept at responding to the needs of children with MID in academic situations. Study findings suggest that lower functioning parents may at times adopt a less involved parenting style (e.g., lower

positive affect and cognitive stimulation) than higher functioning parents when interacting with children with MID in challenging academic situations. Notably, less involved forms of parenting have been associated with a number of negative child outcomes, including lower academic performance (Steinberg, Lamborn, Dornbusch, & Darling, 1992), slowed cognitive development (Feldman et al., 1985) and higher levels of externalizing behaviour difficulties (Stormshak, Bierman, McMahon, Lengua, & CPPRG, 2000). Longitudinal research is necessary to determine whether patterns of low parent involvement in learning-related contexts or in response to specific instances of child difficulty on learning-related tasks lead to any of the aforementioned negative outcomes. Significant findings from this research would contribute to the creation of interventions designed to optimize parents' contributions to the academic success and healthy cognitive and psychosocial development of children with MID.

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APPENDIX A
Background Information Questionnaire

Participant #: _____

Date: _____

Instructions

Please respond as accurately and honestly as possible to the following questions. The information you provide is strictly confidential and intended for research purposes only.

Part 1: Parent Background Information

1. Your sex: _____

2. Your age: _____

3. Your race/ ethnicity:

- Arab/ Middle Eastern
- Black / African Canadian
- East Asian
- Aboriginal / Native Canadian
- Hispanic / Latino
- South Asian
- White / Caucasian
- Biracial / Multiethnic (please specify ethnicities) _____
- Other (please specify): _____

4. Please indicate your approximate household income last year (i.e., the total income of all adults living in your household). **Include scholarships, bursaries, loans, and disability payments as household income.**

- Less than 20 000/ year
- 20 000 – 29 000/ year
- 30 000 – 39 000/ year
- 40 000 – 49 000/ year
- 50 000 – 79 000/ year
- 80 000 – 99 000/ year
- 100 000/ year or greater
- prefer not to answer

5. Please indicate your highest level of education.

- Did not graduate from high school
- High school graduate (Diploma or GED)
- Some completion of college education
- College graduate
- Some completion of university education
- University graduate
- Post-university education (graduate work)
- Other (please specify): _____

6. Are you currently employed? Answer “No” if you are (a) unemployed, (b) unemployed and receiving disability payments, or (c) a student without a full or part-time job.

- Yes
- No

7. If you answered “yes” to #6, what is/are your current job title(s)?

8. If you answered “yes” to #6, how many hours are you employed per week, on average?

- 0 hours/ week
- 1 to 20 hours/ week
- 21 to 40 hours/ week
- 41 to 60 hours/ week
- 61 to 80 hours/ week
- 81 hours/ week or more

9. Please indicate your longest period of employment (including previous or current jobs).

- Less than 1 month
- 1- 3 months
- 4- 6 months
- 7 - 12 months
- 1- 2 years
- More than 2 years
- Never employed

10. Are you currently in a relationship?

- Yes
- No
- Unsure

11. Please indicate your marital status.

- Single
- Common Law (living with partner for a period of at least 3 years)
- Separated
- Divorced
- Widow
- Married

12. What is the approximate size of your social support network (i.e., number of people you can go to for social support, such as friends, relatives, and romantic partners).

- 0 people
- 1-5 people
- 6-10 people
- 11-15 people
- 16-20 people
- 21 people or more

13. In general, do you feel that you receive enough social support from friends/ family/ romantic partners?

- Yes
- No
- Don't know

14. Please provide an estimate of the number of social activities you engage in on a weekly basis (e.g., playing on sports teams, attending clubs, excursions with friends, going on dates).

- 0-2 activities
- 3-5 activities
- 6-8 activities
- 9-11 activities
- 12-14 activities
- 15 activities or more

15. Have you used any of the following community services in the past year? Please select all that apply.

- Parenting courses/ programs
- Employment agencies/ job centres
- Mental health agencies
- Other (please specify): _____

16. Are you satisfied with the quality of the community services you received in the past year?

- Yes
- No
- I have not used any community services in the past year

17. Have you ever been diagnosed with any of the following conditions? Please check all that apply.

- Mental retardation/ Developmental disability
- Learning disorder/ Learning disability
- Attention Deficit Disorder (ADD) or Attention Deficit/ Hyperactivity Disorder (ADHD)
- Schizophrenia
- Major Depression
- Dysthymia
- Bipolar Disorder
- Generalized Anxiety Disorder/ Panic Disorder/ Specific Phobia/ Obsessive-Compulsive Disorder/ Post-Traumatic Stress Disorder
- Anorexia Nervosa/ Bulimia Nervosa
- Other (please specify): _____
- Don't know

18. Have you ever received special education services at school (i.e., high school, university)?

- Yes
- No
- Not sure

19. If you answered “yes” to #18, which special education services did you receive? Please check all that apply.

- Support from a special education teacher within the regular classroom
- Support from a special education teacher outside of the regular classroom (e.g., resource room access)
- Part-time special education classroom placement
- Full-time special education classroom placement
- Other (please specify): _____
- Don't know

Part 2: Child Background Information

1. Child Sex: _____
2. Child Age: _____
3. Child's Grade: _____
4. Child's race/ ethnicity:
 - Aboriginal / Native Canadian
 - Arab/ Middle Eastern
 - Black / African Canadian
 - East Asian
 - Hispanic / Latino
 - South Asian
 - White / Caucasian
 - Biracial / Multiethnic (please specify ethnicities) _____
 - Other (please specify): _____
5. Has your child ever received any of the following psychiatric diagnoses/ special education designations? Please check all that apply.
 - Mental retardation/ Developmental disability
 - Autism/ Asperger's Disorder
 - Mild Intellectual Impairment
 - Learning disorder/ Learning disability
 - Attention Deficit/ Hyperactivity Disorder (ADHD)
 - Schizophrenia
 - Major Depression
 - Dysthymia
 - Bipolar Disorder
 - Generalized Anxiety Disorder/ Panic Disorder/ Specific Phobia/ Obsessive-Compulsive Disorder/ Post-Traumatic Stress Disorder
 - Anorexia Nervosa/ Bulimia Nervosa
 - Other (please specify): _____
 - Don't know
6. Please indicate your child's current educational placement at school.
 - Regular classroom placement
 - Regular classroom placement with in-class support from a special education teacher
 - Regular classroom placement with out-of-class support from a special education teacher (e.g., resource room access)
 - Part-time special education classroom placement
 - Full-time special education classroom placement
 - Other (please specify): _____
 - Don't know

7. Has your child ever been held back a grade?
- Yes
 - No
 - Not sure
8. Do you feel that your child could be doing better in school?
- Yes
 - No
 - Not sure
9. Do you feel that your child's needs are being met in the classroom?
- Yes
 - No
 - Not sure

APPENDIX B
Authorization for Modified Use of the Parental Attributions Coding System

Amy Slep <amy.slep@stonybrook.edu> Fri, Sep 18, 2009 at 10:27 AM
Reply-To: amy.slep@stonybrook.edu
To: Tim Johnston <johns3t@uwindsor.ca>

I see no reason why the coding system wouldn't work the same way as long as the examples parents provide you and that you use as the stimulus are specific (not something like "doesn't listen" or "misbehaves at dinner"). I authorize the use of the code for this purpose.

Hope that's what you needed. Let me know if you need anything else.
-a

Amy Slep <amy.slep@stonybrook.edu> Tue, Sep 22, 2009 at 11:20 AM
Reply-To: amy.slep@stonybrook.edu
To: Tim Johnston <johns3t@uwindsor.ca>

Hi-
Thanks for clarifying. I still think the coding system should work. You'll be interested in child locus trait-stable-global attributions as well as responsibility attributions, though, I would think.
-a

APPENDIX C
Assent/ Consent Forms and Letters of Information



ASSENT FORM FOR CHILD PARTICIPANTS

Today I will be asked to do a few activities like building things with blocks and answering questions. I understand that my parent will not be in the same room as me when I do these activities, but I know that I can visit my parent whenever I want. After I do the activities, I will be asked to spend some time playing a math game with my parent. I understand that my parent and I will be videotaped while we play this game. I know that only study staff members will be allowed to watch the videotape. I know that after the math game I will be able to play with toys for a while. I understand that I can stop doing the activities at any time. I know that before I leave today I will get a prize. I know that I can ask questions at any time and that these questions will be answered.

I understand what I am being asked to do to be in this study, and I agree to be in this study.

Child's Signature

Date

Witness



CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: **Helping Children with Academic Challenges – Community Sample**

You are asked to participate in a research study conducted by Tim Johnston, principle investigator, and Dr. Sylvia Voelker, research supervisor, from the Psychology department at the University of Windsor. The results of this study will contribute to the principle investigator's dissertation project.

If you have any questions or concerns about the research, please feel to contact Tim Johnston (email: johns3t@uwindsor.ca) or Dr. Sylvia Voelker (phone: 519-253-3000 ext. 2249).

PURPOSE OF THE STUDY

This research study seeks to compare the thoughts, feelings, and behaviours of children who struggle academically with those of children who do not struggle academically. The research study also investigates the challenges faced by parents of children who do and do not struggle academically.

PROCEDURES

At the start of the appointment, your child will complete a screening assessment, including a partial IQ test, a letter/word reading task, a pencil-and-paper math task, and a questionnaire asking about his/ her abilities in different areas. While your child completes these activities, you will complete a background information questionnaire, a survey asking about your child's behaviours, and several activities taken from an adult IQ test. You will also be interviewed about instances of academic difficulty experienced by your child. Your interview responses will be audiotaped. You will then spend 15 minutes in an observation room with your child, playing a mathematics game. You and your child will be videotaped during this 15 minute interaction. Finally, your child will have the opportunity to engage in free play for 10 minutes in the observation room. He/she will not be videotaped during this 10 minute period. The entire appointment should last no longer than 2 hours.

POTENTIAL RISKS AND DISCOMFORTS

You may or may not experience some discomfort regarding your performance on the partial IQ test, and your child may or may not experience some discomfort on the partial IQ test, letter/word reading task, pencil-and-paper math task. In addition, you and your child may or may not experience some discomfort during the mathematics game. In order to address concerns participants may have about their abilities after participating in

the research study, lists of parenting, educational, and community mental health resources will be provided.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

At the end of the appointment, your child will be rewarded with at least 1 small age-appropriate toy and a gift card entitling him/her to one free game of Laser Tag. In addition, you will have the option of entering your name into a draw for either a Wii video game console or a \$200 Best Buy gift card (2 winners will be drawn). You will also receive a list of parenting resources for yourself and academic resources for your child. Finally, if you wish, you will be provided with verbal and written feedback regarding how you performed on the IQ tasks administered in this study and/or how your child performed on the IQ, reading, and math tasks administered in this study. Note that in requesting feedback regarding test scores, you give the principle investigator permission to associate your name with your IQ test scores and/or your child's name with his/ her IQ, reading, and math test scores.

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You may withdraw your consent at any time and discontinue participation without penalty. If you have questions regarding your rights as a research subject, contact: Research Ethics Coordinator, University of Windsor, Windsor, Ontario, N9B 3P4; Telephone: 519-253-3000, ext. 3948; e-mail: ethics@uwindsor.ca

SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE

Please Check All That Apply:

- I would like to receive verbal and written feedback regarding how I perform on the IQ tasks to be administered in this study
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I understand the information provided for the study “**Helping Children with Academic Challenges**” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Participant

Signature of Participant

Date

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator

Date



CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: **Helping Children with Academic Challenges – Participant Pool Sample**

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At the start of the appointment, your child will complete a screening assessment, including a partial IQ test, a letter/word reading task, a pencil-and-paper math task, and a questionnaire asking about his/ her abilities in different areas. While your child completes these activities, you will complete a background information questionnaire, a survey asking about your child's behaviours, and several activities taken from an adult IQ test. You will also be interviewed about instances of academic difficulty experienced by your child. Your interview responses will be audiotaped. You will then spend 15 minutes in an observation room with your child, playing a mathematics game. You and your child will be videotaped during this 15 minute interaction. Finally, your child will have the opportunity to engage in free play for 10 minutes in the observation room. He/she will not be videotaped during this 10 minute period. The entire appointment should last no longer than 2 hours.

POTENTIAL RISKS AND DISCOMFORTS

You may or may not experience some discomfort regarding your performance on the partial IQ test, and your child may or may not experience some discomfort on the partial IQ test, letter/word reading task, pencil-and-paper math task. In addition, you and your child may or may not experience some discomfort during the mathematics game. In order to address concerns participants may have about their abilities after participating in

the research study, lists of parenting, educational, and community mental health resources will be provided.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

At the end of the appointment, your child will be rewarded with at least 1 small age-appropriate toy and a gift card entitling him/her to one free game of Laser Tag. In addition, you will receive 2 bonus points for 120 minutes of participation towards the University of Windsor psychology participant pool, provided that you are registered in the pool and enrolled in one or more eligible courses. You will also have the option of entering your name into a draw for either a Wii video game console or a \$200 Best Buy gift card (2 winners will be drawn). You will also receive a list of parenting resources for yourself and academic resources for your child. Finally, if you wish, you will be provided with verbal and written feedback regarding how you performed on the IQ tasks administered in this study and/or how your child performed on the IQ, reading, and math tasks administered in this study. Note that in requesting feedback regarding test scores, you give the principle investigator permission to associate your name with your IQ test scores and/or your child's name with his/ her IQ, reading, and math test scores.

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Please Check All That Apply:

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I understand the information provided for the study “**Helping Children with Academic Challenges**” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Participant

Signature of Participant

Date

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator

Date



CONSENT FOR AUDIOTAPING

Title of Study: **Helping Children with Academic Challenges**

I consent to the audiotaping of my responses to interview questions.

I understand that this is a voluntary procedure and that I am free to withdraw at any time by requesting that the taping be stopped.

I understand that confidentiality will be respected and that the audiotape will be for professional use only. I also understand that audiotapes are filed by number only and stored in a locked cabinet.

Name of Participant

Signature of Participant

Date



CONSENT FOR VIDEOTAPING

Title of Study: **Helping Children with Academic Challenges**

I consent to the videotaping of myself and my child as we play a math game.

I understand that this procedure is voluntary and that I am free to withdraw at any time by requesting that the videotaping be stopped.

I understand that confidentiality will be respected and that the videotape will be for professional use only. I also understand that videotapes are filed by number only and stored in a locked cabinet.

Name of Participant

Signature of Participant

Date



LETTER OF INFORMATION FOR CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: **Helping Children with Academic Challenges - Community Sample**

You are asked to participate in a research study conducted by Tim Johnston, principle investigator, and Dr. Sylvia Voelker, research supervisor, from the Psychology department at the University of Windsor. The results of this study will contribute to the principle investigator's dissertation project.

If you have any questions or concerns about the research, please feel to contact Tim Johnston (email: johns3t@uwindsor.ca) or Dr. Sylvia Voelker (phone: 519-253-3000 ext. 2249).

PURPOSE OF THE STUDY

This research study seeks to compare the thoughts, feelings, and behaviours of children who struggle academically with those of children who do not struggle academically. The research study also investigates the challenges faced by parents of children who do and do not struggle academically.

PROCEDURES

At the start of the appointment, your child will complete a screening assessment, including a partial IQ test, a letter/word reading task, a pencil-and-paper math task, and a questionnaire asking about his/ her abilities in different areas. While your child completes these activities, you will complete a background information questionnaire, a survey asking about your child's behaviours, and several activities taken from an adult IQ test. You will also be interviewed about instances of academic difficulty experienced by your child. Your interview responses will be audiotaped. You will then spend 15 minutes in an observation room with your child, playing a mathematics game. You and your child will be videotaped during this 15 minute interaction. Finally, your child will have the opportunity to engage in free play for 10 minutes in the observation room. He/she will not be videotaped during this 10 minute period. The entire appointment should last no longer than 2 hours.

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These are the terms under which I will conduct research.

Signature of Investigator

Date



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SIGNATURE OF INVESTIGATOR

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Signature of Investigator

Date

APPENDIX D

Parent Interview Script and Thought Listing Form

Interviewer Script

1: "I'm sure that you could name at least a few instances, off the top of your head, in which your child has experienced success on a school-related task. However, what I'm interested in asking you about today are your child's negative academic experiences. I'd like you to try to think of one or more instances in the last three months in which your child under-performed on an academic task. For instance, you might mention one or more instances in which your child struggled on an in-class activity, homework assignment, quiz, test, or examination. Does this make sense?"

Answer any questions asked by the participant.

2. "When you are ready, go ahead and describe an instance in which your child under-performed on an academic task. Please describe this instance in as much detail as possible."

Allow the parent to describe an instance of academic underachievement. Encourage the parent to elaborate on his/her response as much as possible. If the parent struggles to identify an instance of academic difficulty, remind him/her that it is not uncommon for even the brightest of students to occasionally "slip up" on school-related tasks, for whatever reason

If parent describes a behavioral difficulty or continues to have trouble coming up with an instance of academic difficulty, say, "Basically, what I'm looking for are examples of times when your child experienced difficulty learning something. For instance, can you think of a time in the last three months when your child struggled to learn the rules for a board game or a computer or video game? Or a time in the last three months when your child struggled to read an unfamiliar word?"

3. **Hand the parent a Thought Listing handout.** "On the paper provided, please list any thoughts or feelings that occurred to you while you were describing to me this instance of academic difficulty."

Wait for participant to indicate that he/she has finished. Rephrase the task instruction if the parent is confused about what he/she is supposed to be doing. However, do NOT indicate that the purpose of the task is to get parents to identify the cause(s) of their child's academic difficulty(ies).

4. "What do you think caused your child to experience difficulty on this academic task? Why do you think your child experienced difficulty?"

If parent indicates that he/she does not know, encourage him/her to guess.

Repeat prompts 2 through 4 until parent has described 5 instances of academic difficulty, OR until parent indicates that he/she is unable to recall any additional instances of academic difficulty. At the end of the interview, stop the audio recording.

Important: use a new Thought Listing handout for each instance of academic difficulty described by the parent (up to a maximum of 5 instances). Write the date, the case number, and academic difficulty number (1, 2, 3, 4 or 5) at the top of each Thought Listing handout.

Case # _____
Academic Difficulty # _____

Date _____

Thought Listing

Please list any thoughts or feelings that occurred to you while you were describing your child's academic difficulty. Use as much or as little space as you require.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

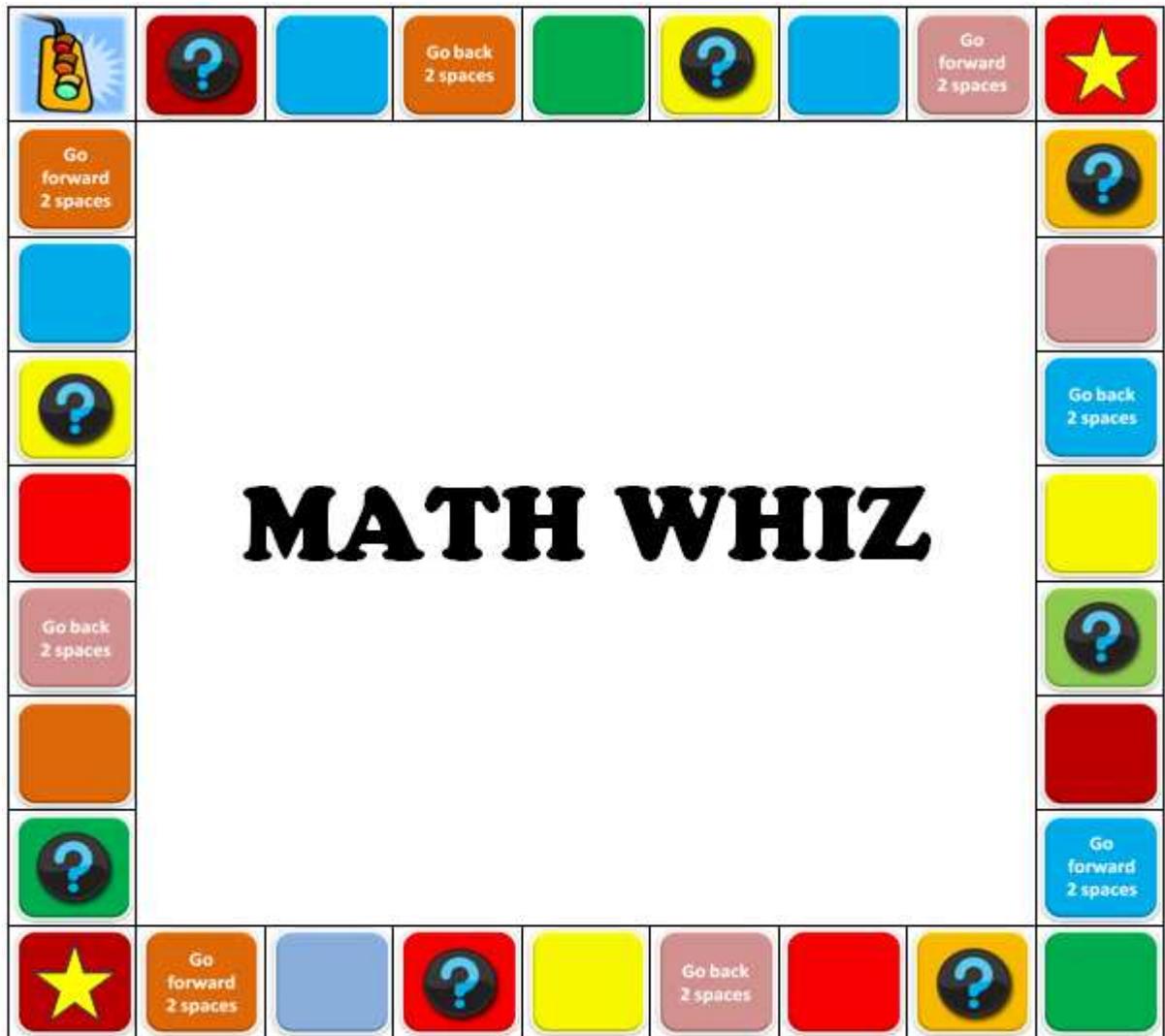
8. _____

9. _____

10. _____

APPENDIX E
Selected Math Game Materials

Math Game Board





Game Rules



Object of the Game...

- ✓ Your child has 15 minutes to earn tokens (💰) by moving his/her playing piece clockwise around the game board. At the end of the game, tokens can be traded in for small prizes!
- ✓ Sometimes, your child will answer a math problem before making his/her next move.

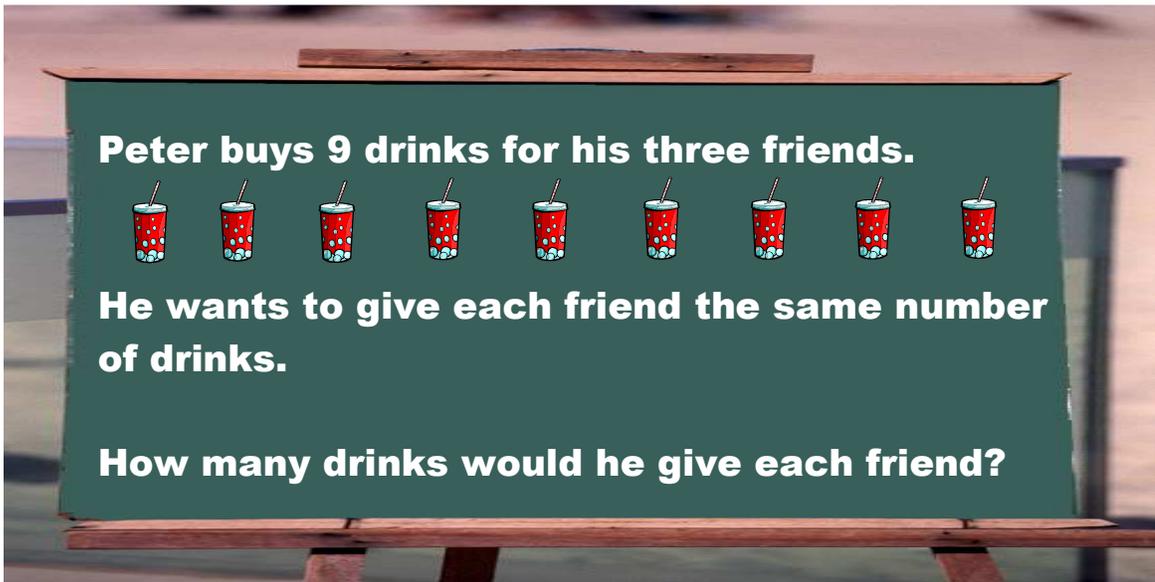
Before Playing the Game...

- ✓ Get your child to choose a piece of scrap paper from the folder to use for the math problems.
- ✓ Get your child to choose a playing piece and place it on the traffic light (🚦) on the game board.
- ✓ Give your child one token, just to get him/her started!

Playing the Game...

- ✓ Your child spins the wheel (🎡) and moves forward the number of spaces shown.
- ✓ Land on a star (★): Take a token!
- ✓ Land on a question mark (❓):
 - Your child takes a game card and answers the math question on the back.
 - Use the **Record Form** to figure out which deck of game cards to use.
 - It's up to you how much help you give your child on a math question.
 - Use the **Answer Booklet** to look up the correct answer to a math question. The booklet contains answer keys for each deck of game cards. Answers are listed by card number.
 - Your child moves forward 3 spaces for a correct answer and 1 space for an incorrect answer.

Sample Math Questions (Printed on the Backs of Game Cards)



Sample Answer Key (from Answer Booklet)



Answer Key: Yellow Game Cards

Card 1.

Question: **Place these numbers in order from lowest to highest**

Answer: **8, 17, 29, 33, 48, 67, 70**

Card 2.

Question: **How much money?**

Answer: **76 cents**

Card 3.

Question: **Mike has 14 oranges. Pam has 8 oranges Mike has ____ more oranges than Pam.**

Answer: **6**

Card 4.

Question: **What is the missing number?**

Answer: **165**

Card 5.

Question: **Kate has 80 cents. She buys a toy for 33 cents. How much money does she have left?**

Answer: **47 cents**

Card 6.

Question: **Kelly has 12 cupcakes to give to her four friends. She wants to give each friend the same number of cupcakes. How many cupcakes would she give each friend?**

Answer: **3 cupcakes**

Card 7.

Question: **Who has more money?**

Answer: **The character with blue glasses.**

Card 8.

Question: **$9 + 8 = ?$**

Answer: **17**

Card 9.

Question: **$13 - 5 = ?$**

Answer: **8**

Card 10.

Question: **Place these numbers in order from highest to lowest**

Answer: **98, 81, 71, 56, 42, 31, 15**

Card 11.

Question: **How much money?**

Answer: **94 cents**

APPENDIX F
Debriefing Form



DEBRIEFING FORM

There were some details about the purpose of this study that were not provided to you when you signed up for the study. I want to take a moment to describe to you exactly why I needed to withhold these details from you. Oftentimes, when participants know about the goals of an investigation and all of the researcher's predictions, they may purposefully change the way they act to help show that the researcher's predictions are correct. Alternatively, participants with full knowledge of an investigation may choose to act in ways that help to show that the researcher's predictions are incorrect. In both of these cases, the participant's behaviours at the time of the study tell the researcher very little about the participant's behaviours in real life.

Now I'll describe the specific goals and predictions of this study. The first goal of this study is to compare the thoughts, emotions, and behaviours of children who struggle academically with those of children who do not struggle academically. We are predicting that among children who struggle academically, those who receive out-of-class special education services with similarly struggling peers will have more confidence in their academic abilities than those who spend all of their time in the regular classroom with higher-achieving peers. We are also predicting that children who struggle academically may be at greater risk for the development of various social, emotional, and behavioural problems than children who do not struggle academically.

The second goal of the study is to look at the types of factors that influence how well parents are able to help their children with their homework. This goal was not revealed to you when you signed up for the study. It makes sense that in order to be able to help their children with their homework, parents would need to understand exactly what is causing their children to struggle. Some children may struggle on homework assignments because they have difficulty problem solving. Other children may struggle because they have difficulty staying motivated. In this study, we are predicting that parents will have the most difficulty helping their child with his/her homework when they mistake their child's problem solving difficulties for a lack of motivation. Another factor that could affect how well parents are able to help their children with their homework is the quality of their teaching skills. Teaching skills include, but are not limited to, the parent's ability to problem solve, create a positive learning environment for their child, and cater their instruction to their child's skill level. In this study, we are predicting that

parents' success in helping their children with their homework will depend on the extent of parents' teaching skills.

As I mentioned earlier, there were times during your participation in this study when I deliberately did not tell you things. For instance, when you signed up for the study I did not tell you that a major goal of the study was to look at the types of factors that influence how well parents are able to help their children with their homework. I also didn't tell you about any of the study's research predictions. When I asked you to complete the math game and the activities taken from an adult IQ test, I did not tell you that the purpose of these activities was to look at particular teaching skills that you may rely upon when assisting your child with his/her homework. When I asked you to complete the math game, I also did not tell you that most of the math questions were selected to be overly difficult for your child so that he/she would need to rely on your teaching skills to solve the questions. Finally, I did not tell you that the purpose of the interview questions was to find out what you think would cause your child to struggle with his/her homework. I withheld all of this information so that your knowledge of the study would not influence your responses to test/interview/survey questions or your behaviours during the math game. I want to assure you that I am no longer attempting to withhold information from you about this study.

I'd like to request that you not share the secrets I have just revealed about the study with other parents. Remember that parents who know all the details of this study may not respond naturally to test/interview/survey questions or behave naturally during the math game. If another parent asks you what this study is about, just say that it is about the thoughts and behaviors of school children, and about the challenges faced by parents of school children. If another parent asks you about what you did in the study, just say that you were asked to answer questions and play a math game with your child. Thank you for your cooperation!

One or more of today's activities may have caused you or your child to experience some discomfort or frustration. You are welcome to contact either the principle investigator or his supervisor to talk about what is bothering/ frustrating you or your child. Alternatively, you could speak with the Research Ethics Coordinator (phone number: 519-253-3000 ext. 3948; email: ethics@uwindsor.ca). I am providing all parents who participate in this study with a list of community mental health resources in case they or their children wish to speak to a Mental Health Professional. I am also providing parents with a list of parenting resources for themselves and a list of educational resources for their child. Finally, I am providing parents with a list of places where they or their child can go to find out more about their academic and problem solving abilities.

In this letter you have learned lots of new things about this study. It is OK if, based on this new information, you now want to remove your own or your child's data from this study. If you wish to remain in the study and/or you want your child to remain in the study, you will need to sign a form indicating this preference.

If you have any questions or concerns about this research, please feel free to contact the principle investigator, Tim Johnston (email: johns3t@uwindsor.ca), or his research supervisor, Dr. Sylvia Voelker (phone: 519-253-300 ext. 2249).

Signature of Researcher

Date

APPENDIX G
Final Consent to Participate in Research



FINAL CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: **Helping Children with Academic Challenges**

The true nature of the research project, "Helping Children with Academic Challenges" has been explained to me.

At this point in time: (please check all that apply):

- I wish to remain a participant in this research investigation
- I want my child to remain a participant in this research investigation

I have received a copy of this form.

Name of Parent

Signature of Parent

Date

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator

Date

APPENDIX H
Psychological Screening Report Templates

**UNIVERSITY OF WINDSOR
CHILD STUDY CENTRE**

CONFIDENTIAL PSYCHOLOGICAL SCREENING REPORT

Name: Click here to enter text.

Age: Click here to enter text.

Date of Birth: Click here to enter a date.

Dates of Evaluation: Click here to enter a date.

Parent: Click here to enter text.

Date of Report: Click here to enter a date.

Assessed by: Choose an item.

Reason for Referral:

Click here to enter text. underwent psychological screening as part of a research study conducted by Tim Johnston, doctoral student at the University of Windsor.

Tests Administered:

Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV) – selected subtests
Wechsler Individual Achievement Test, Second Edition (WIAT-II) – selected subtests

Test Results:

Cognitive Functioning: Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV)

The WISC-IV is an intelligence test for children between the ages of 6 and 16. Test scores reflect a child's performance relative to his/her same-aged peers. Scores less than 8 reflect below average performance, scores between 8 and 12 reflect average performance, and scores greater than 12 reflect above average performance. Click here to enter text. was administered the Block Design, Similarities, Digit Span, and Coding subtests of the WISC-IV.

The **Block Design** subtest is a measure of non-verbal ability that requires the test-taker to assemble blocks to match a model. Compared to other children Choose an item. age, Click here to enter text.'s score was Click here to enter text..

The **Similarities** subtest is a measure of verbal ability that requires the test-taker to say how two objects or concepts are alike. Compared to other children Choose an item. age, Click here to enter text.'s score was Click here to enter text..

The **Digit Span** subtest is a measure of short-term memory that requires the test-taker to repeat strands of digits both forwards and backwards. Compared to other children Choose an item. age, Click here to enter text.'s score was Click here to enter text..

The **Coding** subtest is a measure of processing speed that requires the test-taker to rapidly copy symbols. Compared to other children Choose an item. age, Click here to enter text.'s score was Click here to enter text..

Academic Achievement Assessment: Wechsler Individual Achievement Test, Second Edition (WIAT-II)

The WIAT-II is an academic achievement test for children and adults. Test scores reflect an individual's performance relative to his/her same-aged peers. Scores less than 90 reflect below average performance, scores between 90 and 110 reflect average performance, and scores greater than 110 reflect above average performance. [Click here to enter text.](#) completed the Word Reading and Numerical Operations subtests of the WIAT-II.

The **Word Reading** subtest is a measure of reading ability that requires the test-taker to Choose an item.. Compared to other children Choose an item. age, [Click here to enter text.](#)'s score was [Click here to enter text.](#)

The **Numerical Operations** subtest is a measure of mathematical ability that requires the test-taker to Choose an item.. Compared to other children Choose an item. age, [Click here to enter text.](#)'s score was [Click here to enter text.](#)

Choose an item.
Clinical Assistant

Sylvia Voelker, Ph.D., C.Psych.
Licensed Clinical Psychologist

**UNIVERSITY OF WINDSOR
CHILD STUDY CENTRE**

CONFIDENTIAL PSYCHOLOGICAL SCREENING REPORT

Name: Click here to enter text.

Age: Click here to enter text.

Date of Birth: Click here to enter a date.

Dates of Evaluation: Click here to enter a date

Assessed by: Choose an item.

Date of Report: Click here to enter a date.

Reason for Referral:

Click here to enter text. underwent psychological screening as part of a research study conducted by Tim Johnston, doctoral student at the University of Windsor.

Test Administered:

Wechsler Adult Intelligence Scale, Fourth Edition (WAIS-IV) – selected subtests

Test Results:

The WAIS-IV is an intelligence test for adults between the ages of 16 and 90. Test scores reflect an individual's performance relative to his/her same-aged peers. Scores less than 8 reflect below average performance, scores between 8 and 12 reflect average performance, and scores greater than 12 reflect above average performance. Click here to enter text. was administered the Vocabulary, Visual Puzzles, Digit Span, and Coding subtests of the WAIS-IV.

The **Vocabulary** subtest is a measure of verbal ability that requires the test-taker to provide definitions for words. Compared to other adults Choose an item. age, Click here to enter text.'s score was Click here to enter text..

The **Visual Puzzles** subtest is a measure of non-verbal ability that requires the test-taker to determine which three shapes from a set of six shapes combine to form a particular visual pattern. Compared to other adults Choose an item. age, Click here to enter text.'s score was Click here to enter text..

The **Digit Span** subtest is a measure of short-term memory that requires the test-taker to repeat strands of digits forwards, backwards, and in order from least to greatest. Compared to other adults Choose an item. age, Click here to enter text.'s score was Click here to enter text..

The **Coding** subtest is a measure of processing speed that requires the test-taker to rapidly copy symbols. Compared to other adults Choose an item. age, Click here to enter text.'s score was Click here to enter text..

Choose an item.
Clinical Assistant

Sylvia Voelker, Ph.D., C.Psych.
Licensed Clinical Psychologist

APPENDIX I Evaluation of Statistical Assumptions

The statistical procedures followed in the present study's primary analyses included a series of between-groups multi-factorial ANOVAs, independent samples *t*-tests, multiple regressions, Pearson's *r* and Spearman's *rho* correlations, and Mann-Whitney *U* and Kruskal-Wallis *H* tests. The relevant statistical assumptions for these parametric and non-parametric tests were evaluated for each of the variables under investigation (alpha was set at .05 for statistical procedures used to evaluate these assumptions).

Between-Groups ANOVAs

The statistical assumptions for between-groups ANOVAs include sufficient sample size, independence of observations, univariate normality, homogeneity of variance, and the absence of outliers. With respect to the first assumption, ANOVA-based analyses require samples that are large enough to ensure sufficient statistical power to detect differences between groups. Small sample sizes increase the risk of a Type II error. Notably, a power analysis revealed that the size of the sample in the present investigation ($N = 96$) was not ideal for the identification of group differences with moderate effect sizes (recommended sample size = 158). As such, main effects and interactions occurring in the population under investigation may not have been detected through ANOVA-based analyses conducted on the present study's sample. To address this shortcoming, the ANOVA-based analyses were supplemented by a series of multiple regressions. The use of continuous versions of one or more of the study's independent variables in each multiple regression analysis allowed for greater statistical power to detect significant main effects and interactions.

The independence of observations assumption refers to the need for the study sample to closely represent the population under investigation. Random sampling methods and the absence of systematic error in data collection procedures help to satisfy the assumption of independence of observations. Like many other clinical studies, the present investigation relied on a convenience, rather than random, sample of parent-child dyads. As such, it cannot be assumed that the present study's sample is perfectly representative of the population under investigation (i.e., school-aged children and their parents). However, steps were taken during the study's recruitment phase to ensure that the sample would closely *approximate* the population under investigation (e.g., one parent and child assessment per family, advertising through a diverse array of community agencies and through the use of a variety of mediums). In addition, systematic error variance was minimized in the present study through the standardization of data collection procedures, as well as through the use of standardized test measures and manualized coding schemes.

The univariate normality assumption stipulates that a dependent variable's data should be normally distributed around its mean, for each level of an independent variable or combination of independent variables. The primary indices of univariate normality used in the present study were z -scores for skewness and kurtosis. As mentioned previously, skewness and kurtosis z -scores ≥ -2.0 or ≤ 2.0 were considered to reflect normally distributed data. Transformations were applied to skewed or kurtotic data distributions in an attempt to reduce their skewness or kurtosis z -scores to acceptable levels. In certain cases, transformations were unsuccessful in normalizing distributions of data (i.e., the skewness or kurtosis z -score values could not be lowered below the cutoff of -2.0 or 2.0). Because ANOVAs are generally robust to violations of statistical

normality (Harwell, Rubinstein, Hayes, & Olds, 1992), marginally skewed or kurtotic distributions (i.e., distributions with skewness or kurtosis z -scores between -2.0 and -2.5 or between 2.0 and 2.5) were not excluded from the study's analysis. The adapted PACS' proportion of internal locus attributions variable more severely violated the normality assumption (a substantial number of data points had the same extreme value) and was therefore excluded from the ANOVA analyses.

The homogeneity of variance assumption indicates that the variability of a distribution of data should be similar across each level of an independent variable or combination of independent variables. Homogeneity of variance was evaluated through a series of Levene's tests. Statistically significant F -values associated with these tests indicate that homogeneity of variance across groups cannot be assumed. The assumption of homogeneity of variance was violated for the adapted PACS' Globality scale (i.e., a statistically significant Levene's test F -value was obtained for this scale). The Globality scale's between-group heterogeneity of variance was successfully reduced to a statistically nonsignificant level through the use of a $y^{1/2}$ transformation (applied to the already transformed version of the scale). This $y^{1/2}$ transformation was only applied to the Globality scale for the ANOVA analysis in question and did not interfere with the scale's univariate normality.

The absence of outliers assumption stipulates that extreme data points should be removed or modified to ensure that they do not exert excessive influence over the results of a statistical analysis. In the present study, outliers were defined as data points located three or more standard deviations above or below the mean of a distribution.

Transformational procedures and, in some cases, combined transformational and

Winsorization procedures were effective in reducing the influence of all univariate outliers (i.e., all data points had z -scores ≥ -3.0 and ≤ 3.0).

Independent Samples t-tests

The statistical assumptions for independent samples t -tests include independence of observations, univariate normality, and homogeneity. These assumptions were evaluated and deemed to have been met for the relevant analyses (see the “Between-Groups ANOVAs” section, p. 227, for a description of each assumption and how it was evaluated).

Multiple Regressions

The statistical assumptions for multiple regression include adequate sample size, absence of outliers and influential points, absence of multicollinearity and singularity, univariate normality, normality of error terms, linearity, homoscedasticity of error terms, and independence of error terms. With respect to the adequate sample size assumption, it is generally recommended that a sample consist of approximately 15 cases for every predictor variable used in a multiple regression analysis (Stevens, 2002). An insufficient sample size (i.e., fewer than 15 cases for every predictor variable) serves to compromise the statistical power of a multiple regression analysis. The present study’s sample size consisted of more than 15 cases per predictor variable.

Two other assumptions of multiple regression analyses are the absence of outliers and influential data points. Outliers on the X-plane are defined as extreme points amongst combinations of predictor variables, whereas outliers on the Y-plane are defined as extreme data points relative to the mean of the dependent variable. Influential points refer to extreme data points on the X-plane that are also extreme data points on the Y-plane. By definition, these data points are disproportionately influential in the derivation of one or

more of a regression model's beta weights (Stevens, 2002). In the present analysis, outliers on the X-plane were identified through examination of Mahalanobis' distance and Leverage statistics (using standard cutoffs), and outliers on the Y-plane were identified through examination of standardized residuals, studentized residuals, and studentized deleted residuals (residual values greater than or equal to ± 3.0 were considered outliers). Outliers that could be clearly differentiated from other data points through visual examination of a plot of the standardized residuals versus standardized predicted residuals were removed from the analysis. Cook's Distance, standardized DFFITS, and standardized DFBETAS statistics did not reveal the presence of any influential data points (data points with Cook's Distance values greater than 1.0 or DFFITS/DFBETAS values greater than or equal to ± 2.0 would have been considered influential).

According to the absence of multicollinearity and singularity assumption, overlapping predictor variables should not be included in the same regression analysis. Multicollinearity occurs when highly related predictor variables are entered into the same regression model, whereas singularity occurs when two or more completely overlapping variables are entered into the same model. Because it is rarely the case that predictor variables are completely related to each other, whether the multicollinearity and singularity assumption is violated depends more on the *degree* to which a set of predictor variables overlap. Multicollinearity and singularity were diagnosed in the present study through the use of the Tolerance statistic (i.e., $1 - R^2$). Tolerance values of .1 or less were considered to reflect significant multicollinearity. None of the predictor variables used in the present study evidenced elevated Tolerance scores.

The normality assumption stipulates that a dependent variable's data should be normally distributed around its mean. Efforts were made in the present study to normalize

(through transformations) relevant dependent variables prior to their inclusion in the multiple regression analyses. As mentioned previously, variables evidencing only marginally skewed or kurtotic data distributions (i.e., skewness or kurtosis z -scores between ± 2.0 and ± 2.5) were not excluded from further analysis. The adapted PACS' proportion of internal locus attributions variable more severely violated the normality assumption (due to the substantial number of data points with the same extreme value) and was therefore excluded from the multiple regression analyses.

In multiple regression, it is also assumed that a given model's error terms (i.e., residuals) are normally distributed. In the present study, normal distributions of residuals were defined as those with skewness and kurtosis z -scores ≥ -2.0 and ≤ 2.0 . One regression model's residuals were found not to be normally distributed (i.e., the regression model featuring the adapted PCIRS' Cognitive Stimulation scale for the BRAD condition as the dependent variable). However, the distribution of residuals was only mildly kurtotic (the kurtosis z -score fell between 2.0 and 2.5). Given how multiple regression procedures are generally robust to violations of the normality of error terms assumption (Osborne & Waters, 2002), the decision was made not to remove the regression model in question from the analysis.

The linearity assumption stipulates that the predictor variables included in a multiple regression analysis should be linearly related to the dependent variable. When the relationship between a predictor variable and a dependent variable is perfectly linear, a one unit increase in the value of the predictor variable will always result in an increase of b units in the dependent variable, where b represents the value of the unstandardized or standardized regression coefficient. Violations of the assumption of linearity are likely to result in the distortion of beta weights in multiple regression analyses. In the present

study, plots of the predicted standardized residuals (X-axis) versus standardized residuals (Y-axis) were examined to determine whether a linear relationship existed between the variables under investigation. Patterns of residuals that did not appear to vary systematically were taken as evidence for the presence of a linear relationship between variables. The assumption of linearity was supported for all combinations of variables used in the present study's multiple regression analyses.

The homoscedasticity of error terms assumption stipulates that the degree of variability in a regression model's error terms (i.e., residuals) at a given value of X should remain relatively constant across all values of X. In the present study, homoscedasticity was evaluated through examination of the plot of the standardized residuals (Y-axis) versus the predicted standardized residuals (X-axis) for relevant combinations of predictor and dependent variables. Data points that were consistently scattered across all values of X were taken to reflect homoscedasticity of error terms, whereas data points that became less or more variable across levels of X were considered to reflect heteroscedasticity of error terms. Heteroscedasticity of error terms can reduce the strength of a statistical procedure but is unlikely to invalidate the procedure (Tabachnick and Fidell, 1996) unless the normality assumption is also violated (personal communication, D. Jackson, August 31, 2012). All of the present study's regression models evidenced at least some heteroscedasticity, likely as a result of the study's small sample size. Because these models' dependent variables were either normally distributed (as evidenced by skewness and kurtosis z -scores between - 2.0 and 2.0) or (in the case of the adapted PCIRS' Cognitive Stimulation scale for the BRAD condition) only mildly kurtotic (the variable's kurtosis z -score fell between 2.0 and 2.5), the decision was made not to alter or

exclude any of the heteroscedastic regression models but to interpret any findings relating to these models with caution.

The final multiple regression assumption is the independence of error terms. Similar in nature to the independence of observations assumption for ANOVA-based analyses, this assumption stipulates that the residuals from a multiple regression analysis should be unrelated to one another. As previously described, random sampling and the absence of systematic error in data collection procedures are two important mechanisms through which the independence of error terms assumption is satisfied. Methods used in the present study to satisfy the independence of error terms (i.e., observations) assumption were previously outlined (see “Between-Groups ANOVAs” section, p. 227).

Pearson’s r / Spearman’s ρ Correlations

The statistical assumptions for both Pearson’s r and Spearman’s ρ correlations include independence of observations and linearity. Pearson’s r correlations also require that the variables under investigation be normally distributed. The independence of observations and univariate normality assumptions were evaluated and deemed to have been met for relevant analyses (see the “Between-Groups ANOVAs” section, p. 227, and the “Multiple Regression” section, p. 230, for descriptions of these assumptions and how they were evaluated). It should be noted that the procedure for evaluating the linearity assumption involved the visual examination of scatter plots, rather than residual plots, of pairs of variables. While these scatter plots did not reveal any obvious linear patterns between pairs of variables, they also did not reveal any obvious nonlinear patterns. Weak linear patterns were treated as evidence for the *absence* of statistically significant relationships between pairs of variables, rather than as evidence for violations of the linearity assumption.

Mann-Whitney U/ Kruskal-Wallis H Tests

In general, the previously reviewed statistical assumptions do not apply to the Mann-Whitney U and Kruskal-Wallis H tests because these tests are nonparametric in nature. An important exception, however, is that the two nonparametric tests assume independence of observations. This assumption was previously described and evaluated (see the “Between-Groups ANOVAs” section, p. 227). While the two nonparametric tests do not assume that data are normally distributed across groups, they do assume that data patterns remain consistent across groups. In the present study, data to be analyzed using Mann-Whitney U and Kruskal-Wallis H tests (i.e., the proportions of internal locus attributions made by parents) were similarly distributed across groups.

VITA AUCTORIS

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