Addressing the Gender Gap:

Risk and Protective Factors Influencing Boys' and Girls' Academic Trajectories

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ABSTRACT

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Danielle Kingdon

We applied a risk and resilience perspective to the understanding of the gender gap in academic performance that emerges at the transition from elementary to secondary school among at-risk children. The goal was to determine: (1) the extent to which children's social-behavioural resources (including problem behaviours, attention, and social skills) at school entry explain these gaps; and (2) the role of parental school involvement in protecting against academic decline. Multiple-group latent growth curve analysis was used to compare the academic trajectories among 126 boys and girls from at-risk backgrounds. Children and their families were part of the Concordia Longitudinal Risk Project and were followed across four time points, from early elementary to the end of secondary school. Results revealed a decline in academic performance associated with the transition to secondary for all children; however, boys (who as a group had lower social-behavioural competencies than girls) experienced the greatest rate of decline. A protective effect of teacher rated parental involvement emerged. Teacher rated involvement predicted children's grades at the end of elementary school, although these effects were stronger for boys than girls. For boys only, teacher rated involvement exerted large protective effects against academic decline over time. In contrast, mother rated involvement was negatively associated with boys and girls' elementary school grades, but had no lasting impact on academic trajectories. Results suggest the protective

effects of parental involvement among at-risk populations may vary according to reporter and child gender.

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Introduction

Across Canada and the United States, the rates of grade retention, grade repetition, and high school dropout are about 1.5 times greater for boys than for girls (Statistics Canada, 2011; OECD, 2011). On average, girls build stronger relationships with teachers, receive higher school grades, have lower high school dropout rates, are more likely to continue onto higher education and are less likely than boys to be referred for remedial services (Birch & Ladd, 1998; Cappon, 2011; Coley, 2001; Duckworth & Seligman, 2006; Matthews, Kizzie, Rowley, & Cortina, 2010).

The achievement gap has received increased attention in recent years, with some researchers and popular news media declaring a "boys crisis" in education (Cappon, 2011; Globe and Mail, 2010; Mead, 2006). A careful analysis of these statistics reveals that the gender gap is small in most populations. However, there are subgroups of boys who show alarmingly poor outcomes. National data and current research indicate that the gender gap in academic achievement is pronounced in ethnic minority populations (Hefner, 2004; Klienfeld, 1998; Matthews, Kizzie, Rowley, & Cortina, 2010; National Center for Education Statistics [NCES], 2006) and in children coming from low socioeconomic (SES) backgrounds (Hinshaw, 1992; OECD, 2011; Mead, 2006). There is also some evidence suggesting that the gender gap widens at the critical transition from primary to middle/secondary school, the same time in which the long-term implications of academic performance increase (Entwisle, Alexander, & Olson, 1997; Buchmann,

DiPrete, & McDaniel, 2008). The transition from elementary to the next level of schooling is marked by changes in school context, family relationships, and developmental processes. In the context of these changes, academic performance often declines, and declines are more pronounced for children who are already struggling in school (Catterall, 1998; Eccles, 2004; Hill & Tyson, 2009). As a result, by secondary schooling boys (in particular ones from low SES families or minority backgrounds) are more likely than girls to receive poorer grades, be held back a grade, drop out of school, and require specialized education classes (Dauber, Alexander, & Entwisle, 1993; McCoy & Reynolds, 1999).

Although there are many statistics showing that boys from ethnic minority and low SES backgrounds are performing more poorly in school than their female counterparts, very little is known about how this gender difference emerges. In describing the female advantage, researchers have offered a variety of explanations ranging from biological differences in cognitive development and physical maturation to societal expectations for women, parenting, and the structure of the classroom learning environment (Duckworth & Seligman, 2006; Eccles, 2004; Maccoby, 1990). Another popularly accepted explanation, and the focus of the present study, is that differences in school behaviour (e.g., motivational, attentional and behavioural factors) contribute to the discrepancy (Duckworth & Seligman, 2006; Ready, LoGerfo, Burkam, & Lee, 2005). Relatively few studies to date have focused on identifying how these environmental factors and children's developing social, emotional, and behavioural competencies may explain observed gender differences in achievement across schooling. Recently, one group of researchers has begun to investigate the gender gap in ethnic minority (African

American) populations (Matthews et al., 2010). Yet, little research has investigated risk and protective factors that predict differing academic trajectories for boys and girls from low SES backgrounds (see Entwisle, Alexander, & Olson, 2007 for an exception), and none of this work has longitudinally followed children from school entry to secondary school.

Transitions, risk, and resilience. The transition between primary and secondary school has been established as a period of adversity in the academic lives of children (Catterall, 1998; Eccles & Midgley, 1989). The transition from primary school to the next level of education is marked by a number of changes including: the physical location and environment of the school; peer group composition; pedagogical style and expectations of teachers that increase demands for self-reliance and independence; and the onset of puberty, which leads to physical, social, and cognitive changes within the child (Eccles & Midgley, 1989). The transition typically involves a shift from familiar to unfamiliar contexts and task demands, thus it is not surprising that this period is marked by considerable uncertainty and potential stress.

Transitional periods are times of threat, but also present opportunities for change (Newman & Blackburn, 2002; Rutter, 1987). If the child possesses adequate coping resources and is exposed to a supportive environment that provides opportunities to learn and adapt to reasonable levels of risk, then a successful transition is likely. However, if the child does not posses the coping resources or a supportive environment, then the transition may result in negative outcomes. Under this theoretical framework, it is important to identify the risk factors, defined as the biological, environmental, and psychosocial threats, which increase the likelihood of a maladaptive outcome. Yet, it is

difficult to predict outcomes by examining risk factors alone. It is equally important to identify the protective processes or resources that work to counteract risks. Risk and protective factors interact in a dynamic process to influence whether an individual is resilient, or able to successfully cope with a period of adversity.

The purpose of the present study is to explore the related concepts of risk, resilience, and transitions in order to understand the academic trajectories of low-income boys and girls. is to identify the protective processes that reduce risk of academic failure at key turning points in schooling (i.e., the transition to high school).

Risk factors for low academic achievement. A broad range of behaviours and skills are required for a child to learn in school. Child attention, social skills, and lower levels of externalizing behaviour problems in the early school years have been identified as critical components for successful classroom functioning at school entry and are associated with higher academic achievement throughout all levels of school (Duncan et al., 2007; Howse, Lange, Farran, & Boyles 2003; Vitaro, Brendgen, Larose, & Tremblay, 2005). These social-behavioural skills have been found to be important factors in determining children's academic achievement for both boys and girls and in families from all socioeconomic status backgrounds (Duncan et al., 2007). Attentional skills such as task persistence and self-regulation increase children's ability to be engaged and profit from educational instruction. Externalizing behaviour problems, which are defined by conduct problems and aggression, cause disruptions in the classroom that inhibit academic achievement and are associated with school dropout (Hinshaw, 1992). Further, social skills are important for fostering positive child-teacher and peer relationships,

which are important for individual learning and classroom dynamics (Malecki & Elliot, 2002; Newcomb, Bukowski, & Pattee, 1993; Parker & Asher, 1987).

Gender and SES associations with social-behavioural skills are also well established. Researchers have reported gender differences in attentional, behavioural, and social skills in the early school years (before the emergence of the gender gap in achievement), with boys having more difficulties in these areas than girls (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006; Matthews Ponitz, & Morrison, 2009; McClelland, Morrison, & Holmes, 2000; Ponitz et al., 2008). Recent research suggests that boys' school-related difficulties (e.g., lower grades, dropping out of school) may stem from early behavioural difficulties (Entwisle et al., 2007). Further, a large body of research confirms that children from low SES families have higher rates of externalizing behaviour problems (and to a smaller degree, attentional problems) than children coming from families with higher income levels (Entwisle, Alexander, & Olson, 2005; Miech, Essex, & Goldsmith, 2001; Raver, 2004). The transition to secondary school is a period in which additional problem behaviours may arise, given the numerous changes that take place and children experiencing social-behavioural difficulties are more likely to experience a chaotic transition (Duchense, Larose, Guay, Vitaro, & Tremblay, 2005).

Taken together, boys from low SES backgrounds are at particularly high risk for social-behavioural difficulties, a difficult transition to secondary, and a sequalae of poor academic outcomes. Given this high degree of risk for low SES boys, it is clear that the identification of protective factors against low academic achievement is important for promoting positive change in their academic trajectories.

Parental involvement: A protective factor? Regardless of their level of financial resources, parents can foster their children's academic achievement by participating in their children's education. Parents can become involved in their children's education directly by assisting with homework and also by volunteering in the classroom, communicating with the teacher and school personnel, participating in academic-related activities in the home, communicating the positive value of education, and participating in the parent-teacher relationship (Hill & Taylor, 2004; Eccles & Harold, 1993). Although levels of parental involvement, as defined above, decline from elementary to secondary school (Eccles & Harold, 1993), early involvement has been identified as an important protective factor for academic achievement that exerts its effect across all grade levels (Crosnoe, 2001; Fan & Chen, 2001). There is also increasing evidence that involvement improves the academic outcomes of both high- and low-achieving students from across a variety of populations, no matter the level of parental education or SES background (Jeynes, 2003; Jeynes, 2005). Parental involvement is viewed by researchers as a means through which at-risk youth can receive additional supports.

Parental involvement in school has become central to most public efforts aimed at reducing the achievement gap between low and high SES children in North America (e.g., US Department of Health and Human Services, 2005; No Child Left Behind Act, 2001). Despite this large investment in encouraging parental involvement in school, most research has examined the main effects of involvement and has not yet moved to understanding how parents become involved in school and the children for whom involvement may be most beneficial. Given that some children are at greater risk than

others for poor school performance, researchers have reasoned that parental involvement may benefit at-risk children most (Jeynes, 2005; Eccles & Harold, 1993; Jeynes, 2007). Recently, researchers have begun to speculate that child gender may be important when considering the effects of involvement on academic performance (Pomerantz, Moorman, & Litwack, 2007). Because low SES boys are at particularly high risk for poor academic achievement, they might also particularly benefit from parental involvement in school. Citing evidence that girls have better self-regulation and success in school than boys (e.g., Duckworth & Seligman, 2006), Pomerantz and colleagues have suggested that girls have more academic resources and thus may benefit less from parental involvement than boys.

The hypothesis that low SES boys may benefit most from parental involvement is supported by the risk and resilience literature. Of critical importance in understanding risk and resilience is that multiple risk and protective factors are involved (see Rutter, 1987; Rutter, 1999). These risk and protective factors interact and their effects accumulate; reducing risk factors and increasing protective ones influences the degree to which the effects of adversity persist across development (Rutter, 1999). In addition, positive experiences are more likely to exert a protective effect if they directly counter or compensate for a given risk factor. For example, past research has shown that supportive relationships with teachers had the greatest academic benefit for disadvantaged students (Muller, 2001). Thus, for low SES boys who are likely to have poor social-behavioural skills, which are associated with lowered academic achievement, parental involvement in schooling may be critically important in buffering them against trajectories of declining achievement. By focusing attention on the resources students do have, risk is shaped into resilience.

Despite theoretical reasons suggesting that parental school involvement may be particularly important protective factors for boys, little research has been examined gender differences in involvement and whether they are related to gender differences in achievement. Although no studies examining the effects of parental involvement have incorporated gender as a central focus, recent meta analyses suggest that the effect size for parental involvement among minority groups is somewhat larger for boys (.62) than for girls (.52) (Jeynes, 2005). However, no research has explicitly investigated how parental involvement may be linked to the gender gap in achievement.

How and why parents get involved. The unfortunate reality is that the children who are most likely to benefit from parental involvement are the ones who are least likely to receive it. There is a high correlation between SES and parental involvement, as highly educated parents are more likely to value education, believe in the importance of parental support in education, and to feel equipped to work with the educational system (Hill et al., 2004). As a result, families from low SES backgrounds are less likely to be involved in their children's schooling than parents with higher SES status and it may be more difficult for these parents to positively influence their children's education.

Parental involvement may serve different purposes across sociodemographic backgrounds and according to child characteristics (Hill et al., 2004). Some research suggests that both low and high SES families may get more involved in schooling when their children are experiencing behaviour problems, but this involvement may have different implications for child outcomes (Hill, 2001). For example, involvement in the PTA and attending school events may have differential associations with children's academic achievement than frequent parent-teacher meetings because of child

misbehaviour. It is plausible that parents and teachers view this type involvement differently; while parents who are having frequent parent-teacher meetings due to child misbehaviour may rate themselves as being highly involved, teachers may not perceive this behaviour as exemplifying parental involvement. Thus, for some populations and from certain perspectives, high levels of involvement could signal problem child behaviour and be negatively associated with achievement outcomes (Hill et al., 2004).

Although parental involvement may signal problem behaviours in some instances, when parents do get involved in their children's schooling, children's academic performance improves over time. For example, experimental work by McNeal (1999) found that parental school involvement reduced problem behaviour at school (disruptive behaviours and off-task performance) and in turn, improved school performance. One proposed mechanism through which involvement may exert its effects on behaviour and academic achievement is by increasing parents' knowledge of school policies and behavioural expectations and their ability to shape school behaviour.

Current research has identified gender differences in academic achievement, parental involvement, and social-behavioural skills, with boys having fewer of these protective factors than girls (Duncan et al., 2007; Hill & Craft, 2003; Trzensiewski, Moffitt, Caspi, Taylor, & Maughan 2006). However, a number of limitations diminish our understanding of the developmental roots of boys' and girls' academic trajectories and the processes that impact these trajectories across key turning points in school (e.g., the transition to secondary). First, most research has only identified mean level differences in boys' and girls' functioning, yet mean level differences do not necessarily imply that the academic trajectories for boys and girls or the parenting processes linking

behaviour to achievement differ. In addition, no research has systematically considered how these associations differ by gender *and* SES. Given that low SES boys are at a double disadvantage for increased attentional, behavioural, and social problems, parental school involvement may have different associations with academic achievement for low SES boys than for low SES girls. No research has examined how parenting practices (i.e., school involvement) are related to boys' and girls' academic trajectories across the transition to secondary school and how the protective effects of parental involvement among low SES populations may vary according to reporter and child gender.

Second, these studies did not employ a sophisticated method to analyze developmental trajectories of gender differences in academic functioning. Most studies in this area are cross-sectional or only include two time points, making it impossible to statistically analyze the developmental roots of academic trajectories and how early elementary school functioning impacts adjustment to the transition to secondary school and beyond. In a recent study, we examined the factors that promoted success across the important transition from elementary education to the next level of schooling among at-risk children (Serbin, Stack, & Kingdon, under review). Using the same sample of children and some of the same measures as employed in the present study, results indicated the widely reported gender and socio-economic effects in school achievement appear to operate primarily via parenting practices and specific social and academic skill development. The present study builds upon this research by including an additional time point such that *trajectories* of boys' and girls' academic performance from early elementary to the end of secondary can be examined.

The current study. In the present study we trace the academic trajectories of boys and girls over 9 years (four time points), from early elementary to the end of secondary school, and use a statistical technique – the multiple-group latent growth curve model (LGM) – that allows us to identify: (1) the different academic trajectories of boys and girls from low SES backgrounds that may emerge in development, and (2) the risk and protective factors contributing to differing academic trajectories, focusing on the specific predictive patterns for each gender. LGM is one of the best methods for answering questions about how, when and why individuals change over time and is becoming one of the analytic strategies of choice for developmental scientists (Ram & Grimm, 2007). Using a structural equation modeling approach, LGM reflects individual differences in growth trajectories through latent growth factors that estimate initial status (intercept factor) and rate of change (slope factor). By incorporating multiple-group analysis into LGM, researchers are able to compare different developmental trajectories and examine how the effect of exogenous predictor variables in predicting these trajectories is moderated by group membership (Curran & Bollen, 2006). Thus, LGM is a powerful approach to analyzing longitudinal data that goes beyond mean level differences in the skills of boys and girls to understand the differing trajectories of boys and girls, as well as the predictors that are important for describing change in these trajectories.

LGM models are much more flexible and appropriate for answering questions about developmental change than are traditional longitudinal analytic methods (e.g., repeated measures analysis of variance, multivariate analysis of variance, raw and residualized change scores). LGM can include partially missing data, unequally spaced

time points, complex nonlinear shapes of growth, time-varying covariates and multiple growth processes (Curran, Obeidat, & Losardo, 2010). All of these issues arise routinely in longitudinal research, but pose significant challenges to traditional longitudinal analytic approaches. Importantly, LGMs are characterized by much higher levels of statistical power than comparable traditional methods when applied to the same data (see Muthén & Curran, 1997).

There were two questions investigated in this study. First, we wanted to verify the at-risk nature of the sample and the impact of cumulative risk on academic performance. Academic achievement is conceptualized as a cumulative process in which early learning experiences build the foundation upon which a child's academic trajectory is constructed. Thus, children who have fewer academic and social-behavioural skills early in their academic careers are likely to experience increasing failure with time (Rutter, 1996). Further, transition periods, such as the transition from elementary to the next level of schooling (in this case, secondary school) pose a particular challenge to children who are already struggling in school (Benner, 2011). The first research question was designed to test whether children from an at-risk sample will, on average, demonstrate a decreasing trajectory of academic performance. In addition, we wanted to empirically validate whether the transition to secondary school magnified this effect.

Second, we wanted to determine whether trajectories of academic performance differed for boys and girls from an at-risk population and to identify risk and protective factors predicting these trajectories. Prior research has indicated that a range of social-behavioural variables influences academic achievement, including social skills, externalizing problem behaviours, and attentional skills (Duncan et al., 2007) and that

boys and girls differ in their acquisition of these skills (Matthews et al., 2009). The study was designed to examine the extent to which these social-behavioural factors explained gender gaps in academic performance from early elementary to the end of secondary. We hypothesized that boys would display more externalizing and attentional problems, which would contribute to their lower academic performance. We hypothesized that girls would not exhibit these externalizing and attentional problems and instead, would have greater social skills, which would protect them from academic underperformance. We hypothesized that gender differences social-behavioural skills would be evident at the beginning of elementary school, but the gender gap in academic trajectories would emerge at the transition to secondary school, a key turning point in the academic lives of children where pre-existing risk factors and coping resources would activate to bring about changes to developmental trajectories.

A central hypothesis of the present study was that parental involvement in schooling would exert a positive impact on all children's academic performance, beginning in elementary school. However, for children who are most at-risk for poor academic performance (i.e., boys in our at-risk sample), parental school involvement would act as a particularly important buffering factor against academic decline. We also examined whether mothers' or teachers' report of involvement was a more important protective factor again academic underperformance and whether this pattern differed for boys and girls. Further, we expected that these early social-behavioural and parenting differences would exert a continuing and lasting impact on the academic trajectories of boys and girls. That is, children who begin school with fewer skills and competencies

would face increasing challenges across the school years, resulting a widening of the achievement gap.

Method

Participants

The original sample. The children and their families are part of the Concordia Longitudinal Risk Project (Concordia Project), a large, prospective, intergenerational community-based research project that examines the processes that are associated with positive versus negative social and health outcomes across the life course of at-risk families. The original sample included over 1770 elementary-school French-speaking children living in predominantly lower income neighborhoods of Montreal in 1976–1978. The original participants, and their families, have been followed since that time via archival records of health, educational, social services and criminal offenses. Smaller but representative subsets of the participants have been screened at approximately 3-year intervals on observational and interview-based measures, and questionnaires on health, educational, social and occupational functioning. The individuals who participated in the original wave of the Concordia Project have now reached adulthood, providing the opportunity to study parents and their offspring in order to understand the intergenerational transfer of risk via parenting and environmental stress. For a more detailed description of the project, please refer to Serbin et al. (2011).

The current sample. A representative sub-sample of 126 participants who had children (55 boys) in the second cycle of secondary schooling (i.e., equivalent in the Quebec system to grades 9 to 11, mean age = 16.53 years, *SD* = 1.44) participated in the current study. Selection criteria included participation in previous waves of testing at

approximately 3-year intervals since early childhood, having a child of the appropriate age or grade level at the time of this phase of the longitudinal study, and living within a 2-hour travel radius from our laboratory. Approximately 91% of invited families participated, and these families did not differ from those who did not participate in terms of demographics, family income, or other characteristics. Families were of Caucasian descent, spoke French at home, and the children attended French language schools.

In terms of demographics, families in the current sample fell below population averages on several measures of social and economic functioning. At the time they gave birth to their first child, the mean age of mothers was 25.02 years (Range = 17.43 to 36.84; *SD* = 3.23). Sixty-seven percent of these women had their first child below the age of 26.4 years, the mean age at first childbirth for women in Quebec for that same period (Institut de la statistique du Québec, 2004). When they entered elementary school 28% of children were living with only one biological parent (almost always their mother), increasing to 43% of the children at the end of elementary school. Regarding marital status, 17% of mothers were raising their children alone at the time they entered elementary school; 42% of mothers were cohabitating with a partner and 41% were married. At the end of elementary school 24% of mothers were raising their children alone; 33% of mothers were cohabitating with a partner and 43% were married. Mothers' mean years of education was 12.11 years (*SD* = 2.31) and ranged from 6 to 18 years of education.

When the children entered elementary school, families had a median annual income of $42,050 CND (SD = $25,414) (equivalent to $28,022, SD = $17,199, U.S.D at that time). This was well below the median family income in Quebec and across Canada

($50,242 and $55,016 respectively; Statistics Canada, 2010). Approximately 65% of families in this sample had a family income below the Canadian median. To measure the economic strains faced by families in our study, we adopted the well-recognized 'relative' measure of poverty (OECD, 2008). We identified families living in poverty (50% or less than the Canadian median income), acute poverty (having an income 30% or less of the median income of Canada) and families living in near-poverty who are vulnerable to falling below the poverty line (having an income between 50% and 75% of the median). In this sample, 28% of families were living in poverty (with 14% of these families living in acute poverty) and an additional 22% of families were living in near-poverty. In other words, this was a lower income sample on average, but with considerable variability allowing us to explore the effect of family resources across a wide range of income. Given their relatively low social and economic functioning, we considered this to be an at-risk sample.

Design

Children and their families were followed across four time-points for the present study. At Time 1 (1999-2003), children had entered elementary school (Primary Cycle I in the Quebec system, grades 1 - 2; ages 6 - 9; M = 7.68 years, SD = .95), at Time 2 (2003-2005), children were in the final years of elementary school (Primary Cycle III; grades 5 - 6; ages 9 - 12; M = 10.91 years; SD = .96), at Time 3 (2005-2009), children had begun secondary school (Secondary Cycle I; grades 7-8; ages 12-15; M = 13.79 years, SD = 1.27) and in the final wave of data collection, at Time 4 (2010-2011), children had transitioned into the final years of secondary school (Secondary Cycle II; grades 9 - 11; ages 15-18; M = 16.53 years, SD = 1.44).

Measures

Family resources. Also at Time 1, mothers' level of education and yearly family income were assessed. Mothers reported the final level of education obtained in years and their family income for the past year, in Canadian dollars. Yearly family income was computed into a 10-point scale. 1 = $0-10,000; 2 = $10,001-20,000; 3 = $20,001-30,000; 4 = $30,001-40,000; 5 = $40,001-50,000; 6 = $50,001-60,000; 7 = $60,001-70,000; 8 = $70,001-80,000; 9 = $80,001-90,000; 10 = $90,000 and above.

Children's characteristics. To measure individual differences in behavioural adjustment we administered the CBCL, teacher format (Child Behavior Checklist TRF/6-18; Achenbach, 1991) at Time 1. In the present study, the T-scores from the Externalizing Problems (assesses rule-breaking behaviour and aggression) and Attention scales (assesses inattention and hyperactivity-impulsivity), which are normed by age and gender, were examined. These were selected because the literature suggests that they are critical to academic performance that may be linked to sex differences in school performance, as described above. The reported internal consistency of the Externalizing Problems and Attention scales is excellent (α = .94 and α = .84, respectively, for all age and gender groups; Achenbach, 1991).

To assess differences in children's social skills, the Social Competence Scale—Teacher (SCT; Gifford-Smith, 2000) was administered at Time 1. The SCT includes 25 items assessing competency across three primary areas—academic behaviour, prosocial skills, and emotional regulation. The Prosocial/Emotional Regulation Skills scale was used in the present study. This scale assesses prosocial behaviour such as the degree to which the child "acts friendly toward others," "works well in a group," "listens to others'

points of view," as well demonstrates emotional regulation skills such as "can calm down when excited or wound up," "plays by the rules of the game," and "shares materials with others." Teachers rated how well children exhibited these social behaviours on a 5-point scale, ranging from 0 to 4, with higher scores reflecting greater social skills. The reported internal consistency of the Prosocial/Emotional Regulation Skills is excellent (α = .97; Conduct Problems Prevention Research Group, 1995). The SCT was selected in place of a measure that only assessed interpersonal problems (e.g., the CBCL Social Problems subscale) because it captures a wide range of social skills that are important for individual learning and functioning well in a classroom/group dynamics.

Mothers' school involvement. Given the importance of assessing parental involvement from multiple perspectives (Hill et al., 2004; Kohl et al., 2000; Reynolds, 1991; Stevenson & Baker, 1987) ratings of involvement were obtained from both mothers and teachers. Teachers and mothers rated mother's involvement in her child's schooling during Time 1 (school entry; grades 1-2) using an adapted version of the Parental-Teacher Involvement Questionnaire (PTIQ; The Conduct Problems Prevention Research Group, CPPRG, 1991). There are multiple dimensions of school involvement, including overt school-based involvement, cognitive-intellectual involvement in the home, and perceived value of education (Hill & Craft, 2003). Both teachers and mothers rated mothers' school involvement on these dimensions by reporting the extent to which mothers participated in school activities, participated in PTA meetings, met with teachers to discuss her child's progress, promoted school success in the home, the quality of the parent-teacher relationship, and the perceived value they placed on education (see Table 1 for items on the mother and teacher questionnaires). Questions were rated on a 4-point

scale, with higher values indicating higher levels of involvement. Items were averaged to create a mean score of maternal involvement that ranged from 1 to 4. The reported internal consistency for both the original PTIQ mother and teacher report measures are excellent (α = .91 among high-risk groups; CPPRG, 1991).

Because the items on the involvement measures reflecting the teacher's report and the mother's report were nearly identical, we were able to directly compare which perspective was useful in predicting the academic trajectories of boys and girls. Some research has suggested that in normal populations, parents' and teachers' report of involvement are only modestly intercorrelated, but both are uniquely related to student achievement (Reynolds, 1991). Given that parents from low SES backgrounds face barriers to school involvement, we were interested whether mothers and teachers report of involvement were uniquely or differentially related to children's academic trajectories.

Table 1. Parent-Teacher Involvement Questionnaire (Mother and Teacher Report)

	Mother Report	Teacher Report
Participation in school activities	How often do you participate in school events, such as shows, outings, fundraisers, volunteer work? How often do you participate in the parents' association and/or school administration?	How frequently do the parents of the child participate in school events such as entertainment, outings, fund-raising, volunteer work? How frequently do the parents of the child participate in the parents' association and/or the school administration?
Parent-teacher contact	How often do you attend parent-teacher meetings between to discuss your child's progress?	How frequently do the parents of the child participate in parent-teacher meetings between to discuss the progress of the child?
Education supported at home	How often do you perform each of the following at home? Helping your child with homework. Reading with your child or playing educational games.	To your knowledge, how often do the parents of the child provide efforts to promote the success school for their child, for example helping the child with homework and lessons, reading with the child, or playing educational games?
Quality of the parent-teacher relationship	You feel that your opinions and your contribution to your child's schooling are recognized by the school and the teacher. [Rate your agreement with this statement].	You feel that these parents are receptive to your comments and suggestions and are interested to applying them. [Rate your agreement with this statement].
Importance of education	In your opinion, post-secondary education is essential to getting a good job. [Rate your agreement with this statement].	In your opinion, these parents see education as a core value. [Rate your agreement with this statement].

Academic performance. End of year report cards were obtained from the administrator of each participant's school at each successive time point: Time 1 (school entry), Time 2 (end of elementary), Time 3 (early secondary), and Time 4 (end of secondary). Grading systems differed between schools and school boards (most used letter grading; some used percentages); therefore we created a standardized system of classification so that children's school marks could be directly compared. We coded scholastic marks according to the extent to which they met grade-level expectations: 1 = does not meet expectations for grade-level (D); 2 = partially meets expectations (C); 3 = fully meets expectations (B); 4 = surpasses expectations (A). For the outcome measure, a score from 1 to 4 was assigned for children's report card marks in French (Language Arts; reading, writing, oral expressive and receptive language), Math, Humanities/Social Studies, Science, and English (second language) from one academic year. These scores were averaged to generate a mean score for each child.

Procedure

Informed consent and demographic information (educational attainment, occupation, income, marital status, family structure) were obtained during a telephone interview at each of the four phases of data collection. At Time 1, parents and teachers completed questionnaire-based measures of children's health, social, behavioural and educational functioning, and also of parental involvement with schooling. Families and children were compensated with a nominal honorarium (family) and small gift (child). Children's final report card marks for the year were obtained at the end of the school year.

Statistical Analysis

For the present study, LGM was used to examine change in academic achievement over time and to examine the effect of inattention, externalizing problem behaviours, social skills, and maternal school involvement (both mothers' and teachers' report), on boys' and girls' academic achievement from school entry until the end of high school. Family resources, in particular mother's level of education and yearly family income, were included as controls in the analysis. The relationship of these variables to the intercept (Time 2; late elementary academic achievement) and slope (linear change in academic achievement over time) were estimated. We selected to define the intercept at Time 2, rather than Time 1, as we were interesting in examining which variables were important contributors to boys' and girls' grades before the transition to secondary, when academic performance is known to decline and the gender gap emerges. Further, by defining the intercept at Time 2, we eliminated problems related to shared rater variance (i.e., social-behavioural skills and parental involvement were rated by teachers at Time 1, and grades at Time 2 were assessed by *different* teachers).

There were two questions investigated in this study. First, we wanted to know what growth shape best describes the mean developmental trajectory of academic achievement over time. Because this initial model included no predictors, it was referred to as an unconditional model.

Second, we wanted to determine whether trajectories of academic performance differed for boys and girls from an at-risk population and to identify risk and protective factors predicting these trajectories. Multiple-group analysis was used to examine differences across gender in initial levels of academic performance, changes in academic performance over time, and the predictive strength of child social-behavioural, parenting,

and demographic variables. This approach was used rather than including gender as a covariate of the LGMs because the covariate approach imposes strict assumptions regarding the equality of model measurement across gender (e.g., equal intercept and slope factor means, variances, residual variances, and covariances) and structure (e.g., equal predictive relations between the predictor variables). The multiple-group framework imposes no assumptions on measurement equality and allows the relations among variables to differ across gender, rather than only testing for mean differences. Importantly, the multiple-group framework systematically includes tests of gender differences in all analyses by modeling whether there is an interaction between gender and the independent variables in the prediction of academic trajectories. For example, we were able to estimate whether the magnitude of the relation between involved parenting varies for boys and girls. Because this model included predictors, it was referred to as conditional model.

Missing data. As with most longitudinal research, a degree of missing data were present in this sample across the four time points. The data reflected increasing missing data over time due to attrition. All observations were included in the analysis, using the Full Information Maximum Likelihood (FIML) approach of Mplus. Unlike listwise and pairwise deletion, which can result in biased parameter estimates due to nonrandom attrition, FIML treats data as missing at random (MAR) and uses all the data available in the dataset to generate parameter estimates (Arbuckle, 1999). Under FIML, the growth model is estimated by adding the individual contributions to each case and cases with a larger proportion of data points are weighted more heavily than observations with fewer data points. The Little's MCAR test resulted in a chi-square = 1073.17 (df = 933; $p < .05$),

which indicates that these data were not missing completely at random and FIML was appropriate for the data set. FIML estimates are less biased than other methods, do not require large sample sizes, and are the recommended approach for structural equation modeling analysis using incomplete data (Arbuckle, 1999; Schafer & Graham, 2002; Wothke, 2000). Covariance coverage for the measurement models ranged from .39 to 1.00, exceeding the minimum covariance coverage of 0.1 recommended for model convergence.

Testing model fit. All models were estimated via Mplus Version 5.1 (Muthén & Muthén, 1998). Model fit was assessed by examining the chi-square statistic test, which indicates whether there is a significant difference between the sample means and variance-covariance structure and those implied by the hypothesized a prior model. Good-fitting models yield nonsignificant chi-square goodness-of-fit tests. Because the chi-square index is highly sensitive to sample size, we considered three other fit indexes, which are relatively independent of sample size in conjunction with the chi-square statistic, including: Tucker-Lewis Index (TLI; Tucker & Lewis, 1973); comparative fit index (CFI; Bentler, 1990); and the root mean square error of approximation (RMSEA; Brown & Cudeck, 1993). The TLI, CFI and RMSEA take into account model complexity, which is an important consideration when comparing several alternative models with different degrees of complexity. TLI and CFI values greater than .95 indicate good fit, and values between .90 and .95 indicate adequate fit (Hu & Bentler, 1999). Generally, RMSEA valued less than .05 are considered to indicate good fit, values between .05 and .08 indicate adequate fit, and values larger than .10 indicate poor fit (Browne & Cudeck, 1993).

Sample size. Although a number of rules of thumb have been proposed regarding the necessary sample size for LGM models, no one-size–fits-all rule applies. The sample size needed for a particular study depends on factors such as distribution of the variables, amount of missing data, reliability of the variables, effect sizes, and number of assessment points (Muthén & Muthén, 2002). Recent Monte Carlo simulation studies have shown that LGMs with characteristics similar to the present study (i.e., four assessment points, a degree of missing data, medium effect sizes) hold up well with relatively small *Ns* (e.g., in the 100-250 range; Muthén & Muthén, 2002). In LGM analysis, the inclusion of predictor variables increases the power to detect individual variability in the intercept and slope growth factors. Thus, the present analysis has sufficient power to model trajectories for boys and girls and to examine predictors of growth and change.

Results

Descriptive Statistics

Descriptive statistics and independent samples *t*-tests confirmed the existence of an achievement gap between boys and girls in this at-risk sample. Table 2 displays univariate descriptive statistics (mean scores and standard errors) for the predictor variables measured at Time 1, as well as the outcome variable measured at Time 1, Time 2, Time 3, and Time 4. Skewness and kurtosis of the observed variables were minimal and thus no power transformations were required.

The gap in academic performance was observed between boys and girls from the beginning of school entry through the end of high school, intensifying after the transition to high school. At Time 1, school entry, girls were outperforming boys by .10 points (on

a 4-point scale) and at Time 2, end of elementary school, girls were outperforming boys by .07 points, although these differences were not statistically significant. After the transition to secondary school, the school grades of both boys and girls declined sharply and the performance gap between boys and girls widened. At Time 3, the beginning of secondary school, girls were outperforming boys by .43 points ($p < .001$) and by Time 4 at the end of secondary school the performance gap had widened further such that girls were outperforming boys by .54 points ($p < .001$). At the end of secondary schooling, on average girls were performing at the expected level ($M = 2.42$) but boys were performing far below expectations ($M = 1.88$) (see Table 2).

Table 2. Descriptive Statistics and Independent Samples *t*-tests

	Boys			**Girls**			**Independent samples *t*-tests**			
	Mean	SD	% Missing	Mean	SD	% Missing	*t*-test statistic	df	*p* value	Cohen's *d*
Outcome Variables										
Time 1 grades	2.73	0.73	5%	2.83	0.72	15%	0.76	124	0.44	0.14
Time 2 grades	2.80	0.47	22%	2.87	0.52	21%	0.78	124	0.44	0.14
Time 3 grades	**2.10****	0.58	22%	**2.53****	0.59	34%	**4.09****	124	**0.00**	**0.74**
Time 4 grades	**1.88****	0.47	53%	**2.42****	0.58	44%	**5.62****	124	**0.00**	**1.01**
Predictor Variables										
Mother's education	12.02	2.32	0%	12.18	2.29	0%	0.39	124	0.70	0.07
Family income	4.55	2.36	0%	4.63	2.23	0%	0.19	124	0.85	0.03
Child inattention	58.96	9.64	20%	56.03	9.07	17%	1.58	101	0.12	0.31
Child externalizing problems	**57.89***	11.35	20%	**53.45***	8.00	17%	**2.33***	101	**0.02**	**0.46**
Child social skills	58.68	18.77	18%	63.06	18.81	20%	1.17	100	0.25	0.23
Involvement - teacher's report	2.12	0.49	18%	2.21	0.40	17%	1.03	102	0.31	0.20
Involvement - mother's report	2.09	0.36	7%	2.10	0.41	6%	0.14	116	0.89	0.03

Note. Estimated sample statistics from the final conditional model using FIML. In accordance with FIML procedures, missing values on the outcome measures were estimated, but missing values for the predictor variables were not estimated. Thus, degrees of freedom for the outcome measures reflect an imputed full sample, while degrees of freedom for the predictor variables reflect the number of observations. As data collection for Time 4 was still in progress at the time these analyses were conducted, missing data at Time 4 reflects participant attrition as well as data that have not yet been collected. ** $p < .01$; * $p < .05$.

In terms of the exogenous predictor variables, at school entry, boys were rated by their teachers as significantly higher than girls on measures of externalizing behaviour. Approximately 23% of boys were rated by their teachers as having externalizing problems that fell within the Borderline or Clinically significant range, compared to 7% of girls. Boys were also rated by their teachers as having greater attentional problems, although this effect did not reach statistical significance (p = .12). In terms of attentional difficulties, 27% of boys ranked within the Borderline or Clinically significant range, compared to 12% of girls who fell in this range. Girls were rated by their teachers as having greater social skills, although this effect was also not statistically significant. There were no significant differences between girls and boys in levels of education or family income. Finally, there were no significant gender differences in level of maternal involvement from the mother's report, or the teacher's report. In sum, these statistics revealed gender differences on the outcome measure (academic performance) as well as on the social-behavioural variables, indicating a need for multiple-group analysis to model the differential trajectories for boys and girls. The zero-order correlation matrix for all variables used in the analysis are presented in Table 3.

Table 3. Correlation matrix for all variables used in the analysis

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Time 1 grades											
2. Time 2 grades	.52**										
3. Time 3 grades	.38**	.41**									
4. Time 4 grades	.42**	.68**	.73**								
5. Mother's education	.27**	.37**	.24**	.33**							
6. Family income	.11	.23*	.14	.17	.48**						
7. Child inattention	-.47**	-.39**	-.21*	-.36**	-.28**	-.07					
8. Child externalizing problems	-.27**	-.30**	-.25**	.37**	-.15	.05	.60**				
9. Child social skills	-.09	.10	.04	.03	-.14	-.00	.11	.29**			
10. Involvement - teacher report	.43**	.23*	.22*	.31**	.40**	.09	-.37**	-.39**	-.19*		
11. Involvement - mother report	.01	.01	-.08	.09	.09	.09	-.04	-.20*	-.12	.30**	
12 . Child gender (female)	.07	.12	.29**	.47**	.04	.02	-.14	-.19*	.10	.10	.01

** $p \leq .01$; * $p \leq .05$. n =126

Unconditional Latent Growth Model

We first estimated an unconditional latent growth model (omitting the predictor variables) to establish the growth function that best captured achievement growth. This permitted the examination of the average growth trajectory as well as the presence of individual variability around the average growth parameters. This also helped us test our first hypothesis: students in our at-risk sample will demonstrate decreasing academic performance over time, with the decline increasing in magnitude across the transition to secondary schooling (i.e., from Time 2 to Time 3).

We began by estimating a linear model with all the time-specific residual variances set to be equal over time, which resulted in poor model fit (χ^2 (5) = 41.90, p < .001; CFI = 0.65; TLI = 0.58; RMSEA = .24). We next tested the improvement in model fit with the inclusion of a quadratic latent curve factor to capture potential nonlinearity over time. In estimating the quadratic model, multiple estimation problems were encountered including negative variance estimates and nonconverged solutions, indicating that the model was a poor representation of the observed data. The model did not result in a significant improvement in model fit and was not retained (χ^2 (1) = 21.64, p < .001; CFI = 0.80; TLI = -0.18; RMSEA = .41). Poor fit of the "default" linear and quadratic growth factors and examination of graphical displays pointed to a non-linear growth pattern not captured by traditional functions. Thus, growth functions in which some time loadings are freely estimated were explored (see Meredith & Tisak, 1990).

Given the poor fit when predetermined time values were selected to model the shape of growth, a latent basis growth model was selected (Meredith & Tisak, 1990). A latent basis growth model is an appropriate choice for a developmental process where the

yearly intervals may not reflect the developmental rate. As such, time is "stretched" or "shrunk" to the pattern of the data to produce a model in which developmental time is more important than chronological time (Curran & Hussong, 2003). In our model the first time point was freed, the second time point was fixed at 0 (the intercept), the third time point was fixed to 1, and the final time point was freed. The latent basis growth model allowed us to capture all the nonlinear aspects of intraindividual change through a single growth factor. This model requires fewer degrees of freedom than a quadratic slope and has the advantage of providing easier model parameter interpretation and explanation of nonlinear changes. Because there was no significant differences in the mean grades between Time 1 and Time 2, we selected to fix the intercept at Time 2 so we could understand the effects, relationships, and individual differences that emerge at the beginning of the growth process (i.e., to understand the marked decline in grades that begins from Time 2 to Time 3). This model resulted in significant improvement in model fit (χ^2 (3) = 13.17, $p < .001$; CFI = 0.90; TLI = 0.81; RMSEA = .16).

We then tested the adequacy of the equal residual variances over time and found that there was a significant decrement in model fit associated with this restriction. We removed this restriction and allowed the residual variances associated with grades measured at Time 2 and Time 3 to be freely correlated, which allowed for estimation of a common omitted cause (e.g., the transition from elementary to secondary school). By lifting the restriction of equally correlated residual variances, we allowed for covariance in random error between Time 2 and Time 3 grades. This resulted in a significant increase in model fit and was retained as the final unconditional model (χ^2 (2) = 1.72, p = .42; CFI = 1.00; TLI = 1.01; RMSEA = .00).

Results from the unconditional model revealed the mean intercept level of academic performance was 2.84 and the mean slope was -0.51, indicating that at Time 2, children's grades ranked at 2.84 (on a 4-point scale) and fit a trajectory of decreasing performance. The coefficients of the intraindividual change vectors were estimated to be at [0.10, 0, 1, 1.33], reflecting the nonlinear pattern observed in the means. There was no significant change in grades from Time 1 to Time 2 ($p = .42$), but significant change in grades from Time 2 to Time 3 ($p < .001$) and from Time 3 to Time 4 ($p < .001$). When interpreted as percentages of the total amount of growth, these change coefficients indicate an intraindividual change pattern characterized by stability during the first two time points, followed by a 133% decrease in growth over the next three time points. These results indicate a decreasing trajectory of grades beginning at Time 2, but that the magnitude of this decrease slows from Time 3 to Time 4. The intercept variance (Time 2) was significant ($\Psi = .19$, $p < .001$), indicating that there were significant individual differences in grades at Time 2. The slope variance was not significant ($\Psi = .04$, $p = .33$), indicating nonsignificant individual difference in the rate of change over time (i.e., children experienced the same decreasing growth trajectory).

The results confirmed our first hypothesis; students demonstrated decreasing academic performance over time, and that the rate of change did not correspond directly to the passage of time (i.e., was nonlinear). In particular, the magnitude of the decline was largest across the transition to secondary schooling (i.e., from Time 2 to Time 3). Further, there are potentially important individual differences in these nonlinear trajectories.

Multiple-Group Model

After finding the optimal model that explained the full sample's growth trajectory, we wanted to model differences in the academic trajectories of boys and girls. The model was first fit to boys and girls separately, and then simultaneously in the same model, as recommended by Duncan and Duncan (2004) and Bollen and Curran (2006). Nested model comparisons conducted separately for boys and girls indicated than the latent basis growth curve model with time scores at Times 1 and 4 freely estimated (i.e., Time 1 freely estimated; Time 2 fixed at 0, Time 3 fixed at 1, Time 4 freely estimated) and with correlated residual variances for Time 2 and Time 3 grades best fit the data for both boys and girls (boys: χ^2 (2) = 2.81, p = .83; CFI = 1.00; TLI = 1.20; RMSEA = .00; girls: χ^2 (2) = 2.52, p = .28; CFI = 0.99; TLI = 0.98; RMSEA = .06). See Figure 1 for the observed individual means of the latent basis growth curve for boys and girls.

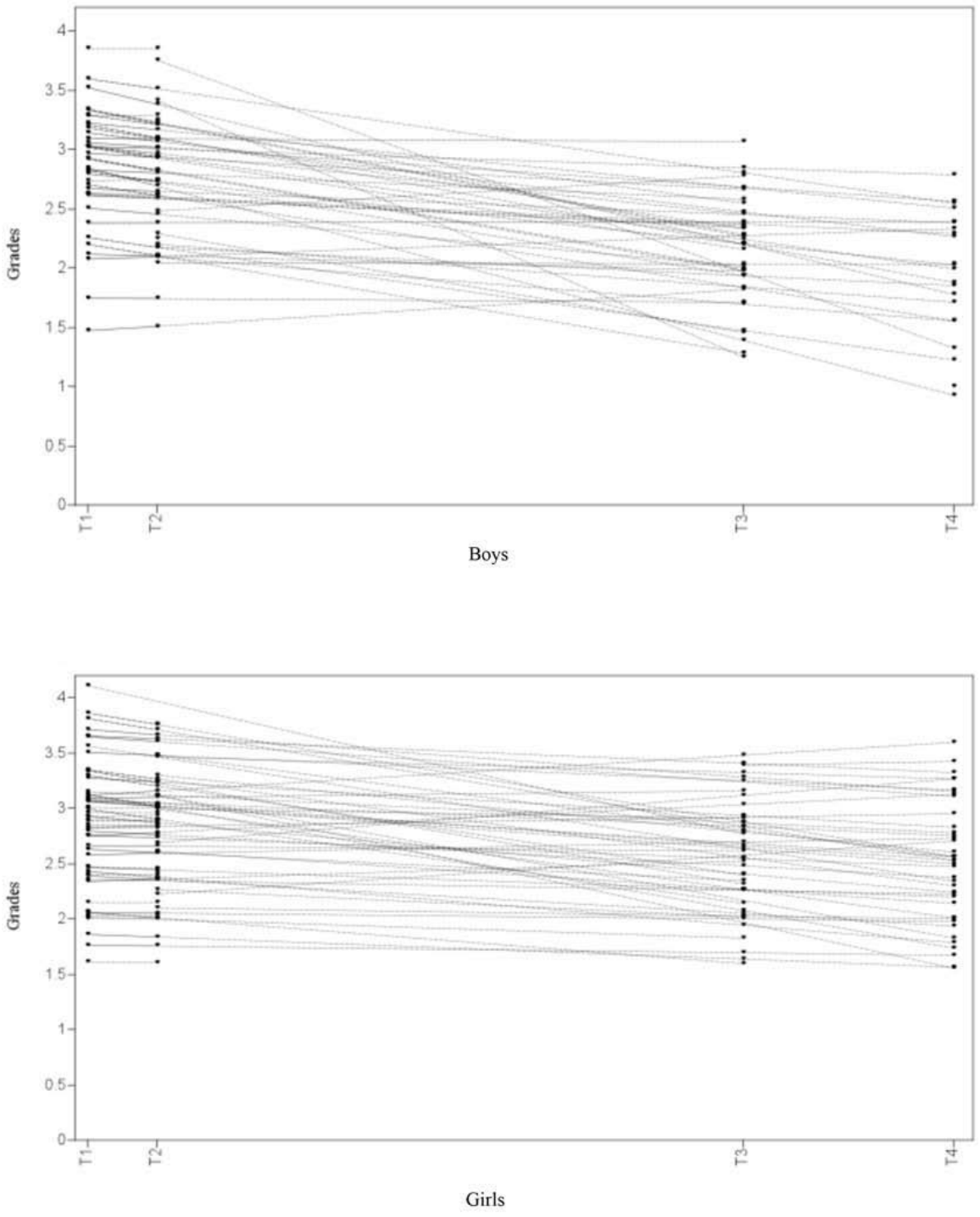


Figure 1. Observed individual means for the latent basis growth curve, across groups (boys and girls). Time scores were freely estimated, separately for boys and girls.

Next, we examined whether the measurement model was equal for boys and girls. Multiple-group analyses were conducted with increasing restrictions placed on the model parameters. Equality of models across gender was tested using the chi-square difference test, with nonsignificant differences between the models indicating that the more restrictive model fit the data just as well as the less restrictive model. Differences in degrees of freedom reflect the number of parameters estimated freely across the groups and thus provides a test of whether there are significant differences among the groups with respect to these parameters. In addition to considering chi-square difference tests, we also considered the quality of fit measured by the CFI, TLI, and RMSEA. If the constraint did not result in a significantly worse fit over the base model, the parameter was considered to be equal for both genders. After each parameter of interest had been tested individually, all constraints that did not result in significantly worse model fit were tested simultaneously against the base model.

Model 1, in which all parameter estimates were allowed to vary across gender resulted in good model fit and provided significantly better fit than Model 2, in which intercept and slope means and variances were constrained to be equal across groups. In order to identify how males and females differed, we conducted four nested model comparisons in which we constrained: the intercept mean (Model 2a); the intercept variance (Model 2b); the slope mean (Model 2c); the slope variance (Model 2d). Only the model in which all the parameters but the slope mean were free to vary across gender did significantly differ from Model 1. Therefore, the model in which the slope mean was allowed to vary across groups and the intercept mean and variance and slope variance were constrained to be equal was retained as the final measurement model (Model 3).

The final measurement model fit the data well (χ^2 (9) = 8.30, p = 0.50; CFI = 1.00; TLI = 1.00; RMSEA = 0.00). This analysis provides strong evidence that the mean of the intercept and the variances for the intercept and slopes are equal, but with differences in the mean of the slope (i.e., the mean rate of change), which necessitates the use of multiple-group analysis. See Table 4 for the comparative fit indexes for the multiple-group models.

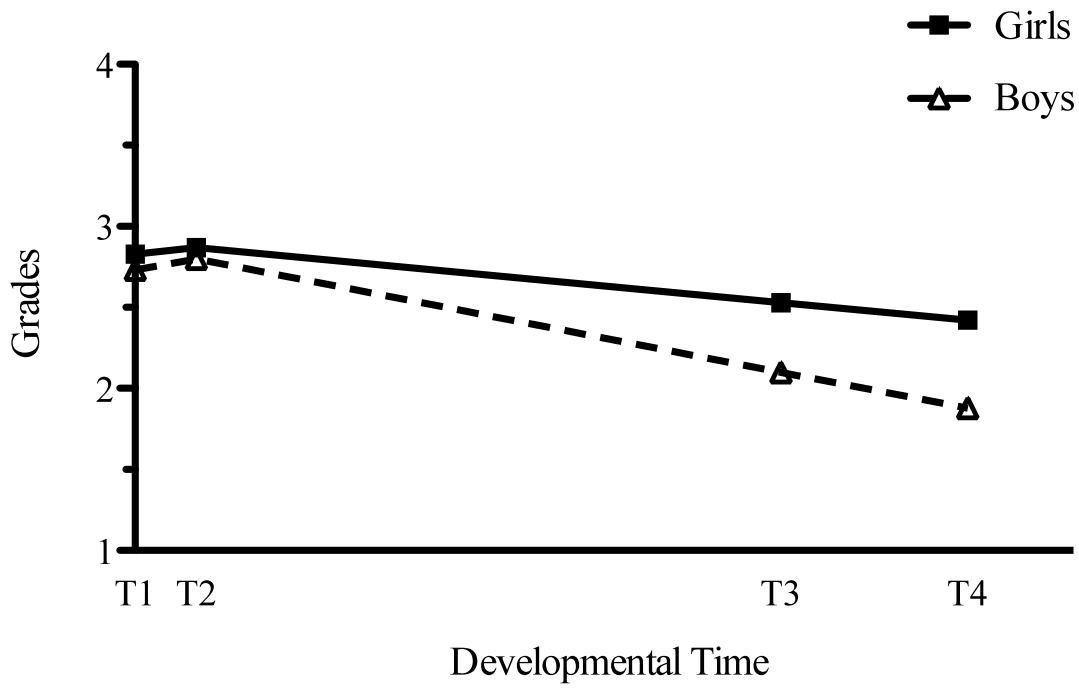
The model estimated means for the final measurement model for boys and girls, fit simultaneously, are presented in Figure 2. Boys and girls exhibited a similar trajectory, although across all time points, girls were outperforming boys. Boys and girls did not differ in their initial level of academic achievement, however their rate of change did significantly differ. There was no significant change in academic performance between early and late elementary school (Time 1 and Time 2) for boys and girls. After the transition to secondary school (Time 3), both boys and girls exhibited a sharp decline in academic performance. In the final years of high school (Time 4), the academic performance of boys declined even further, while the academic performance of girls remained relatively stable. The intercept and slope were not significantly related for boys or girls; having a higher initial status was not significantly related to the rate of change.

Table 4. Equivalence between boys and girls on growth parameters using multiple-group analysis

	χ^2	df	*p* value	CFI	TFI	RMSEA
Model 1 (no constraints across classes)	4.78	6	0.57	1.00	1.02	0.00
Model 2						
Model 2a (intercept mean constrained)	5.36*	7	0.61	1.00	1.03	0.00
Model 2b (intercept variance constrained)	7.04*	7	0.42	1.00	1.00	0.00
Model 2c (slope mean constrained)	22.78	7	0.00	0.85	0.74	0.19
Model 2d (slope variance constrained)	4.97*	7	0.66	1.00	1.03	0.00
Model 3 (final measurement model)	8.30	9	0.50	1.00	1.00	0.00

Note. *chi-square difference tests revealed that the constraint did not significantly decrease model fit compared to the base model (Model 1) and was incorporated into the final measurement model (Model 3).

Figure 2. Model estimated means for the final measurement model, fit simultaneously for boys and girls, no predictor variables.



Conditional Latent Growth Model

We then tested whether child social-behavioural, parenting, and demographic variables predicted initial levels (intercept) and rate of change (slope) in academic performance across boys and girls. Seven predictors (maternal level of education, family income, child externalizing problems, child attentional problems, child social skills, maternal school involvement – teacher's report and mother's report) were entered simultaneously into the model as correlated exogenous variables. The effects of predictor variables on growth parameters were allowed to vary by gender, given preliminary testing that revealed significant gender differences in these effects.

The intercept and slope factors were regressed onto each of the seven predictors and were freely estimated across groups. Examination of the modification indexes indicated the need to remove the restriction for equality of covariances within groups. We allowed for covariance in random error between maternal involvement (teacher's report) and Time 2 grades for boys and inattention and Time 1 grades for girls, given their common method of measurement. This model (Model 4) resulted in significant improvement in model fit and was retained.

The conditional latent curve model (Model 4) was compared to a model in which covariances among the predictors were constrained to be equal across groups (Model 5) and a model in which the regression paths to all outcomes were constrained to be equal across groups (Model 6). Models 5 and 6, in which these parameters were constrained to be equal across groups did not fit the model well (Model 5: χ^2 (42) = 71.97, $p < .01$; CFI = .81; TLI = .70; RMSEA = .14; Model 6: χ^2 (49) = 55.23, $p = .25$; CFI = .96; TLI = .95; RMSEA = .05) and significantly differed from Model 4. Therefore, Model 4, which had

excellent model fit (χ^2 (35) = 34.53, p = .49; CFI = 1.00; TLI = 1.00; RMSEA = .00), was retained as the final model. These results confirm that there were significant differences in strength among covariances of the predictor variables across gender, as well as in the strength of the regression paths between the predictor variables and the growth factor parameters (i.e., intercept and slope).

To evaluate the overall fit of the final model, in addition to the fit indexes, we also considered the squared multiple correlations and the magnitude of the standardized parameter estimates. We assessed the amount of variance accounted for in the latent intercept and slope factors by the set of predictor variables. For boys, the predictor variables accounted for 58% of the variance in the intercept ($p < .001$) and 74% of the variance in the slope ($p < .01$). For girls, the predictor variables accounted for 48% of the variance in the intercept ($p < .001$) and 21% of the variance in the slope, although this effect was not statistically significant ($p = .55$). These results reveal that the predictor variables explained a considerable amount of the variance in the intercept (i.e., grades at Time 2) for boys and girls, but had differential predictive power in explaining variance in the slope (i.e., rate of change) for boys and girls. For boys, the predictor variables explained nearly three-quarters of the variance in the slope, whereas for girls the predictor variables did not explain a meaningful proportion of variance in the slope.

The parameter estimates obtained from the final conditional model are presented in Table 5. The significance of these standardized estimates provide evidence for direct effects of the predictor variables on either initial status (intercept factor – Time 2) or the rate of change (slope factor). Previous analyses revealed that mean grades in the elementary school years (Time 1 and Time 2) did not differ for boys and girls, although a

gender gap in school performance emerged after entry into the high school years (Time 3 and 4). However, descriptive statistics (described previously in Table 2) revealed that in early elementary school (Time 1), boys and girls differed in social-behavioural skills that contribute to academic performance. Boys had fewer protective factors than girls and were rated by their teachers as having more externalizing problems than girls. Trends also emerged such that boys had higher levels of attentional problems and lower social skills. In examining the predictors of the intercept (grades at Time 2), the interest was to see which earlier (Time 1) social-behavioural skills and parental involvement measures predicted boys' and girls' grades at Time 2.

The mean initial grades (intercept – Time 2) for boys and girls were statistically equivalent, however predictors that were important for explaining the variance in boys' and girls' Time 2 grades differed. Social-behavioural skills as well as family resources of girls predicted individual difference in their initial grades. For girls, higher social skills, lower externalizing behaviour problems, and higher levels of family income predicted higher initial status, controlling for all the other predictors in the model. However for boys, social-behavioural skills and family resources did not significantly predict individual differences in their grades, controlling for all other predictors in the model. Although there were no gender differences in academic performance in elementary school, boys and girls differed on social-behavioural skills in early elementary (Time 1) and these skills differentially predicted their level of academic performance at the end of elementary (Time 2). These results demonstrated that girls had more developed social-behavioural skills than boys, which are protective factors against poor academic

performance. As such, boys may be at higher risk than girls for academic decline across the secondary years.

To understand the rate of change or decline in grades across the secondary years, we examined the slope factors for boys and girls. The mean rate of change (slope) for boys and girls was negative, indicating a decreasing trajectory of academic performance. In addition, the mean rate of change for boys and girls significantly differed such that boys (α = -.70) had a steeper decreasing trajectory than girls (α = -.34). Examination of the covariance of the intercept and slope factors revealed that the initial status did not predict the rate of change for boys or girls. That is, having higher grades at Time 2 did not protect children against decline in grades over secondary; there was little inter-individual variability in the rate of change; children in this at-risk sample predominately demonstrated declining grades across the transition to secondary. Notably, neither social-behavioural nor family resource variables significantly predicted the rate of individual change for boys or girls.

The primary purpose of the present study was to evaluate the effect of maternal involvement on boys and girls trajectories. For both boys and girls, maternal involvement from the teacher's perspective was significantly positively related to individual variability in initial status controlling for all the variables in the model, although examination of the standardized regression coefficients revealed the magnitude of the effect was larger for boys (β = .69, $p < .01$) than for girls (β = .39, $p < .05$). Surprising, maternal involvement from the mother's perspective was significantly *negatively* related to individual variability boys' (β = -.46, $p < .05$) and girls' initial status (β = -.30, $p < .05$). Further, an interaction emerged for the effect of teacher rated involvement on the rate of change; for

girls, teacher rated involvement exerted no effect on rate of change ($\beta = -.17$, $p > .05$), but teacher rated involvement did exert a significant effect on rate of change ($\beta = -.48$, $p < .05$) and was associated with a protective effect against poor academic achievement. These effects were associated with the largest regression coefficients in the model, above and beyond the effects of variables known to be associated with children's academic outcomes such as parental education, family resources, and prior achievement (i.e., initial grades at Time 2). Maternal involvement from the mother's perspective had no significant relation to the rate of change for boys or girls.

Table 5. Parameter estimates in the final conditional model

	Boys (N = 55)		Girls (N = 71)	
	β	SE	β	SE
Effect on intercept				
Mother's education	.02	.17	**.31***	.15
Family income	.15	.17	.08	.13
Child inattention	-.15	.18	-.05	.17
Child externalizing problems	.02	.19	**-.38***	.18
Child social skills	-.07	.16	**.36****	.13
Involvement – teacher report	**.66****	.15	**.33***	.15
Involvement – mother report	**-.32***	.13	**-.27***	.13
Effect on slope				
Mother's education	.17	.30	.23	.40
Family income	.01	.30	-.11	.34
Child inattention	.24	.34	.26	.60
Child externalizing problems	-.49	.30	-.06	.48
Child social skills	.14	.27	-.03	.39
Involvement – teacher report	**-.77****	.24	-.11	.47
Involvement – mother report	.44	.25	.21	.42
Covariance of intercept and slope	-.32	.37	.39	.63

Note. β = regression coefficient, SE = standard error, * $p < .05$; ** $p < 01$, Standardized solution.

As described in Table 3, there was no difference in the mean scores of maternal involvement from mothers' and teachers' reports; mothers and teachers rated similar levels of involvement for both boys and girls. Mothers' and teachers' ratings were modestly intercorrelated ($r = .30$, $p < .01$), but exerted opposite effects on children's academic trajectories. To better understand this effect, post-hoc analysis examined whether there were any mean level differences in mothers' and teachers' endorsement of items that contributed to the maternal involvement measure across gender, using the Bonferroni correction for multiple comparisons (see Table 5). One mean level difference emerged between mothers' and teachers' tendency to endorse each of the items on the Parent-Teacher Involvement Questionnaire, such that teachers reported more frequent parent-teacher meetings for boys than for girls.

Table 6. Parent-Teacher Involvement Questionnaire items.

	Boys		**Girls**	
	Mean	Std. Deviation	Mean	Std. Deviation
Mother Report				
School events	0.65	0.84	0.91	1.02
PTA	0.19	0.71	0.19	0.64
Meetings	0.98	0.64	1.00	0.63
Education at home	3.56	0.59	3.53	0.46
Relationship	3.51	0.77	3.54	0.70
Importance of education	3.57	0.80	3.43	1.01
Total Involvement	2.09	0.36	2.10	0.41
Teacher Report				
School events	0.56	0.64	0.67	0.91
PTA	0.28	0.85	0.38	1.10
Meetings	1.20*	0.66	0.99*	0.29
Education at home	3.66	0.78	3.82	0.32
Relationship	3.47	0.97	3.66	0.79
Importance of education	3.70	0.69	3.84	0.44
Total Involvement	2.12	0.49	2.21	0.40

Note. * $p < .05$; ** $p < 01$. Post-hoc analysis using the Bonferroni correction for multiple comparisons examining differences in mothers' and teachers' endorsement of items and total scale scores across gender.

Summary

Results verified the at-risk nature of the sample and the impact of cumulative risk on academic performance. Children from the sample demonstrated a decreasing trajectory of academic performance and this effect was magnified by the transition from elementary to secondary school. There were between-individual differences in elementary school grades (at Time 2, treated as the intercept in the analysis), but non-significant between-individual differences in the rate of decline. It is not surprising that elementary grades were not significantly related the rate of change as children predominately experienced decline grades across the transition to secondary school. Multiple-group analysis revealed that the rate of decline was more pronounced for boys than girls, validating the differential trajectories of academic performance for boys and girls from an at-risk population. From late elementary school (Time 2) to the end of secondary (Time 4), boys' marks declined significantly more than girls'. Although both boys and girls were meeting grade-level expectations at the end of elementary (Time 2 M = 2.87 girls; 2.80 boys), grades declined for both genders across the transition to secondary (Time 3 M = 2.53 girls; 2.10 boys) and the gap increased so that at the end of secondary school girls were meeting grade-level expectations, while boys were failing (Time 4 M = 2.42 girls; 1.88 boys).

Next we examined the risk and protective factors predicting these trajectories in order to examine whether children who have poorer social-behavioural skills early in their academic careers are likely to experience increasing failure with time. In support of our hypothesis, boys and girls differed in their acquisition of these skills; boys had significantly higher levels of externalizing behaviour problems (as well as more

attentional difficulties and lower social skills, although these differences were not statistically significant). Unexpectedly, boys' social-behavioural skills did not contribute to individual variability in their initial grades. Instead, girls' social behavioural strengths and family income were important predictors of individual variability in achievement; lower externalizing problems and higher social skills and family income contributed to higher initial grades. However, none of these social-behavioural skills or demographic factors influenced the rate of change and did not explain individual differences in the rate of academic decline for boys or girls.

Gender differences in academic trajectories were identified at elementary school, when boys' and girls' differing social-behavioural skills emerged. As expected, the transition from elementary to high school posed a particular challenge to boys, who as a group, had fewer social-behavioural competencies than girls. Their rate of decline was significantly greater than the rate of decline for girls. The central goal of this study was to identify how parental involvement in schooling may act as a particularly important buffer against academic decline for children who are most at-risk for academic failure. Results revealed that teacher rated parental involvement exerted a positive impact on the academic performance of all children in our at-risk sample. For both boys and girls, teacher rated parental involvement served as a compensatory factor against poor initial academic achievement; the effect of involvement on initial grades was twice as large for boys ($\beta = .66$) as for girls ($\beta = .33$). For boys, whose academic trajectories were more negative, teacher rated parental involvement was an especially important protective factor against the academic decline and was associated with the largest effect in the model ($\beta = -.77$). Teacher rated parental involvement was not associated with the rate of change for

girls. In this at-risk sample, involvement when rated by mothers was negatively associated with boys' and girls' initial grades, highlighting the importance of considering the multiple perspectives.

Discussion

Understanding the Gender Gap

Some researchers have declared a boys' crisis in education, citing boys' lower school grades and high rates of high school dropout, grade retention, and remedial services as cause for great concern (Coley, 2001; Duckworth & Seligman, 2006; Globe and Mail, 2010; Matthews et al., 2010; Silverman, 2003). Boys from disadvantaged backgrounds have been identified as a group that is much more likely to experience these difficulties in school compared to boys from advantaged backgrounds, as well as girls from disadvantaged backgrounds. However, no research has compared the academic trajectories of boys and girls from at-risk backgrounds in order to understand why the trajectories of boys and girls differ and the predictors that enable success, even in the face of multiple risk factors. Parental school involvement has been long been known to promote academic outcomes and in a recent review, Pomeratz and colleagues (2007) speculated that is has the potential to be particularly beneficial for children with fewer resources/coping abilities, such as boys.

The present work adds to the literature by for the first time by: (1) examining longitudinally the differential academic trajectories of boys and girls from early elementary to the end of secondary schooling; and (2) identifying the social-behavioural and parenting risk and resilience factors impacting these trajectories. Of central interest was determining how the parental involvement-achievement link may be moderated by

gender, and whether mothers' or teachers' ratings of parental involvement was more important in buffering children against poor academic outcomes. Multiple-group analysis was conducted so that differences in boys' and girls' initial levels of academic performance, changes in academic performance over time, and the predictive strength of child social-behavioural, parenting, and demographic variables could be directly compared. The multiple-group framework systematically includes tests of gender differences in all analyses so we were able to estimate whether the magnitude of the relation between involved parenting (and other predictor variables) varied by gender.

Consistent with prior research (Entwisle et al., 1997; Buchmann et al., 2008), our results confirm the existence of a gender gap in academic performance, emerging after the transition to high school. Boys and girls did not differ with respect to their initial levels of academic achievement in elementary school. However the rate of decline in academic performance differed significantly across boys and girls, emerging after the transition to high school and steadily increased so that by the end of high school, on average, boys were failing school, but girls were meeting grade level expectations. The low academic performance of this group of children, and boys in particular, by the end of secondary school confirmed the risk status of the sample for school failure and high school drop out. Consistent with transition theory and the risk and resilience literature, the transition from elementary to secondary school was challenging for children from our at-risk sample. The transition to secondary school marked the beginning of a trajectory of academic decline for both boys and girls, with boys experiencing increasing difficulties over time.

Our results also confirmed previous evidence of higher prevalence of behaviour problems among boys and indicated a trend for increased attentional problems among boys and higher social skills among girls, emerging at school entry. Although gender differences in attentional, behavioural, and social skills has been documented in many studies (e.g., Elliott, Barnard, & Gresham, 1989; Else-Quest et al., 2006; Konold, Jamison, Stanton-Chapman, & Rimm-Kaufman, 2010; Moffitt, Caspi, Rutter, & Silvia, 2001) and academic achievement (Buchmann et al., 2008), little research has tested whether gender moderates the relation between social-behavioural skills and achievement (see Trzesniewski et al., 2006 for an exception). Not confirmed by our analyses was the notion that the gender gap is accounted for by earlier attentional and behavioural problems in boys. In these data, boys were rated by their teachers at the beginning of elementary school as higher on externalizing behaviour than girls, but these problem behaviours did not significantly predict individual differences in academic performance at the end of elementary school, or the decline in academic performance throughout the school years. Consistent with our hypotheses, for girls, the absence of these behavioural problems and the presence of social skills predicted girls' higher initial level of academic performance.

Researchers have reasoned that gender differences in variability of achievement are a function of social-behavioural skills; small initial gender difference in achievement increase over the middle and high school years as a function of differential social-behavioural skills in boys and girls (Konold et al., 2010). This explanation suggests that girls' social and behavioural competencies may be acting as protective processes which allow them to acquire academic skills and experience continued success. These findings

are consistent with recent empirical work indicating the association between boys' externalizing problems and educational difficulties was best explained by a reciprocal causation model in which behavioural problems led to educational difficulties and vice versa (Trzesniewski et al., 2006). In our sample, and consistent with previous literature, girls were not experiencing the same degree of social-behavioural difficulties as boys. Our data suggest that girls have more social-behavioural strengths than boys and these strengths operate as coping resources that contribute to their initial academic performance. In accordance with transition theory described by Rutter (1996), it appears that girls' better developed social-behavioural skills prepare them to weather the challenging transition better than boys; after the transition girls are able to consolidate their skills and stabilize academic performance, while boys experience increasing struggles in the final years of schooling.

It has been speculated that mothers' involvement may serve as an important protective factor against negative factors associated with disadvantage within low resource families (Conger & Conger, 2002; Duchesne et al., 2005; Grolnick & Slowiaczeck, 1994; Mistry, Vandewater, Houston, & McLoyd, 2002). Supporting this protective factor hypothesis, teacher rated maternal involvement exerted a positive effect on initial levels of academic achievement for boys and girls, although the magnitude of the effect was stronger for boys than for girls. That is, boys, as a group, were most at risk for decreasing academic performance, but they also benefited the most from this involvement over the course of schooling. For girls, teacher rated maternal involvement was not associated with the change in grades over time. It is important to note that equal levels of involvement (both teacher rated and mother rated) were observed for boys and

girls, so the protective effect of involvement for boys is not explained by differing levels of involvement across genders. The rate of change in grades for girls was much slower than it was for boys, confirming the hypothesis that parental involvement acts as an especially important protective factor for low SES boys who face multiple risk factors.

At the core of risk and resilience research is the understanding why some children are more vulnerable to adverse life events than others (Jenkins, 2008). That is, why do some children do well, even though they are exposed to high levels of environmental adversity? We identified a group of children who were particularly high-risk for poor academic outcomes – low SES boys. Among this group, boys whose parents were involved in their schooling had higher initial grades and a slower rate of decline across the critical transition to secondary school, a period in which at-risk children face increased challenges (Benner, 2011). As a group, girls had on average higher levels of social-behavioural resources and academic performance, but the protective effects of involvement against academic decline were not detected. Consistent with a risk and resilience perspective described by Rutter (1987; 1996), parental involvement acted as a protective effect because its effect was magnified in at-risk groups (i.e., boys). These findings support the hypothesis that children with fewer competencies are the most likely to benefit from involvement and are most likely to suffer when involvement is not provided. Thus it appears that adopting the risk and resilience theoretical framework is a useful avenue for understanding the effects of parental involvement.

It should be recognized that parental involvement is not solely an environmental effect; children with more positive behaviours elicit more positive reactions (e.g., involvement) from their environments. In considering the interactions that occur between

children and parents, it becomes evident that how parents get involved in schooling may be important. It may be that parents heighten their involvement in school when children are experiencing difficulties in school, often in response to calls from school personnel (Eccles & Harold, 1993; Grolnick, Kurowski, Dunlap, & Hevey, 2000). Although parents may report higher levels of involvement in these situations, teachers may not consider this to be constructive involvement as involvement is focused around attending to behaviour problems (Reynolds, 1991). To illustrate this effect, Reynolds and colleagues (1992) asked teachers to rate the frequency and quality of parents' school involvement among a sample of low-income kindergarten children. Teacher's ratings of the quality of parental involvement (i.e., satisfaction with involvement and how constructive involvement was believed to be) were a stronger predictor of decreased problem behaviours one year later than were the frequency ratings of parental involvement. Other research has found that parent reported contact with the school negatively influenced school achievement (Bakker, 2007), supporting the hypothesis that parents and schools come in contact when students are experiencing academic and/or behavioural problems (Epstein & Sanders, 2000) and not under more positive circumstances.

Considering the effect of child behaviour on how and why parents get involved in schooling may be important in disentangling the differential influence of parent and teacher reports of involvement on student's achievement. In examining the relationship between parental and teacher report of parental involvement in predicting student achievement among low-income populations, researchers have found low correspondence between reporters (Bakker, 2007; Reynolds, 1992; Stevenson & Baker, 1987). Teachers' ratings had the most consistent and positive association with school achievement. Parents'

ratings have small associations with achievement, although only teacher's ratings predicted growth in achievement over the next several years of elementary school (Reynolds, 1992).

Our sample of at-risk children exhibited poor school performance and mothers' reports of involvement negatively predicted initial school performance, but teachers' reports positively predicted initial school performance. For the group who had most significant social-behavioural and academic difficulties (boys), these effects were more pronounced. In examining item-level differences in mothers' and teachers' reports of involvement, we found that teachers reported more frequent parent-teachers meetings for boys than for girls. Future research is needed to determine whether mothers' perceptions of involvement may reflect involvement that has been prompted by the child's difficulties at school, while teachers' perceptions of involvement may reflect constructive involvement. The negative relation between mother rated parental involvement and the initial academic achievement of boys is provocative as it may be interpreted that involvement has a direct, negative impact on school achievement. However, the present results are consistent with the other research indicating that schools contact parents primarily when children are experiencing difficulties (Bakker, 2007; Epstein & Sanders, 2000; Reynolds, 1992). Further, only teacher rated parental involvement influenced the change of growth in boys' academic trajectories, suggesting that teacher rated parental involvement assesses a constructive aspect of involvement that acts as a protective effect against academic decline for children facing multiple risks (i.e., boys).

This is the first study to longitudinally examine the different academic trajectories of low SES boys and girls. Importantly, we identified some social-behavioural skills (low

externalizing behaviour problems and social skills) that differentially contribute to boys' and girls' elementary school grades and the important protective role of parental involvement against boys' academic decline. Teacher rated parental involvement had a large effect in predicting boys' elementary grades (β = .66) and in protecting against academic decline following the transition to secondary school (β = -.77). For girls, teacher rated parental involvement was associated with a medium effect in predicting elementary grades (β = .33) and had no significant effect in protecting against declining grades. A unique contribution of this research is the adoption of a risk and resilience framework to understanding the social-behavioural, involvement, and school performance links of boys and girls in a low SES sample.

The present study adds to the extensive literature on parental school involvement in several ways. First, much of the research linking involvement, school behaviour and school performance has been cross-sectional and has not followed children from early elementary school to the end of high school. Second, few studies have examined the influence of different perspectives on our understanding of the involvement-achievement link (Hill et al., 2004; Reynolds, 1991), especially among at-risk samples. As demonstrated in the present study, parental reports of involvement in low SES samples may not be predictive of children's school performance. Although the present study was not able to differentiate between the frequency and quality of parental involvement, these results add to the literature by highlighting the importance of assessing multiple perspectives and the factors underlying differences in rater's perspectives. Instead of asking simply how much parents are involved in schooling (with higher levels always assumed to be better), researchers should ask *why and how* parents are becoming

involved. This question may be especially critical to understanding the involvement of parents from at-risk backgrounds, whose children are more likely to experience social, behavioural, and academic problems. Considering the quality of and the reasons behind parents' involvement in schooling allows for a more nuanced understanding of the factors that maximize the benefits of involvement.

Limitations and Future Directions

A strength of this study was its longitudinal design. With multiple waves of assessment from early elementary school through the end of high school, we were able to model trajectories in school performance for boys and girls, an important contribution to a literature in which designs are predominantly cross-sectional. Ideally, the predictor variables would have been assessed at each successive educational cycle so that changes in individual levels of social-behavioural skills and involvement could be related to changes in individuals' academic trajectories. Predictor variables were not evaluated in a time-varying manner due to the administration of the parental involvement measure only at school entry, and the substantial amount of missing data on behavioural variables in the later grades. Further, it is often difficult to measure school involvement in a time-varying manner because the items traditionally used to assess involvement are less appropriate as the child ages and the middle and high school contexts require the child to display increasing independence in their academics (see Hill & Tyson, 2009 for an exception). Nevertheless, these social-behavioural skills and levels of parental involvement are amenable to change and growth. Future research should examine how these skills potentially change over schooling and their impact on academic performance, particularly at the transition to secondary school.

Other variables have also been identified as important contributors to children's overall school performance. Children's specific academic competencies, such as literacy and math skills are known to be contributors to overall school grades and the gender gap in achievement (Serbin, Stack, & Kingdon, under review). Preliminary analyses revealed that children's performance on standardized measures of language ability and math achievement at school entry did not differ by gender. Given that early attention and social-behavioural skills affect academic performance in large part by supporting the development of school-entry achievement skills (e.g., literacy and math skills), by including them in the analysis would potentially rob the school-entry nonachievement measures of their explanatory power. In addition, social-behavioural skills are believed to matter more for outcomes such as school grades or dropping out of school (behaviour based educational outcomes), than for standardized test scores (Duncan et al., 2007). Thus, we believe the present results are valuable and stand despite having not assessed the contributors of literacy and math skills to the gender gap.

The present study relied on teacher's reports of academic performance (i.e., school grades) and social-behavioural skills. Some researchers have suggested that teachers have the potential to have a biased perception of children's academic and behavioural skills that favours girls (Bonesrønning, 2008). It may be an interesting avenue of research to explore how other perspectives (e.g., parent reports, child reports, direct observation) of social-behavioural skills of boys and girls differ, and the influence of these perspectives on other measures of achievement (e.g., school grades as well as standardized achievement tests, drop out rates, etc.). The literature on school involvement, including the present study, largely ignores the influence of the father's involvement on

school outcomes (see McBride, Schoope-Sullivan, & Ho, 2005 for an exception). It would be important to understand the unique contributions of mothers and fathers to children's academic outcomes, especially among at-risk samples for whom fathers are often not involved in their children's lives.

The present study may be perceived as focusing on the deficiencies of boys and children from low SES backgrounds and boys' poor performance relative to their female peers. The purpose of this study is not to suggest that the focus should only be on boys; although females are more likely to attend university, they are still under-represented in the STEM fields (science, technology, engineering, math) and receive lower pay than males, even after controlling for their choice of field (U.S. Department of Commerce, 2011). Instead our goal was to describe how parental involvement in school promotes academic success in both boys and girls, despite social or systemic risk factors. We illustrated this point by showing that both boys and girls whose mothers were involved in their education (as rated by teachers) had higher trajectories of academic performance than children without involved mothers, despite the presence of risk factors (i.e., SES, externalizing behaviour, attentional problems, poorer social skills). Further, the protective effects of involvement were most pronounced for boys, who had more risk factors.

By examining how children can succeed in school, despite risk-associated conditions, interventions and policies can be instituted to promote more resilience among children. That parental involvement confers maximal protection against academic underperformance to children who are most at-risk has important implications for preventive programs. In addition, the fact that parental involvement measured in early elementary school had significant effects on the academic trajectories of children through

high school supports the use of early intervention programs to increase parental involvement for at-risk children (e.g., Head Start). To date, interventions designed to promote parental involvement have not been particularly successful in increasing children's academic achievement (see Mattingly, Prislin, McKenzie, Rodriguez, & Kayzar, 2002). Unfortunately, low-SES families often experience barriers to involvement due to factors including lack of resources and social support, increased stress, less knowledge and competence within the school system, and increased rate of child behavioural problems (Reynolds, 1991). Thus it is of critical importance to understand how involvement works for children of at-risk backgrounds, as these families are most likely to be the targets of intervention and prevention efforts.

In studying parents' involvement, a significant advance in this field will be to take into account the child characteristics that interact with parental involvement. We demonstrated how child gender interacts with involvement, such that involvement acts as a stronger protective factor against academic decline for boys than for girls. This effect was associated with the greater degree of social-behavioural and academic difficulties experienced by boys. Future research could examine which psychological characteristics, social-behavioural and academic competencies influence how parents become involved and the associated outcomes for children. In addition, experimental designs that successfully manipulate parents' involvement in children's schooling are needed to determine the causal role of involvement and the specific aspects that are related to beneficial outcomes for children. By moving to an understanding of how and why parents get involved and for whom involvement is most beneficial, interventions are more likely to be efficacious.

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