FINAL REPORT

The Transition from Primary to Secondary Schooling: Strategies for Success in Vulnerable Populations*

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* *La transition du primaire au secondaire : trajectoires de succès chez les populations vulnérables*
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RÉSUMÉ

La transition du primaire au secondaire : Trajectoires de succès chez les populations vulnérables

Depuis les dernières années, le faible taux de réussite scolaire et le taux de décrochage ont grandement préoccupé le Québec et le Canada tout entier. Au Québec, une fois et demie plus d'élèves des écoles publiques desservant des milieux non désavantagés obtiennent leur diplôme comparativement à ceux des milieux défavorisés. Le genre compte beaucoup dans cette équation du risque, car les garçons risquent beaucoup plus de décrocher que ne le font les filles. D'autres facteurs, y compris les caractéristiques individuelles, tels les problèmes de comportement, de piètres habiletés sociales et scolaires, des difficultés émotionnelles, sous forme de niveaux élevés d'anxiété à titre d'exemple, peuvent également identifier les élèves au « risque accru ». Les statistiques du ministère de l'Éducation démontrent que la répétition d'une année joue un rôle important dans la prédiction de l'échec à obtenir le diplôme du secondaire. De plus, environ la moitié des redoublements surviennent au cours du premier cycle du secondaire, après la transition entre le primaire et le secondaire. Le présent projet traite des prédicteurs de la réussite scolaire, en tenant compte de cette transition critique qui pose tant de défis. Il comprend trois études longitudinales complémentaires.

Étude 1. La première étude portait sur un échantillon de 78 enfants « à risque » et leurs familles, le risque étant défini ici par la structure familiale et le revenu, ainsi que par le fonctionnement socio-comportemental de l'enfant et son développement cognitif-langagier en bas âge. Notre objectif était de voir comment ces enfants, qui fréquentaient des écoles francophones de Montréal et des environs, franchissaient la transition cruciale entre le primaire et le secondaire. Un devis longitudinal s'étalant sur neuf ans et englobant quatre périodes, de l'âge préscolaire jusqu'à la fin du cycle 1 du secondaire, servait à prédire le succès scolaire. **Résultats de l'Étude 1.** Des analyses de régressions hiérarchiques multiples révèlent que les prédicteurs les plus puissants sont constitués de trois mesures du fonctionnement de l'enfant, prises à la fin du primaire (Primaire Cycle-3). Ainsi, on trouve des facteurs mesurant les *difficultés au plan des relations sociales*, *l'estime de soi* et les scores sur des tests standardisés de *rendement scolaire,* particulièrement sur le test d'*épellation*. Les prédicteurs à **long terme** comprenaient les *problèmes comportementaux d'extériorisation* et le *rendement scolaire*, mesurés peu après le début du primaire (Primaire Cycle-1), et dont l'influence est partiellement canalisée par le développement des prédicteurs du troisième cycle du primaire. Quant aux **variables parentales**, comme le *niveau scolaire*, *l'implication de la mère dans le cheminement scolaire* et le *style de soutien parental*, elles ont eu un effet principalement sur le développement en bas âge sur le plan scolaire et celui des habiletés comportementales. Les différences de notes scolaires **entre garçons et filles** au premier cycle du secondaire semblent relever principalement d'une plus grande force chez ces dernières sur les trois prédicteurs principaux du succès lors de la transition.

Études 2 et 3. Ces études visaient l'évaluation des processus généraux d'adaptation lors de la transition au secondaire, ainsi que l'examen des différences individuelles par rapport à ces processus. Les variables en jeu comprenaient des *auto-évaluations* des états émotionnels et des *évaluations par les pairs* du fonctionnement social et scolaire. Dans

l'Étude 2, nous avons eu recours à un modèle d'échantillonnage d'événements intenses auquel se sont soumis 77 élèves, qui fréquentent les écoles de la commission scolaire Riverside, et ce pendant les deux premières semaines de la transition au secondaire. L'Étude 3, pour sa part, regroupait 122 élèves que nous avons suivis pendant les quatre premiers mois de leur parcours au secondaire. Les deux ensembles de résultats permettent de dégager trois modèles importants. Selon le premier, il se produit un taux remarquable de changement au cours des deux premières semaines de la transition dans le nouvel environnement scolaire. Ce que nous retenons principalement de ce résultat est : a) que l'anxiété du début constitue la norme; et b) que le contentement s'accroît lentement dans la première partie de la période de transition. Le deuxième modèle qui se dégage est la présence de niveaux quelque peu élevés d'anxiété au début du secondaire, même chez les élèves compétents sur le plan social. Enfin, le troisième modèle à retenir traite des variations observées dans le changement avec le temps. Il est clair que certains enfants s'adaptent plus vite que d'autres. L'Étude 3 visait également à vérifier si les mesures d'*adaptation sociale et émotionnelle* pendant la transition sont liées à la perception des pairs de leur *rendement scolaire en* fin d'année. Effectivement, les élèves dont le niveau d'acceptation par les pairs s'est accru au cours des quatre premiers mois du secondaire ont aussi connu un meilleur rendement scolaire à la fin de cette première année.

CONCLUSIONS ET RETOMBÉES. La trajectoire de succès permettant de franchir la transition cruciale du primaire au secondaire commence tôt, bien avant l'entrée à l'école et le début du primaire. Les habiletés scolaires et sociales essentielles sont interreliées et s'acquièrent graduellement pendant le primaire. Les enfants qui grandissent dans des milieux défavorisés ont besoin d'un soutien adéquat tout au long du primaire pour acquérir les habiletés de base nécessaires à l'atteinte du succès. En plus des habiletés scolaires, diverses caractéristiques individuelles, comme le niveau d'anxiété, l'estime de soi, les habiletés sociales et d'autres indicateurs socio-émotionels, de même que les modèles d'amitié, laissent présager l'adaptation pendant la première année du secondaire. Ces résultats corroborent la notion qu'une scolarisation réussie n'est pas seulement due à l'acquisition de compétences et de connaissances scolaires, mais également à l'apprentissage d'habiletés sociales et émotionnelles efficaces pour affronter le quotidien. Les résultats présentés ici ont des implications quant à l'élaboration et à l'évaluation de stratégies d'interventions préventives pour étayer le développement des enfants dans ces divers secteurs. Enfin, nous proposons des lignes de recherche en nous appuyant sur la prémisse que tous les enfants québécois méritent de se classer de façon optimale lors de la transition vers le secondaire.

ABSTRACT
(English version)

**The transition from Primary to Secondary Schooling:
Strategies for Success in Vulnerable population**

In recent years, low high school completion rates and school dropout have been of great concern within Quebec and across Canada. In Quebec, students in public schools serving non-disadvantaged areas are one and a half times more successful in obtaining their diplomas than students attending schools serving disadvantaged neighborhoods. Gender is also an important factor in the risk equation: boys are at much higher risk of high school drop-out than girls. Other factors, including individual characteristics such as behavioral problems, poor academic and social skills, and emotional difficulties such as high levels of anxiety may also identify "at risk" students. Ministry of Education statistics demonstrate that grade repetition is highly predictive of failure to obtain a secondary school diploma. Further, approximately half of all grade repetitions occur during Secondary Cycle-1, following the transition between primary and secondary schooling. The present project examined the predictors of school success across this critical and, challenging transition. Three complementary longitudinal studies were carried out.

Study 1: The first study examined how a longitudinal sample of 78' "at risk" children and their families (based on family income and structure, children's social/behavioral functioning, and early cognitive/language development) attending French language schools serving communities in the Montreal region navigated the critical transition between primary and secondary schooling. A nine year longitudinal design was used to predict these children's school success in Secondary Cycle 1 across four time points: from preschool age through the first cycle of secondary school (Secondary Cycle-1). **Results of Study 1:** Using hierarchical multiple regression analyses, the strongest identified predictors of secondary school grades were three measures of children's functioning taken at the end of primary schooling (i.e. at Primary Cycle-3). These included constructs measuring *social relationship difficulties*, *self-esteem*, and scores on standardized tests of *academic achievement*: particularly *spelling ability*. **Long term** predictors included *externalizing behavior problems* and *academic performance* measured soon after school entry (i.e. at Primary Cycle-1), which were partially mediated through their influence on the development of the Primary Cycle-3 predictors. **Parental variables**, including *education*, maternal *involvement* in early schooling, and *supportive parenting* style, worked primarily by supporting the early development of academic and behavioral skills. **Gender** differences in Secondary Cycle-1 marks appeared to result from girls' greater strength in the three major predictors of success across the transition.

Studies 2 and 3: These studies assessed the general processes of adaptation during the transition to secondary school, as well as individual differences in these processes. Outcome measures included *self ratings* of emotional states and *peer rated* evaluations of academic and social functioning. In Study 2, we used an intense event sampling design in which we followed a group of 77 students attending schools of the Commission scolaire Riverside across the first two weeks of their transition to secondary school. In Study 3, we followed 122 children over the first four months after their entry into secondary school. The two

sets of findings point to three important patterns. The first is the remarkable amount of change that occurs during the first two weeks of the transition to the new school environment. The important message of this finding is (a) that anxiety at the outset is the "norm" and (b) that contentment slowly increases across the earliest transition period. The second important finding is that somewhat elevated levels of anxiety at the start of secondary school are seen even with socially competent children. The third interesting result is the observation of variations in change over time. It is clear that some children become adapted more quickly than others. In Study 3, an additional goal was to assess whether measures of emotional and social adjustment during the transition would be associated with peer perceptions of their academic achievement at the end of the year. Children who established increasingly high levels of acceptance with their peers during the first four months of secondary school were also perceived to show higher levels of academic achievement at the end of the first year.

CONCLUSIONS & IMPLICATIONS: The path to success across the challenging transition to secondary education begins early: from before school entry and the start of primary education. Essential academic and social skills are inter-related, and are acquired gradually across the years of primary schooling. Children from disadvantaged backgrounds need appropriate support over the entire course of the Primary Cycles to acquire the basic skills necessary for success. In addition to academic skills, children's individual characteristics, including level of anxiety, self-esteem, social skills and other social/emotional indicators, as well as friendship patterns, predict adaptation during the first year of secondary education. These results support the position that successful education is not only about acquiring academic competencies and knowledge, but also about learning effective social and emotional coping skills. The present findings have implications for the design and evaluation of preventive interventions to support children's development across these areas. Future research directions are discussed based on the premise that every Quebec child deserves to be optimally positioned for a successful transition to secondary education.

The Transition from Primary to Secondary Schooling: Strategies for Success in Vulnerable Populations

CHAPTER 1: INTRODUCTION

Background and Objectives

In recent years, the topics of low high school completion rates and school dropout have been of great concern within Quebec and across Canada (Gouvernement du Québec, 2007; Lapointe, Archambault, & Chouinard, 2008; Globe and Mail, 9 Feb. 2009; Le Devoir, 15 Nov. 2008; Statistiques Canada, 2007). Analyses of high school graduation rates demonstrate that the majority of students who begin secondary school one year or more behind their peers never receive their high school diploma. More specifically, according to the Ministry of Education (Gouvernement du Québec, 2008), youth who enter secondary school older than 13 years of age are three times less likely than their younger counterparts to graduate. In addition, females are twice as likely as males to receive their diploma. Approximately 30% of youth aged 20 years, the majority of whom are males, enter adulthood never having obtained their diplomas (Le Devoir, 15 novembre 2008). In Quebec, in 2006-2007, only 69% of youth had earned their high school diplomas by age 20, a rate much lower than the Minister's objective of 85% (Gouvernement du Québec, 2008). Additionally, compared to students attending schools serving disadvantaged neighborhoods, students in public schools serving non-disadvantaged areas are one and a half times more successful in obtaining their diplomas.

Approximately 45% of the individuals who never receive their diploma enter secondary school one year behind their peers. However, only 36% of dropouts were ever officially identified as having learning difficulties (Le Devoir, 15 novembre 2008). That is, most dropouts were never formally identified during their school careers as being in need of special education or remediation services, including many of the children who repeated a grade during their primary school years. Even for many of those identified or « coded » as ''at-risk'', the remediation and support provided within their schools did not significantly improve their chances of success in obtaining a diploma.

The need for early identification of ''at-risk'' children, and for effective intervention prior to failure of an academic year, is strongly indicated by the current pattern of high school failure. The present project examined this urgent problem using a multidimensional, longitudinal approach. Specifically, we examined the predictors of school success across a critical transition within the academic sequence: from primary to secondary level schooling.

Rationale for the present study: Ministry of Education statistics indicate that risk for high school dropout can be estimated relatively early in a child's school career. Most incidences of failing an academic year occur during primary school, when approximately 15% repeat a year, or during Secondary Cycle 1, when an additional 13% of children repeat: totalling 28% of children repeating during grades 1 to 7. Relatively few children experience their first repetition of a grade after Secondary Cycle 1 (see Table 1; Gouvernement du Québec, 2006). Secondary Cycle 1 presents the period of greatest risk for academic failure

prior to dropout, across the 11 years of schooling (see Figure 1; Gouvernement du Québec, 2006). Ministry statistics regarding academic performance across years of schooling also suggest that success can be conceptualized as a "trajectory'', rather than a specific event. Each child follows an individual trajectory, which is predicted and influenced by early characteristics, home environment, subsequent learning, and skill development across the period of schooling. This trajectory approach enables us to examine the variables operating at specific periods in a child's development which enable future progress, or that conversely, lead to failure. Predictors may be sequential and complementary, or may influence the development of a sequence of skills as the child progresses across their years of schooling.

Table 1. Proportion des élèves en retard par rapport à l'âge attendu, selon l'ordre d'enseignement et la classe (en %; Gouvernement du Québec, 2006)

	1983-1984	1993-1994	2001-2002	2002-2003	2003-2004	2004-2005
Total	**20,9**	**24,0**	**18,9**	**18,2**	**17,8**	**17,1**
Primaire[1]	**13,2**	**16,2**	**11,6**	**10,7**	**10,1**	**9,1**
1 (ou A) (ou 1.1)	6,5	8,6	4,3	2,6	2,9	2,7
2 (ou B-C) (ou 1.2+)	9,2	12,5	10,2	9,8	9,7	9,1
3 (ou D) (ou 2.1)	11,3	15,9	10,5	9,0	8,2	7,5
4 (ou E-F) (ou 2.2+)	14,3	17,9	13,7	13,0	11,9	10,5
5 (ou 3.1)	16,1	20,2	14,6	13,2	12,3	10,5
6 (ou 3.2 +)	22,4	21,6	15,7	15,4	14,5	13,3
Secondaire (formation générale)	**30,6**	**32,9**	**28,5**	**27,6**	**26,9**	**26,0**
1	33,4	36,8	28,7	27,5	27,7	27,2
2	30,4	32,6	30,4	28,5	27,4	27,2
3	29,4	33,1	30,4	29,2	28,0	26,5
4	25,2	30,1	27,1	26,6	25,9	24,4
5	33,5	30,4	25,3	25,4	24,6	23,4

Table 1. Proportion of Students who are Older than the Expected Age by Level of Education and Grade (in %; Government of Quebec, 2006)

The transition to secondary schooling: Based on Ministry of Education statistics, as well as developmental theory, a critical period for school success seems to be the transition from primary to secondary education. There are many reasons why this transition poses a challenge to most children: First, the physical location and environment of the school usually changes. The peer group is also likely to change in composition at this stage of schooling. The curriculum and demands for self-reliance and independence also change dramatically as the child enters secondary school. Finally the physiological processes of puberty occur at about this time, leading to physical, social, and cognitive transformations according to each child's individual timing of development. It is hardly surprising, then, that Secondary Cycle 1 is the period when nearly half of grade repetitions occur, and when the probability of eventual graduation from high school becomes very clear for individual children.

A longitudinal approach: Most research on the antecedents of high school dropout has involved identifying characteristics of children who are currently failing in school (or have

recently dropped out), using concurrent or retrospective approaches to research design and data collection. The difficulties of using these designs are well known: it is difficult to establish the meaning of correlations or the sequence of predictive effects. In addition, it is hard to avoid bias in the selection of research participants and of specific predictors after the outcomes for a sample are already known.

In contrast with most studies to date, the current project examined how multiple systems of functioning affect the academic success of "at-risk" students prospectively over time, predicting academic outcomes after the transition to secondary schooling. We also investigated associations among the predictive domains, and the ways in which sequential skill development may influence academic success over time. Finally, in Studies 2 and 3, we examined the more immediate influences on emotional wellbeing and academic success in Secondary Cycle 1, examining predictors across the first year of the secondary program.

Our project was designed to help understand the complex developmental trajectories of a low income population of children who are at increased risk of experiencing academic difficulty. Another of our goals was to shed light on the urgent problem of why boys are at a much higher risk of failure than girls. Accordingly, trajectories were examined and compared for boys and girls, to gain a better understanding of how gender influences the processes leading to success in secondary school.

The two complementary studies carried out for this project were based on four premises: (a) research on school success needs to be focused on those parts of the population who are most at risk for negative academic outcomes; (b) developmental processes can be most clearly understood by examining the antecedents and consequences of transitions; (c) the transition to secondary education is an especially critical transition for subsequent achievement and school success; and (d) school success needs to be studied from a multidimensional and contextual perspective.

Background: Understanding school success and failure within the population of Quebec.

"At-Risk" Youth: It is well known that there are specific groups of Quebec youth who are particularly "at-risk" for school failure (e.g., Gouvernement du Québec, 2006; Lapointe et al., 2008; Pagani, Boulerice, Vitaro & Tremblay, 1999; Mâsse & Tremblay, 1999). Characteristics such as family and neighborhood poverty, gender, language, and ethnicity are all predictive of Quebec children's probability of school success and their eventual level of educational attainment. Moreover, parents' educational level and family structure appear to be significant predictors of school achievement in Quebec (Deslandes, Potvin, & Leclerc, 1999). Children living under disadvantaged social and economic conditions, (e.g., children living in poverty, coping with the stress of family health problems, or having psychological or behavioral problems) are likely to experience academic failure, grade retention, and to dropout of school before completing their secondary education. Longitudinal studies have shown that children exposed to persistent poverty during middle childhood and early adolescence are at greater risk of being behind in grade for age (Pagani, Boulerice & Tremblay, 1997; Pagani et al., 1999).

Links between socio-economic status and academic outcomes have long been known (Coleman & Ward, 1955; Gouvernement du Québec, 2005; Lapointe et al., 2008; White, 1982). These links have been found across methods of measurement (i.e., income, occupation, and educational status) and when the methods are combined (White, 1982). These links have also been found across various aspects of academic achievement such as test scores, grade retention, course failure, placement in special education, and graduation rates (Coleman & Freedman, 1996; Conger, Conger, & Elder, 1997; Entwisle & Alexander, 1990; Gouvernement du Québec, 2006; Haveman & Wolfe, 1993, 1994; Lapointe et al., 2008; Patterson, Kupersmidt, & Vaden, 1990).

According to reports from the Government of Quebec (2005), low SES is a factor that places children at an increased risk for entering secondary school behind their peers. As such, only 59% of students in schools serving underprivileged populations obtain their diploma within five years after attending high school, compared to 67% in non-underprivileged schools (Lapointe, Tremblay, & Hébert, 2005; Lapointe et al., 2008). The negative impact of low SES on youth's school performance can be seen at both the primary and secondary levels of education.

In Quebec, poverty has been shown to have a direct effect on children's academic performance. Using a carefully constructed measure of poverty and controlling for several phenomena typically associated with poverty, such as parental divorce, Pagani et al., (1999), found that family financial resources predicted adolescent achievement and delinquency. In this project, the effects of children's behavioral problems were also controlled statistically, providing the opportunity to examine the direct effects of poverty on achievement rather than those due to other factors.

However, "family poverty" may operate through a variety of sequential effects on children's performance over time. For example, poverty may lead to impoverished cognitive stimulation in the home environment (Dodge, Pettit & Bates, 1994; McLoyd, 1998), resulting in a lower general level of cognitive functioning at school entry which, in turn, results in poor academic performance from the beginning of the primary cycles. Failure to acquire basic academic skills across the primary grades may affect academic success in subsequent cycles. Similarly, low self esteem and poor social relationships are known to develop gradually across the school years in children from impoverished backgrounds, while they fall further and further behind in their school work and academic skills. These psychological and social difficulties may then lead to further academic problems. In other words, the impact of poverty is not unitary or stable over the course of development. Poverty can be "unpacked" developmentally, to reveal its' ongoing effects across childhood. Given that poverty is currently a reality for a large number of Quebec children, such studies are essential if we are to develop strategies for remedying the long term impact of economic disadvantage on academic performance.

The importance of challenge and transitions: Although development is often conceptualized in terms of continuous processes, the effects of transition points have been well documented (Rutter, 1996). Rutter summarized the major points related to the effects of transitions as follows: First, transitions are opportunities for risk and for recovery. The

outcome of a transition varies across individuals and successful navigation of a transition depends on the person's ability to effectively respond to the new environment. Second, transitions are likely to differentially affect sub-populations rather than have universal effects across the population. Third, the effect of a transition is likely to vary as a function of various systems including biological processes, social or interpersonal skills and experiences, and social cognitive processes. It may be that the effects of some of these phenomena on adjustment may not have been apparent prior to the transition therefore it is critical to study the impact of adjustment on particular features of functioning during periods of change. Fourth, transitions are likely to have more negative effects on persons with the fewest material resources. This is because biological, psychological, social and environmental resources may mediate the association between SES and adjustment. Fifth, transitions are similar to critical or sensitive periods as the effects of a transition can be long lasting. By establishing patterns of behavior, attitudes, and goals, the experiences associated with a transition are likely to have enduring effects that reach far beyond the period of the transition *per se*.

The transition to Secondary School: Data from the Ministry of Education show that more Quebec children repeat the first year of secondary school than any other year of schooling. For example, Table 1, (Gouvernement du Québec, 2006) indicates that whereas 15.4% of sixth graders are behind with respect to the expected age level, this figure jumps to 27.6% for students in Secondary 1. Repeat rates across the secondary grades are depicted in Figure 1. The white line that runs across the top of this figure shows that across the past 20 years, retention in Secondary 1 has been higher than at any other level of Secondary school. These figures point to the critical need to understand the factors that underlie a successful transition to Secondary schooling.

Figure 1. Proportion des élèves qui redoublent une classe du secondaire, selon la classe (en %; Gouvernement du Québec, 2006)

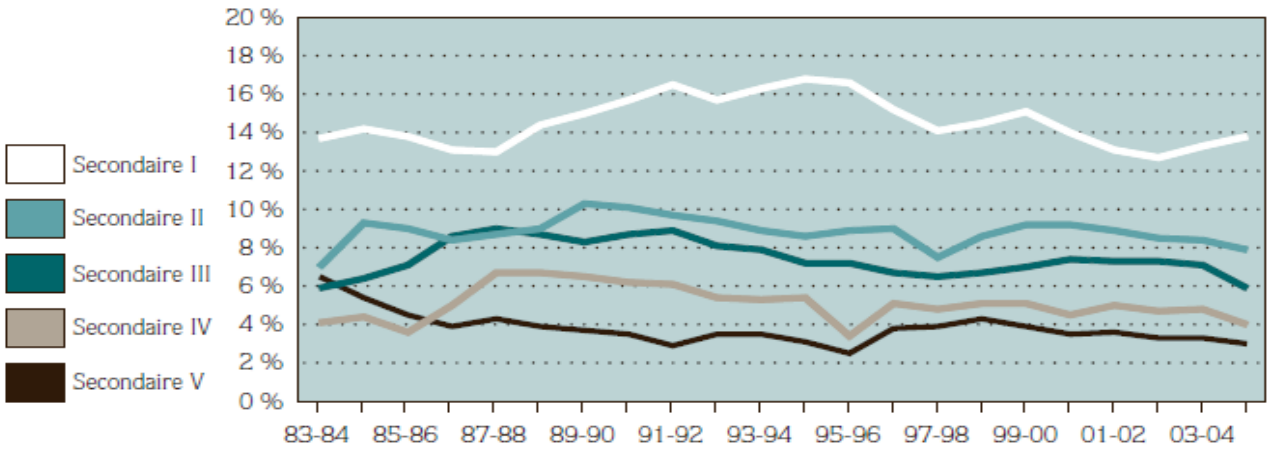


Figure 1. Proportion of students who repeated a year at secondary level by grade (in %; Government of Quebec, 2006)

The high rate of grade retention at Grade 7 (Secondary Cycle 1.1) in Quebec is familiar to the Ministry, and has been attributed to two factors. First, all children are sent on to Secondary school by age 13, regardless of their academic skills or ability to pass Grade 6

(Primary Cycle 3.2) requirements. Second, some children in special programs at the secondary level may be classified as being in Secondary 1 (Secondary Cycle 1.1) for several year, for administrative purposes (see "Grade repetition in Elementary school and in Secondary general education-youth sector" in Education Indicators, 2005, Gouvernement du Québec).

However, the extremely high rate of repetition at this level suggests that additional factors may be at work. We hypothesized that these others factors might include the greater academic, structural, and social demands of the secondary environment and the challenging nature of the transition itself. The stress of these processes may be intensified for economically disadvantaged and other "at-risk" children who have fewer supports and resources to help them navigate and cope with the stress of the transition. As shown in Figure 1, significant progress has been made already in decreasing the rates of grade repetition. Over the past 12 years, following the implementation of new programs and curricula (e.g. the introduction of "Cycles" at the primary and secondary levels), these rates have fallen substantially. Nevertheless, as of the most recent annual statistics available, the repetition rate associated with the first cycle of secondary school remains stubbornly high.

Addressing the "gender gap": For many years, it has been noted that boys are more likely than girls to experience low academic achievement, school failure and dropout. More boys than girls reach Secondary Cycle 1 late according to their expected progression in school (Gouvernement du Québec, 2005; Lapointe et al., 2008). Boys can be conceptualized as a specific "at-risk" population, with a much higher rate of high school dropout than girls (24.6 % versus 14.4% in 2005). Rates of grade retention are roughly 50% higher for boys than for girls. This "gender gap" is seen at all levels of schooling: rates of grade repetition are more than 1.5 higher for boys, across the primary and secondary years. This index of lower achievement for boys mirrors similar educational "gender gaps" across Canada and the U.S.A. The reasons for the gender gap are poorly understood: higher rates of learning disabilities, attentional and behavioral problems, and maturational lags in boys have all been identified as contributing to the discrepancy (Taanila, Ebeling, Heikura & Järvelin, 2003). Results from other studies (Bouchard & St-Amand, 1996; Veillette, Perron, & Hébert, 1993) have reported that adolescent boys are more vulnerable to adverse family and social conditions than are adolescent girls. Moreover, boys from non-intact families (single parents) and low socioeconomic families are less likely to obtain high grades than are girls from the same environments (Deslandes, Bouchard & St-Amand, 1998). Motivational and social factors such as differential self, peer, teacher, and parent expectations (often related to traditional gender stereotypes concerning boys' lack of interest in reading and greater interest in non-academic pursuits) have also been identified. Clearly, the causes of this problem are multiple and complex.

A developmental approach, examining the onset of gender differences in factors that affect academic performance (such as behavioral problems, specific academic achievement skills, social/relational skills and self-esteem) over the course of the primary cycles, is one approach that may be helpful in understanding the "gender gap" that is so pronounced by the Secondary 1 level.

Continuing trajectories: It should be noted that failure in Secondary Cycle 1 is highly predictive of continuing behavioral and social problems (Nagin, Pagani, Tremblay & Vitaro,

2003; Pagani et al., 1999; Pagani, Tremblay, Vitaro, Boulerice & McDuff, 2001), as well as failure to complete high school. Conversely, a successful transition between elementary and secondary school is strongly predictive of a continuing trajectory of academic success and graduation (Heck & Mahoe, 2006; Reyes, Gillock, Kobus, & Sanchez, 2000). Within ''at-risk'' populations, such as families living in poverty, outcome is extremely variable for individual children: some do well, while others (a much higher proportion than in the general population) have serious academic and social difficulties. A detailed understanding of the characteristics of the individual child, school, and home environments during the years prior to high school which facilitate successful transitions is essential for developing effective programs to support the most vulnerable children across this critical academic transition.

The importance of a multidimensional approach over time

The traditional research practice of focusing on a small set of variables as antecedents of academic success has been replaced by the theoretical and methodological perspective that a multi-dimensional approach is more comprehensive, and likely to explain more of the variability in children's outcomes (Sameroff, Gutmsan, & Peck, 2003). In the present studies, we examined the effects of multi-dimensional systems over time: across early and middle childhood in Study 1, and across the first year of secondary education in Study 2. The specific systems examined in the present project are summarized below. In addition to considering the univariate effects on Secondary 1 performance for the individual variables within each of these domains of functioning, one of the goals of the study was to assess sequential effects of these variables, and the compensatory or mediational associations among them.

Family Relationships and Parenting: Children's relationships with their parents and their friends serve as supportive and protective experiences. It is well known that parenting quality and experiences within the family affect children's and adolescents' functioning and adaptation outside of the home (Masten & Powell, 2003; Steinberg & Collins, 2006). The impact of the family-based experiences derives from several sources. These include (a) emotional experiences such as warmth and support, (b) cognitive stimulation within the early home environment and ongoing support for learning during the primary school cycles, (c) expectations for achievement and for well regulated behavior, (d) parental monitoring, and (e) the presence of a well structured environment. Although it is clear that the family functions differently during early adolescence than during early childhood, its influence is nevertheless strong, with ongoing influence across the course of development.

Social skills and peer relationships: Motivated by Sullivan's (1953) original claims that friendships can play a pivotal role in children's lives, friendship has been studied as a factor that protects children from a variety of psychosocial challenges (Hartup, 1983; Rubin, Bukowski, & Parker, 1998). Empirical studies have generally supported the position that friended children (with friends) will have a more positive response to psychosocial challenges than would be seen among children who are unfriended. For example, using the family context as one that can produce challenges, Gauze, Bukowski, Aquan-Assee, and Sippola (1996), showed that friended children (with friends) who were from either rigid or very disorganized families exhibited the same positive level of well-being as seen among children from more optimal homes (these findings were replicated by Sesma (2001)). Within the peer domain, results from some studies have revealed the capacity of friendship to protect against

the negative effects of peer relations (Criss, Pettit, Bates, Dodge, & Lapp, 2002; Hodges, Boivin, Vitaro, & Bukowski, 1999), such as being victimized. Such studies show that the ability to form friendships is a significant personal and social skill that helps children deal with psychosocial challenges and that minimizes the effects of stress. In the same way, we expected social relationship skills (and children's satisfaction with their social relationships) to be a critical predictor of a successful transition to secondary school.

Acquisition of specific academic skills and general cognitive ability: Specific academic skills, including reading, writing, and math abilities, as well as overall cognitive ability, are likely to predict academic performance at the Secondary 1 level. Many of the academic problems of disadvantaged children have been linked to failure to acquire cognitive and academic skills (relative to population norms and school expectations) across the course of early and middle childhood (Leventhar & Brooks-Gunn, 2000; Miller, 2000; Weatherholt, Harris, Burns, & Clement, 2006). This may be a primary pathway by which children from disadvantaged backgrounds are placed "at-risk" for eventual school failure and dropout. The present study examined the sequence of acquisition of specific academic skills within a lower income sample, and their predictive roles in relation to school performance at various stages in a child's academic trajectory.

By middle childhood, academic skills have an established link to children's sense of accomplishment and self-esteem (Baumeister, Campbell, Krueger, & Vohs, 2003; Hansford & Hattie, 1982; Wylie, 1979). Academic skills are also linked to higher social status and successful peer relationships by the end of the primary cycles (Berndt & Das, 1987). In the present study, specific academic achievement skills, including reading, spelling, and math abilities were explored as both direct and indirect (i.e. via linkages to psychological and social functioning) contributors to academic success at Secondary Cycle 1. Acquisition of specific academic skills was also of interest in understanding the increased differentiation of academic performance between girls and boys across the years of primary schooling.

General cognitive ability (IQ) was measured at repeated time points, to control for this established source of variance in both academic achievement tests and school performance. There is a large literature suggesting that IQ is a major mediator in the relation between income and school performance, but that IQ itself requires a rich and stimulating home environment in order to develop optimally within disadvantaged populations (Espy, Molfese, & DiLalla, 2001; Jimerson, Egeland, Sroufe & Carslon, 2000). In the present study, we addressed this issue directly by examining stimulation provided in the children's home environments at multiple points, in relation to IQ and academic performance over time.

Behavioral problems and the experience of emotional distress: Behavioral problems, particularly those referred to as "externalizing" (including attentional problems, aggression, disruptive behavior, oppositional problems, conduct disorder and hyperactivity), are an established negative predictor of school performance from the first primary cycle onwards through high school (Jimerson, Morrison, Pletcher, & Furlong, 2006; Lounsbury, Sundstrom, Loveland, & Gibson, 2002). Behavior problems were measured at four time points in the present study, to examine their impact on academic performance over time, as well as potential indirect effects via social-relational problems, low self-esteem, and emotional distress

which develop over the primary school years. Increasing gender differences in academic performance over time were also examined in relation to antecedent behavioral problems.

Similarly, the experience of emotional distress (specifically, self-reported problems related to depression and anxiety) as reported by girls and boys at the end of their primary schooling and at the start of secondary was examined. Emotional distress was explored both as a predictor of academic success in Secondary Cycle 1, and as a potential mediator of gender differences in academic performance.

Self-esteem and self-perceptions: Finally, children's self-esteem has been implicated as a predictor of academic success, as well as a factor which may mediate both socio-economic and gender differences in academic success. Conversely, self-esteem may itself develop during middle childhood in response to experiences of academic and social success in the early years of primary education. A model in which early academic success was expected to predict self-esteem by the later primary grades, followed by a predictive relation between self-esteem in Primary Cycle 3 and school performance at Secondary Cycle 1, was examined. Again, the role of self-esteem in middle childhood as a mediator of gender and socio-economic effects on school performance at Secondary Cycle 1 was explored.

The Current Project

To date, few prospective longitudinal studies have been conducted to investigate the characteristics of children and families that function to promote success in highly vulnerable children as they enter high school. Schools are naturally concerned with preparing children for this transition, and much is known about the factors that underlie successful completion of elementary school programs. As a result, grade repetition rates during elementary school have fallen encouragingly since the introduction of the new program of Primary Cycles. Ministry of Education researchers, policy-makers, school administrators, school board officials, teachers, and parents alike are highly invested in ensuring the success of this new program. Nevertheless, to our knowledge, there has been no prospective longitudinal research in Quebec or elsewhere to examine the specific factors that predict a successful transition to secondary school.

Results from the three studies in the present project point to various predictors and pathways that facilitate success across this critical transition. The current project also identified the inter-relations between children's social, behavioral, cognitive, and emotional functioning prior to and during the first year of secondary schooling. Finally, the information obtained through this project is intended to support our educational programs in ways that specifically address the needs of some of the most vulnerable children within the broad population of students in Quebec.

CHAPTER 2

STUDY 1: Predicting academic success in a disadvantaged sample from preschool age through Secondary Cycle 1 (*Study directed by Lisa Serbin, Ph.D.*)

Goals for Study 1: The first study examined how a longitudinal sample of ''at-risk'' children (based on family income and structure, children's social/behavioral functioning, and cognitive/academic performance) attending French language schools serving communities in the Montreal region navigated the critical transition between primary and secondary schooling. The goals of the study were to identify both long and short term characteristics of the child and environment that predict a successful transition from primary to secondary school within a vulnerable, disadvantaged population.

First, the accuracy of early (i.e. prior to school entry) identification of children who would subsequently repeat a grade during the three primary cycles or at secondary cycle 1 was examined.

Second, the specific predictors of success during the primary school cycles, and the developmental sequences in which these factors operate, were addressed. Through Hierarchical Multiple Regression analyses, the ways in which family disadvantage in terms of income, parental education, and family structure operate to place children at a long term academic disadvantage were examined.

Third, we addressed the complex issue of why boys within disadvantaged, ''at-risk'' populations appear to do more poorly than girls in navigating this critical transition.

Development and description of the sample for Study 1

Background: Participating children were drawn from an ongoing longitudinal study of Quebec families. These children are offspring of the original participants in the Concordia Longitudinal Risk Project: a large community-based study of risk and resilience, which was initiated in 1976 (Schwartzman et al., 1985). In addition to social and economic disadvantage, many of the original participants had profiles of behavioural problems, including aggression and social withdrawal. Many of the original participants now have children, some of whom are enrolled in the current intergenerational project. The Concordia sample provides a unique opportunity to study the inter-generational transfer of health and psycho-social risk during childhood, and to determine the processes and protective factors that predict positive outcomes for children within an ''at-risk'' population.

Current sample: The 78 children included in the present analyses attend French language schools in the Montreal Island region, with the majority at inner-city schools of the Commission Scolaire de Montréal (CSDM). They are a sub-set of an original sample of 175 families from the Concordia Project, who had been recruited when their children were of preschool age. Of the families initially contacted to participate in the intergenerational family study at Time 1, the participation rate was 76%. The current 78 children are those who have completed four assessments at three-year intervals, in order to provide data for the present

longitudinal analyses. (N.B., an additional 30 children have entered Secondary Cycle-1 and will be assessed in 2008-2009. These children will be included in final analyses for publication).

The children in the current study have participated in a series of four intensive child and family assessments: at Preschool age (Time 1), Primary Cycle 1 (Time 2), Primary Cycle 3 (Time 3), and finally, Secondary Cycle I (Time 4). The initial phases of the project, Times 1 and 2 were funded with support from the *FQRSC-Équipes* program, the SSHRC, and Health Canada. Data collection and analysis at Times 3 and 4 which related specifically to predicting success across the transition to secondary schooling was funded through the FQRSC Program: Persévérance et Réussite Scolaire (L.Serbin, P.I.).

The present sample included 38 boys and 40 girls. At Time 3, the mean age of children was 11.0 years (SD = 0.91), and at Time 4, 13.6 years (SD =1.12). Most of these children were from white, francophone families (reflecting the composition of the Concordia Project sample, which was originally, recruited from Commission scolaire des Écoles Catholiques de Montréal (CECM), in 1976).

Family socio-economic and demographic background of participants: At the time they gave birth to their first child, the mean age of mothers of the original sample was 24.5 years (which is lower than the Quebec average age of 27.8 at parenthood; Institut de la Statistique du Québec, 2005). In terms of marital status, 17.1% of mothers were raising their pre-school aged children alone (i.e. with no spouse or live-in partner) when the study began at Time 1. The average number of children in these families is currently 2.46, which is high in comparison to the Quebec norm of 1.77 children per family (Statistique Canada, 2006). In terms of parents' education, the median number of years was 11. Twenty-five percent of these parents *never* obtained a high school diploma, which is approximately double the rate for the population of Quebec. There was a wide range of education among the parents, ranging from only 4 years completed (i.e. 4th grade of primary school) up to 18 years which is equivalent to a Master's degree or Cycle 2 University.

The families' average income levels and occupational status for the most part were significantly below the average levels for Quebec. Families in the current sample had a mean annual income in 2006 of $ 55,708 (SD = $ 30,580), compared to the Quebec 2006 average family income of $ 71,830. Approximately 19% of the sample was dependent on government social assistance (i.e., receiving welfare) at the time of the study and an additional 29% of the families were considered to be ‘‘working poor’’, given that their annual income fell below the Canadian low-income cut off for that year (CLICO; Center for International Statistics). That is, 48% of the current sample of children lived in families whose income was below the Canadian “poverty line”. The annual income of about 73% of the single-parent families fell below the CLICO, while 42% of two-parent families had incomes below this level.

Taken together, the descriptive information about the families confirmed the continuing socio-demographic risk status of the children in the present study. On average, the families of these children fell below population norms on several important measures of socio-economic status: including early parenthood, number of children, single parent status, parent's educational attainment, family income, poverty rate, and welfare dependency.

Procedures

Parents of the children were contacted by telephone, provided with a detailed description of the study, and invited to participate. Home visits were carried out for data collection at Times 1 and 3. For Times 2, 3 and 4 children's measures were administered during a series of school visits, and parents completed questionnaires at home (returned by mail). Teachers and school administrators returned academic data (report card grades) and rating scales by mail.

Measures: A variety of measures available from Times 1 and 2 were used as predictors of school success over time (see Tables 2 and 3). The Time 3 measures addressed the various domains of children's individual functioning and home environments that were hypothesized to contribute to successful transition to secondary education (see Tables 2 and 3). For the present set of analyses, Academic Performance at Time 4 (Secondary Cycle-1) was the primary outcome measure. A summary of descriptions of the major predictors at Times 1, 2, and 3 and the measure of academic performance used at Time 4 are described below (N.B., the Time 4 measures of family environment and children's functioning were not used in the preparation of the analyses for this report).

Table 2. Family, Parenting, and Home Environment measures assessed at each time Point

Measures at each Time Point	**Time 1**	**Time 2**	**Time 3**	**Time 4**
	Preschool age	**Primary Cycle 1**	**Primary Cycle 3**	**Sec Cycle 1**
a) Family and environmental predictors of school success				
1- Socio-economic level: Demographic information quest. - Income, education, marital status, family size	**X**	**X**	**X**	**X**
2- The Conflict Tactics Scale (*CTS*; Straus, 1979) - Family Violence and Parenting			**X**	**X**
3- Parenting Stress Index (*PSI*; Abidin, 1990)	**X**		**X**	**X**
4- Social Support Satisfaction (*SSS*; Telleen, 1985)	**X**		**X**	**X**
5- Home Environment (Home; Caldwell & Bradley, 1984) - Preschooler and Adolescent versions	**X**		**X**	
6- Symptom Checklist-90 (*SCL-90-R*; Derogatis et al., 1993)	**X**		**X**	
b) Supportive Parenting				
1- Parenting Dimensions Inventory (*PDI*; Power, 1993) - Parental Support, Control, and Structure			**X**	**X**
c) Parental Involvement in Education				
1- Parental Involvement Questionnaire (*PIQ*; Reynolds & Gill, 1994)		**X**		**X**

Family and environmental predictors

1. Family socio-demographics were assessed by asking parents to indicate their family income for the previous tax year, their occupations and their level of education. Standardized questionnaires were used to ascertain family size and structure (e.g. married, co-habitation, single parent, shared custody, number and ages of children, etc.).
2. *The Conflict Tactics Scale* (*CTS*: Straus, 1979) was used to measure self-reported physical violence towards spouse and children.

3. *The Parenting Stress Index* (*PSI*; Abidin, 1990) was designed to assess the sources and levels of stress perceived by mothers in relation to their parenting roles and responsibilities.
4. *The Social Support Satisfaction Scale* (*SSS*; Telleen, 1985) was used to measure the number of members in the mother's social support network (resource size) along with perceived satisfaction with social support.
5. *The Home Observation for Measurement of the Environment* (*HOME*; Bradley & Caldwell, 1984; Preschool version at Time 1 and Adolescent version at Time 3 were used) was administrated to each participating family as a measure of the support and stimulation offered to the child in the home.
6. *The Symptom Checklist-90-Revised* (*SCL-90-R*; Derogatis et al., 1993) was used to capture mothers' level of discomfort caused by a number of symptoms, primarily related to anxiety and depression.

Parenting Style

1. The measure of parenting style used for the present analyses was the *Parenting Dimensions Inventory* (*PDI*; Power, 1993), which yields factors related to warmth, support, and harsh punishment. This measure was completed by the mothers at Times 1, 2, and 3. The ''support'' factor was the strongest predictor of Time 4 outcome, which was retained in the final regression model.

Parental Involvement in Education

1. The parents' involvement in schooling was measured by the *Parental Involvement Questionnaire* (*PIQ;* Reynolds & Gill, 1994), which includes homework supervision, contact with teachers, volunteering, attending school events, etc. It was completed by parents and teachers at Times 2 and 4. Mother's involvement, as perceived by teachers, was used in the present analyses.

Children's school performance, academic skills, and cognitive ability

Table 3. Children's Measures at each Time Point

	Time 1	**Time 2**	**Time 3**	**Time 4**
	Preschool age	**Primary Cycle 1**	**Primary Cycle 3**	**Sec Cycle 1**
a) Children's self-concept, affective well-being, social and psychological adjustment				
1- Self-Esteem (Harter & Pike, 1985)			**X**	**X**
2- Children's Depression Index (*CDI*; Kovacs, 1982)			**X**	**X**
3- Revised Children's Manifest Anxiety Scale (*RCMAS*; Reynolds & Richmond, 1978)			**X**	**X**
b) Behaviour Problems				
1 – Child Behaviour Checklist Parent, and Teacher versions (*CBCL*; Achenbach et al., 1991a, 1991b, 1999, 2004)	**X**	**X**	**X**	**X**
c) Social relationships				
1- Social Skills Rating Scales (*SSRS*; Gresham & Elliot, 1990)			**X**	**X**
2- Matson Evaluation of Social Skills for Youth (*MESSY*; Matson, 1990)			**X**	**X**

Table 3. Children's Measures at each Time Point (cont'd)	Time 1	Time 2	Time 3	Time 4
	Preschool age	**Primary Cycle 1**	**Primary Cycle 3**	**Sec Cycle 1**
d) Children's school performance, academic skills, and cognitive ability				
1- Achievement Tests and Cognitive Ability				
a) Math achievement skills (*WIAT-II*, 1992)		**X**	**X**	**X**
b) Test de Rendement pour francophones (*TRF*, 1991) - spelling and reading subscales			**X**	
c) Test de Rendement individuel de Wechsler (*WIAT-11*; 2005)				**X**
d) Échelle d'intelligence pour enfants (*WISC-III,* 1991; *WISC-IV, 2005*)	**X**		**X**	**X**
2- End of year average of Report Card Marks		**X**	**X**	**X**

Children's self-concept, affective well-being, social and psychological adjustment

1. Self-Esteem: *Harter's Self-Perception Profile for Children* (*SPPC*; 1985) was completed by the children at Times 3 and 4.

2. Depression: the *Children's Depression Index* (*CDI*; Kovacs, 1982) a measure of depressed affect was completed by the children at Times 3 and 4.

3. Anxiety: the *Revised Children's Manifest Anxiety Scales* (*RCMAS*; Reynolds & Richmond, 1978), were administrated to the children to assess anxiety-related psychological and social problems.

Behaviour Problems

1. To measure individual differences in behavioral, social, and psychological adjustment, we administered the CBCL (*Child Behavior Checklist*) formats (*CBCL/6-18, TRF/6-18;* Achenbach et al., 1991a; 1991b; 1999; 2004) at Times 1 to 4 which were completed by parents and teachers in appropriate formats. In the present study, the Externalizing, Internalizing, and Total Problems Scales, which are normed by age and gender, were examined.

Social relationships

1. Children were administered the *Social Skills Inventory* (*SSI*; Riggio, 2005), and the *Matson Evaluation of Social Skills with Youth* (*MESSY*; Matson, 1990). These measures were combined in a factor labeled ''Social Relationship Problems'', to provide a comprehensive measure of children's difficulties with social skills, peer relationships, and relationship satisfaction.

Children's school performance, academic skills, and cognitive ability

1. Academic achievement skills: Standardized measures of children's language arts (reading, writing and spelling; *Test de Rendement pour Francophones*, (*TRF*, 1991); and math achievement skills (*Wechsler Individual Achievement Test* (*WIAT-II*, 1992)

were obtained at Time 3. The Test de Rendement individual de Wechsler was obtained at Time 4 (Wiat-II, 2005; see Table 3).

2. Cognitive ability: *Échelle d'intelligence de Wechsler pour enfants* (at Times 1 and 3: *WISC-III, 1991*, and at Time 4: WISC-IV, 2005). Because school grades were likely to be influenced by general cognitive ability, measures of full-scale IQ at Times 1 and 3 were administered and used in the prediction equations as a control variable.

3. Academic performance: End of year Report Cards were obtained from the administrators of the participants' schools, including final end-of year evaluations at Time 2 (Primary Cycle 1), Time 3 (Primary Cycle 3), and Time 4 (Secondary Cycle 1). Grading and evaluation systems differed depending on the school and school board in which the child was enrolled. Therefore, a standardized system of classification was created to evaluate and compare the children's school marks. According to our scale, scholastic grades were coded as follows: 1 = does not meet expectations; 2 = partially meets expectations; 3 = meets expectations; 4 = surpasses expectations. A score from 1 to 4 was assigned for each academic subject on the report card, and these scores were then averaged to produce a mean score for each child at Times 2, 3, and 4.

CHAPTER 3: RESULTS OF STUDY 1

The primary goal of Study 1 was to predict the school success of a sample of disadvantaged, "at-risk" children across the transition from Primary to Secondary schooling. A nine year longitudinal design was used to predict their school success in Secondary Cycle 1 across four Time points: from preschool age (Time 1), through school entry (Time 2: Primary Cycle-1), to the end of their primary schooling (Time 3: Primary Cycle-3), and, finally, during the first Cycle of Secondary school (Time 4: Secondary Cycle-1).

The results summarized below are based on a sample of 78 children and their families who had completed **all four** phases of the 9-year longitudinal study (at Time 1: preschool age; Time 2: Primary Cycle 1; Time 3: Primary Cycle 3; and Time 4: Secondary Cycle 1) by November 2008. As originally anticipated, an additional sample of 30 children in the inter-generational longitudinal sample has completed the protocols for Times 1 to 3. These children are currently in Secondary Cycle-1, and are scheduled to complete the Time 4 protocol in 2009; their data will be incorporated into future reports for publication.

Part 1: Success across the transition to Secondary schooling

The present report begins with a description of the children's functioning at Time 4 and across the four time points in the study. These figures illustrate both the continuing risk nature of the sample, and a general decline in academic success across the transition to secondary school.

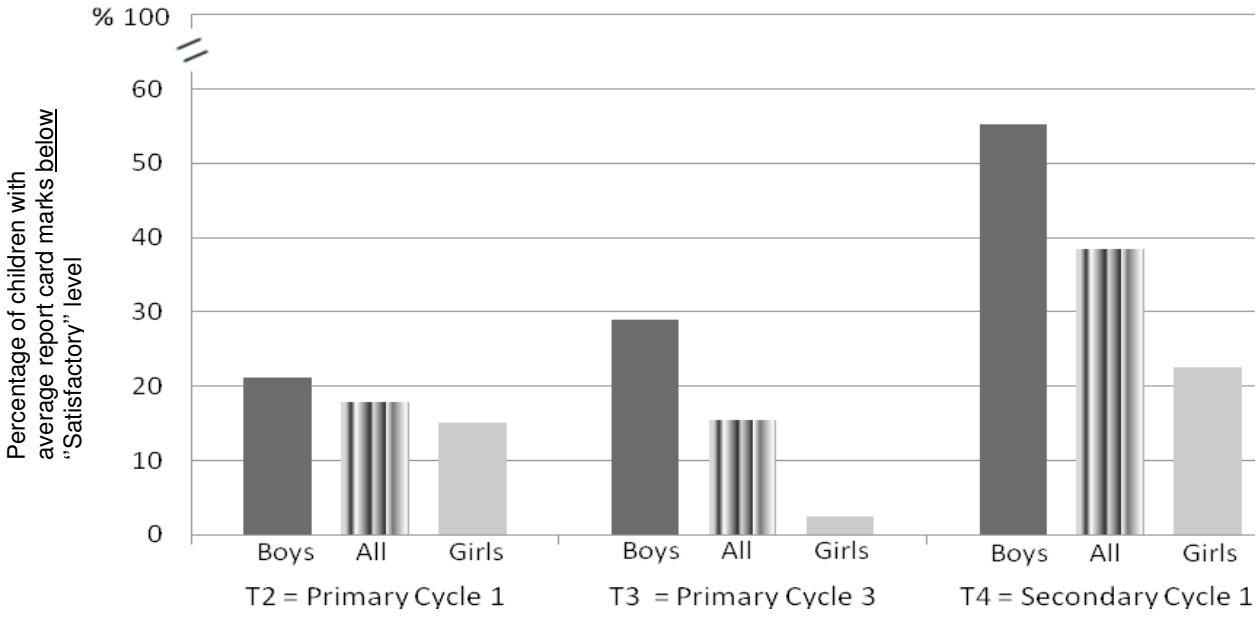
The next part of this section, deals with the possibility and accuracy of early (Time 1) prediction of subsequent grade repetition during the Primary and Secondary-1 Cycles. For these analyses, a combination of qualitative assessment and standardized testing was used to identify children who were at highest risk within the sample. We then compared their outcomes with those of children who seemed to be functioning relatively well prior to school entry.

The final part of the Results section focuses on the specific predictors of academic success at Time 4, after the transition to Secondary 1. For these questions, a series of Hierarchical Multiple Regression analyses were carried out to identify the major sources of variance and important control variables.

Functioning of the sample at Time 4: Secondary Cycle 1

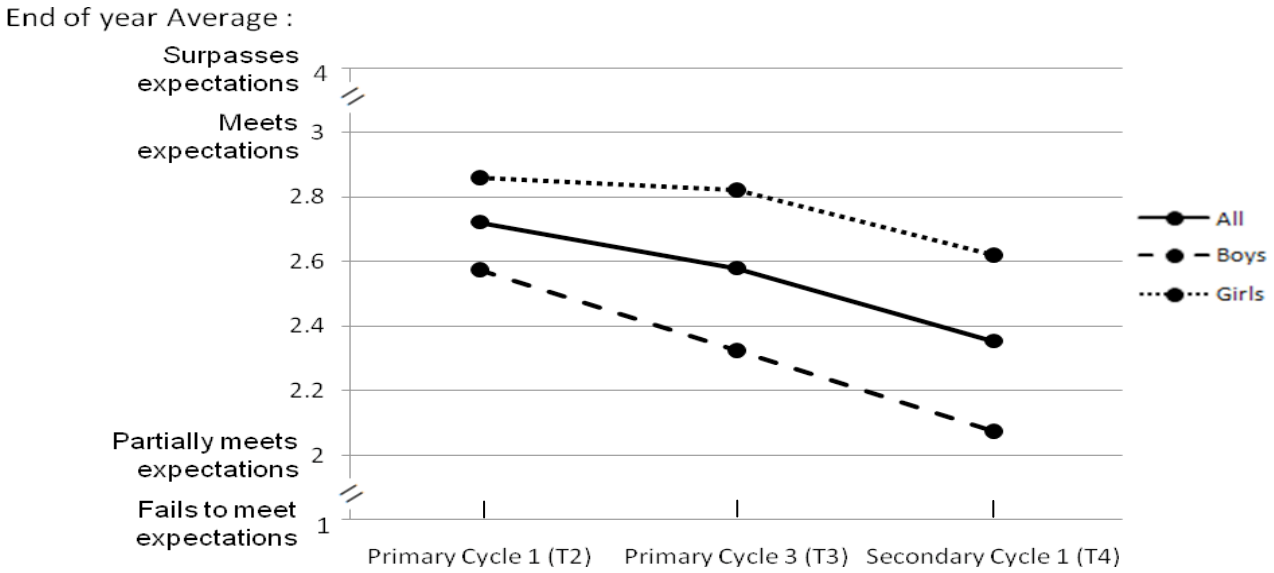
Rates of academic success in Secondary Cycle 1: Rates of "satisfactory" performance or above (i.e. "meets" expectations or "surpasses" expectations), based on average end-of-year report card marks, decreased from 85% of the children at Primary Cycle 3 to 62% at Secondary Cycle 1. In other words, 39% of children, (55% of the boys and 25% of the girls), received academic marks in Secondary Cycle 1 that were below the level indicative of satisfactory performance (i.e. "does not meet or only partially meets expectations''; see Figure 2*)*.

Figure 2. Percentage of Children Failing to meet Expected Performance Level, by Academic Cycle



Academic performance over Time: To examine the performance of the children quantitatively, the average report card marks at Times 2 through 4 are presented in Figure 3, for all children and for boys and girls separately.

Figure 3. Average Report Card Marks across Academic Cycles for Boys and Girls



The declining marks of the children over time are clearly illustrated by this figure. However, note that the marks of boys and girls were similar Primary Cycle-1 (Time 2), when there was no statistically significant gender difference, but became increasingly differentiated across the subsequent time points. The lower performance of boys, compared with girls, was established by Time 3: the final cycle of primary schooling (comparing girls and boys at Time 3, t (76) = 4.09, p<.001). However, the largest gender difference was seen at Secondary Cycle-1, when boys' marks dropped significantly (comparing boys at Times 3 and 4, t (37) = 2.02, p<.05) but girls' marks declined less. In the section on prediction of academic performance, below, we examine how declines in boys' academic performance during the primary cycles may lead to differences between the genders in self-esteem, satisfaction with social relationships, and psychological distress by the end of primary schooling. These factors, in turn, contributed to the prediction of success across the transition to Secondary Cycle-1 (also see page 23 re Gender).

Grade repetitions: By Time 4, Secondary Cycle 1, 22% of the children had repeated one or more years of schooling, including 35% of the boys and 10% of the girls. As noted above, Ministry of Education statistics demonstrate that children who have repeated one or more years by the end of Secondary Cycle-1 are at extremely high risk of high school dropout.

Summary: As anticipated, the transition to secondary school was clearly challenging for many of our children: average marks dropped, as did the percentage of children performing at the "expected" level or higher across academic subjects. On the positive side, 62% of the children performed satisfactorily in Secondary Cycle 1. This variability allowed us to analyze the predictors of academic success over time. In the next analyses, we examined the predictors of school success.

Part 2: Can children in danger of repeating a year by Secondary Cycle-1 be identified prior to school entry?

In order to ascertain whether the children who repeated a year over the 9 year course of the study entered school already demonstrating a high likelihood of school failure, we separated the group into two categories based on an evaluation by trained home visitors (two Master's level psychologists) at preschool age. At Time 1, children were identified who had behavioral, cognitive, communication, or social/emotional difficulties based on standardized test scores, parent interviews, and quantitative and qualitative observations. Based on these evaluations, 55% of the children (43% of the girls and 68% of the boys) had signs of some kind of cognitive, communication, or behavioral or social/emotional difficulty at preschool age, ranging from mild to severe problems.

The children who showed difficulties prior to school entry were more likely to repeat a grade by Secondary Cycle 1 (Total sample: $\chi^2(1,77) = 2.764$, p<.10; Boys: $\chi^2(1,37) = 5.218$, p< .05; Girls: $\chi^2(1,39) = 1.184$, ''ns''). The rate of future grade repetition among children with problems at Time 1 was 30 %, compared to 14 % of children who did not have difficulties at Time 1. That is, children with identifiable problems prior to school entry were over **twice** as

likely to subsequently repeat one or more years of schooling than children who did not show significant difficulties at Time 1 (Risk Ratio= 2.1).

These results indicated that predictive accuracy differed by gender. For boys, the accurate prediction rate was 46% (i.e. percentage of boys identified as having problems at Time 1 who subsequently repeated a grade). For girls, this rate was considerably lower, with only 6% of the girls who were identified with problems at Time 1 repeating a grade later on. However note that only 13% of the girls repeated a grade over their course of primary schooling.

These findings confirm that early (prior to school entry) identification of children who are likely to experience academic failure by Secondary Cycle-1 is possible at above chance levels. Fully 78% of the children who subsequently repeated a grade were identified at Time 1 as having serious problems. However, accuracy differed by gender: 92% of the boys who subsequently repeated a grade were identified at preschool age, but only 20% of the girls who later repeated were identified.

There were errors in prediction as well, including false positives (i.e., children who showed difficulties at the preschool assessment, but did not subsequently repeat a grade: 70%), and false negatives (i.e., children who were not identified as having problems at preschool age, but subsequently repeated a grade: 14%). The implications of these accuracy and error rates for early assessment detection and intervention programs are discussed later in this report.

Having established that children who are likely to fail a grade by Secondary Cycle-1 often show early signs of difficulty prior to school entry, the specific predictors of academic success in SC-1 across the course of primary school were explored in detail. These analyses identified the multiple and sequential influences during the primary school years on children's success across the transition to Secondary Cycle-1.

Part 3: Predicting success across the transition to secondary schooling

A correlation matrix including the specific characteristics and behavior that predicted academic performance at Secondary Cycle-1 was examined, as shown in Table 4.

To identify which of these variables predicted Time 4 performance when combined into a multiple regression equation, a series of hierarchical models were tested. The final regression model, shown in Table 5, had been previously tested with controls for children's IQ, family income, mothers' education, and other relevant variables from previous Time points (see Tables 4 and 6 for list of original predictors). None of these factors remained significant in the final model, so these were excluded from the regression analysis to improve goodness of fit and reduce the number of predictors considered simultaneously in the model.

In the regression analysis summarized in Table 5, children's Report Card Marks at Time 4 were predicted, accounting for 47% of the total variability in the outcome measure (final F to enter (18,59) = 4.817, p<.001). In other words, we were able to account for nearly half of the

variability of Secondary Cycle-1 school marks, based on the variables we had measured and selected for the equation (N.B., the remaining variability is assumed to be due to factors not included in the present study, plus error variance).

From a descriptive perspective, using a log-linear analysis, 81% of the children were correctly identified from this set of predictors, based on whether their average grades at Time 4 were above or below a "satisfactory" level (i.e. at/above or below an average of 2: ''partially meets expectations'', on a scale from 1 to 4) at Time 4 ($\chi^2(7) = 33.30$, $p<.001$). The specific predictors of Secondary Cycle-1 Marks in the Hierarchical Multiple Regression analysis are discussed below.

Predictors of success across the transition from the end of primary (Time 3) to the first year of secondary schooling (Time 4):

1. **Social Relationship Difficulties**: Correlation with Secondary Cycle-1 Marks $r=.52$, $\beta= -.31$, $p<.01$.

2. **Self-Esteem**: Correlation with Secondary Cycle-1 Marks $r=.25$, $\beta=.22$, $p<.05$.

3. **Standardized tests** of **academic achievement**: This set of tests included three specific skills: Reading (TRF), Math (WIAT), and Spelling (TRF). The strongest individual predictor from among these specific skills was **Spelling** ($r=.45$, $\beta=.20$, $p<.05$) which was therefore included in the final trimmed regression model shown in Table 5.

Long term Predictors of marks at Time 4

Problem behavior: The Externalizing Behavior Problems Scale of the CBCL, measured at school entry (Time 2), was a long term predictor of academic performance (see Table 5 of regression model). Interpreting successive steps in the final model, behavior problems during the early years of schooling appeared to limit or interfere with the development of academic and social skills by the end of primary school at Time 3. These, in turn were the major predictors of Secondary Cycle-1 Marks.

Externalizing behavior problems measured at the end of primary schooling (Time 3), were not a significant predictor of Secondary Cycle-1 Marks in the final Regression Model (and therefore were not included in the trimmed model presented in Table 5). Despite a significant correlation with Time 4 Marks (see correlation matrix Table 4; $r =-.49$, $p<.001$), Time 3 Behavior problems were not a significant predictor of academic success at Time 4 after other factors were included in the model.

These results suggest that behavioral problems occurring early in the child's schooling interfered with the development of academic abilities, social/relational skills and self-esteem across the years of primary education, which in turn predicted academic performance across the transition to secondary school.

Table 4. Correlations among Predictors of Academic Performance at Secondary Cycle-1 (page 21)

$^{t}p<.10$, $^{*}p<.05$, $^{**}p<.01$, $^{***}p<.001$ N=78

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Demographics																
1 Gender (1=M; 2 = F)	-.14	.26*	.25*	.23*	-.35**	.22^{t}	.36**	-.43**	-.35**	.10	-.13	.34**	.26*	.31**	.42**	.45**
2 Age of child at Time 4		-.10	-.19^{t}	.12	.15	-.33**	-.12	.17	.19^{t}	.07	-.09	.00	.02	-.14	-.17	-.24*
TIME 1 Pre-school Assessment																
3 Home environment			.55**	.45**	-.24*	.31**	.21^{t}	-.20^{t}	-.25*	.03	-.17	.31**	.26*	.03	.19^{t}	.22^{t}
4 Child's Intelligence				.32*	-.26*	.36**	.28*	-.25*	-.18	.18	-.25*	.35**	.39**	.26**	.23*	.20^{t}
TIME 2 Primary Cycle-1																
5 Mothers' involvement					-.14	.24*	.15	-.28*	-.28*	.16	-.22^{t}	.30**	.14	-.03	.22^{t}	.21^{t}
6 Externalizing Behavior PC-1						-.26*	-.38**	.53**	.21^{t}	.04	.23	-.28*	-.28*	-.22*	-.36**	-.37**
7 Report Card Marks PC-1							.08	-.30**	-.23*	-.06	-.20^{t}	.32**	.29*	.14	.34**	.40**
TIME 3 Primary Cycle-3																
8 Supportive parenting								-.54**	-.30**	.09	-.37	.29*	.08	.21^{t}	.11	.37**
9 Externalizing behavior PC-3									.42**	-.04	.47**	-.27*	-.20^{t}	-.22^{t}	-.43**	-.49**
10 Relationship problems										-.08	.34	-.18	-.09	-.09	-.16	-.52**
11 Self-esteem											-.19^{t}	.13	-.01	.14	.12	.25*
12 Psychological distress												-.23*	-.15	-.22^{t}	-.25*	-.23*
13 Spelling Achievement score													.49**	.31**	.22^{t}	.45**
14 Reading Achievement score														.26**	.24*	.22^{t}
15 Arithmetic Achievement score															.25*	.26*
16 Report Card Marks at PC-3																.37**
TIME 4 Academic Performance																
17 Report Card Marks at SC-1																

See Table 6 for correlation between Maternal Education and Family Income

Table 5. Predictors of Academic Success across the Transition to Secondary Schooling

	Trimmed Hierarchical Regression Predicting Secondary Cycle-1 Report Card Marks			
Predictor variables	*r*	Beta (β)	ΔR^2	ΔF
Model 1				
Gender [a]	.45***	.43***		
Age at Secondary Cycle-1	-.24*	-.18[t]		
			.24	11.77***
Model 2				
Gender		.36**		
Age		-.16		
Externalizing problems (PC-1)	-.37**	-.22*		
			.04	4.25*
Model 3				
Gender		.33**		
Age		-.09		
Externalizing Problems		-.17		
Report Card Marks (PC-1)	.40***	.26*		
			.05	6.10*
Model 4				
Gender		.28**		
Age		-.08		
Externalizing problems		-.11		
Report Card Marks		.27*		
Supportive Parenting (PC-3)	.37**	.19[t]		
			.03	3.27[t]
Model 5				
Gender		.18[t]		
Age		-.06		
Externalizing Problems		-.13		
Report Card Marks		.24*		
Supportive Parenting		.11		
Relationship Difficulties (PC-3)	-.52***	-.31**		
Self-Esteem (PC-3)	.25*	.22*		
			.13	9.35***
Model 6				
Gender		.14		
Age		-.09		
Externalizing Problems		-.11		
Report Card Marks		.17[t]		
Supportive Parenting		.08		
Relationship Difficulties		-.31**		
Self-Esteem		.20*		
Spelling achievement test (PC-3)	.45***	.20*		
			.03	4.44*
		R = .73	R^2 = .47	F = 9.68***

Note: r = zero-order correlation between predictors and Report Card Marks at Secondary Cycle-1

[a] 1= male, 2 = female

[t] p< .10, * p< .05, ** p< .01, *** p< .001 N=78

Marks at Primary Cycle-1: Report Card Marks in Primary Cycle-1 (Time 2) were retained in the trimmed model as a predictor of Time 4 Marks. That is, Primary Cycle-1 Marks were a significant predictor of Secondary Cycle-1 Marks (r=.40, β=.26, p<.001), even when including various control variables such as IQ. This finding confirmed that children's academic performance showed stability across the school years, from Primary Cycle-1 to Secondary Cycle-1. Children who experienced poor academic performance during their first years of schooling generally continued to perform at a lower level across the Primary Cycles and into secondary school. Despite the educational curriculum and whatever remediation may have been provided in their schools, the weakest students at Time 2 generally remained the poorest students six years later, at Time 4. Conversely, students who performed well in Primary Cycle-1 generally obtained higher marks in the first Cycle of Secondary Schooling.

It is important to note that the stability of **Marks** over time was partially mediated through other variables in the equation, including **Spelling** (Sobel Z-value =2.32, p<.02), and **Social Relationship Difficulties** (Sobel Z-value=1.92, p<.05). These findings suggest that although moderately stable over time, early academic success also has additional cumulative effects on children's performance by fostering the development of specific academic and social skills.

Parenting and environmental support: Several measures of emotional, academic and cognitive support by parents were correlated with Time 4 outcome, including, **Quality of Home Environment** at Time 1 (r=.32, p<.01), and at Time 3 (r=.32, p<.01), and **Supportive Parenting** at Time 3 (r=.37, p<.001). However, none of these predictors remained significant when **Academic Skills** and **Social Relationship Difficulties** were included in the model.

Other significant predictors of Time 4 marks

Gender: Girls' marks were higher than boys' at Time 4, Secondary Cycle-1, (r=.45, Beta= .43, p<.001), when gender was entered as a first step in the regression. However, Gender was no longer a significant predictor in the final model, which included Time 3 Social Relationship Difficulties, Spelling Achievement Scores, and Self-Esteem. Girls performed better than boys on two of these predictors (i.e. girls had higher spelling scores, and fewer social relationship problems at Time 3, as well as fewer behavior problems from Time 1 onward) than boys (see Table 5). This finding suggests that gender may "work through" these other variables across the years of primary education. In other words, girls' superior academic performance after the transition to secondary school is related to their better academic and social skills by Primary Cycle-3, and to the fact that they have fewer behavior problems than boys across the years of primary schooling. It is primarily their greater success in these areas, which combine to predict Secondary Cycle-1 marks, that allows girls to obtain higher marks than boys after the transition to Secondary school. It is also noteworthy that girls' higher marks (relative to boys) did not reach the level of statistical significance at Primary Cycle-1 (t=1.92, p<.058, ''ns'').

Follow-up analyses **within** gender indicated that similar factors predicted success for both girls and boys at Secondary Cycle-1, except that Math achievement test scores and Supportive Parenting, both measured at Time 3, were additional predictors of success for the

boys. That is, math ability and supportive parenting seem to be important in promoting boys' success, in addition to the set of predictors such as Spelling Achievement scores, social relationship skills, and positive self-evaluation (i.e., high self-esteem), which were significant predictors across gender groups in the final regression including all participants.

Age: Children who were relatively older when they entered Secondary Cycle-1 generally obtained lower marks than the younger children during that cycle. However, this is probably because the oldest children in the sample were those who had previously repeated a grade, presumably due to relatively weak academic skills. Consistent with prior studies (Pagani et al., 2001), it should be noted that grade repetition or "holding children back" for a year at the primary level apparently did not eliminate their academic difficulties or prevent problems after the transition to secondary school.

Psychological Distress (anxiety and depressive symptoms): Although correlated with Secondary Cycle-1 marks (r=-.23, p<.05), Anxiety and Depression symptoms were not significant predictors of Secondary Marks when Social Relationship Difficulties, Spelling, and Self-Esteem were also included in the model. Hence, this variable was omitted from the final regression analysis in Table 5.

Family income: Family Income did not predict academic performance at Secondary Cycle-1 within the current sample (see Table 6). Because a general effect of income on school marks is widely reported in the literature, the present results probably relate to the relatively low mean income of the present sample, where many of the children came from lower income backgrounds. In other words, the reported predictive effect of family income on achievement may be attenuated at the lower end of the income distribution. Due to the fact that children from families with lower incomes are more likely to be found in the lower part of the academic achievement distribution, family income may not differentially predict achievement when other predictive factors are considered. Note that, within the sample, Income was significantly correlated with Mother's Education (r=.43, p<.001).

Maternal Education: Maternal Education did not directly predict academic performance at Time 4 (see Table 6). However, Maternal Education did predict academic performance at Time 2 (r=.23, p<.05): which, in turn, predicted performance across the primary cycles and at Secondary Cycle-1. Mothers' years of education also was related to other predictors of Secondary Cycle-1 performance, including Social Relationships (r =-.29, p<.05) and Spelling Achievement scores (r=.23, p<.05). Mother's Education also predicted Involvement in Schooling after school entry (r=.71, p<.001), and was ''protective'' against Externalizing Behavior Problems at Time 3 (r=-.22, p<.05). In other words, the long term impact of this variable seems to operate by promoting the development of cognitive, pre-academic and social skills prior to school entry, and by promoting the acquisition of specific academic and social skills across the primary school years. By the final years of primary schooling (i.e. at Time 3), the children's acquired abilities are more predictive of future success than their mothers' educational backgrounds.

Table 6. Correlations between Maternal Education and Family Income with the Predictors of Academic Performance at Secondary Cycle-1

	Maternal education	**Family income**
Demographics		
1 Gender (1=M; 2 = F)	.14	-.00
2 Age of child at TIME 4	-.08	-.11
TIME 1 Preschool Assessment		
3 Home environment (HOME)	.60***	.26*
4 Child's I.Q.	.34*	.21^{t}
TIME 2 Primary Cycle-1		
5 Mother's involvement in schooling	.71***	.20^{t}
6 Externalizing Behavior PC-1	-.14	.01
7 Report Card Marks PC-1	.23*	-.01
TIME 3 Primary Cycle-3		
8 Supportive parenting	.18	.07
9 Externalizing behavior PC-3	-.22*	-.03
10 Relationship problems	-.29*	-.17
11 Self-esteem	.10	.10
12 Psychological distress	-.13	.01
13 Spelling Achievement score	.23*	.17
14 Reading Achievement score	.13	.06
15 Arithmetic Achievement score	-.12	.06
16 Report Card Marks at PC-3	.19^{t}	.08
TIME 4 Academic Performance		
17 Report Card Marks at SC-1	.16	.04

$^{t}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$ N=78

N.B.,The correlation between Maternal Education and Family Income is r=.43, p<.01.

CHAPITER 4: STUDIES 2 and 3

Understanding patterns of emotional and academic adaptation during the transition to secondary school (*Studies directed by William Bukowski, Ph.D.*)

As outlined above, the study of transitions is important for at least three reasons. The first is that they provide an excellent context for the study of risk and resilience. Transitions require re-adaptation. When persons enter a new environment they need to create and re-create the conditions needed for the satisfaction of their instrumental and personal/social needs. These demands might include the establishment of new social contacts, learning new ways of functioning within the existing "culture" of the new environment, and becoming accustomed to new opportunities for success and failure. Compared with observations made of persons as they function in a familiar context, observations made during a transition can reveal how persons respond to stress and they can reveal processes as well as momentary indices of functioning. In other words they are an excellent opportunity to look at risk and resilience.

Second, indices of functioning during transitions may be powerful predictors of functioning across a longer period. Having an index of how well a person negotiates the demands of a new context is likely to provide important information about the person's subsequent adaptation and functioning in this context. In other words, someone who is capable of "hitting the ground running" is likely to continue at a fast pace as she/he continues to function in the new context.

Third, studying transitions provided valuable information for the development of policies about how to introduce persons into new environments. The financial and psycho-social costs of transitions can be high. Knowing how to make sure that transition experiences will promote subsequent success is an important policy issues. This importance is especially high for secondary schools. For a large number of students this transitions Third, studying transitions provide valuable information for the development of policies about how to represents a chance for continued academic success or for a new start towards a higher level of competence than they experienced in primary school. Knowing how to facilitate each of these adaptive processes has inter-related financial and personal benefits. By promoting students' successful adaptation to the new school environment it is possible to increase the value of the funds devoted to secondary school education.

A basic premise of theory regarding transitions is the expectation of an initial period of maladaptation. In so far as a transition is likely to be a stressful experience, at least in a minimal way, observations of distress are to be expected. That is, as the transition pushes a person away from a context to which he/she had been adapted, one can expect to see responsive changes in indices of behavioral and affective adaptation. In this way, some signs of maladaptation are not only to be expected as the norm, but they may be seen as an index of health adaptation.

A second premise of theory on transitions has been implied already. Individual differences in the behavioral and affective responses to the transition experiences are to be

expected. Larger changes in behaviour and affect will be seen in some children than in others. Consistent with the first premise (i.e., that some signs of distress are not only normative but are healthy) it is possible to argue for a curvilinear association between reactivity during a transition and wellbeing. Whereas no response or extreme responses would indices of maladaptation, at least a minimal level of reactivity would be regarded as healthy. For example, initial modest increases in levels of anxiety, or initial decreases in measures of perceived well being would be seen as indices of appropriate responses to the stress of a transition. The lack of a response or an extreme response would be seen as maladaptive reactions as they indicate (a) a lack of sensitivity to or defensiveness against the demands of the new context, or (b) a heightened sensitivity to these news demands and a lack of coping resources to deal with them.

A third premise has also been implied already. In so far as adaptation to a new context is likely to be a dynamic process, it cannot be studied with a one-time-only design. It needs to be studied as a process that unfolds over time. Accordingly, the use of longitudinal data is needed to show how measures of adaptation vary across the transitional period. This approach is ideally suited to the use of growth trajectory analyses.

For this section of the project, we conducted two transition studies to assess the general processes of adaptation during the transition to secondary school and to assess individual differences in these processes. In one case we used an intense event sampling design in which we followed a group of 77 students across the first two weeks of their transition to secondary school. In the final study, the period of the assessment was the first four months of the first year in secondary school. In each study a growth curve model was computed for each participant. With this strategy it was possible to assess the overall levels of adaptation across the transition period and we could also assess the changes at the level of the individual.

Study 2: EMOTION ACROSS THE INITIAL TRANSITION TO SECONDARY SCHOOL

The participants in the first study were 77 boys and girls from a school from the Commission Scolaire Riverside. The design of the study includes two assessments. The first took place in May during the students' final year in primary school. The second assessment took place during the first two weeks of secondary school. All of the children attended the same secondary school although they had come from three different primary schools. At the first assessment peer assessment and self report techniques were used to assess several domains including (a) aggressive behaviour, (b) social isolation, (c) prosocial behaviour, (d) the self concept and self involvement (e) acceptance and rejection among peers and friendship. The measures collected at T1 were used to create three scores for each child. These measures were indices of (a) antisociality (above average in aggression and self involvement), (b) social competence (positive scores acceptance and friendship, low scores on rejection, and perceived social competence) and (c) social wariness (high on measures of social avoidance, low on measures of perceived social competence). The correlations between these measures were of a weak to moderate size (*r* between antisociality and social competence = -.31; *r* between antisociality and wariness = .23; and *r* between wariness and social competence = -.35).

During the assessment at the beginning of secondary school an event sampling technique was used to assess affective well being on each of four days (Tuesday through Friday) during the first weeks of the school year. The participants completed the diary twice a day, once in the morning before going to school and again in the afternoon after the school day was over and before they had their evening meal. Each child could have been assessed up to 16 times during the assessment period. (Only those who completed the diary on at least 12 occasions were included in subsequent in the diary they were asked to complete a measure known as the Positive and Negative Affect Scales (Watson, Clark, Tellegen, 1988). At each assessment the participants used a five point scale to rate their current affective state on each of 8 emotions. Higher scores indicated a stronger presence of the emotion in the child's affective state at that moment. From this measure we created two measures, one for anxiety and the other for contentment.

Our analyses were conducted with multilevel modeling using Hierarchical Linear Modeling (HLM). The level 1 model consisted of creating a growth curve for each of the participants on each of the two measures of affect. These curves were made by using the participant scores on a particular measure (i.e., either anxiety or contentment) as the dependent variables and using a measure of time as the predictor. Our measure of time was the number of days since the first day of the assessment. The first day (i.e., Tuesday of week 1) was scored as 0, the second day as 1, and so on; the first assessment in week 2 (i.e., Tuesday) was scored as day 7, the second day as 8 and so on (Only the participants who completed the diary on at least 12 occasions were included in subsequent analyses). In the level 1 analysis linear and curvilinear effects were computed for the changes in the affect measure across the eight days. Both linear and curvilinear effects were computed. The analysis of the anxiety score showed that the overall linear and the curvilinear effects were (a) significant with the linear effect being substantially stronger (21%) than the curvilinear effect (2%), and (b) that the linear effect and the intercept were random (i.e., non fixed). The observed overall association had the shape of a reclining J. Findings observed with the contentment measure also showed both linear and curvilinear effects. Again both effects were observed to significant with the linear effect being substantially stronger (16%) than the curvilinear effect (3%), and the linear effect and the intercept of the slope were random (i.e., non fixed). With this measure the observed overall association had the shape of a truncated U. (These curves are shown in Figures 4). These findings show that anxiety subsided over the first two weeks of the school year and that contentment increased.

The level 2 analyses assessed whether any of the individual differences in the (i.e., the randomness) in the intercepts and the linear components of the growth curves were associated with the antisociality, competence and wariness measures derived from the data collected at T1 in primary school. When these scores were used at level 2 predictors of variations in the parameters observed as random effects at level 1 effects were observed with each of the three measures and for each of the two forms of affect. Given the conceptual links between the three predictors (i.e., antisociality, competence and wariness) and the two level 1 affect measures, it is not surprising that the observed effects were stronger for the parameters for the intercept rather than for the slopes.

The findings for the measure of anxiety are shown in Figure 4. The overall curves are shown in a heavy black line. As shown in the Figure 4, the overall decrease across the two week period is strongest for the low anti social and weakest for the high antisocial. The decrease is stronger for the participants high in social competence than for those who are low but differences associated with the intercept persist across the two week period. Participants who are high in wariness show a higher intercept than those who are low in wariness. Change across two weeks was not associated with wariness, most likely because of a floor effect in the anxiety score for persons who are low in wariness.

Slightly different patterns were seen with the contentment measure. As shown in Figure 5, the overall pattern shows an increase over time. This increase, however, was not seen in all cases. For example, participants who are high on the antisocial score show a decrease and the participants who are high in wariness show little change. The largest increase was by shown by participants who were high on the measure of social competence.

Taken together, these two set of findings point to three important patterns. The first is the remarkable amount of change that occurs during the first two weeks of the transition to the new school environment. Especially on the measure of anxiety, there is a large change. Whereas anxiety decreases, to floor levels in some cases, contentment increases. The important messages of these findings are (a) that anxiety at the outset is the “norm” and (b) that contentment slowly increases across the earliest transition period. The second important finding is that initial levels of somewhat elevated levels of anxiety are seen even with socially competent children. Their initial level of anxiety is not different from the average child in the class. This particular finding shows that at the beginning a little anxiety may not be a negative factor. Aside from the children who were lowest on the measure of wariness, and who would be expected to show little anxiety, the antisocial/self involved children show low levels of anxiety. The third interesting result is the observation of variations in change over time. It is clear that some children become adapted more quickly than others. On both the measures of anxiety and contentment changes across time vary for the different types of children. On the measure of contentment antisocial children actually show a decrease over the two week period. A similar pattern is seen with children who are high in wariness. This set of findings may tell us two things: (a) that some groups of children might be targeted from the outset so that their anxiety can be minimized and their contentment will show less of a decrease as the transition continues, and (b) that for some children the anxiety of the new school is not merely a transitory experience.

Subsequent analyses will examine a larger set of level 2 predictors and it will consider how the growth trajectories observed across the transition period are related to subsequent school performance.

Study 3. THE FIRST 100 DAYS: ASSESSING CHANGES ACROSS A THREE MONTH PERIOD AT THE BEGINNING OF SECONDARY SCHOOL

A similar approach using growth curve analysis was used with the next study. In this study, however, the time period was longer and a slightly different set of measures was used. In this case the transitional period was longer and the measures included a peer-rated index of academic achievement. Our goal was to assess whether measures of emotional and social adjustment during the transition would be associated with measures of academic achievement at the end of the year. We were again able to assess the children in primary school prior to the transition. There were 122 participants in the study, recruiting from schools of the Commission Scolaire Riverside.

The design of the study included three assessment phases. The first phase took place in May at the end of the school year when the participants were in three different primary schools that fed into a single secondary school. In this phase of the study peer and self assessments were made of perceptions of academic competence and of social adjustment. They also completed a measure of their expectations of success in secondary school and the amount of support they expected from their parents. The second phase again used an event sampling procedure. At four times – early September (the third week of school), early October, early November and early December – the participants completed a set of self report measures regarding their emotional adjustment, their academic competence, and their social relations. The measures collected in the four assessments of the second phase of the study were repeated in the third phase conducted in May of secondary school.

The measures of emotional well being included an index of loneliness and a measure of depression. The measure of self perceived academic competence assessed in all three phases was taken from the Perceived Competence Scale for Children. Academic performance was measured in the first and third phases of the study with peer assessments. That is, using peers as assessors we measured the extent to which each child had a profile as a person who does well in academic subjects. Peers are known to be very reliable and valid informants of each other's level of competence in observable domains such as school performance (see Rubin, Bukowski & Parker, 2006). The measures of social relations were used to create indices of how much each child was liked and disliked by their peers.

Two sets of illustrative findings will be presented here. In the first set of findings we examined the association between growth curves of emotional well being across the four months of the second phase of the study and the measures of academic achievement collected in the first and third phases. Our goal was to assess whether changes in affect across the first four months of secondary school were related to (a) prior academic success and (b) subsequent academic performance. The second analyses assessed whether changes in social adjustment during the transition were associated with peer ratings of academic performance at the end of the year.

Growth curves for the two measures of affect were computed using the same procedures used in Study 1 except that only linear effects were assessed. (Assessing curvilinear effects with just four observations per person is unlikely to produce stable results.)

In the level 1 growth curve analysis time was used as the predictor variable and the measure of affect were used as the dependent measures. In this case time was the month when the assessment was made. September was coded as 0, October was 1 and so on. Separate analyses were conducted with the measures of loneliness and depressed affect. With both of these analyses, the overall growth curve was negative. That is loneliness and depressed affect decreased as the transition continued. Again, however, this effect was random. Whereas most of the participants showed a decrease as a function of time, the size of this change varied from one child to another. The level 2 analysis assessed whether is variability was associated with prior and subsequent academic performance.

This assessment was carried out by using the peer-assessed measures of academic performance for phase 1 (i.e., at the end of primary school) and phase 3 (i.e. at the end of the first year of secondary school) as level 2 predictors. In these analyses, the phase 1 measure was used as the first predictor; then the phase 3 measure was added as an additional predictor. Since similar results were found with both measures only the findings for the loneliness measure will be presented. Our findings show that (a) academic performance in primary school was weakly related to the intercept of the measures of loneliness during the period of the transition but not to the slope, whereas (b) the measure of academic performance at the end of the first year in secondary was related to the slope of the growth curves but not the intercept. This pattern tells us that academic performance in primary school tells us about a student's emotional starting point when they arrive in secondary school. Changes in affect across this period are a predictor of where someone will be at the end of the first year in their academic achievement.

The results of our second set of analyses are as follows. Children who established increasingly high levels of acceptance with their peers during the first four months of secondary school showed higher levels of academic achievement at the end of the first year even after controlling for academic performance in the final year of primary school. The results of our second set of analyses point to the importance of basic processes. The first process refers to the importance of considering how different domains are inter-related. In this study we avoided the typical practice of looking at within domain patterns of associations. That is, instead of assessing how school performance in primary school was related to school performance in secondary school, we assessed how measures of academic performance at this two times were linked to each other via measures of affective well being assessed during the first three months after the transition. The second process shown by these findings is that trajectories matter. One part of our findings show that after accounting for the effect of school performance in primary school, academic performance at the end of the first year of secondary school was predicted by change in depressed affect during the transition period. That is, it was a change in affect that predicted subsequent school performance. Another part of our findings revealed that children who established increasingly high levels of acceptance with their peers during the first four months of secondary school showed higher levels of academic achievement at the end of the first year even after controlling for academic performance in the final year of primary school.

These findings point to the importance of assessing how functioning in one domain is related to functioning in others. To increase academic performance at the end of secondary

school it might be useful for schools to promote affective and social well being as well in addition to devoting attention to academic success only. These findings show also that processes of change matter. The negative downward cascades in affect and the positive upward movement in social relations predicted subsequent performance. That change, rather than an absolute level of well being, predicts academic competence is important as it shows that one needs to look at more than a person's current functioning. One needs to assess how the person is changing over time.

Figure 4. Anxiety across Time as a function of Measures from Primary School

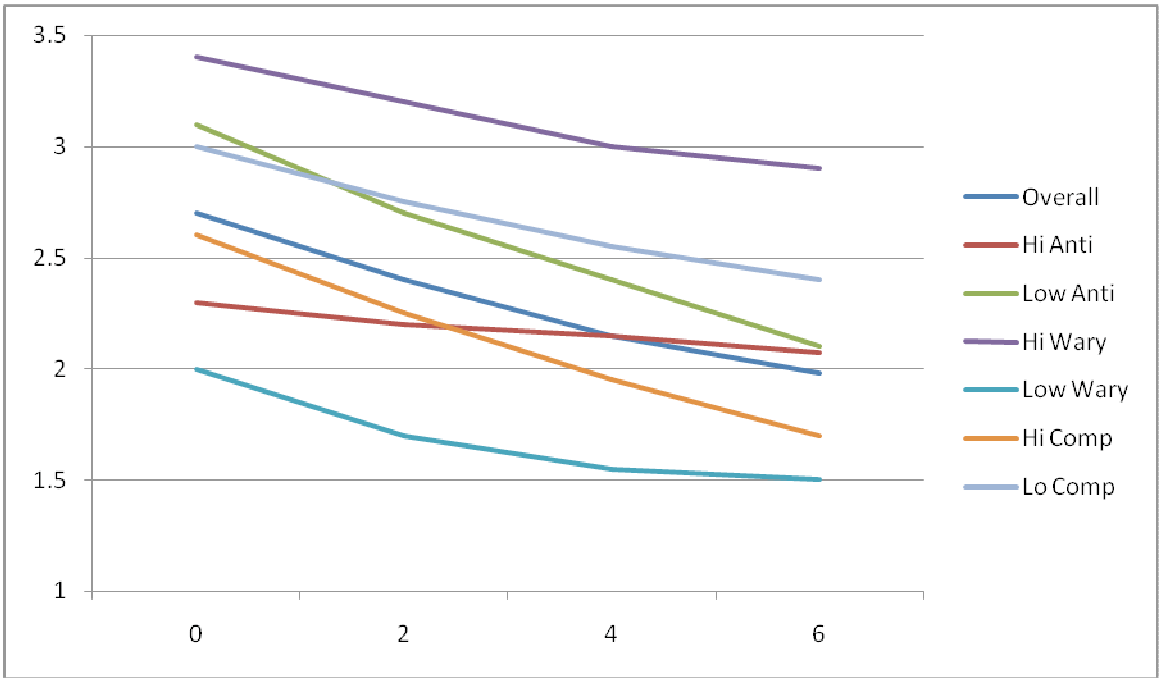
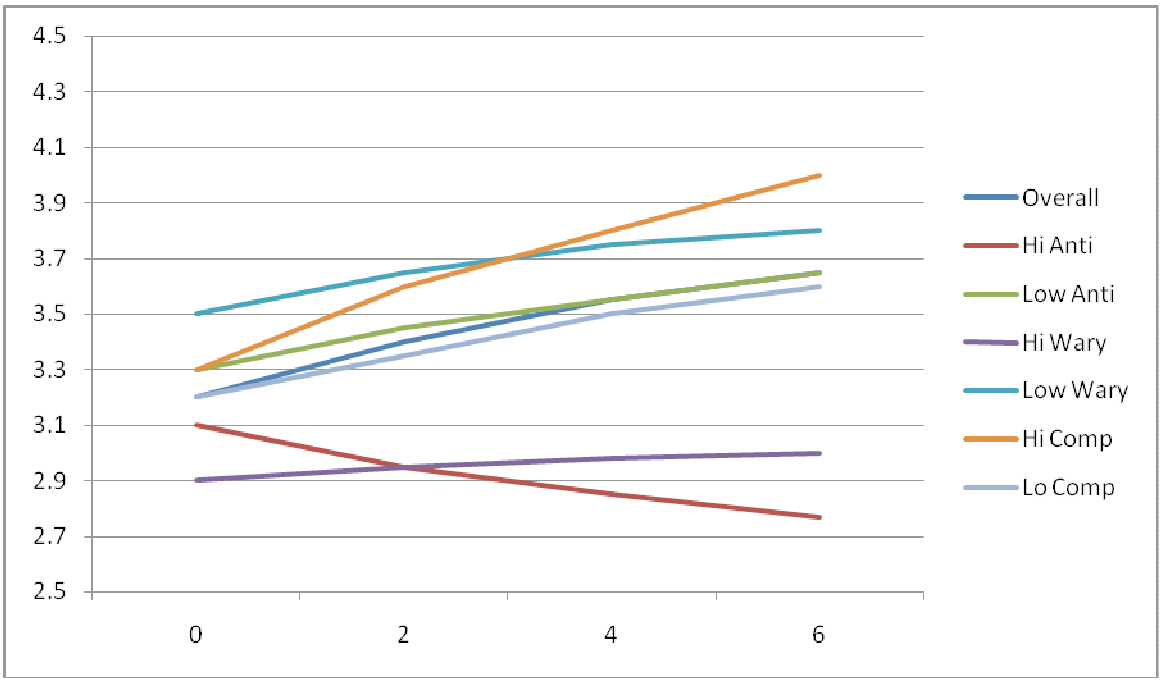


Figure 5. Contentment across Time as a function of Measures from Primary School



CHAPTER 5: CONCLUSIONS & IMPLICATIONS

The present results shed light on at least three major questions regarding the prediction and promotion of academic success at the critical transition to secondary schooling.

1) First, are individual children within a disadvantaged sample showing cognitive, language, or behavioral difficulties prior to school entry and during the first cycle of primary school that accurately predict academic failure (defined here as grade repetition) by the Secondary Cycle 1 level?

2) Second, what are the specific academic, behavioral and social skills across the course of primary schooling that can foster academic success at Secondary Cycle 1? How do these abilities develop and inter-relate to promote success, within an ‘‘at-risk’’, disadvantaged sample?

3) Third, what are the personal characteristics, relationships, and social/relational skills that foster children’s perceptions of social and academic success across the first year of secondary schooling?

The findings with regard to these issues are summarized below and discussed in relation to potential prevention and intervention strategies.

With regard to the first question pertaining to early detection of children’s risk for failure, it is clear from the present results that cognitive/language deficits and behavioral problems can be identified prior to school entry. Such problems identify a sub-group of children who will later fail at above chance levels, particularly among boys.

However, the future of these children is not ‘’sealed’’ at preschool age: it is in the course of development over the early and middle years of primary schooling that they will either acquire or fail to acquire the necessary skills for academic success. Hence, the experiences and acquisition of essential academic and social skills during the primary cycles is critical to long term success, even in children who have a high risk of failure based on their level of functioning and family backgrounds prior to beginning schooling.

It is important to underscore that while 30% of the children who were initially identified with problems subsequently repeated a year, many (70%) of the children with problems at preschool age did **not** go on to repeat a grade. Conversely, some children (in this sample, 14.3%) who appeared to be developing without serious difficulties at preschool age subsequently developed serious academic or behavioral problems that interfered with their school success. In other words, experiences and learning **during** the primary cycles played an important role in long term success within this disadvantaged population.

Our findings also imply that an effective preventive intervention to prevent future academic failure could be implemented from the point of school entry (e.g. kindergarten and Primary Cycle-1 levels). However, the rate of “false positives” (‘problematic’ children who do not go on to fail) was relatively high at 70%. Thus, intensive individualized interventions at the

time of school entry may not be a practical way of using limited support resources. An alternative strategy would be to introduce a **universal** preventive strategy to promote basic literacy and math skills, as well as improve behavioral and attentional styles that promote classroom learning among children from at-risk backgrounds (i.e. poverty, social disadvantage).

Subsequently, success versus failure in that basic universal program during Kindergarten and Primary Cycle-1 would identify children who will require more **intensive** and **individualized** intervention, and ongoing support to acquire basic academic and social skills. This two stage strategy would likely be highly effective in terms of providing appropriate prevention services for most of the children in the system that are likely to fail a grade by Secondary Cycle-1. It would also be efficient: the level of overall skill in the population would be raised at relatively low cost, while costly intensive interventions would be directed only at those children with demonstrated need for such support.

With regard to the second issue pertaining to the specific predictors during the primary cycles that promote success at Secondary Cycle-1, children's academic skills, self-esteem, social skills, and positive peer relationships showed significant ability to predict academic performance in Secondary Cycle-1. In other words, the combination of strong academic preparation (in particular formal written communication skills, including spelling, and also math skills, particularly for boys), satisfying and supportive relationships with peers, and a sense of personal competence and confidence were important elements for success across the challenging transition to secondary schooling. However, abilities in each of these domains at Primary Cycle-3 were the product of gradual development across the primary cycles. Early academic success and the absence of serious behavioral problems (particularly disruptive and attentional difficulties) as well as maternal involvement during the early years of schooling allowed these critical skills to develop by Primary Cycle-3.

Parental support and involvement in schooling also appear to be particularly important elements for boys, who had much more difficulty than girls in developing these critical skills by the end of the primary cycles. In fact, the large gender difference in performance by Secondary Cycle-1 was largely "explained" statistically by girls' acquisition of stronger literacy (spelling) skills, social abilities, and good relationships with peers, and self-esteem across the Primary Cycles. For boys, additionally, development of mathematical skills and strong support from parents appears to give them an advantage over boys without these assets. However, for both boys and girls, the basic predictors of success included the three main characteristics: basic literacy skills, good peer relationships, and self-esteem.

How schools can foster the development of these characteristics in disadvantaged children, and especially children entering the system with cognitive, language, or behavioral problems, is the greatest challenge identified by these results. Although academic skills, such as literacy and math, are clearly the traditional province of educational systems, developing good social relational skills and strong peer relationships, or an overall sense of self confidence and self-esteem, may be less widely acknowledged as failing within the province of schooling.

The present results confirm that academic success in the early primary cycles is an important contributor to the development of supportive peer relationships and self-confidence by the end of primary schooling. However, parenting (parental involvement, support), which fosters academics success, is not the traditional target of educational programming. Programs designed to improve parental involvement and support for academic goals (and monitoring of homework and regular attendance, etc.) have been explored with success (Spoth, Randall & Shin, 2008). The present results suggest that programs designed to involve parents and encourage parental support for children's academic activities may be an important element in improving performance and lowering failure rates, particularly among boys within ''at-risk'' populations.

Socio-Economic Status and Parental Education: Given the large literature indicating that family income is a major determinant of school success, it was perhaps surprising that economic factors did not predict success within the disadvantaged sample of Study 1. Even the correlations between family income and the significant predictors of school success across the transition to secondary school were small, and generally did not reach statistical significance. Although family income is a predictor of performance across the entire population, it may have less of a statistical impact **within** the population of disadvantaged children. Family income, of course, is related to another traditional indicator of socio-economic status: parental education.

When we looked at background and demographic variables that correlated with the predictors of school success, we found that mother's level of education predicted child's IQ and, interestingly, a cognitively stimulating home environment (the HOME measure). Education was also a strong predictor of the mother's involvement in the child's schooling during the first primary cycle. These, in turn, predicted academic success at school entry (Primary Cycle-1 Marks). Subsequently, mother's education was correlated with important success predictors at the end of primary school, including both academic indicators (Primary Cycle-3 Marks; Spelling Achievement scores) and behavioral and social relationship measures. The effect of mother's education seems to work largely via promoting "school readiness" (i.e. academic preparation and receptive classroom behavior) and by providing academic support after school entry. After school entry, the child's academic, social and behavioral patterns become increasingly important as predictors of subsequent success.

Father's education was generally not a significant predictor, and so was excluded from the regression models, but this is not to ignore its potential importance in a child's development. In this sample, as in much of the general population, many of the children were being raised in the absence of their biological fathers (either by single mothers or with a step-father, who may or may not have had much opportunity to influence the child's cognitive and social development during the early years). Also, even within traditional (i.e., two biological parents) families, mothers typically spend more time with their preschool-aged children than fathers. Hence, we were not surprised to find that it was mothers whose education was important in promoting early school success.

Promoting development during early childhood is outside the scope of the present discussion, which focuses on predictors of success across the school years. However, it

should be noted that these results add to mounting evidence that education, and in particular girls' education at the high school and post-secondary levels, is a critical factor in promoting the healthy and successful development of children in the subsequent generation.

Individual differences in anxiety, and the importance of friendships across the transition: The results of the second and third studies in this report indicate that there are major individual differences that predict children's social and academic adjustment within the challenging context of the first year of secondary schooling. Children who are highly anxious and lack friendships are particularly vulnerable within the transitional context of high school entry. Practical implications of these findings may be evident to readers of this report. For example, children whose initial anxiety upon entry to Secondary Cycle-1 does not resolve over the first few weeks may need explicit support to overcome the emotional, social, and academic challenges of this crucial year. This support could be implemented for highly anxious children early in the first semester of Secondary Cycle-1. Of course, such an experimental approach would require careful evaluation (e.g., using an experimental trial or ''added value'' design) before widespread adoption.

Overall, the low academic success rate (across the population) at Secondary Cycle-1 may be related to generally high levels of anxiety in the early weeks of high school, and a general strategy to help children cope, relax, and make new friendships might improve this picture. This has long been a goal at the Secondary Cycle-1 level, but perhaps systematic programs for support could be implemented and evaluated for more effective prevention of difficulties across the school population. Again, rigorous evaluation should accompany any trials of this approach.

Finally, all three studies indicate that developing good peer relationships by the end of primary schooling, along with well developed social skills, are crucial to effective functioning across the primary-secondary transition. Similarly, maintaining and forming new social relationships within the new secondary school environment is important for success across the first year of high school. Some high schools have implemented "bonding opportunities": trips or informal sports or cultural activities, to help with this process. Such activities, however, may not have been used systematically (especially within disadvantaged school populations), or evaluated for effectiveness. Children with more extreme social/relational issues and few friends may require more support in this area than programs designed for all students can provide. Many ways of fostering peer relationships could be considered, but a detailed discussion is outside the scope of this report.

Limitations of the present studies: The three studies together address important issues and provide information that may be helpful in designing further targeted research and future policy. However, they each have limitations within their designs. The most important limitation is sample size and attrition, especially for Study 1, the nine year longitudinal study. Although 175 families initially enrolled in the sample population for Study 1 at preschool age, and participated at Time 1, attrition was considerable across the four time points. Many children participated in only some of the assessment periods (eg. Times 1, 3, 4, but missed Time 2), while others had incomplete records at one or more time points (e.g. missing school or parent information for a specific time point). Attrition is a well known problem in carrying out long term

longitudinal research programs, especially with a very intensive assessment protocol requiring hours of children's, parents' and teachers' time. We did evaluate the participants' characteristics to estimate the "randomness" of attrition, and found that the children and families who left the study did not differ from the continuing participants in terms of the Time 1 parameters that were utilized in the analyses. It should be noted that an additional 30 children are scheduled for assessment during the present academic year, as they reached secondary school in September, 2008. This will increase the N for analysis of four time points to about 108 (these analyses will be completed before the results are submitted for external publication in fall, 2009). Nevertheless, the small sample sizes in each study should raise some caution in interpreting, in particular, non-significant effects in the analyses. A larger N will raise the power of the analyses for detecting statistical significance, particularly for small but "marginally significant" effects in the regressions.

Further directions for research: The need for replication of research findings and empirical testing of conclusions is a well established principle in the area of policy and program development. In this case, in addition to replication, short-term interventions (with appropriate research designs) might be attempted based on some of the findings. In addition, the long term impact of the factors predicting success at the Secondary Cycle-1 level should be examined: to ascertain whether these variables also predict secondary school completion. This issue could be examined within the next three years by an additional follow-up of the samples involved in the present study. Finally, the present studies have created a data base of information about children's functioning and environment **during** the first cycle of secondary school. In future studies with these samples, variables collected for the present project could be included in predictive analyses of success during the upcoming years of high school.

In conclusion, there are a number of familiar as well as relatively new findings in these results. While it will surprise no one that strong academic skills are important for success, the importance of social skills, peer relationships and self-esteem support the position that effective education is not only about acquiring academic skills and knowledge, but also about social, emotional skills and adaptation. These issues need to be addressed, so that every child is optimally positioned for success including those from disadvantaged backgrounds.

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Contributions to Research Training supported by the Current Grant

Two graduate students (Paula Ruttle and Lisa Campisi, supervised by Lisa Serbin) were involved in various aspects of the project including testing participants, data entry and reduction, and data analyses using a variety of statistical tools. Two post-doctoral fellows (Jennifer Naschen, Ph.D. Queens University, and Ryan Adams, Ph.D., Florida Atlantic University, supervised by Serbin and Bukowski, respectively), also participated in the project.

Five B.A. level research assistants planning to enroll for advanced studies (Julie Aouad, Elizabeth Charbonneau, Nicolas Kessous, Rana Pishva, and Andreann Perron) were directly involved in data collection: including recruiting participants, organizing testing schedules, administering and scoring standardized tests. The project provided trainees with a unique opportunity to learn about problem-focused approaches to longitudinal research design, and provided them with exposure to applied research methods. Working within the schools also offered research trainees the opportunity to experience the process of collaboration within community settings, and to carry out ‘‘needs assessments’’ within a disadvantaged population.

In terms of a training milieu, the Centre de Recherche en Développement Humain (CRDH), sponsored by the Regroupement Stratégiques program of the FQRSC, was an ideal site: offering state-of-the-art programs and facilities. The priority research theme of CRDH research is “Navigating critical transitions across the life-course” and the present proposal fit well within the Centre’s mandate for infrastructure support and training. In a recently published study (Byrnes & McNamara, 2001), our faculty in human development was rated the “most productive” in Canada (and 17th North America wide) in terms of publications in refereed research journals.

The Centre offers a regular Developmental Seminar, a Colloquium Speakers series, workshops focused on basic and advanced statistics and methodology, travel funds for trainees to attend conferences, and many other forms of support to its student members and trainees. Most important, in terms of the present application, students have regular contact with faculty researchers from a variety of complementary social science and health-related disciplines. The goal of research training at CRDH is to allow trainees to acquire a comprehensive trans-disciplinary perspective in understanding the complex processes of transition and development across the life-course.

Presentations:

Campisi, L., Asgary, V., Serbin, L.A., Stack, D.M., & Fisher, D.B.D. (April 2005). *Complexity in the language of young children from disadvantaged families: Is Mean Length of Utterance (MLU) an early predictor of school-aged language and reading skills within at-risk populations?* Poster presented at the biennial meeting of the Society for Research in Child Development, April 2005, Atlanta, Georgia.

Martin-Storey, A., Serbin, L.A., Stack, D.M., & Schwartzman A.E. (2006, May). The relation between early responsive/adaptive behavior, IQ, and later school performance in an at-risk sample of lower SES francophone children. Presented at *The International Summit for the Alliance on Social Inclusion symposium*, Montréal, Qc.

Serbin, L.A., Stack, D.M., & Schwartzman A.E. (2007, February). The transfer of health and developmental risk from women to their children: Exploring intergenerational pathways in a high risk sample. Invited conference, Orebro, Sweden.

Campisi, L., Goldberg, E., Jerabkova, B., Serbin, L.A., & Stack, D.M. (2007, March). *The predictive ability of children's conversational speech on school grades in high-risk elementary school children*. Poster presented at the biennial meeting of the Society for Research in Child Development, Boston, Massachusetts.

Martin-Storey, A., Serbin, L.A., Campisi, L., & Stack, D.M. (2007, June). The relationship between cognitive and behavioural problems in early childhood: The importance of observational measures of child behaviour. Presented at the *68th Annual Canadian Psychological Association* conference, Ottawa, On.

Serbin, L., & Bukowski, W.M. (2008). La transition du primaire au secondaire : Trajectoires de succès chez les populations vulnérables**.** Activité de suivi des projets de recherche financés dans le cadre de l'action concertée *« Persévérance et réussite scolaires ».* Presentation to the Ministère de l'Éducation, du Loisir et du Sport et FQRSC, Novembre 2008, Montréal.

Serbin, Lisa (2009, June). ''Unpacking the effects of poverty on children's heath and development: A longitudinal approach to the transfer of risk from parent to child''. Invited address, Canadian Psychological Association, June, 2009, Montreal.

Manuscripts currently in press, or submitted for publication:

Campisi, L. Serbin, L.A., Stack, D.M., Ledingham J. & Schwartzman A.E. (in press). Precursors of language ability and academic performance: An intergenerational, longitudinal study of at-risk children. Infant and Child Development.

Serbin, L.A., Stack, D.M., & Schwartzman A.E. (in press). The transfer of health and developmental risk from women to their children: Exploring intergenerational pathways in

a high risk sample. Invited chapter, in M. Kerr & H. Stattin (Eds.), *Women's aggression across the life course*.

Serbin, L.A., Bukowski, W.M., Stack, D.M., Girouard, N., Petrakos, H., Burgos, G., & Schwartzman, A. (in preparation). Meeting the challenges of high school entry: Understanding the factors that promote academic success in vulnerable children across the transition to secondary education.