



Centre Interuniversitaire sur le Risque,
les Politiques Économiques et l'Emploi

Cahier de recherche/Working Paper **10-44**

Gender Gap in Dropping out of High School: Evidence from the Canadian NLSCY Youth

Pierre Lefebvre

Philip Merrigan

Novembre/November 2010

Lefebvre: Université du Québec à Montréal and CIRPÉE

Corresponding author : Department of Economics, UQAM, CP 8888, Succ. Centre-Ville, Montréal (Québec) Canada H3C 3P8

lefebvre.pierre@uqam.ca

Merrigan: Université du Québec à Montréal and CIRPÉE

This analysis is based on Statistics Canada's National Longitudinal Survey on Children and Youth (NLSCY) restricted-access Micro Data Files, which contain anonymized data collected in the NLSCY and are available at the Québec Inter-university Centre for Social Statistics (QICSS), one of the Canadian Research Data Center network. All computations on these micro-data were prepared by the authors who assume the responsibility for the use and interpretation of these data. This research was funded by the Canadian Millennium Scholarship Foundation.

Abstract:

This paper exploits the panel features of the Canadian National Longitudinal Survey of Children and Youth (NLSCY) and the large diversity of measures collected on the children and their families over 7 cycles (1994-1995 to 2006-2007) to explain high school graduation (dropout rates) of Canadian youth aged 18 to 23 observed in the most recent wave of the survey. We focus on the gap between females and males which in some provinces is high, particularly in Québec. The econometric approach uses a non-linear Blinder-Oaxaca decomposition technique to identify and quantify the separate contributions of group differences in measurable characteristics (youth attributes and family endowments) to the gender gap in high school graduation rates. We find that the traditional barriers to high school graduation, linked to poverty, are very detrimental for males in Québec. However, we also find that the male-female gap across Canada is very partially explained by differences in endowments such as reading or maths skills in school. Finally, as in other recent studies, our results show that parental expectations about educational attainment are predictors of high school graduation. Public policy approaches for the reduction of the male-female gap are proposed. More radical measures and some experimental approaches (pilot projects) should be adopted in Québec to decrease rapidly the dropout rates and increase high school graduation rates by the age of 18.

Keywords:

Longitudinal data, high school dropouts, youth attributes, family endowments, gender gap, non-linear Blinder-Oaxaca decomposition.

JEL Classification: I21, I28

1. Introduction

“Intellectual capital is the result of stimulation and support for exploration and achievement in the home, the neighbourhood, and the schools. To think that this can be changed by mandate – operating only through schools-is preposterous. Moreover, schools attended by minorities and the poor are wanting in ways that cannot be drastically improved overnight. The problems include the quality of teachers willing to work in these less rewarding schools, the disruptiveness produced by high levels of student turnover, and the nature of the schools’ clientele, whose homes and neighbourhoods make it unlikely that they will be encouraged toward high academic achievement”

-Richard E. Nisbett, (2009)

Canadian students have performed well on recent international assessments of academic achievement,¹ high school dropout rates have fallen, and rates of participation in postsecondary education in Canada are among the highest in the world (OECD, 2008). Canada’s school attendance rates for 15-19-year-olds peaked around the 82% to 84% range in recent years, up considerably from 25 years earlier when only two-thirds of teens in this age bracket were attending school. Although the statistics differ from one survey to another for recent years, Bowlby (2005), using the Labour Force Survey, shows that since the 1990-1991 school year, Canada’s dropout rate for the 20-to-24-year-old age group had fallen from 16.7% to 9.8% by 2004-2005. Over this period, the decline in the high school dropout rates is significant in all provinces, in particular for the later years in Atlantic Canada. The highest rates (over 10%) are observed for Québec and the Prairie provinces. Rural areas are also observed with high dropout rates compared to more densely populated areas.

Despite these signs of progress, troubling trends have emerged or were rather unchanged. First, a gender gap in enrolments and graduation rates has developed in college and university over the last 15 years (Statistics Canada, 2004). Second, males are over-represented among dropouts, although this is not a new phenomenon. In 1990-1991, the dropout rate for males and females were 19.2% and 14% respectively. In 2004-2005 the same percentages were 12.2% and 7.2% (Bowlby, 2005). But because the decrease in the rate of dropping out for young women has been larger, the male’s share of dropouts has increased in recent years (for the same period, from 58.3% to 63.7%). Third, the observation that there is a larger share of male dropouts holds across

¹ In the Programme for International Student Assessment (PISA) which is a project of the Organisation for Economic Co-operation and Development (OECD, 2004).

provinces but the prevalence of males dropping out is much higher in Québec where in 2004-2005 seven in 10 dropouts were young men (Bowlby, 2005). Moreover, the gender gap in dropout rates is larger in Québec than the average rate for all the Canadian provinces: 13 to 15 percentage points depending on years in Quebec versus 5.5 in the Rest of Canada.

Third, for some, dropping out of high school is not a final educational attainment because the “second chance” system offers the opportunity to return in the education system for the purpose of completing the requirements of a high school diploma or to enrol in programs or courses outside of secondary school including programs at the post-secondary level. Again, young women aged 20 to 24 take better advantage of this option. According to estimates of the “1st order and 2nd order” dropout rate computed from wave 1 of Statistics Canada’s Youth in Transition Survey (YITS) among 20-year-olds, Québec has still the largest dropout rate, a decrease from 16.4% to 13.8% after a second chance education compared from 12.0% to 11.0% for all of Canada (Bowlby and McMullen, 2002).

Fourth, Québec’s administrative data (MELS, 2009) computations show the high school graduation rate by age cohort (for all of Québec and by type of the schooling system - public or private - and by language of instruction – French or English).² For a student with no schooling interruption, the typical age of graduation from high school in Québec is 17 (secondary 5 or the equivalent of grade 11 in the Rest of Canada; in the other provinces it is 18 or the equivalent of grade 12). For the 2000 and 2001 cohorts who are observed 7 years (from age 12 to around age 19) after entering high school (secondary 1), the graduation rates are 72.1% and 72.3%, respectively. There is a large gender gap of 14% for the two cohorts: the rate for young women is 79% compared to 65% for males. The general gap between private and public schools is 20% (89% and 69%, respectively in 2001), and between English and French schooled students it is 9% (graduation rate of 81% and 72%, respectively in 2001). For the four latest cohorts, 2000 to 2003, last observed in 2008, the overall graduation rates after five years at the high school level (the “normal” number of years in high school before graduation), have not changed and have been around 60% (68-69% after six years in high school).³

Finally, in all provinces, high schools also offer “technical,” trade, or vocational classes for students less inclined to follow a general formation, leading to a “general equivalence diploma” (GED). The School boards may also offer the same programs and a general high school formation to young adults who have dropped out or have not finished their high school in regular schools.

² School boards in Québec are divided by language. Québec has the largest subsidised system of private schools among the provinces in particular at the high school level where about 20% of students are enrolled in private schools (Lefebvre and Merrigan, 2009).

³ We cannot document the trends in graduation rates for recent cohorts of students in the other provinces.

For the individuals taking this route, it is more difficult to document the trends. Taking Québec as an example, in 2006-2007, 15.0% of youth less than 20 (from 15 to 19 years of age) have transited from the youth sector to the adult sector, and 70% of those obtaining a high school diploma in the adult sector are less than 20 years old (64% are male and 75% are female).

These trends indicate that young males are lagging behind young females and that high school dropout rates should be of concern for education policy. A high school diploma is very important not only because it can provide entry to postsecondary education but it also has a credential effect sending a positive signal to prospective employers (Ferrer and Riddell, 2002). Research shows that high school completion benefits individuals in terms of earnings, labour market outcomes, employability, job selection, subsequent skill acquisition, improved health and happiness (Hansen, 2007; Hankivsky, 2008; Oreopoulos, 2007; Campolieti et al., 2009). Moreover, higher educational attainment has been associated with substantial social (third-party) benefits such as reduced crime and enhanced citizenship skills and participation (see Hankivsky for references). There is also considerable evidence that, on average, youth from socially and economically disadvantaged families are more likely to drop out of high school and participate less in postsecondary education after high school (Bowlby and McMullen, 2002; Finnie et al, 2008). If these observations are credible, reducing the gender gap in educational attainment will generate efficiency effects, distributional effects and social benefits.

We believe that the determinants of the male-female gap graduation rates should be analyzed more closely, particularly in Québec where the gap is dramatic. Male graduation rates in Quebec lag behind those in rest of Canada while Québec-Rest of Canada differences are much smaller for females.

Recent studies in child development, using non-experimental panel data, insist on the dynamic nature of cumulative learning processes at different stages of the life cycle that determine the level of academic achievement (Finnie et al. 2008). Therefore, a particularly rich set of data is necessary to address the topics of high school graduation and gender gap. The paper pursues three objectives:

- 1) To exploit the panel feature of the Canadian National Longitudinal Survey of Children and Youth (NLSCY) and the large diversity of measures collected on children and their families (7 cycles of data from 1994-1995 to 2006-2007) to explain high school graduation (dropout) rates of Canadian youth aged 18 to 23 who were last observed in the most recent wave (Cycle 7, 2006-2007) of the survey.
- 2) To estimate how family background, family income, cognitive abilities, non-cognitive abilities as defined in Cunha and Heckman (2006), and behavioural scores cause the gender gap, and can be used as markers for identifying young males at risk of dropping out of high school.

3) To derive policy implications from the results and to focus on interventions that could provide students, particularly males, incentives to persevere in school and graduate from high school.

The structure of the paper is the following. Section 2 starts out with a review of the recent empirical evidence on high school dropouts. Section 3 describes the information collected in the NLSCY, the data set of youth respondents, and the dependent and control variables constructed and used for the estimations. Section 4 presents high school graduation/dropping out rates of youth in the data set by gender, for Québec and the Rest of Canada, and descriptive statistics. The estimation methods are exposed in section 5. Section 6 presents and discusses the econometric results. The next section derives policy implications from the results. Section 8 summarizes and concludes the paper.

2. Review of recent research

Identifying the causes of dropping out is extremely difficult because like other forms of educational achievement it is determined by a diversity of factors related to both the individual student and to the family, the school, peers, and community environments where the student lives. Table 1, which presents the variety of reasons youth stopped or interrupted high school for different cycles of the NLSCY⁴ and for the two cohorts of youth respondents in different cycles of the YITS, illustrates the array of factors. For the YITS, the statistics are computed using all cross-sectional observations per cycle. The main reasons for dropping out are school-related, followed by work-related factors, and finally family-related factors. But these reasons, although they reveal that attributes of students such as their preferences, values, attitudes, school performance and behaviours contribute to their immediate decision to leave school, do not identify those causes or factors from earlier years in the life-cycle determining these attributes.

Eckstein and Wolpin (1999) formulate and estimate an explicit sequential decision model of high school attendance and school grade progression (and labour supply while attending school) that accommodates the variety of responses given in Table 1. The value of attending high school is composed of two parts, its current consumption value and the youth's perceived payoff of increased earnings to graduation. Given that youth have a diversity of experiences and backgrounds, they differ when they begin high school in terms of unmeasured attributes such as preferences for leisure and school (psychic costs and disutility of schooling), skills, abilities and motivation (with respect to school and the labour market), and expectations about the value of a high school diploma. These attributes are represented by types of youth and related through

⁴ A very large majority of youth do not provide an answer to this question.

information on respondents' family background characteristics (parents, household structure). They summarize their results as follows: "youths who drop out of high school have different traits than those who graduate - they have lower school ability and/or motivation, they have lower expectations about the rewards from graduation, they have a comparative advantage at jobs that are done by non-graduates, and they place a higher value on leisure and have a lower consumption value of school attendance." Increasing ability/motivation of dropouts to the levels of the high school graduate type is estimated to have a small effect on the graduation rate. However, if motivation *and* the expected valuation of graduation are increased to the values of the graduate type, the graduation rate is estimated to be 100 percent. The dropout type is associated with the following family background characteristics: low-schooling level of the mother/father, not living with either a natural parent at age 14 or only the youth's natural mother, with four or more siblings or no sibling, and living in a family with income less than one-half the median of the sample.

To this perspective of dropping out that Campolieti et al. (2009) qualify as "rational", can be opposed as they suggest the "irrational" decision to quit high school before graduating. Empirical evidence supports the idea that lifetime opportunity costs are very high, and that future gains offset costs such as the psychological burden of attending school and foregone present wages. Influential results, presented by Oreopoulos (2007, 2006, 2005) who uses compulsory schooling laws that force students to take an extra year of school experience, indicate that this extra year of schooling will increase annual earnings on average by 10-12% as well as generate significant benefits for health, employment, poverty, and raise subjective measures of well-being. An investment model of school attainment would suggest that students ignore future consequences of present decisions (have a high time preference) and/or poorly predict these consequences (as well as their parents), since other explanations such as students or parents financial constraints and the risk of investment in education are less credible (Oreopoulos, 2007).

Alternative explanations identify attitudes and motivation (of students and parents) as important determinants. Recent research has emphasized the role of personality and other psychological traits like risk-aversion, self-esteem, locus of control⁵ or the "big five"⁶ for

⁵ Locus of control, or "internal-external" attitudes, is a psychological concept measuring "a generalized attitude, belief, or expectancy regarding the nature of the causal relationship between one's own behaviour and its consequences" that can influence a variety of behavioural decisions in everyday situations (Rotter 1966). Individuals hold beliefs regarding whether situational outcomes are due to their own efforts or whether the outcomes are the result of luck, chance, fate or the intervention of others. Individuals who hold beliefs that outcomes are due to their own efforts have an "internal locus of control" while individuals who hold beliefs that outcomes are due to luck or chance have an "external locus of control". Thus, the psychological trait, locus of control, is often referred to as an "internal-external" attitude in the social science and psychology literature.

individual economic success (see Borghans, Duckworth, Heckman and ter Wel, 2008, for a comprehensive overview). Two recent studies by Mueller and Plug (2006) and Fortin (2008) show that non-cognitive traits play a significant role in explaining the gender wage gap among American workers. Braakmann (2009), building on these two studies, provides evidence from the German Socio-Economic Panel by considering a greater number of traits, specifically the “big five”, positive and negative reciprocity, locus of control and risk aversion. Similar to the results of Mueller and Plug (2006) and to a lesser extent Fortin’s (2008) results, the evidence from decomposition techniques presented in Braakmann indicates that psychological traits play a significant and non-negligible role in explaining gender inequalities in employment and wages. Waddel (2006) finds evidence for the United States that poor attitude and low-esteem during youth influence individuals’ educational attainment, later employment prospects and later wages negatively. Similar evidence for educational attainment is found by Coleman and DeLeire (2003) who present and estimate an economic model of how “locus of control” influences human capital investments (high school graduation) through expectations. Heckman, Stixrud and Urzua (2006) present a large body of evidence that cognitive and non-cognitive abilities help explain a large number of economic outcomes.

The social science disciplines using a variety of qualitative and quantitative methods have identified a very large number of *individual* predictors of dropping out: academic engagement/disengagement (do homework, expectations), academic achievement (grade progression and test scores, retention), social engagement (school attendance, school activities, and misbehaviour), stability (residential and school mobility), high school employment (long hours at work),⁷ teenage pregnancy, and background characteristics (gender, ethnicity, immigration status, language background, disabilities and health problems, behavioural problems). Similarly the *institutional perspective* also presents an array of factors associated with dropping out: family factors such as socioeconomic status (parental education and income), family structure (number of siblings, type of family, divorce/separation), parental involvement (expectations, support), parental practices and monitoring; school factors such as student composition, resources, structural characteristics, school process and practices, teacher characteristics (qualifications, credentials, involvement); and peer and community characteristics.

Finally, two recent Canadian research papers can be singled out because they used the youth cohorts from the new YITS survey to study high school graduation. Using cycle 3 of the 18-to 20-

⁶ It is a commonly used measure of personality of five basic personality traits, specifically, openness to experience, conscientiousness, extraversion, agreeableness and neurotic.

⁷ The evidence on is mixed as shown in Parent (2006).

year-olds cohort-B (aged 22-24 in December 2003), Campolieli et al. (2009) examine 15 outcomes (from wages to employment, to subsequent skill acquisition and to job/pay satisfaction) of youth dropouts compared to high school graduates who did not pursue postsecondary education. With respect to the determinants of dropping out (a first stage of their analysis is necessary to calculate an instrumented dropout variable), they find no gender effect (which is surprising; provinces are control variables but their estimated parameters are not presented), and the usual effects associated with peers (those who continued their education), teachers (getting along with them) and parents (education), positive school attitude (e.g. did school work, participation in school activities, interested in learning, regarded school positively) and negative behaviours (skipping class, using drugs, drinking), and youth and adult unemployment rates.

Using cycle 3 of the 15-year-olds' cohort-A (PISA cohort) respondents, aged 19 years in December 2003, Foley et al. (2007) examined the determinants of dropping out of high school. They find a large significant socio-economic gradient (parental education and income) on the probability of dropping out for both males and females. But, after controlling for reading scores (from the PISA test) and for parental (and youth own) expectations⁸ about their educational attainment (interpreted as the parents valuation of schooling), the socio-economic "gradient" is statistically not significant for females and is reduced by half for males. That is, high parental expectations countervail low parental education and income as well as high cognitive (reading) ability as the main explanations for dropping out. The other control variables (family structure, rural residence, residential/school mobility, immigrant and aboriginal status of youth, school effort, and dependent child) are statistically significant and have the expected sign. Peer variables, defined broadly, have no effect (except in the tails of the distribution, such as a binary variable set to one if all peers skip classes or have dropped out of school, where they have a small effect). Smoking weekly at age 15, a marker for risky behaviour (likely reflecting a relatively high discount rate), raises the probability of dropping out by 5 percentage points for males and 1.5 points for females but leaves the socio-economic gradient almost intact. The authors do not examine the gender gap and provincial differences.

3. Survey, data set and variables

Survey

The data used in this study are provided by Statistics Canada's National Longitudinal Survey of Children and Youth (NLSCY) which is a survey designed to provide information about

⁸ These expectations are revealed only once when the child is aged 15 years.

children and youth in Canada. The survey covers a comprehensive range of topics including childcare, information on children's physical development, learning and behaviour as well as data on their social environment (family, friends, schools and communities) and their educational attainment. The NLSCY began in 1994-1995 and data collection occurs biennially. The unit of analysis for the NLSCY is the child or youth. The person who is the most knowledgeable (PMK) about the child, usually the child's mother (biological or not, but it can also be the father, a step-parent or an adoptive parent who lives in the same dwelling) provides the information (child component) for each selected child when he or she is between *0 and 17 years of age* in the household. The PMK also provides family information (including the spouse when present) and personal information.

In addition, respondents between *10 and 17 years of age* completed a questionnaire on various aspects of their lives and their parents. Youth aged *18 years or older* respond for themselves and the PMK provides no information on the family. Therefore, most current values for the family variables are not observed when the child turns 18.

For the purpose of our study, the NLSCY has two main strengths compared to other surveys such as the YITS or the SLID. First, the survey covers a comprehensive range of topics collected over many waves: some variables relate to non-cognitive skills (self-esteem, emotional quotient), parenting practices, behaviours when the youth was a child or a mid-teen, and about the schools attended. Second, the survey administered tests measuring "skills": a math test in all cycles for children in Grade 2 or above, ranging in age from 7 to 15; a reading test in cycles 2 and 3 for grade school children; other cognitive tests or assessments, according to age for those aged 16 to 23.

The NLSCY has its limits. Although it is not particular to this survey, several observations are missing for certain variables; in particular those regarding schools in the youth self-completed questionnaire. For the tests such as reading and mathematics, a significant number of respondents have missing scores, before cycle 4 when tests were administered at the children's schools.⁹ But in our case we will be using the mean value of the test score over all cycles, minimizing the number of missing values. Because math tests are taken more often than reading, the math achievement measurement may be superior to the reading achievement measurement.

Finally, for the purpose of this study, the sample size of the 18- to 23-year-olds in the NLSCY is small compared, for example, to the two samples (cohorts A and B) in cycles 1 to 4 of the

⁹ For the tests, consent had to be given by the parent(s) and the school boards. For cycle 1, the NLSCY received results for about 50% of eligible children; for cycle 2, the percentage was 74% and for cycle 3, it was 54%. Since cycle 4, the test is administered at the home of the child and almost all eligible children take the test.

YITS. This is particularly true for the Québec sample when analysed by gender. Moreover, the attrition rate between cycle 1 and cycle 6 has been important: from 4,646 to 3,792 respondents. Fortunately, cycle 7 of the survey has retrieved most of these respondents.

Data set and multiple imputations

In cycle 7 (2006-2007) there are 4,646 longitudinal youth respondents which constitute the 18-23-year-old cohort. After excluding 219 respondents with unknown schooling status or a PMK with no education information we are left with 4,427 youth, 779 from Québec and 3,558 from the Rest of Canada (ROC).

In the NLSCY, there are missing values in particular for the youth self completed questionnaire (very few for the child component provided by the PMK) and even more for the reading test (approximately 25% of the sample) which was introduced in cycle 2 and dropped in cycle 4. For these reasons we choose to impute missing values for all variables using the “ICE” (which stands for Imputation by Chained Equations) procedure written by Royston (2005) for STATA.¹⁰ In most cases we are using means of independent variables (computed over several cycles) as explanatory variables, and treat them as continuous for imputation purposes. Only parental expectations are modelled as discrete values and an ordered Logit is used for imputing these variables. A total of five imputed samples were computed for the purposes of regression analysis. Imputations are performed using all variables in the regression analysis. We are then left with 1,833 females and 1,725 males for the ROC and 433 females and 346 males from Québec, after dropping 73 respondents schooled in the English school system (see below), for each of the five imputed samples.

Variables used for the regression analysis¹¹

Table 2 presents the variables used in the estimations and their definition. The first basic group of control variables are the family background characteristics: province of residence for the Rest of Canada sample in cycle 1,¹² education level of the PMK and spouse if present, family

¹⁰ The idea of multiple imputations is to create multiple imputed data sets for a data set with missing values. The analysis of a statistical model is then done on each of the multiple data sets. The multiple analyses are then combined to yield a set of results. Multiple imputations require that missing observations are missing at random (MAR). The ICE approach is based on each conditional density of a variable given all other variables. There are some obvious advantages using STATA's ICE instead of SAS's PROC MI or any other program with the same approach: no multivariate joint distribution assumption; this reason alone makes it appealing since it allows different types of variables to be imputed together; allowing weights, as long as the regression models allow them.

¹¹ Most of these variables in the NLSCY related to the 18-23-year-olds were constructed into a panel data set for cycles 1 to 7 but not necessarily used for the estimation results presented below. A STATA do file appendix is available from the authors.

¹² Using the province of residence at the moment entering high school had no impact on the results as compared to using the province of residence at another age.

structure, immigration status of the PMK, presence and number of siblings, size of the community of residence in cycle 1, and quartile of “permanent” family income in 2002 dollars (computed as an average of total income over cycles 1 to 4, to 5 or to 6 depending on age of youth).

Abstracting from family background characteristics, we experimented with almost all *child or parenting scores on parent-reported scales*¹³ and *scores on youth-reported scales*.¹⁴ Regarding scales few showed promise while many were far from significant. A problem with these scales is that they are highly correlated so that when they are all included in the same regression, standard multi-collinearity problems emerge (e.g. unexpected sign for certain coefficients, large standard errors). The second group of control variables consists of four measures of parenting scores and an index of family functioning; these have very few missing values over the cycles.¹⁵

The third group of variables are parental schooling expectations about their youth (highest level of education the PMK would like the child to achieve), transformed in three categories (high school or equivalency graduation, post-secondary diploma or certificate or equivalency graduation, and university level diploma or more). The variables are reported at different ages of the child (10-11, 12-13, 14-15, and 16-17 years). The other groups of variables refer to the youth characteristics. The basic variables are age and reported health status by the youth.¹⁶ The second

¹³ In parentheses, age of child at which measures are taken: depression rating (PMK; 0-15 years); family functioning score (PMK or spouse; 0-15 years); social support (PMK or spouse; 0-15 years); home responsibilities (PMK; 10-13 years); hyperactivity-inattention (PMK; 4-11 years); pro-social behaviour (PMK; 4-11 years); emotional disorder-anxiety (PMK; 4-11 years); physical aggression-conduct disorder (PMK; 4-11 years); indirect aggression (PMK; 4-11 years); property offences (PMK; 8-11 years); health status of the child on a scale of five (from excellent to poor). The NLSCY also includes parenting scales: positive reaction (PMK; 2-11 years); ineffective parenting style (PMK; 2-11 years); consistent parenting style (PMK; 2-11 years); rational parenting style (PMK; 2-11 years); conflict tactics/resolution (PMK, 12-15 years); parent-child cohesion (PMK, 12-15 years).

¹⁴ In parenthesis, age of child at which measures are taken: emotional/social capacity quotient, five composite scales and two aggregated measured (10-17 years, cycles 5 and 6; and 20-21 years, cycle 6); general-self (10-19 years); hyperactivity-inattention (10-15 years); pro-social behaviour (10-15 years); emotional disorder-anxiety (10-15 years); physical aggression-conduct disorder (10-15 years); indirect aggression (10-15 years); property offences (10-15 years); parental nurturance (10-15 years); parental rejection (10-15 years); parental monitoring (10-15 years). For the older youth (self-completed): neighbourhood structure (16-17 years); depression (16-17 years); conflict resolution mother/father (16-17 years); friends (10-17 years).

¹⁵ As stated in the NLSCY’s user guide for the first survey (1994-1995): “This scale was administered to the Person Most Knowledgeable (PMK) of the child, generally the child’s mother, or to the spouse/partner on the Parent Questionnaire, and measures how family members relate to each other.” More precisely: “Questions related to family functioning were developed by researchers at the Chedoke-McMaster Hospital of McMaster University and have been used widely both in Canada and abroad. This scale is used to measure various aspects of family functioning, e.g. problem solving, communications, roles, affective involvement, affective responsiveness and behaviour control.”

¹⁶ The health status of the child as perceived by the PMK in cycles 1 to 4 (5-6) was not a significant variable.

group is their scores on Math and Reading tests, their scores on the scales of Self-esteem,¹⁷ and for their Emotional quotient.¹⁸ In their analysis of the effect of cognitive and non-cognitive abilities on labour market outcomes and social behaviour, Heckman et al. (2006) (and Cunha and Heckman, 2007) retain math and reading scores as their preferred measures of cognitive skills. For their measure of non-cognitive skills they use standardized sum of scores on scales of “Locus of control” and “Self-Esteem”. The emotional/social capacity quotient (for ages 10 to 19 in cycles 5 to 7; and ages 20 and 21 in cycle 6 and 7), and the general-self or self-esteem measure (for ages 10 to 19 years) correspond partially to their measures of non-cognitive skills. Unfortunately, not all respondents have a scale for the emotional quotient scale (i.e. answered these questions from the self-completed questionnaire or have been administered this component; moreover the scale of the measure changes for the 20 and 21 year-olds). Estimations for a sample of respondents with such a measure used as a regressor show that the effect of the variable was never significant (possibly because of a small sample problem). The self-esteem measure (much fewer respondents have a missing value) remains the only credible non-cognitive skill variable in our regressions.

The third group comprises youth behavioural scores as reported by parents: hyperactivity-inattention, conduct disorder-physical aggression, and pro-social behaviour. Socio-emotional behavioural scales, except hyperactivity-attention and aggression, were generally insignificant predictors of high school graduation even among children with relatively high levels of problem behaviour and for children from high and low socio-economic backgrounds. Hyperactivity and aggression (conduct disorder) are variables in the psychology literature which are given an important role in child development, particularly in the work of Richard E. Tremblay and his co-authors (Tremblay et al., 2008; Fontaine et al., 2008; Leblanc et al., 2008). Therefore, we included a measure for each of these behaviours in the analysis. We also examined youths’ attitudes and perceptions towards school and teachers (in the self-reported questionnaire) as well as their expectation (hope of level of education they would attain). Many of them had too many missing values or were not significant (e.g. skip classes, expelled from school, hours watching TV, expectations) and were not retained. The group of variables kept are scales on: likes school, importance of grades, reading out of school, parents and teachers help with school when having a problem, perceived teacher’s fairness, and feeling safe at school. Besides using the value of all the

¹⁷ The objective of the General-Self Scale is to measure the child’s overall self-esteem. The self-esteem scale was expanded each year to include the oldest cohort. This means that by Cycle 7 the items making up this scale are asked of all youth aged 10 to 23.

¹⁸ The emotional quotient measures: intrapersonal competencies - self-awareness and self-expression; interpersonal competencies - social awareness and interpersonal relationship; stress management competencies - emotional management and regulation; adaptability competencies - change management; general mood - self-motivation.

scale variables they were also transformed in quartile dummy variables, including family income. The quartiles are specific to the two samples (Québec and the ROC) except for the math and reading scores which were first standardised to have a mean of a zero by level of education and cycle of the NLSCY.

4. High school graduation/dropping out rates and descriptive statistics

High school graduation/dropping out rates

The task of measuring dropout rates is difficult because information on educational attainment, coverage, and age restrictions¹⁹ vary from survey to survey. Younger youth, who drop out or interrupt school, are more likely to return to school after the normal time for high school graduation. These variations inevitably lead to different rates. The Labour Force Survey of Statistics Canada for the age group 20 to 24 has been used to estimate dropout rates over time. More recently, researchers have relied on the YITS survey. Usually, on the basis of survey questions a dropout is identified as anyone who responded that they had not obtained a high school diploma and who was not attending school. Educational attainment (the highest degree completed) is different information, given that it is possible to obtain a postsecondary certificate or diploma without completing a high school degree or equivalency. Those enrolled to complete a high school degree are not counted as dropouts. Finally, comparing high school graduates including both dropouts and current students leads to the computation of a “*completion*” rate.

Table 3 illustrates these difficulties by presenting rates of high school dropouts, continuers and graduates by gender for the two YITS cohorts over time.²⁰ The first panel summarizes these descriptive statistics from cycles 1 to 4 for the older cohort-B. It highlights an important fact about participation in secondary education: although the usual age of graduation from high school is 18 in most provinces (17 in Québec), approximately 76% of youth received their diploma in December 1999 at the ages of 18 to 20; 13% are high-school continuers and manage to graduate six years later (including high school dropouts) in December 2005. In 2005, compared to 1999, the percentage of dropouts has been reduced from 11% to 8%. For the dropout rate, a small gender gap (4%) exists at ages 18 to 20, which increases for ages 20-22 and 22-24 and decreases for youth aged 24-26 years to 4%. A very marginal number of youth are still high school continuers at the ages of 24 to 26. A substantial proportion of high-school graduates in Canada

¹⁹ Québec’s administrative data present summary measures of dropout rates over time with a 20 years-old cut-off point. Administrative data from school boards have the advantage of constituting a census of all students. But students enrolled in private schools, are counted separately. Those who move out of the province cannot be distinguished from actual dropouts and tend to overstate the dropout rate.

²⁰ We do not present the rate of high-school dropouts who report attending postsecondary education.

obtain their high-school diploma by way of equivalencies. The exact number of young adults who obtain their diploma this way is difficult to ascertain but in the YITS at least 15 percent obtain their diploma between the ages of 20 and 26 (Table 3, panel 1).

The second panel of Table 3 presents the same statistics for younger cohort-A (PISA). All the students in the YITS-A are in school and drop-outs would not have taken this test, therefore the sample is not exactly representative of all 15 year-olds in the first wave. Most youth are high school continuers by the age of 17 and a sizeable proportion are high school leavers (stopped or interrupted school). But this younger cohort has by the age of 19 (or 21) a higher high school graduation rate than cohort-B at the ages of 20 to 22 (24 to 26). The gender gap is higher when the youth are 19 years old (7%) and decreases by the age of 21 (to 4%). These statistics illustrate the trends presented in the introduction: each generation of young women is progressing towards more education and at a younger age.

Table 4 displays graduation rates computed with samples from Québec and the ROC for the sample of 18- to 23-year-olds found in cycle 7 of the NLSCY. We compute three high-school graduation rates. The first measure, HS0, includes all 18- to 23-year-olds and is a *completion rate*. The second, HS1 excludes from the computation of graduation rates those who are in high school at the time of the survey and is a standard *graduation rate*, while the third, HS2 excludes high school students except those in grades that are lower than the grade necessary to graduate, as we assume these students will not graduate.²¹ We present the rates with no weights, longitudinal weights, and funnel weights (computed by Statistics Canada for respondents appearing in all cycles). Whatever the method, we find that the graduation rate in Québec is considerably lower than the rates in the ROC; for both regions, there is a gap favouring females, consistent with the YITS, for this age group. Finally, we obtain a much larger male-female gap in Québec when we exclude students schooled in English (who have a much lower dropout rate and a gender gap similar to the ROC). We use the HS2 definition for graduation rates and the former sample for the regression analysis because this gap is closest to administrative data graduation rate gaps at age 19. The administrative data also show that the graduation rate is much lower in French school boards rather than English school boards. Therefore, if a gap is to be explained, it is reasonable to explore it where it is large.

²¹ HS2 excludes current high school students older than 19 and attending high school at grades below secondary IV in Québec and grade 11 in the Rest of Canada or a school with no grade or students who do not know their grade. Given these exclusion restrictions, 47 students in Québec and 230 in the ROC are considered as dropouts.

Descriptive statistics for Québec and the ROC

Characteristics of graduates and dropouts by gender and region

Tables A1 and A2 present the mean characteristics (for the control variables) of high school graduates and dropouts by gender for Québec and the ROC, respectively. For the ROC sample (Table A2), we observe that dropouts of both genders, compared to graduates, have a higher proportion of PMK with a high school diploma or less who lives with a spouse (if present) having the same level of education, live more with a single-parent PMK, have more siblings, spent their teen years in a low-income household, and are over represented in the two lower quartiles of family income. For parenting and family functioning scores quartiles, there is not much difference for females between graduates and dropouts when they were young children; the differences are larger for males. In general, the dropouts are more likely to be in the two least favourable quartiles. The same observation can be made for behavioural score quartiles, but here male dropouts are definitely in the less favourable part of the distribution. Low parental schooling expectations characterize dropouts especially for males. Parents having high expectations for their child at a young age see them graduate. Although expectations are diminishing as a child ages, the decreases are much more pronounced for the dropouts. The dropouts, males and females, are overrepresented in the lower quartiles of the math and reading test scores. Nonetheless, a significant proportion of males and females in the low quartiles do succeed to graduate. Finally, for the school perception/attitude variables male and female dropouts are in the least favourable quartiles. Female dropouts are more comparable to male graduates for many of these variables.

For the Québec sample (remembering that the youth here were schooled in the French system), as can be seen in Table A1, PMKs are less educated than in the ROC for both groups (dropouts and graduates), except for male dropouts whose PMKs are on average slightly more educated (49% compared to 46% in the ROC). Dropouts are much more likely to live with a single parent and with a low-income family. For parenting scores and family functioning, dropouts are also in the less favourable quartiles. At a very young age (10-11 and 12-13), parents of future dropouts have much lower expectations for their child than in the ROC, and surprisingly also lower expectations in general for future graduates at all ages compared to the expectations for the ROC. Dropouts have disastrous scores in math and reading, 78% of both males and females are in the two lower quartiles. They also declare themselves with a lower health status. For behavioural scores, in particular hyperactivity and conduct disorder, male dropouts are heavily concentrated in the two least favourable quartiles, more than in the ROC. There are some similarities in the case of the school perception/attitude variables for male and female dropouts with those in the ROC in

the least favourable quartiles. Again, female dropouts are more comparable to male graduates for many of these variables.²²

Graduation rates by sub-groups and region

Our descriptive analysis is pursued in Table A3 which displays the graduation and dropout rates for both gender and region by sub-group. The male-female gap is remarkably constant across groups in the ROC. The most intriguing results are clearly from the Québec sample.

The most revealing sub-group is composed of males and females who are at the bottom of the household income distribution, precisely the bottom quartile of the distribution (Family Income Q1 =1, Table A3) compared to the males or female from the three higher quartiles. Remarkably, the graduation rate for males is identical to females when computed for children in the top three income quartiles. However, there is a 19 point gap in the bottom quartile. We find the same large gaps in sub-groups characteristic of low-income households. For youth in single-parent households, the gap is 26 points, for children with a PMK with a level of education that is a high-school degree or less, the gap is 22 points, for youth with ineffective parents (Ineffective Q4=1), the gap is 39 points, with high level of hyperactivity (Hyperactivity Q4=1), the gap is 30 points. Other groups with large gaps are at the bottom quartile of reading, conduct disorder and inconsistent parenting, all associated to disadvantaged families.

If the percentage of males in each of these categories were considerably higher than females then the gap would be easily explained, but when we look at these proportions in Table A2, we notice that they are quite similar, males are not doing as good as females in reading and math but not considerably so. This will be reflected in our conclusions about the impact of differences in endowments (means of the explanatory variables in the Probit regressions computed by gender) on the graduation gap found later, in section 6. We believe these results are crucial for policy.

First, females in Québec lag females in Canada, but it is not certainly as dramatic as for males. This does not mean that policy should disregard young females but that a particular attention should be paid to young males in French schools, males who lag behind females in Québec, and even substantially males in the ROC. The main result is that a very significant part of the gap in Quebec is due to very large gaps found in categories of families that present characteristics found in low-income families.

²² We can also note that they are more 18-year-olds dropout females in Québec than in the other age group, and as in the ROC, very few dropouts female in the 19-year-olds group, which may indicate that the attrition rate is different for these age groups than the others.

5. Estimation approach

In the first step of the econometric analysis, five Probit regressions of the probability of obtaining a high school diploma or its equivalent, are run with the five imputed samples and the marginal mean values of the estimated coefficients are calculated with standard errors computed by the ICE procedure. Six different specifications, each model adding a new block of variables, are estimated separately for males and females and for Québec and the ROC.

In the second step, an Oaxaca-Blinder (1973) approach is applied to decompose the graduation rate gap between genders in an explained and unexplained part. The standard Oaxaca-Blinder approach for wage decompositions is generally used with OLS regressions to identify the part of the wage differential explained by differences in the covariates and the part of the differential unexplained by these observable differences.²³ More formally, let \bar{y}^M and \bar{y}^F denote the mean value of the dependent variable (in our case, the graduation rate) of males and females respectively, \bar{X}^M and \bar{X}^F are the vectors of mean values of the regressors and β^M and β^F are the regression coefficients. The decomposition is then defined as:

$$\bar{y}^M - \bar{y}^F = (\bar{X}^M - \bar{X}^F)' \beta^M + \bar{X}^{M'} (\beta^M - \beta^F), \quad (1)$$

The usual analysis focuses on the explained part of the differential as the unexplained part might be due to genuine differences in the (structural) coefficients as well as to differences in unobservables. The first part of the right hand side of equation (1) is the part of the gap explained by differences in means (endowments), while the second part is related to differences in coefficients. Results will depend on the choice of the group of coefficients used for weighting the differences (Oaxaca and Ransom, 1994, 1999).

In the case of our Probit regressions, we rely on the decomposition technique developed by Fairlie (1999, 2004) who shows that for binary choice models the raw difference in the outcome can be decomposed as:

²³ The use of a standard Oaxaca-Blinder OLS linear decomposition with a dichotomous dependent variable is reasonable if the empirical individual probabilities are not outside the 0 to 1 range. Frenette and Zeman (2007) who examine the gender gap among 19 years old in 2003 for university participation, use a linear decomposition affirming that their individual probabilities are not close to 0 and 1. In our case, a significant number of probabilities were over 1 (for females) and below 0 (for males), although marginal effects of estimations by an OLS or Probit were similar.

$$\bar{Y}^M - \bar{Y}^F = \left[\sum_{i=1}^{N^M} \frac{F(X_i^M \hat{\beta}^M)}{N^M} - \sum_{i=1}^{N^F} \frac{F(X_i^F \hat{\beta}^M)}{N^F} \right] - \left[\sum_{i=1}^{N^M} \frac{F(X_i^M \hat{\beta}^M)}{N^M} - \sum_{i=1}^{N^F} \frac{F(X_i^F \hat{\beta}^F)}{N^F} \right], \quad (2)$$

where F is the standard normal cumulative function. The first term in brackets in (2) is the part of the outcome differential that is due to differences in endowments and the second term represents what is attributable to differences in coefficients. In (2), endowment differences appearing in the first term in brackets are weighted by the male regression coefficients, but we will also present decomposition results using female regression coefficients as well as pooled (male and female samples together) regression coefficients as weights.²⁴

6. Econometric results

Four samples of individuals aged 18 to 23 are constructed for the regression analysis: (1) males residing in Québec having attended French schools, (2) males residing in other provinces (ROC), (3) females residing in Québec and having attended French schools, (4) females residing in other provinces (ROC). For each sample, 6 specifications are estimated. Starting from a baseline case of a few standard variables (family characteristics) we add quartiles of family income, afterward we add variables by group (lagged parenting scores, lagged child behavioural scores, lagged cognitive child scores and non-cognitive scores, lagged parental expectations, and finally lagged school-related behaviours and perceptions).

Males in the Rest of Canada

We start our analysis with young males from the ROC. The first specification for males, column (1) in Table 5, includes standard variables for such models but excludes income variables. All the parameters that are significant in specification (1) are also significant in all specifications except for P-Edu University, the dummy variable indicating a university degree for the PMK. In all cases, the size of the marginal effects decline as more variables are added to the regression showing that the youth's health, parental education, and family type are correlated with behavioural scores, cognitive scores as well as parental expectations and mean family income, a classic result in this literature.

There are some striking elements in the Table. First, the education effects of the PMK are very non-linear. There is a very large effect of having a PMK with an education level above high school when compared to not having one. However, the effects of having a more highly educated

²⁴ The decomposition uses the Stata ado-File Fairlie developed by Jann (2006) and standard errors of these contributions are computed using the formula found in Royston and the STATA matrix language.

PMK compared to a partly postsecondary level educated mother are negligible and statistically insignificant. The effect of being in a household with two biological parents (compared to living in a single mother household) is very strong at .169 in specification (1) and remains strong throughout specifications ending at .124 in specification (6). Being in a two-parent family with a non-biological parent is similar to being in a single-mother family. Finally, there is a strong link of perceived health with graduation from high school. However, very few youth declare a very poor health.

Our second specification adds mean income in quartiles. Only quartiles 2 and 3 are positive and statistically significant. In most cases, there are no significant income effects. This result is probably caused by the very strong correlation between PMK education and household income and family type. Most studies show that parental education is a more important factor than income. In specification (3), we add size of the city of residence, immigration status of the PMK, number of siblings, and indicators for the quality of parenting and behavioural scores as regressors. Out of all these variables, only hyperactivity and conduct disorder are significant and with the expected sign, negative. These effects are quite large as the mean value for hyperactivity is 4 with a standard deviation of 3, for conduct disorder the values are 1 and 1.7. Therefore, the effects of an increase in the aggression score by a standard deviation yields an approximate effect of -3.6 percentage points, while the same for hyperactivity yields -4.2 points. However, only the results for aggression are robust to the presence of the additional regressors in specifications (4) to (6).

Specification (4) adds quartile dummies for reading and mathematics as well as for two non-cognitive scores. Surprisingly, only the highest quartile in math yields a strong and statistically significant effect (compared to the lowest quartile), but this result is not robust to the addition of parental expectations and school-related behaviours in specifications (6). Therefore, factors other than math and reading skills are at play for high school graduation. A possible interpretation of this result is that most males have the proper qualifications to graduate, however other factors such as the education of parents, emotional behaviours, parental expectations and health will provide the proper motivation and desire to earn a high school degree. The non-cognitive scores are found to have no effects.

Specification (5) adds parental expectations about the educational attainment level of their child. *Ceteris paribus*, a child with a PMK who expects that he/she, when the child is aged 16 or 17, will obtain a post-secondary degree lower than university is predicted to gain 8.9 percentage points to his probability of obtaining a high school degree (compared to a PMK who expects a high school degree or less than a high school degree), the gain is 13.3 points for a PMK who

expects a university degree. Given that the regression controls for family income, parental education and cognitive scores, it is surprising that the coefficients are so large, even for parental expectations at 10.

The last specification (6) includes attitudes towards school and school work, perceptions of teachers and school, and a parental help measure. For these other variables, only the variable on the frequency of doing homework is significant, a higher score meaning doing less homework.

Given the importance of parental expectations, we proceed with a series of regressions that seek to demonstrate that their impact is not strictly based on a correct evaluation of children's skills and ambitions, but could indicate a high level of valuation of schooling and possibly involvement of parents in child development.²⁵ To assess this, we estimate specification (6) 4 times, each time substituting the age at which parental expectations are measured, starting from 10 right up to 16, with a two years interval between each measure. The results are found in panel 4 of Table A4. Clearly, the coefficients are the highest at age 16; however, they are substantially high at age 10. Therefore, parents are probably learning about their child's skills, motivation or attitudes towards school, but the estimates at age 10 reveal that there is probably more to expectations than simply correctly assessing children's abilities or support for the child's endeavours.

Females in the Rest of Canada

We now turn to young females from the ROC. Specifications (1) through (6) are the same as for males. In specification (1), in contrast to males, only four estimated coefficients are statistically significant, of these 4 only 2 remain significant in specification (6) and as for males the size of the parameters substantially declines when other regressors are added. Only one PMK education category is significant in (1), university level. As for males, family type is very important. However, in contrast to males we observe that a poorly educated spouse will produce a negative effect on high school graduation, the effect remaining relatively large across specifications.

For the second specification, adding mean income in quartiles, the results are very different from males. Females raised in high quartiles of family income do much better than those in lower quartiles and this is found to be statistically significant. Contrary to males, income seems to matter more than parental education, an intriguing result.

²⁵ Foley et al. (2007) obtain similar results for parental and youth expectations and discuss the factors underlying expectations giving greater importance to valuation of the education factor, which can potentially be acted upon by policy measures.

In specification (3), adding size of the city of residence, immigration status of the PMK, the number of siblings and indicators of parenting and problematic behaviours as regressors, only having two or more siblings is found to be significant; however, it is no longer significant in specification (6).

In specification (4) with quartile dummies for reading and mathematics as well as for the two non-cognitive scores, only the math results are a strong predictor of graduation. However the pattern of the math coefficients shows that what is important being in quartile 2, 3 or 4; there is no distinct advantage of moving from quartiles 2 to 4. These effects remain in specification (6), but are slightly lower.

Specification (5), adds parental expectations about the educational attainment level of their child. *Ceteris paribus*, a child with a PMK who expects her child aged 16 or 17 will obtain a post-secondary degree lower than university is predicted to gain 5 percentage points to his probability of obtaining a high school degree (compared to a PMK who expects a high school degree or less than a high school degree); the gain is 10.4 points for a PMK who expects a university degree.

As for males, we also proceed with a series of regressions that seek to demonstrate that their impact is not strictly based on an evaluation of children's skills and ambitions, but indicate a high level value given to schooling and potentially a high level of involvement of parents. The results are found in panel 3 of Table A4. Again, the coefficients are the highest at age 16; however, they are substantially high at age 10. So our conclusion about males reveals itself to be the same for females.

Males in Québec

One important note for Québec is that the sample size is much smaller (and only from French schools), approximately one quarter the size of the ROC sample. We start the analysis with young males (Table 7). Specification (1) displays how important living in a single-parent home can be for a young male in Québec, the coefficient for living in a two biological-parents home compared to a single-mother home is .426, very large even controlling for PMK education and youth health. In specification (6), the coefficient remains over .2, but it is no longer significant. However, this result, in our view does not rule out the importance of this factor. It simply shows that the estimate is not a precise one. The coefficient on spousal education is very high and significant, but is not robust to the addition of other control variables. In specification (6), it is small and not significant. These results are consistent with what we find in the descriptive statistics, male graduation rates are very low in single mother homes.

The second specification shows that being in an upper quartile of family income predicts much higher graduation probabilities demonstrating again the great difficulties for young males in

underprivileged homes. The effects remain large in specification (6) where, as for the two biological-parents effect, the standard errors are large. Within the set of added variables in specification (3), only hyperactivity is significant, however the p-value becomes very low in specification (6). The results for specification (4) are the most striking in terms of their differences with respect to males from the ROC. They show that males in the upper two quartiles of the reading scores are predicted to have much higher graduation probabilities than males in the first quartile, and substantially higher probabilities compared to males in the second quartile. Therefore, poor reading (and also likely writing) skills are a very important barrier for young Québec males. However, males with low reading and math skills in Québec do not rank poorly in Canada; they are ranked similarly to low-skilled (in math and reading) males in the ROC and do substantially better in math, according to PISA's tests. Males in the ROC seem to be able to overcome these barriers and graduate which is not the case for males in Québec. The reading score results are not changed by the addition of other variables.

None of the additional variables are statistically significant in specifications (5) and (6). However, the parental expectations, despite being not significant, remain in the same range as for males and females in the ROC. One should therefore not rapidly jump to the conclusion that parental expectations do not matter for males in Québec. Finally, there is some evidence that parenting styles has an impact on males. Aversive parenting, corresponding to a disciplinary style, has a strong positive effect on graduation, which is statistically significant. Ineffective parenting has a negative effect but only close to being significant. We showed in the section on descriptive statistics that males with very ineffective parents displayed a huge negative gap for graduation rates compared to females with very ineffective parents.

Females in Québec

We now turn to the young females in Québec (Table 8). The results are very different from the males. Parental expectations when the youth is 16-17 years old are the only coefficients with a strong impact, when the size of the impacts is compared to the size of strong impacts in the male regression. Math quartiles are statistically significant, but effects are extremely non-linear as the coefficients are practically the same for the top three quartiles in specifications (4) to (6). Having siblings and private schooling are positive predictors of graduation. What is most important given our concerns is that a disadvantaged family environment is not an insurmountable barrier as it is for males. Even the family status coefficient is relatively small for females when compared to males. Income parameters are not only very small but have very small p-values. Therefore, the question remains why do Québec males in disadvantaged situations have so much difficulty graduating? Why is low achievement in reading in Québec such a huge barrier to graduation

compared to females in Québec or males in the ROC? Such questions must be answered for an efficient policy to be successful in Québec.

Regressions with variables indicating extreme characteristics

We also performed the same regressions for all samples, but for several variables we include some dummy variables that indicate whether youth are in the bottom or top of the distribution for particular scores. For examples, we include dummies for being in the bottom quartiles of reading and mathematics, or a dummy for being in the top quartile for the conduct disorder score. We do this because, in particular for males who reside in Québec, children at the bottom of the distribution in qualifications, income, or behavioural scores have serious difficulties finishing high school. We also re-estimated the effect of low parental expectations by ages (Table A5).

We start with males from the ROC, focusing on specification (6) in Table 9. First, having a PMK with a very low level of education is predicted to decrease the probability of graduation by 12 percentage points. Second, being very aggressive is a strong marker for at-risk of not graduating. The rest of the conclusions found earlier are the same, except that now having an immigrant PMK is negative and significant. For females and specification (6) in Table 10, we find that being in the top quartile of pro-sociality is positive and significant. For both groups, low parental expectations, having a low education PMK and living as a teen in a single-parent and a low-income family has detrimental effects.

For males in Québec, more revealing results are found in Table 11, in particular for parenting measures. Parents showing strong consistency and stressing discipline will produce good results, while those who are in the most ineffective quartile produce extremely poor results, the estimated coefficient being $-.295$. Being in the bottom quartile of reading reduces the probability of graduating by $-.406$ compared to those in the top two. Finally, youth receiving a considerable help from their parents have a much higher chance of graduating.

Therefore, these results show that for males, the role of parents can be crucial for graduation, whether it is in terms of parental methods or simply help with homework. If one simply looks at cognitive scores, we would conclude that males from Québec should be graduating at the same rate as males from the ROC, and just slightly less than females as their scores are on average slightly lower. The role of parents has been estimated to be important in a substantial number of studies (Todd and Wolpin, 2007; Cunha and Heckman, 2006). For males in Québec, this seems particularly true. But it is very hard to pinpoint why, and so policy wise, it is very difficult to devise a simple strategy from these results to enhance graduation rates.

For example, we find that graduation rates for males in the lowest quartile of reading are predicted to be 40 percentage points lower than children in the top 3 quartiles, holding other

things equal. However, these quartiles are computed at the Canadian level and if we compare males in the bottom reading quartile from Québec with males from the ROC in that same quartile, we find that the standardised scores are almost the same. Therefore, in the ROC, males with the same low reading skills are graduating at much higher rates. So it is not clear that moving males from the lower quartile in reading to the next quartile (a formidable task) may not substantially raise graduation rates. Parenting could be the key for males in Québec.

In that case, the policy is more problematic. It is difficult for policy mechanisms to replace good parenting. But given that Québec males are doing just as well school wise as ROC males, proper motivation which could be achieved by a system of rewards for good work and proper attitudes at school may be helpful.

Finally, for females in Québec, results presented in Table 12 for the extreme specifications are very similar to those in Table 8. Low quartile females are shown to have considerable difficulties graduating.

Explaining Gender Gaps

How much do differences in family endowments, skills or attitudes contribute to the graduation gap? To answer this question we will use a non-linear version of the Blinder-Oaxaca decomposition. The traditional decomposition is not appropriate because we seek to decompose a gap in proportions (graduating by sex) and not the means of a continuous variable such as the wage. Proportions, of course, lie between 0 and 1, and there lies the problem. A linear probability model could be used as long as the predicted probabilities of graduating estimated from such a model lie between 0 and 1. In our case, we tried this approach and obtained too many observations with predicted probabilities over 1, particularly for females, this is not surprising as graduation rates for females in high-income families are close to 1.

The Fairlie approach computes the proportion of the gap in graduation rates that is attributable to differences in endowments, i.e., the mean value of the variables used in the regression. However, in contrast to the linear case, it cannot attribute the proportion of gaps attributable to differences in particular coefficients. One major problem with the Blinder-Oaxaca approach is the set of regression parameters to weight the differences in the means. Three sets of results, computed from the 5 imputed samples, are available, the probit regression estimated coefficients for males, the coefficients for females, and finally the coefficients from a probit where males and females are pooled in the same regression. In Table 13 we present gaps computed with each set of weights. Standard errors are computed by the authors of this paper.

We start with the results for the ROC, where the gap is found to be small (5.6%). Unfortunately, the results are extremely sensitive to the weights and no firm conclusion can be

obtained from the Fairlie decomposition. If female coefficients are used differences in endowments explain none of the gap. When male coefficients are used half the gap is explained, finally when the pooled coefficients are used, approximately one quarter of the gap is explained. The only variable that gives very similar results is the parental expectations variables when children are 16 or 17, because coefficients are quite similar for both sexes. Approximately, 25% of the gap could be explained by differences in parental expectations.

In Québec, where the gap in graduation is 13.4%, there are also important differences in the gap percentage explained by differences in endowments by weighting methods, however, no methods yield a zero percentage explained. In Québec, 3 to 6 percentage points of 13.4% of the gap are explained by differences in endowments. Again, the most salient endowment gap is parental expectations concerning graduation.

Therefore, our results show that if males and females had the same endowments in Québec at best half of the gap would be reduced. Realistically much less than 50% of the gap would be reduced. The differences in estimated coefficients explain a very large percentage of the gap. In other words, a large percentage of the gap remains unexplained. To understand this, we must try to understand why being in a disadvantaged family is such an important barrier for males in Québec.

An important implication from the decomposition is that the variables in the regression do not operate the same way for boys and for girls. It is possible that the interplay between unmeasured characteristics and observed ones is also different across genders. These differences demonstrate the complexity of a model that could eventually explain the gender gap in education. The “selection on observables” hypothesis which is necessary for this composition could be too strong and relaxed in later work.

7. Policy Implications

According to the MELS (2008), in 2008 only 69% of the population aged 16 years and more obtain a high school diploma (or a trade/vocational high school diploma) before the age of 20 years, 16% obtain their diploma after the age of 20 years, and 15% never obtain a high school diploma. Furthermore, there is some recent evidence in the United States which shows that strictly focusing on high school graduation rates as a measure of a successful education policy could be a mistake. Heckman and Lafontaine (2006, 2008) and Cameron and Heckman (1993) demonstrate that high school degrees in the United States that are named GEDs (i.e. are obtained by equivalencies) have a questionable value in the labour market. Therefore, the value of obtaining a high school degree after 19 years of age could be questionable.

A recent Report of the “Groupe d’action sur la persévérance et le succès scolaire” (RGA, 2009) suggests a very modest target for high school graduation rates in Québec, that is a graduation rate of 80% before the age of 20 by year 2020 (to close the gap with the other provinces), being silent about the gender gap. The report proposes a series of poorly defined measures or measures that have been showed to have modest success propping up graduation rates (see below);²⁶ and, to dedicate 137 to 237 million \$ yearly to reduce the rate of high school dropouts.

The Ministry of Education of Québec already dedicates 40 million \$ per year to a special program (“Agir Autrement”) targeting specifically 195 schools with higher dropout rates. But the evaluation of the program has been dire and success very limited according to a preliminary evaluation report prepared by university researchers for the government.²⁷ In our view, more radical measures and some experimental approaches (pilot projects) should be adopted in Québec to decrease rapidly the dropout rates and increase graduation rates by the age of 18 years. We identify some that could be promising.

Policy responses to secondary-school education completion problems have been very diverse. In developed countries, besides free public secondary schools, the oldest approach is to increase the compulsory school-leaving age, shown to be quite successful (Oreopoulos, 2006, 2005). But school laws in Canada do not constrain students to finish high school. In all provinces the minimum age for leaving school is 16, except in New Brunswick where the age was raised to 18 in 1999 and in Alberta where it was raised to 17 in 2001 (Ontario plans to raise it to 18). A first simple measure would be to increase the compulsory school-leaving age to 17.

Other countries have developed specific programs to counter high school dropping and increase educational attainment. Conditional cash transfer (CCT) programs have become an important policy option. In developing countries, examples include PROGRESA (Programa Nacional de Educacion, Salud y Alimentacion) in Mexico, Bolsa Escola/Familia in Brazil; programs copied in more than a dozen other countries, which extend beyond education (health

²⁶ The measures are: 1) a public campaign to promote the value of education and school perseverance; 2) mobilize the regions; 3) services to parents of children aged 0 to 5 years living in families considered “at-risk”; 4) community programs for the 0 to 5 year-old children considered “at-risk”, to better prepare them for primary school; 5) find the best practices to reduce gaps of achievement at the primary school level and conduct experimental studies to find new approaches; 6) find best practices of the “Agir Autrement” program and apply them to the “at-risk” schools; 7) implement community projects in urban neighbourhoods where the dropout rates are high; 8) promote trade/vocational formation and open pathways between them and general high school formation; 9) incorporate in the school system incentives measures to boost primary school readiness and management tools for school perseverance; 10) create a provincial dialogue organisation between the government, the school systems, the civil society and business.

²⁷ The newspaper *Le Devoir* summarized the Power Point presentation of the report on July 9th 2009.

and nutrition) and have been demonstrated to produce fairly significant positive outcomes (Todd and Wolpin, 2006).

In developed countries, some experiences have been successful, such as an Education Maintenance Allowance (EMA) in the United Kingdom (also in operation in Australia since 1988). The idea of this program is to transfer allowances to low-income youth (aged 16 to 18) if they remain in school and/or perform well the last year of compulsory education, which is 16 years of age - “year 12” in the school system). It started as a pilot study in 1999 in a number of areas in England and rolled out on a national basis since September 2004.²⁸ An evaluation by Dearden et al. (2005) of the British EMA pilot program, indicates that the transfer’s impact was substantial: full-time education participation rates increased by 4.5 percentage points; proportion of 16 year-olds receiving two additional years of education increased by 6.7 percentage points; participation of eligible males increased by 5 points (7.4 in second year) and 4.0 for females (5.9 in second year); a larger (9.1 points) statistically significant impact of the policy is found for those in rented housing compared to those in owned housing (3.8%). New York City has announced in April 2007 an experimental CCT, Opportunity NYC.²⁹ A second measure in Québec would be to conduct experiments with a CCT.

In the USA, even accounting for a host of background factors, the achievement gap between blacks and whites, reflecting differences in income and family background, remains large and statistically significant (Fryer and Levitt, 2004; Todd and Wolpin, 2007). In a very recent paper, Dobbie and Fryer (2009) review the evidence (see the reference therein) on the diversity of attempts to close the gap: “early childhood interventions boost kindergarten readiness, but the effects on achievement often fade once children enter school”; “more aggressive strategies that place disadvantaged students in better schools through busing have also left the racial achievement gap essentially unchanged”; “there are several successful charter schools and charter-management organizations, but the bulk of the evidence finds only modest success”;

²⁸ The EMA (financial year 2008-2009) comes in weekly payments of £10, £20 or £30 which are transferred directly into the bank account of the youth conditional on full-time enrolment. The student needs to be 16, 17 or 18 and have left – or be about to leave – compulsory education. If eligible for EMA, the amount is calculated by considering household net (after taxes) income: the maximum is up to £20,817 per year. The allowances are not affected by income the youth can earn from part-time work, and are not considered for family benefits up to £20,817 per year. For family net income of £30,810 or more, there is no EMA entitlement. On top of the weekly amount, the youth can also receive bonuses (£50 per term for retention and £50 for achievement) – but only if he does well and meets the targets set by teacher, tutor or provider (<http://ema.direct.gov.uk>).

²⁹ In its initial phases, it is being funded by a number of private partners including The Rockefeller Foundation, Robin Hood Foundation, the Open Society Institute, Starr Foundation, AIG, and Mayor Bloomberg’s personal foundation. The program is being evaluated by MDRC, a nonprofit research firm, using a random assignment research design. Opportunity NYC is administered by Seedco, a nonprofit community development organization (http://www.rockfound.org/efforts/nycof/opportunity_nyc.shtml).

“school districts array of strategies to close the achievement gap, including smaller schools and classrooms, mandatory summer school, merit pay for principals, teachers and students, budget, curricula, and assessment reorganization, and policies to lower the barrier to teaching via alternative paths to accreditation; these programs have thus far been unable to overcome the achievement gap in even the most reform-minded of districts.” In a recent review of education policy focused on poor children, Jacob and Ludwig (2008) find that targeted investment in early childhood education, smaller class sizes, and bonuses for teachers in hard-to-staff schools all pass a cost-benefit analysis, but are unlikely to eliminate the racial and social class disparities in education outcomes by themselves.

For another reason, the Dobbie and Fryer paper is of the utmost importance given that the graduation problem in Québec is clearly very serious in disadvantaged families. In their paper they evaluate Harlem Children’s Zone (HCZ) an ambitious social experiment to alleviate the consequences of poverty on educational attainment.³⁰ They show that a schooling system stressing long hours of work and proper attitudes as well as rewards for performance have a stunning impact on the performance of children from poor households in Harlem. The program starts immediately in first grade and children remain in this system until graduation. The results shows that high-quality schools or high-quality schools coupled with community investments generate the achievement gains and those community investments alone cannot explain the results (the only two community programs in HCZ that keep detailed administrative data, show mixed success).

These results as well as our results show that it would be economically efficient to target young males from disadvantaged families early on, particularly those with poor reading skills and or poorly educated parents, and find ways to intervene so that the child does not see his disadvantage as a barrier to graduation and perceives rewards to graduation. In fact, there is no gap between males and females if we do not consider the first income quartile. A third measure for Québec would be considerably longer hours in school for at-risk youth, coupled with strict behavioural codes and a system of rewards to enhance graduation rates.³¹

³⁰ “Harlem Children’s Zone is a 97-block area in central Harlem, New York, that combines reform-minded charter schools with a web of community services created for children from birth to college graduation that are designed to ensure the social environment outside of school is positive and supportive. The schools provide free medical, dental and mental-health services (students are screened upon entry and receive regular check-ups), student incentives for achievement (money, trips to France, e.g.), high-quality, nutritious, cafeteria meals, support for parents in the form of food baskets, meals, bus fare, and so forth, and less tangible benefits such as the support of a committed staff. The schools also make a concerted effort to change the culture of achievement, surrounding students with the importance of hard work in achieving success,” Dobbie and Fryer, 2009.

³¹ The RGA (2009) evaluates its measures 6) and 7) at \$4,500 per targeted youth.

We make two final comments on the importance of expectations. One avenue that has not been explored in this paper concerns expectations about the value of graduating if you are a low skilled individual. One may ask, what is the expected economic return of graduation for males with low reading skills and from a disadvantaged household? If it is very small or is perceived to be small for males and not for females then this could explain part of the gap. Unfortunately, the NLSCY's oldest individuals are too young to verify such a hypothesis. However, results of Campolieti et al. (2009), who examine for youth aged 22 to 24 years, the labour market outcomes and skills acquisition of high school dropouts compared to graduates who did not pursue postsecondary education, indicate that dropouts have a much lower probability of employment (19 percentage points), lower wages (20%), and are not able to compensate their lack of formal education by acquiring skills through subsequent training. However, these estimates are nation-wide and could be different for Québec.

We are currently assessing the value of different types of high school degrees across Canada and in particular in Québec with the Analytic Census files containing 20% of all Canadians. These large numbers will permit us to assess whether males and females in Québec with low levels of education face different rate of returns in education and see whether such a difference could play a role in the large graduation rate gap that exists in Québec between males and females. We are also pursuing this avenue of research with the large samples of the YITS (analysing the gender gap of cohort-A, and labour outcomes of cohort-B, for those graduating after 19 years of age).

Québec parental expectations concerning the value of schooling are lower than in the ROC. According to some results from an Ipsos-Reid - Kumon Math and Reading Centres poll of 2003, presented by Gervais (2005), Québec parents value less different aspects of education (good knowledge of reading, writing, math; good discipline towards studies; obtaining the skills necessary for a good job) compared to the ROC (the approval rates for these different aspects are around 80% for the ROC and 60% in Québec). Collectively, Québec seems to adopt an "external locus of control" towards life-cycle outcomes. Moreover, as the results from the Survey of Approaches to Educational Planning (SAEP) conducted in October 2002 by Statistics Canada presented Shipley et al. (2003) indicate, Québec had the lowest proportion of children with parents who saved (amounts saved to date and contributions made to savings) for the education of their children which is not surprising given the low cost of higher education.. Unfortunately, their paper does not disaggregate the educational aspirations the parents held for their children by province. One last measure would be to fund campaigns promoting intensively supportive attitudes and values about education among parents with school age children: parental perceptions towards education in general, including information on parental beliefs about the importance of

good grades, high school graduation and schooling beyond, informing parents and youth of the consequences of dropping out.³² These campaigns should start as soon as possible in early grade school and even kindergarten.

8. Summary and conclusion

Our results demonstrate that males lag females in high school graduation for the 18 to 23 year-olds in the NLSCY. However, the gap in Québec is very high at more than 13 percentage points. Our regression analysis that identifies determinants or predictive factors of high school graduation shows that different factors are important for different sub-groups. In the ROC, parental expectations and family structure are the key determinants for high-school graduation for both males and females. For females, we find that being in the lower quartile of math scores and family income has negative effects, but they are not very large at around -.04 to-.08. For males, perceived poor health, parental education and not doing their school homework are found to be statistically significant factors for high-school graduation. In Québec, for females, poor health, very low income, poor math scores and low parental expectations are conducive to dropping out. For males, we find a host of characteristics that are strong predictors for dropping out of high school, all related to poverty. They are diverse and linked to poorer parenting practices, poor reading skills, and conduct disorder. Our main result is that a very significant part of the male-female gap in Québec is due to very large gaps observed in categories of families that present characteristics found in low-income families.

Therefore, some form of policy targeting low-income children, young males in particular, would clearly be a more efficient solution to the gap-issue than some universal policy that would be extremely costly and could direct resources towards children who would benefit marginally or receive no benefit from the reform. The latest overhaul of the primary and secondary educational system in Québec is in our view a highly inefficient solution to the dropout problem in the province of Québec. The very large majority of children in Québec were doing quite well before the reform. International PISA scores were particularly high for 15 year-olds in mathematics.

It is our opinion that a worthwhile approach would be to develop some randomized experiments across the province of Québec and in the ROC using different approaches in different experiments, from the less costly to the very costly. One challenge is to find the correct interventions in a system where both males and females are present, but where the main problem concerns males.

³² The RAG (2009) proposes to fund a 2-3 million dollars yearly campaign.

References

- Blinder, A. (1973) "Wage Discrimination: Reduced Form and Structural Estimates," *The Journal of Human Resources*, 8(4): 436-455.
- Borghans, Lex, Angela Lee Duckworth, James Heckman and Bas ter Wel (2008) "The Economics and Psychology of Personality Traits", *The Journal of Human Resources*, 43(4): 972-1059.
- Borghans, Lex, Bas ter Wel and Bruce A. Weinberg (2008) "Interpersonal styles and labor market outcomes," *The Journal of Human Resources* 43(4): 815-858.
- Bowlby, J. (2005) "Provincial Drop-out Rates: trends and Consequences, *Education Matters*, Statistic Canada, Catalogue 81-004-XIE.
- Bowlby, Jeffrey and Kathryn McMullan (2002) *At a Crossroads: First Results from the 18-20-Year-Old Cohort of the Youth in Transition Survey*. Ottawa: Human Resources Development Canada. Sciences and Humanities Research Council, Working Paper 2006 C-11.
- Braakman, L. (2009) "Psychological Traits and the Gender Gap in Full-time Employment and Wages: Evidence from Germany," Working Paper Series in Economics, University of Lüneburg.
- Cameron, S. and J. Heckman (1993), "The Nonequivalence of High School Equivalents," *Journal of Labor Economics*, 11 (1, Part 1): 1-47.
- Campolieti, M., T. Fang and M. Gunderson (2009) "Labour Market Outcomes and Skills Acquisition of High-School Dropouts," Canadian Labour Market and Skills Researcher Network, Working Paper No. 16.
- Coleman, Margo and Thomas DeLeire (2003) "An Economics Model of Locus of Control and the Human Capital Investment Decision," *The Journal of Human Resources*, 38(3): 701-721.
- Cunha, F. and J. Heckman (2007) "Formulating, Identifying and Estimating the Technology of Cognitive and Non-cognitive Skill Formation," University of Chicago, Department of Economics, Forthcoming, *Journal of Human Resources*.
- Cunha F. and J. Heckman (2006) "Investing in our Young People," Department of Economics, University of Chicago.
- Dearden, L, C. Emmerson, C. Frayne, and C. Meghir (2005) "Education Subsidies and School Drop-out Rates," The Institute for Fiscal Studies, Working Paper 05-11.
- Eckstein, Zvi and Kenneth Wolpin (1999) "Why Youths Drop out of High School: The Impact of Preferences, Opportunities and Abilities," *Econometrica*, 67: 1295-1239.
- Fairlie, Robert W. (1999) "The Absence of the African-American Owned Business: An Analysis of the Dynamics of Self-employment," *Journal of Labor Economics*, 17(1): 80-108.
- Fairlie, Robert W. (2004) "An extension of the Blinder-Oaxaca decomposition technique to Logit and Probit models", *Journal of Economic and Social Measurement*, 30(4): 305-316.
- Ferrer, A. and W.C. Riddell (2002) "The Role of Credentials in the Canadian Labour Market," *Canadian Journal of Economics*, 35 (5): 879-905.
- Finnie, R., A. Sweetman and A. Usher (2008) "Introduction: A Framework for Thinking about Participation in Post-Secondary Education." In *Who Goes? Who Stays? What Matters? Accessing and Persisting in Post-Secondary Education in Canada*, edited by R. Finnie, R.E. Mueller, A. Sweetman, and A. Usher. Montreal and Kingston: McGill-Queen's University Press and School of Policy Studies, Queen's University.
- Foley, K, G. Gallipoli and D. Green, (2007) "Expectations as a Key Determinant of the Socio-Economic Gradient in Dropping out of High School," Working Paper, Department of Economics, University of British Columbia.
- Fontaine, N., Carbonneau, R., Barker, E. D., Vitaro, F., Hébert, M., Côté, S. M., Nagin, D. S., Zoccolillo, M. and Tremblay, R. E. (2008), "Females' Hyperactivity and Physical Aggression During Childhood Predict Adjustment Problems in Early Adulthood: A 15-year Longitudinal Study," *Archives of General Psychiatry*, 65(3): 320-328.
- Fortin, Nicole M. (2008) "The Gender Wage Gap among Young Adults in the United States – The Importance of Money Versus People," *The Journal of Human Resources*, 43(4): 884-918.

- Fortin, Nicole (2005) "Rising Tuition and Supply Constraints: Explaining Canada-U.S. Differences in University Enrollment Rates," in *Higher Education in Canada*, edited by Charles Beach, Robin W. Boadway and R. Marvin McInnis, John Deutsch Institute, pp. 369-413.
- Frenette, M. and K Zeman (2007) "Why are Most University Students Women? Evidence Based on Academic Performance, Study Habits and Parental Influences," Analytical Studies Branch Research Paper Series, Statistics Canada, Catalogue no. 11FQ0019MIE – No. 303.
- Fryer, Roland and W. Dobbie (2009) "Are High-Quality Schools Enough to Close the Achievement Gap? Evidence from a Bold Social Experiment in Harlem," Working Paper, Harvard University.
- Fryer, Roland, and Steven Levitt (2004) "Understanding the Black-White Test Score Gap in the First Two Years of School," *The Review of Economics and Statistics*, 86(2): 447-464.
- Gervais, M. (2005) "Rapport sur l'accès à l'éducation (L'éducation: L'avenir du Québec)," Ministère de l'Éducation, du Loisir et des Sports.
- Hankivsky, Olena (2008) "Cost Estimates of Dropping Out of High School in Canada," Canadian Council on Learning.
- Hansen, J. (2007), "Education and Early Labour Market Outcomes in Canada," Report prepared for Prepared for Learning Policy Directorate, Strategic Policy, Human Resources and Social Development Canada, SP-793-12-07E.
- Heckman, James J. (2007). "The Economics, Technology and Neuroscience of Human Capability Formation," NBER Working Paper No. 13195.
- Heckman, James and Paul LaFontaine (2006), "Bias Corrected Estimates of GED Returns," *Journal of Labor Economics*, 24(3), July 2006, 661-700. NBER Working Paper 12018 (<http://www.nber.org/papers/w12018>)
- Heckman, James J., and Paul LaFontaine (2008), *The GED and the Problem of Noncognitive Skills in America*, Chicago: University of Chicago Press, Forthcoming.
- Heckman, J. J. and P. A. LaFontaine (2008a), "The American High School Graduation Rate: Trends and Levels," Unpublished manuscript, University of Chicago, Department of Economics.
- Heckman, J. J. and P. A. LaFontaine (2008b), "Testing the Test: What the GED Reveals and Conceals," Unpublished book manuscript, University of Chicago, Department of Economics.
- Heckman, J., J. Stixrud and S. Urzua (2006) "The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior," NBER Working Paper 12006.
- Jacob, Brian and Jens Ludwig (2008) "Improving Educational Outcomes for Poor Children," NBER Working Paper 14550.
- Jann, Ben (2006) "Fairlie: Stata module to generate nonlinear decomposition of binary outcome differentials" (<http://www.ideas.repec.org>).
- Jann, Ben (2008) "The Blinder-Oaxaca Decomposition for Linear Regression Models," *The Stata Journal*, 8(4): 453-479.
- Leblanc, N., Boivin, M., Dionne, G., Brendgen, M., Vitaro, F., Tremblay, R. E. and Pérusse, D. (2008) "The Development of Hyperactive/Impulsive Behaviors During the Preschool Years: The Predictive Validity of Parental Assessments," Forthcoming, *Journal of Abnormal Child Psychology*. [Online first 2008 March 11]
- Lefebvre, Pierre and Philip Merrigan (2009) "Private Schools Do Make a Difference on Math Scores: Canadian Longitudinal Evidence using the Primary to Secondary School Transitions as a Natural Experiment," Working paper, UQAM.
- MELS (2008) "Statistiques de l'éducation - Édition 2008," Ministère de l'Éducation, du Loisir et des Sports, <http://www.mels.gouv.qc.ca/sections/publications/index.asp?page=fiche&id=67>.
- MELS (2009) "Statistiques de l'éducation - Édition 2008," Ministère de l'Éducation, du Loisir et des Sports, http://www.mels.gouv.qc.ca/sections/publications/publications/EPEPS/Sanction_etudes/RAPPORT-FINAL-2008.pdf
- Mueller, Gerrit and Erik S. Plug (2006) "Estimating the Effect of Personality on Male-Female Earnings," *Industrial and Labor Relations Review*, 60(1): 3-22.
- Nisbett, Richard (2008) *Intelligence and How to Get It: Why Schools and Cultures Count*, W. W. Norton & Co Inc.

- Oaxaca, R. (1973) "Male-Female Wage Differentials in Urban Labor Markets," *International Economic Review*, 14(4): 693–709.
- Oaxaca, Ronald and Michael Ransom (1994) "On Discrimination and Decomposition of Wage Differentials", *Journal of Econometrics*, 61(1): 5-21.
- Oaxaca, Ronald and Michael Ransom (1999) "Identification in Detailed Wage Decompositions," *Review of Economics and Statistics*, 81(1): 154-157.
- OECD (2008) "Education at a Glance," Organization for Economic Cooperation and Development Publishing, Paris.
- OECD (2004), *Learning for Tomorrow's World – First results from PISA 2003*, Paris. The PISA Homepage at www.pisa.oecd.org.
- Oreopoulos, Philip (2007) "Do Dropouts Drop Out Too Soon? Wealth, Health and Happiness from Compulsory Schooling," *Journal of Public Economics*, 91(11–12): 2213–29.
- Oreopoulos, Philip (2006) "The Compelling Effects of Compulsory Schooling: Evidence from Canada," *Canadian Journal of Economics*, 39(2): 22-52
- Oreopoulos, P. (2005) "Canadian Compulsory School Laws and their Impact on Educational," Analytical Studies Branch Research Paper Series, Statistics Canada, catalogue no. 11F0019MIE, No. 251.
- Parent, Daniel (2006) "Work While in High School in Canada: Its Labour Market and Educational Attainment Effects," *Canadian Journal of Economics*, 39 (5) 1125–1150.
- RGA (2009) "Savoir pour pouvoir," Rapport du Groupe d'action sur la persévérance et la réussite scolaire au Québec.
- Rotter, J.B. (1966) "Generalized Expectancies of Internal versus External Control of Reinforcements," *Psychological Monographs*, 80 (whole no. 609).
- Royston, P. (2005) "Multiple Imputation of Missing Values: Update of Ice," *Stata Journal*, 5(4): 527-536.
- Raymond, Mélanie (2008) "High School Dropouts Returning to School," Statistics Canada, catalogue no. 81-595-M, No. 055.
- Shaienks, Danielle and Tomasz Gluszynski (2007), "Participation in Postsecondary Education: graduates, Continuers and Drop Outs, Results from YITS Cycle 4," Statistics Canada, Catalogue no. 81-595-MIE – No. 059.
- Shiple, L., S. Ouellette and F. Cartwright (2003) "Planning and Preparation: First Results from the Survey of Approaches to Educational Planning (SAEP) 2002," Statistics Canada, Catalogue no. 81-595-MIE2003010.
- Statistics Canada (2009) "University Enrolment," The Daily, March 11.
- Todd, Petra and Kenneth Wolpin (2007) "The Production of Cognitive Achievement in Children: Home, School and Racial Test Score Gaps," *Journal of Human Capital*, 1(1): 91-136.
- Todd, P., and K. Wolpin (2006) "Using Experimental Data to Validate a Dynamic Behavioral Model of Child Schooling: Assessing the Impact of a School Subsidy Program in Mexico," *American Economic Review*, 96, 1384–1417.
- Tremblay, R. E., D. Larocque, M. Boivin, D. Pérusse, M. Zoccolillo, and R. O. Pihl (2008). "Physical Aggression During Infancy and Onset of Male Conduct Disorder," in W. Koops, N. W. Slot and R. Loeber (Eds.), *A Developmental Approach of Antisocial Behavior*, Forthcoming, Abingdon, United Kingdom : Psychology Press.
- Waddell, Glenn R. (2006) "Labor Market Consequences of Poor Attitude and Low Self-esteem in Youth", *Economic Inquiry*, 44(1): 69-97.

Table 1: Main reason youth stopped or interrupted school, NLSCY youth 18- to 23-year-olds in cycle 7 and YITS youth cohorts A and B

Survey	NLSCY			
Reasons in NLSCY	Cycle 4 2000/01	Cycle 5 2002/03	Cycle 6 2004/05	Cycle 7 2006/07
School related	6.79	19.8	13.56	14.36
Not interested/don't like school	3.64	11.09	5.45	9.35
Problems with school work	0.50	2.07	2.50	0.99
Problems with teachers	0.83	3.24	1.27	1.85
Problems with other students	0.50	0.36	1.01	0.27
Kicked out/expelled	1.32	1.62	3.33	2.90
Not worth continuing/see future benefits	0.17	1.11	0.50	0.43
Personal or family	1.33	2.60	4.26	2.53
Health problems	0.50	0.62	0.66	1.37
Pregnancy/caring for own children	0.66	0.68	2.08	0.69
Problems at home	0.17	1.30	1.52	0.57
Work related	1.49	8.20	11.00	8.13
Had to work/money problems	0.50	1.97	3.34	1.89
Wanted to work	0.99	6.23	7.66	6.24
Other reasons	3.81	7.99	10.12	5.92
Not stated	86.42	61.50	60.54	67.53
N un-weighted (with longitudinal weights)	604 (267,970)	534 (284,612)	710 (331,707)	699 (342,502)
Survey	YITS Cohort B		YITS Cohort A	
Reasons in YITS	Cycle 2 2001 20-22 years old	Cycle 3 2003 22-24 years old	Cycle 2 2001 17 years old	Cycle 3/4 2003/2005 19/21 years old
School related	30	35	37	27/24
Bored/not interested	17	19	15	14/14
Problems with school work	4	5	7	5/4
Problems with teachers	4	5	8	4/3
Kicked out/expelled	5	6	7	4/3
Missing a few credits/not worth continuing	3	4	2	3/3
Personal or family	15	17	11	11/11
Own health problems	4	5	4	3/4
Pregnant/caring for own children	6	6	3	4/4
Problems at home	5	6	4	4/3
Work related	22	23	16	19/19
Had to work/money problems	10	10	7	8/10
Wanted to work	12	13	9	11/9
Other reasons	14	14	16	14/12
Not stated	15	7	19	26/29
N un-weighted (with longitudinal weights)	3,106 (221,286)	3,514 (192,325)	1,541 (21,651)	2,526/2,013 (45,771)/(50,751)

Note: Coverage is youth who have not completed high school in cycle and are not in school.

Sources: Author's calculation from cycles 4 to 7 of the NLSCY and from cycles 2 to 4 of the YITS.

Table 2: Definition of controls variables (reference category in parenthesis)

Controls variables	Definition
Family characteristics	
Provinces in the Rest of Canada (ROC) sample	Dichotomous variables taking the value of 1 for the province of residence of youth in cycle 1, 0 otherwise; Ontario is the reference province
(P-Edu Primary)	Value of 1 if the person most knowledgeable (PMK) about this child highest education is primary in cycle 1, 0 otherwise
(P-Edu Secondary)	Value of 1 if PMK highest education is some high school studies in cycle 1, 0 otherwise
(P-Edu HS)	Value of 1 if PMK highest education is high school diploma in cycle 1, 0 otherwise
P-Edu Some PSE	Value of 1 if PMK highest education is some postsecondary studies in cycle 1, 0 otherwise
P-Edu College	Value of 1 if PMK highest education is a college diploma in cycle 1, 0 otherwise
P-Edu University	Value of 1 if PMK highest education is university degree or more in cycle 1, 0 otherwise
S-≤High school	Value of 1 if spouse of PMK highest education in high school diploma or less, 0 otherwise
(One-parent)	Value of 1 if the child is living with a one parent/guardian in cycle 1, 0 otherwise
Two Bio-Parents	Value of 1 if the child is living with two biological parents in cycle 1, 0 otherwise
Two Parents	Value of 1 if the child is living with two parents in cycle 1, one or two of them are not biological, 0 otherwise
P-Immigrant	Takes the value of 1 if the PMK in cycle 1 is not born in Canada, 0 otherwise
(Sibling 0)	Takes the value of 1 if the child has no sibling in cycle 1, 0 otherwise
Sibling 1	Takes the value of 1 if the child has one sibling in cycle 1, 0 otherwise
Siblings 2 or more	Takes the value of 1 if the child has two sibling or more in cycle 1, 0 otherwise
Com Size Rural	Value of 1 if a child lives in a rural community in cycle 1, 0 otherwise
Com Size Small	Value of 1 if a child lives in a town with less 99,999 inhabitants in cycle 1, 0 otherwise
(Com Size Large)	Value of 1 if a child lives in town with 100,000 inhabitants or more in cycle 1, 0 otherwise
Private School	Value of 1 if a child was in a private high school, 0 otherwise
Family Income Q1-Q4	Dichotomous variables taking the values of 1 if the mean value of family income (\$2002) over cycles 1 to 4 is in the first, second, third or fourth quartile, 0 otherwise
Parenting scores	
Interaction (i)	Positive Interaction: mean value of score over cycles 1 to 3 and ages 6 to 11 years; the total score varies from 0 to 20, a high score indicating positive interactions
Interaction Q1-Q4	Dichotomous variables taking the values of 1 if the mean value of score over cycles 1 to 3 is in the first, second, third or fourth quartile, 0 otherwise
Consistency (i)	Consistency: mean value of score over cycles 1 to 3 and ages 6 to 11 years; the total score varies between 0 and 20, a high score indicating consistent parenting behaviour
Q1-Q4 Consistency	Dichotomous variables taking the values of 1 if the mean value of score over cycles 1 to 3 is in the first, second, third or fourth quartile, 0 otherwise
Aversive (i)	Rational parenting style: mean value of score over cycles 1 to 3 and ages 6 to 11 years The total score varies between 0 and 20, a high score indicating punitive/aversive interactions
Aversive Q1-Q4	Dichotomous variables taking the values of 1 if the mean value of score over cycles 1 to 3 is in the first, second, third or fourth quartile, 0 otherwise
Ineffective (i)	Ineffective parenting style: mean value of score over cycles 1 to 3 and ages 6 to 11 years; the total score varies between 0 and 25, a high score indicating hostile/ineffective interactions
Ineffective Q1-Q4	Dichotomous variables taking the values of 1 if the mean value of score over cycles 1 to 3 is in the first, second, third or fourth quartile, 0 otherwise
Family Functioning	The total score varies between 0 and 36, a high score indicating family dysfunction
Family Functioning Q1-Q4	Dichotomous variables taking the values of 1 if the mean value of score over cycles 1 to 3 is in the first, second, third or fourth quartile, 0 otherwise
Parental schooling expectations	
P-Exp-HS P-Exp-PSE P-Exp-U 10, 12, 14, 16 (i)	The highest level of education PMK you would like this child to get; dichotomous variables take the values of 1 if High school diploma or graduation equivalency and trade/ vocational/ business schools level courses of certificate (HS); 1 if College, CEGEP or trade/vocational certificate or diploma (or similar for example; hospital school of nursing or radiology, technical institute) or registered apprenticeship apprentice or university certificate or diploma below a Bachelor's degree (PSE); 1 if University bachelor's degree or more (U); 0 otherwise; the values are computed at ages 10-11, 12-13, 14-15 and 16-17 (if still in school) and over cycles 1 to 6

Table 2 end: Definition of controls variables (reference category in parenthesis)

Youth Characteristics	
Age	Age of youth in cycle 7; from 18 to 23 years
Health	Mean health status from excellent (1) to poor (5) over cycles 5 to 7; youth aged 16 years or more
Math Q1-Q4 (i)	Dichotomous variables taking the values of 1 if the mean value of score over cycles 1 to 4 is in the first, second, third or fourth quartile, 0 otherwise
Reading Q1-Q4 (i)	Dichotomous variables taking the values of 1 if the mean value of score over cycles 1 to 4 is in the first, second, third or fourth quartile, 0 otherwise
Self-esteem (i) Self-esteem Q1-Q4	Mean general positive self score (0 to 16) for children aged 10 to 19 years over cycles 1 to 7 Dichotomous variables taking the values of 1 if the mean value of score over cycles 1 to 4 is in the first, second, third or fourth quartile, 0 otherwise
Emotional quotient (i)	Four factors emotional quotient score (0 to 36 for the 10 to 19 years old; 1 to 64 for the 20-21 years old); a high score indicates a well developed emotional/social capacity; mean value over cycles 5 to 7
Emotional Quotient Q1-Q4	Dichotomous variables taking the values of 1 if the mean value of score over cycles 1 to 4 is in the first, second, third or fourth quartile, 0 otherwise
Behavioural scores (as reported by parents)	
Hyperactivity (i)	Mean value of hyperactivity/inattention score (for children who are less than 11 years over cycles 1 to 3); the total score varies from 0 to 14, a high score indicating the presence of hyperactive/inattentive behaviour
Hyperactivity Q1-Q4	Dichotomous variables taking the values of 1 if the mean value of score over cycles 1 to 4 is in the first, second, third or fourth quartile, 0 otherwise
Conduct Disorder (i)	Mean value of conduct disorder-physical aggression score (for children who are less than 11 years over cycles 1 to 3); the total score varies from 0 to 12, a high score indicating behaviours associated with conduct disorder and physical aggression
Conduct Disorder Q1-Q4	Dichotomous variables taking the values of 1 if the mean value of score over cycles 1 to 4 is in the first, second, third or fourth quartile, 0 otherwise
Pro-social (i)	Mean value of pro-social behaviour score (for children who are less than 11 years over cycles 1 to 3); the total score varies from 0 to 20, a high score indicating pro-social behaviour
Pro-social Q1-Q4	Dichotomous variables taking the values of 1 if the mean value of score over cycles 1 to 4 is in the first, second, third or fourth quartile, 0 otherwise
Attitudes/perceptions towards school and teachers (as reported by the youth)	
Like school (i)	From very much (1) to hate school (5); ages 10 to 15 and mean of scores over cycles
Importance of Grades (i)	From very important (1) to not at all (4); ages 10 to 15 and mean of scores over cycles
Do Homework (i)	Do homework when teacher give them: from all the time (1) to never (5); ages 10 to 15 and mean of scores over cycles
Read out of School (i)	How often read for fun (not for school) from every day/daily (1) to less than once a month/never (5); ages 10 to 15 and average of scores over cycles
Parent Help (i)	When problems at school parents are ready to help: from all the time (1) to never (5); ages 10 to 15 and average of scores over cycles
Teacher Help (i)	When need help teachers give help: from all the time (1) to never (5); ages 10 to 15 and average of scores over cycles
Teacher Fair (i)	In general teachers treat the child fairly: from all the time (1) to never (5); ages 10 to 15 and average of scores over cycles
Safe at School (i)	Feel safe at school: from all the time (1) to never (5); ages 10 to 15 and average of scores over cycles
Attitudes/Perceptions Q1-Q4	Dichotomous variables taking the values of 1 if the mean value of score is in the first, second, third or fourth quartile, 0 otherwise; ages 10 to 15 and average of scores over cycles

Notes: 1. (i) indicates that some values are imputed (see text); 2. Values are computed separately for Québec and the Rest of Canada sample.

Table 3: Rates of high school leaver, continuer and graduate of Canadian youth [women] (men) by age, and YITS cohorts as of December 2000, 2002, 2004 and 2006

	December 1999	December 2001	December 2003	December 2005
	18-20-year- olds	20-22-year- olds	22-24-year- olds	24-26-year- olds
High-school leaver	11 [9] (13)	12 [9] (15)	10 [7] (13)	8 [6] (10)
High-school continuer	13 [11] (15)	2 [2] (2)	1 [1] (1)	0.6 [0.6] (0.5)
High-school graduate	76 [80] (72)	86 [89] (83)	89 [92] (86)	91 [94] (89)
	15-year-olds	17-year-olds	19-year-olds	21-year-olds
High-school leaver	-	14 [13] (16)	8 [5] (9)	6 [5] (8)
High-school continuer	100	83 [84] (82)	5 [4] (7)	2 [1] (2)
High-school graduate	-	3 [3] (2)	87 [91] (84)	92 [94] (90)

Sources: First panel from YITS survey, cohort B, cycles 1 to 3, Shaienks, Eisl-Culkin and Bussière (2006) and author's calculation for cycle 4. Estimated total number of 24- to 26-year-olds youth as of December 2005: 1,220,000. Second panel from YITS survey, cohort A, cycles 1 to 4, author's calculation. Estimated total number of 21-year-olds youth as of December 2005: 347,220.

Table 4: Number (percentage) of high school graduates by gender, regions, definitions and samples, 18 to 23 years old, NLSCY 2006-2007

	Québec			Rest of Canada		
	All	Female	Male	All	Female	Male
A. Un-weighted samples						
HS0	872 (70.5)	475 (74.0)	397 (66.2)	3,774 (78.2)	1,939 (81.5)	1,835 (74.7)
HS1	825 (81.7)	457 (85.3)	368 (77.2)	3,535 (86.6)	1,826 (88.7)	1,709 (84.4)
HS2	855 (78.8)	466 (83.7)	389 (73.0)	3,586 (85.4)	1,852 (87.4)	1,734 (83.2)
B. With Cycle 7 longitudinal weights						
HS0	523,782 (69.3)	260,632 (71.5)	263,149 (67.2)	1,736,433 (73.2)	842,126 (75.2)	894,306 (71.4)
HS1	498,650 (80.8)	251,478 (84.0)	247,172 (77.6)	1,616,888 (85.0)	787,880 (88.0)	829,007 (82.3)
HS2	513,277 (78.5)	255,268 (82.8)	258,008 (74.3)	1,641,766 (83.8)	799,948 (86.6)	841,817 (81.0)
C. With Cycle 7 funnel weights						
HS0	540,021 (75.8)	266,776 (80.3)	273,245 (71.4)	1,713,765 (81.7)	833,407 (85.8)	880,358 (77.7)
HS1	513,868 (81.7)	259,602 (85.0)	254,266 (78.4)	1,596,295 (86.7)	775,752 (91.2)	820,542 (82.4)
HS2	529,330 (79.3)	263,611 (83.7)	265,719 (75.0)	1,624,644 (85.2)	790,165 (89.6)	834,479 (81.0)
D1 Un-weighted and without English schooled students			D2. Un-weighted and without French schooled students¹			
HS0	799 (69.2)	443 (73.4)	356 (64.0)	3,607 (78.2)	1,847 (81.6)	1,760 (74.7)
HS1	756 (81.1)	427 (85.5)	329 (75.4)	3,374 (86.3)	1,735 (88.2)	1,639 (84.3)
HS2	783 (78.3)	434 (84.1)	349 (71.1)	3,424 (85.0)	1,761 (86.9)	1,663 (83.0)
E1 With Cycle 7 longitudinal weights and without English schooled students			E2. With Cycle 7 longitudinal weights and without French schooled students			
HS0	449,538 (65.6)	232,328 (68.7)	217,210 (62.2)	1,675,522 (75.1)	612,567 (75.1)	866,955 (71.2)
HS1	425,887 (78.8)	223,974 (83.9)	201,914 (73.2)	1,562,510 (84.8)	758,589 (87.6)	803,920 (82.1)
HS2	439,579 (76.4)	226,964 (82.8)	212,615 (69.6)	1,586,659 (83.5)	770,657 (86.2)	816,002 (80.9)

Source: Author's calculation from cycles 4 to 7 of NLSCY dataset.

Notes HS0: completion rates include both dropouts and current high school students; HS1: completion rates exclude current high school students; HS2 completion rates exclude current high school students except those aged 18 or 19 and attending high school for grades below IV in Québec and 11 in the Rest of Canada or a school with no grade or do not know their grade. 1. Includes students in French immersion schools.

Table 5: Marginal effects of Probit estimations of high school graduation, male aged 18 to 23 years, Rest of Canada, 2006-2007

Control/specifications	(1)	(2)	(3)	(4)	(5)	(6)
Age	0.0034	(0.70)	0.004	(0.60)	0.006	(0.46)
Health	***-0.076	(0.00)	***-0.077	(0.00)	***-0.065	(0.00)
Two Bio-Parents	***0.169	(0.00)	***0.134	(0.00)	***0.142	(0.01)
Two Parents	0.005	(0.94)	-0.022	(0.75)	-0.020	(0.74)
P-Edu Some PSE	***0.103	(0.00)	***0.094	(0.00)	***0.090	(0.00)
P-Edu College	***0.125	(0.00)	***0.115	(0.00)	***0.100	(0.00)
P-Edu University	***0.112	(0.00)	***0.108	(0.00)	***0.102	(0.00)
SP-Edu ≤High School	-0.027	(0.44)	-0.027	(0.43)	-0.034	(0.26)
Family Income Q2			***0.079	(0.01)	*0.052	(0.08)
Family Income Q3			***0.090	(0.01)	*0.063	(0.06)
Family Income Q4			0.025	(0.54)	-0.010	(0.82)
Com Size Rural					*-0.084	(0.07)
Com Size Large					-0.013	(0.69)
Sibling 1					-0.031	(0.32)
Siblings 2 or more					-0.051	(0.26)
Private School					-0.055	(0.23)
Interaction					-0.000	(0.95)
Consistency					0.003	(0.55)
Aversive					-0.005	(0.61)
Ineffective					0.007	(0.18)
Family Functioning					0.000	(0.91)
Hyperactivity					***-0.014	(0.00)
Conduct disorder					**-.021	(0.02)
Pro-social					-0.004	(0.44)
Reading Q2					0.040	(0.27)
Reading Q3					0.035	(0.36)
Reading Q4					0.045	(0.25)
Math Q2					0.018	(0.59)
Math Q3					0.029	(0.39)
Math Q4					***0.103	(0.00)
Self-esteem					0.001	(0.90)
Emotional Quotient					-0.001	(0.67)
P-Exp-10-PSE						***0.079
P-Exp-10-U						0.059
P-Exp-12-PSE						0.032
P-Exp-12-U						0.050
P-Exp-14-PSE						0.017
P-Exp-14-U						0.024
P-Exp-16-PSE						***0.089
P-Exp-16-U						***0.133
Like School						0.020
Importance of Grades						-0.014
Do Homework						***-0.048
Read out of School						-0.013
Parent Help						0.001
Teacher Help						-0.008
Teacher Fair						0.006
Safe at School						0.005
N	1,725	1,725	1,725	1,725	1,725	1,725

Note: *p*-values in parentheses for discrete change of dummy variable from 0 to 1: * *p* ≤ 0.10, ** *p* ≤ 0.05, *** *p* ≤ 0.01. Control variables include provinces.

Table 6: Marginal effects of Probit estimations of high school graduation, female aged 18 to 23 years, Rest of Canada, 2006-2007

Control/specifications	(1)		(2)		(3)		(4)		(5)		(6)	
Age	-0.001	(0.91)	-0.001	(0.91)	-0.001	(0.92)	0.007	(0.30)	0.007	(0.25)	0.009	(0.15)
Health	-0.024	(0.16)	-0.024	(0.15)	**-.031	(0.03)	-0.025	(0.08)	*-0.023	(0.10)	-0.022	(0.11)
Two Bio-Parents	***0.214	(0.00)	**0.110	(0.02)	***0.128	(0.01)	***0.119	(0.01)	***0.121	(0.01)	***0.110	(0.01)
Two Parents	***0.078	(0.00)	0.044	(0.16)	0.046	(0.09)	0.039	(0.12)	0.040	(0.11)	0.035	(0.15)
P-Edu Some PSE	0.024	(0.36)	0.017	(0.53)	0.016	(0.52)	0.012	(0.61)	0.005	(0.83)	0.006	(0.77)
P-Edu College	-0.004	(0.88)	-0.018	(0.53)	-0.022	(0.44)	-0.022	(0.42)	-0.032	(0.26)	-0.033	(0.22)
P-Edu University	***0.094	(0.00)	***0.074	(0.01)	***0.072	(0.00)	***0.065	(0.00)	*0.046	(0.07)	*0.041	(0.10)
SP-Edu ≤High School	***-0.091	(0.00)	***-0.080	(0.01)	***-0.080	(0.01)	***-0.072	(0.01)	**-.069	(0.02)	-0.070*	(0.02)
Family Income Q2			***0.065	(0.00)	***0.058	(0.00)	***0.056	(0.00)	***0.046	(0.01)	-0.034	(0.30)
Family Income Q3			***0.105	(0.00)	***0.093	(0.00)	***0.082	(0.00)	***0.071	(0.00)	***0.049	(0.00)
Family Income Q4			***0.089	(0.00)	***0.074	(0.00)	***0.057	(0.01)	0.042	(0.07)	***0.074	(0.00)
Com Size Rural					-0.035	(0.34)	-0.032	(0.35)	-0.039	(0.26)	**0.045	(0.05)
Com Size Large					-0.021	(0.37)	-0.015	(0.47)	-0.007	(0.74)	0.000	(0.99)
Sibling 1					-0.013	(0.55)	-0.015	(0.46)	-0.015	(0.45)	-0.013	(0.50)
Siblings 2 or more					-0.049	(0.13)	-0.042	(0.16)	-0.035	(0.26)	-0.029	(0.33)
Private School					**-.093	(0.02)	**-.080	(0.03)	*-0.069	(0.06)	-0.062	(0.08)
Interaction					-0.006	(0.14)	-0.004	(0.29)	-0.005	(0.18)	-0.005	(0.18)
Consistency					-0.0006	(0.85)	-0.002	(0.57)	-0.002	(0.52)	-0.002	(0.50)
Aversive					-0.001	(0.88)	-0.000	(0.99)	-0.001	(0.93)	-0.001	(0.88)
Ineffective					0.003	(0.46)	0.003	(0.42)	0.002	(0.53)	0.003	(0.41)
Family Functioning					-0.000	(0.89)	-0.001	(0.62)	-0.002	(0.42)	-0.001	(0.55)
Hyperactivity					-0.001	(0.90)	0.002	(0.58)	0.004	(0.23)	0.004	(0.20)
Conduct disorder					-0.009	(0.12)	-0.007	(0.30)	-0.007	(0.27)	-0.006	(0.33)
Pro-social					-0.002	(0.45)	-0.003	(0.38)	-0.004	(0.19)	-0.004	(0.20)
Reading Q2							0.020	(0.43)	0.011	(0.70)	0.008	(0.77)
Reading Q3							0.022	(0.37)	0.001	(0.98)	-0.001	(0.96)
Reading Q4							-0.019	(0.57)	-0.048	(0.20)	-0.050	(0.15)
Math Q2							***0.054	(0.01)	**0.047	(0.03)	**0.046	(0.03)
Math Q3							***0.066	(0.00)	**0.053	(0.02)	***0.052	(0.01)
Math Q4							***0.069	(0.00)	**0.056	(0.04)	**0.051	(0.04)
Self-esteem							**0.013	(0.02)	**0.011	(0.05)	0.007	(0.19)
Emotional Quotient							***-0.003	(0.01)	***-0.003	(0.02)	***-0.003	(0.01)
P-Exp-10-PSE									**0.500	(0.04)	**0.051	(0.02)
P-Exp-10-U									0.021	(0.57)	0.021	(0.57)
P-Exp-12-PSE									0.015	(0.66)	0.011	(0.75)
P-Exp-12-U									0.030	(0.34)	0.038	(0.28)
P-Exp-14-PSE									-0.004	(0.92)	-0.009	(0.82)
P-Exp-14-U									0.011	(0.79)	0.006	(0.87)
P-Exp-16-PSE									**0.053	(0.02)	**0.050	(0.02)
P-Exp-16-U									**0.104	(0.02)	**0.100	(0.02)
Like School											-0.007	(0.62)
Importance of Grades											0.003	(0.90)
Do Homework											-0.009	(0.66)
Read out of School											0.001	(0.88)
Parent Help											-0.004	(0.79)
Teacher Help											0.002	(0.91)
Teacher Fair											-0.029	(0.16)
Safe at School											0.002	(0.86)
N	1,833		1,833		1,833		1,833		1,833		1,833	

Note: *p*-values in parentheses for discrete change of dummy variable from 0 to 1: * $p \leq 0.10$, ** $p \leq 0.05$, *** $p \leq 0.01$. Control variables include provinces.

Table 7: Marginal effects of Probit estimations of high school graduation, male aged 18 to 23 years, Québec 2006-2007

Control/specifications	(1)	(2)	(3)	(4)	(5)	(6)
Age	0.010 (0.66)	0.007 (0.75)	0.019 (0.29)	*0.035 (0.09)	*0.038 (0.07)	*0.042 (0.06)
Health	***-0.124 (0.01)	** -0.109 (0.02)	** -0.107 (0.02)	-0.094 (0.06)	* -0.089 (0.07)	* -0.092 (0.07)
Two Bio-Parents	***0.426 (0.00)	0.278 (0.05)	***0.300 (0.01)	0.232 (0.05)	0* 0.227 (0.07)	*0.228 (0.06)
Two Parents	0.116 (0.33)	-0.001 (0.99)	0.033 (0.81)	0.065 (0.60)	0.087 (0.44)	0.081 (0.50)
P-Edu Some PSE	0.063 (0.45)	-0.006 (0.95)	0.025 (0.76)	0.029 (0.68)	0.025 (0.74)	0.036 (0.62)
P-Edu College	-0.027 (0.77)	-0.078 (0.39)	-0.088 (0.36)	-0.058 (0.53)	-0.057 (0.56)	-0.058 (0.55)
P-Edu University	0.088 (0.35)	-0.060 (0.61)	-0.094 (0.45)	-0.105 (0.40)	-0.136 (0.30)	-0.128 (0.36)
SP-Edu ≤High School	** -0.185 (0.02)	-0.105 (0.19)	-0.051 (0.52)	0.017 (0.82)	0.004 (0.96)	0.024 (0.74)
Family Income Q2		-0.019 (0.85)	-0.040 (0.66)	-0.038 (0.65)	-0.056 (0.53)	-0.057 (0.51)
Family Income Q3		***0.193 (0.01)	***0.205 (0.00)	**0.160 (0.02)	0.134 (0.06)	**0.139 (0.04)
Family Income Q4		***0.238 (0.00)	***0.215 (0.01)	*0.150 (0.06)	0.131 (0.13)	*0.117 (0.17)
Com Size Rural			* -0.142 (0.10)	-0.140 (0.08)	-0.134 (0.11)	-0.120 (0.15)
Com Size Large			-0.117 (0.16)	-0.116 (0.14)	* -0.132 (0.10)	-0.113 (0.17)
Sibling 1			-0.104 (0.24)	-0.040 (0.62)	-0.020 (0.81)	-0.009 (0.91)
Siblings 2 or more			-0.011 (0.92)	0.015 (0.87)	0.044 (0.62)	0.043 (0.62)
Private School			0.059 (0.44)	0.077 (0.24)	0.080 (0.24)	0.077 (0.24)
Interaction			0.012 (0.41)	0.010 (0.51)	0.010 (0.47)	0.016 (0.33)
Consistency			0.008 (0.48)	-0.002 (0.89)	-0.003 (0.83)	-0.002 (0.89)
Aversive			0.043 (0.12)	*0.051 (0.07)	0.050 (0.08)	**0.060 (0.03)
Ineffective			-0.003 (0.80)	-0.016 (0.21)	-0.018 (0.17)	-0.019 (0.13)
Family Functioning			0.008 (0.37)	0.004 (0.67)	0.004 (0.70)	-0.000 (0.99)
Hyperactivity			** -0.024 (0.02)	-0.011 (0.29)	-0.007 (0.46)	-0.003 (0.79)
Conduct disorder			-0.024 (0.24)	-0.016 (0.38)	-0.013 (0.48)	-0.009 (0.60)
Pro-social			-0.002 (0.89)	0.003 (0.77)	0.003 (0.83)	0.003 (0.79)
Reading Q2				0.148 (0.08)	0.142 (0.09)	0.141 (0.07)
Reading Q3				***0.253 (0.00)	***0.244 (0.00)	***0.240 (0.00)
Reading Q4				***0.276 (0.00)	***0.267 (0.00)	***0.269 (0.00)
Math Q2				-0.025 (0.76)	-0.042 (0.62)	-0.046 (0.59)
Math Q3				0.029 (0.75)	-0.004 (0.97)	-0.016 (0.88)
Math Q4				0.115 (0.16)	0.095 (0.30)	0.049 (0.62)
Self-esteem				-0.004 (0.84)	0.005 (0.81)	0.006 (0.75)
Emotional Quotient				0.000 (0.93)	-0.002 (0.87)	-0.000 (0.91)
P-Exp-10-PSE					0.620 (0.22)	0.066 (0.42)
P-Exp-10-U					0.620 (0.78)	0.091 (0.24)
P-Exp-12-PSE					0.113 (0.18)	0.091 (0.32)
P-Exp-12-U					0.050 (0.60)	0.017 (0.86)
P-Exp-14-PSE					0.053 (0.66)	0.034 (0.80)
P-Exp-14-U					-0.039 (0.68)	-0.066 (0.52)
P-Exp-16-PSE					0.112 (0.21)	0.077 (0.32)
P-Exp-16-U					0.073 (0.35)	0.087 (0.35)
Like School						-0.039 (0.25)
Importance of Grades						0.064 (0.35)
Do Homework						-0.034 (0.54)
Read out of School						-0.016 (0.44)
Parent Help						*0.067 (0.06)
Teacher Help						0.029 (0.51)
Teacher Fair						0.011 (0.87)
Safe at School						-0.028 (0.60)
N	346	346	346	346	346	346

Note: *p*-values in parentheses for discrete change of dummy variable from 0 to 1: * $p \leq 0.10$, ** $p \leq 0.05$, *** $p \leq 0.01$.

Table 8: Marginal effects of Probit estimations of high school graduation, female aged 18 to 23 years, Québec 2006-2007

Control/specifications	(1)		(2)		(3)		(4)		(5)		(6)	
Age	**0.032	(0.02)	***0.032	(0.01)	***0.032	(0.00)	***0.033	(0.00)	***0.032	(0.00)	***0.026	(0.01)
Health	**0.071	(0.03)	**0.077	(0.01)	**0.065	(0.01)	**0.045	(0.01)	**0.042	(0.02)	**0.044	(0.01)
Two Bio-Parents	***0.216	(0.01)	*0.135	(0.10)	**0.169	(0.02)	0.087	(0.11)	*0.086	(0.10)	*0.087	(0.09)
Two Parents	0.041	(0.50)	-0.016	(0.85)	-0.001	(0.99)	-0.026	(0.67)	-0.009	(0.86)	0.000	(0.99)
P-Edu Some PSE	-0.045	(0.53)	-0.061	(0.40)	-0.051	(0.32)	-0.010	(0.79)	-0.007	(0.84)	0.004	(0.90)
P-Edu College	-0.022	(0.74)	-0.052	(0.47)	-0.040	(0.50)	-0.053	(0.38)	-0.051	(0.38)	-0.058	(0.32)
P-Edu University	**0.103	(0.05)	0.037	(0.61)	0.040	(0.46)	0.022	(0.54)	0.018	(0.67)	0.008	(0.85)
SP-Edu ≤HighSchool	0.011	(0.84)	0.041	(0.42)	0.028	(0.49)	0.041	(0.17)	0.030	(0.30)	0.012	(0.63)
Family Income Q2			0.076	(0.18)	0.045	(0.29)	0.012	(0.75)	0.007	(0.86)	-0.010	(0.78)
Family Income Q3			0.080	(0.15)	0.049	(0.26)	0.016	(0.67)	0.003	(0.94)	-0.011	(0.78)
Family Income Q4			***0.148	(0.01)	0.075	(0.11)	0.041	(0.30)	0.010	(0.82)	-0.008	(0.88)
Com Size Rural					0.011	(0.80)	-0.014	(0.70)	0.020	(0.54)	0.013	(0.63)
Com Size Large					0.056	(0.11)	0.028	(0.35)	0.022	(0.48)	0.014	(0.60)
Sibling 1					0.054	(0.19)	*0.067	(0.06)	**0.084	(0.02)	**0.074	(0.03)
Siblings 2 or more					-0.034	(0.52)	0.008	(0.94)	0.049	(0.12)	**0.053	(0.05)
Private School					***0.110	(0.00)	**0.068	(0.02)	**0.056	(0.05)	**0.051	(0.05)
Interaction					0.000	(0.99)	0.007	(0.22)	0.010	(0.09)	0.008	(0.18)
Consistency					0.007	(0.22)	0.004	(0.46)	0.005	(0.29)	0.005	(0.26)
Aversive					-0.002	(0.90)	0.004	(0.75)	0.005	(0.70)	0.008	(0.51)
Ineffective					**0.017	(0.02)	0.006	(0.27)	0.005	(0.33)	0.002	(0.74)
Family Functioning					0.004	(0.39)	0.002	(0.55)	0.004	(0.27)	0.004	(0.31)
Hyperactivity					-0.005	(0.53)	0.001	(0.90)	0.003	(0.58)	0.004	(0.45)
Conduct disorder					-0.017	(0.26)	-0.006	(0.60)	-0.016	(0.14)	-0.015	(0.13)
Pro-social					0.007	(0.20)	0.002	(0.70)	0.003	(0.43)	0.003	(0.39)
Reading Q2							**0.078	(0.02)	0.053	(0.14)	0.035	(0.36)
Reading Q3							***0.086	(0.00)	0.051	(0.18)	0.031	(0.33)
Reading Q4							***0.114	(0.00)	**0.075	(0.03)	0.057	(0.07)
Math Q2							***0.097	(0.00)	***0.082	(0.00)	***0.065	(0.01)
Math Q3							***0.104	(0.00)	**0.072	(0.03)	0.059	(0.07)
Math Q4							***0.102	(0.00)	***0.085	(0.00)	***0.077	(0.00)
Self-esteem							0.006	(0.40)	0.000	(0.98)	0.000	(0.96)
Emotional quotient							0.000	(0.96)	-0.000	(0.97)	-0.000	(0.88)
P-Exp-10-PSE									0.037	(0.62)	-0.003	(0.92)
P-Exp-10-U									0.011	(0.80)	0.004	(0.92)
P-Exp-12-PSE									-0.015	(0.80)	-0.026	(0.68)
P-Exp-12-U									0.016	(0.68)	-0.005	(0.89)
P-Exp-14-PSE									**0.055	(0.04)	**0.052	(0.02)
P-Exp-14-U									0.077	(0.17)	0.069	(0.29)
P-Exp-16-PSE									***0.072	(0.01)	***0.060	(0.01)
P-Exp-16-U									**0.131	(0.03)	**0.130	(0.04)
Like School											-0.020	(0.40)
Importance Grades											0.013	(0.66)
Do Home Work											**0.072	(0.04)
Read out of school											0.002	(0.87)
Parent Help											0.007	(0.66)
Teacher Help											-0.009	(0.62)
Teacher Fair											-0.039	(0.15)
Safe at School											-0.019	(0.35)
N	433		433		433		433		433		433	

Note: p -values in parentheses for discrete change of dummy variable from 0 to 1: * $p \leq 0.10$, ** $p \leq 0.05$, *** $p \leq 0.01$.

Table 9: Marginal effects of Probit estimations of high school graduation, male aged 18 to 23 years, extreme specifications, Rest of Canada, 2006-2007

Control/specifications	(1)	(2)	(3)	(4)	(5)	(6)
Age	0.008 (0.35)	0.009 (0.26)	0.011 (0.16)	**0.017 (0.05)	**0.018 (0.03)	**0.020 (0.02)
Health	***-0.071 (0.00)	***-0.071 (0.00)	***-0.064 (0.00)	***-0.066 (0.00)	***-0.052 (0.00)	***-0.054 (0.00)
Two Bio-Parents	***0.155 (0.00)	***0.143 (0.00)	***0.123 (0.01)	***0.119 (0.01)	0.109* (0.02)	***0.114 (0.01)
Two Parents	-0.014 (0.83)	-0.024 (0.72)	-0.032 (0.62)	-0.015 (0.78)	-0.023 (0.68)	-0.028 (0.62)
P-Edu Primary	***-0.416 (0.00)	***-0.346 (0.01)	***-0.306 (0.01)	***-0.316 (0.00)	***-0.245 (0.01)	** -0.230 (0.02)
P-Edu Secondary	***-0.203 (0.00)	***-0.196 (0.00)	***-0.195 (0.00)	***-0.186 (0.00)	***-0.157 (0.00)	***-0.158 (0.00)
P-Edu High School	-0.063 (0.12)	-0.060 (0.12)	-0.068 (0.08)	-0.068 (0.07)	-0.056 (0.13)	-0.059 (0.11)
P-Edu University	0.012 (0.78)	0.008 (0.85)	0.000 (0.99)	-0.020 (0.66)	-0.029 (0.52)	-0.028 (0.53)
SP-Edu ≤High School	-0.012 (0.72)	-0.019 (0.57)	-0.009 (0.77)	-0.007 (0.82)	-0.009 (0.74)	-0.008 (0.79)
Family Income Q1		-0.059 (0.22)	-0.067 (0.16)	-0.068 (0.13)	** -0.097 (0.04)	** -0.102 (0.02)
Family Income Q2		-0.044 (0.25)	-0.025 (0.48)	-0.009 (0.80)	0.005 (0.87)	0.0117 (0.71)
Com Size Rural		0.022 (0.50)	0.024 (0.47)	0.021 (0.49)	0.027 (0.36)	0.031 (0.29)
Siblings 2 or more			-0.011 (0.73)	-0.013 (0.69)	0.009 (0.74)	0.021 (0.45)
Private school			0.012 (0.66)	0.010 (0.70)	0.014 (0.58)	0.015 (0.55)
Interaction Q1			-0.041 (0.24)	-0.045 (0.17)	-0.035 (0.28)	-0.033 (0.28)
Consistency Q1			-0.023 (0.49)	-0.017 (0.58)	-0.015 (0.61)	-0.014 (0.64)
Aversive Q4			0.044 (0.12)	0.041 (0.14)	*0.046 (0.08)	0.042 (0.11)
Ineffective Q4			-0.015 (0.66)	-0.022 (0.51)	-0.016 (0.63)	-0.019 (0.56)
Family Functioning Q4			-0.017 (0.57)	-0.019 (0.53)	-0.029 (0.32)	-0.028 (0.32)
Hyperactivity Q4			***-0.083 (0.01)	** -0.060 (0.05)	-0.035 (0.24)	-0.023 (0.44)
Conduct Disorder Q4			-0.075* (0.05)	** -0.070 (0.05)	-0.066 (0.06)	** -0.074 (0.04)
Pro-social Q1			0.016 (0.54)	0.018 (0.47)	0.017 (0.48)	0.018 (0.48)
Reading Q1				-0.066 (0.14)	-0.058 (0.15)	-0.049 (0.19)
Reading Q2				-0.020 (0.61)	-0.010 (0.79)	0.001 (0.98)
Math Q1				-0.073 (0.06)	-0.043 (0.23)	-0.039 (0.28)
Math Q2				-0.058 (0.15)	-0.049 (0.24)	-0.052 (0.18)
Self-esteem Q1				-0.003 (0.92)	0.0015 (0.96)	0.011 (0.76)
Emotional Quotient Q4				0.044 (0.19)	0.035 (0.29)	0.040 (0.20)
P-Exp-10-HS					*-0.089 (0.06)	** -0.091 (0.05)
P-Exp-12-HS					-0.039 (0.34)	-0.034 (0.35)
P-Exp-14-HS					-0.011 (0.679)	-0.011 (0.74)
P-Exp-16-HS					***-0.123 (0.01)	***-0.120 (0.01)
Like School Q4						0.013 (0.68)
Importance Grades Q4						-0.026 (0.44)
Do homework Q4						-0.004 (0.88)
Read out of School Q4						-0.046 (0.20)
Parent Help Q4						-0.001 (0.96)
Teacher Help Q4						-0.007 (0.83)
Teacher Fair Q4						-0.021 (0.55)
Safe at School Q4						-0.012 (0.72)
N	1,725	1,725	1,725	1,725	1,725	1,725

Note: p -values in parentheses for discrete change of dummy variable from 0 to 1: * $p \leq 0.10$, ** $p \leq 0.05$, *** $p \leq 0.01$. Control variables include provinces.

Table 10: Marginal effects of Probit of high school graduation, female aged 18 to 23 years, extreme specifications, Rest of Canada, 2006-2007

Control/specifications	(1)	(2)	(3)	(4)	(5)	(6)
Age	-0.001 (0.89)	-0.001 (0.86)	-0.000 (0.95)	0.004 (0.58)	0.005 (0.54)	0.006 (0.39)
Health	-0.024 (0.18)	-0.024 (0.15)	*-0.027 (0.06)	-0.023 (0.12)	-0.021 (0.14)	-0.019 (0.17)
Two Bio-Parents	***0.206 (0.00)	**0.112 (0.02)	***0.123 (0.01)	***0.114 (0.01)	***0.119 (0.01)	***0.106 (0.01)
Two Parents	***0.075 (0.00)	0.043 (0.16)	0.046 (0.08)	*0.043 (0.08)	*0.045 (0.06)	**0.044 (0.05)
P-Edu Primary	** -0.183 (0.03)	*-0.124 (0.10)	-0.113 (0.13)	-0.08 (0.19)	-0.069 (0.27)	-0.055 (0.38)
P-Edu Secondary	-0.026 (0.46)	-0.001 (0.96)	-0.005 (0.88)	0.001 (0.97)	0.012 (0.65)	0.010 (0.69)
P-Edu High School	0.017 (0.49)	0.0111 (0.65)	0.003 (0.89)	0.0081 (0.78)	0.009 (0.68)	0.007 (0.74)
P-Edu University	***0.087 (0.00)	***0.069 (0.01)	***0.065 (0.01)	**0.058 (0.02)	**0.050 (0.05)	0.043 (0.11)
SP-Edu ≤High School	***-0.081 (0.01)	** -0.074* (0.02)	***-0.080 (0.01)	** -0.071 (0.02)	-0.069* (0.02)	** -0.074 (0.02)
Family Income Q1		-0.020 (0.62)	-0.027 (0.47)	-0.024 (0.50)	-0.032 (0.39)	-0.032 (0.33)
Family Income Q2		***-0.137 (0.00)	***-0.128 (0.00)	***-0.112 (0.00)	***-0.094 (0.01)	***-0.094 (0.00)
Com Size Rural		-0.051 (0.07)	-0.046 (0.10)	-0.032 (0.22)	-0.030 (0.25)	-0.026 (0.31)
Siblings 2 or more			-0.018 (0.40)	-0.017 (0.42)	-0.012 (0.55)	-0.005 (0.81)
Private school			** -0.045 (0.05)	** -0.044 (0.05)	*-0.041 (0.07)	-0.041 (0.06)
Interaction Q1			0.014 (0.56)	0.003 (0.90)	0.009 (0.70)	0.007 (0.76)
Consistency Q1			-0.014 (0.56)	-0.014 (0.56)	-0.014 (0.56)	-0.014 (0.50)
Aversive Q4			0.008 (0.77)	0.011 (0.66)	0.012 (0.59)	0.009 (0.68)
Ineffective Q4			-0.006 (0.81)	-0.005 (0.84)	-0.007 (0.77)	-0.007 (0.76)
Family Functioning Q4			0.036 (0.08)	*0.033 (0.09)	0.027 (0.15)	*0.030 (0.10)
Hyperactivity Q4			-0.012 (0.64)	0.0034 (0.88)	0.010 (0.64)	0.015 (0.49)
Conduct Disorder Q4			-0.043 (0.23)	-0.031 (0.35)	-0.028 (0.40)	-0.018 (0.57)
Pro-social Q1			*0.038 (0.07)	*0.035 (0.07)	**0.038 (0.04)	**0.041 (0.03)
Reading Q1				-0.017 (0.53)	0.001 (0.98)	0.010 (0.68)
Reading Q2				0.011 (0.72)	0.018 (0.58)	0.024 (0.39)
Math Q1				** -0.085 (0.02)	** -0.068 (0.05)	** -0.073 (0.03)
Math Q2				-0.013 (0.60)	-0.007 (0.76)	-0.008 (0.74)
Self-esteem Q1				-0.038 (0.20)	-0.031 (0.29)	-0.017 (0.51)
Emotional Quotient Q4				0.037 (0.12)	0.035 (0.14)	*0.040 (0.06)
P-Exp-10-HS					-0.041 (0.94)	-0.036 (0.33)
P-Exp-12-HS					-0.008 (0.62)	-0.009 (0.78)
P-Exp-14-HS					-0.003 (0.92)	0.002 (0.96)
P-Exp-16-HS					***-0.110 (0.01)	** -0.103 (0.02)
Like School Q4						-0.047 (0.31)
Importance Grades Q4						0.015 (0.62)
Do homework Q4						-0.021 (0.62)
Read out of School Q4						-0.003 (0.95)
Parent Help Q4						-0.022 (0.59)
Teacher Help Q4						-0.016 (0.67)
Teacher Fair Q4						-0.028 (0.40)
Safe at School Q4						-0.027 (0.54)
N	1,833	1,833	1,833	1,833	1,833	1,833

Note: p -values in parentheses for discrete change of dummy variable from 0 to 1: * $p \leq 0.10$, ** $p \leq 0.05$, *** $p \leq 0.01$. Control variables include provinces.

Table 11: Marginal effects of Probit estimations of high school graduation, male aged 18 to 23 years, extreme specifications, Québec 2006-2007

	(1)	(2)	(3)	(4)	(5)	(6)
Age	0.010 (0.67)	0.007 (0.76)	0.015 (0.43)	0.028 (0.17)	0.030 (0.14)	0.030 (0.15)
Health	***-0.129 (0.01)	***-0.115 (0.01)	**-.099 (0.03)	**-.094 (0.028)	-0.098* (0.02)	*-0.079 (0.06)
Two Bio-Parents	***0.422 (0.00)	**0.286 (0.03)	0.262* (0.04)	0.210 (0.09)	0.213 (0.08)	0.206 (0.07)
Two Parents	0.104 (0.39)	-0.004 (0.98)	0.015 (0.91)	0.062 (0.60)	0.096 (0.34)	0.073 (0.48)
P-Edu Primary)	-0.289 (0.12)	-0.176 (0.35)	-0.205 (0.33)	-0.234 (0.18)	-0.203 (0.22)	*-0.317 (0.06)
P-Edu Secondary	0.024 (0.81)	0.079 (0.38)	0.027 (0.78)	0.021 (0.79)	0.036 (0.66)	-0.008 (0.93)
P-Edu High School	-0.039 (0.68)	0.011 (0.90)	-0.042 (0.65)	-0.087 (0.38)	-0.070 (0.46)	-0.064 (0.48)
P-Edu University	0.074 (0.40)	0.011 (0.90)	-0.067 (0.49)	-0.100 (0.32)	-0.107 (0.31)	-0.111 (0.30)
SP-Edu ≤High School	**-.0167 (0.04)	-0.094 (0.23)	-0.051 (0.52)	0.029 (0.69)	0.014 (0.85)	0.057 (0.38)
Family Income Q1		**-.0250 (0.02)	**-.0265 (0.02)	-0.172 (0.11)	-0.139 (0.18)	-0.115 (0.24)
Family Income Q2		***-.0285 (0.00)	***-.0266 (0.01)	-0.191 (0.06)	-0.179 (0.07)	*-0.176 (0.07)
Com Size Rural			-0.104 (0.19)	-0.115 (0.13)	-0.094 (0.22)	-0.083 (0.23)
Siblings 2 or more			0.098 (0.15)	0.071 (0.28)	0.075 (0.24)	0.087 (0.13)
Private school			0.077 (0.30)	*0.113 (0.07)	0.107 (0.09)	**0.122 (0.02)
Interaction Q1			0.0028 (0.97)	0.016 (0.82)	0.030 (0.67)	-0.004 (0.95)
Consistency Q1			0.082 (0.25)	0.115 (0.06)	0.122* (0.04)	**0.125 (0.03)
Aversive Q4			0.057 (0.47)	0.072 (0.29)	0.063 (0.36)	0.086 (0.17)
Ineffective Q4			-0.140 (0.16)	**-.0219 (0.03)	-0.238* (0.02)	***-.0295 (0.01)
Family Functioning Q4			0.063 (0.41)	0.034 (0.64)	0.032 (0.66)	0.038 (0.58)
Hyperactivity Q4			**-.0164 (0.03)	-0.113 (0.11)	-0.093 (0.18)	-0.067 (0.32)
Conduct Disorder Q4			**-.0175 (0.05)	-0.124 (0.14)	-0.102 (0.20)	-0.077 (0.33)
Pro-social Q1			-0.017 (0.82)	-0.035 (0.60)	-0.021 (0.76)	-0.007 (0.92)
Reading Q1				***-.0432 (0.00)	-0.408*** (0.00)	***-.0406 (0.00)
Reading Q2				-0.211 (0.18)	-0.195 (0.20)	-0.190 (0.17)
Math Q1				-0.093 (0.31)	-0.051 (0.58)	-0.022 (0.79)
Math Q2				-0.114 (0.18)	-0.096 (0.27)	-0.091 (0.27)
Self-esteem Q1				0.085 (0.30)	0.076 (0.37)	0.052 (0.53)
Emotional Quotient Q4				-0.093 (0.36)	-0.077 (0.44)	-0.084 (0.37)
P-Exp-10-HS					-0.076 (0.35)	-0.089 (0.26)
P-Exp-12-HS					-0.061 (0.50)	-0.056 (0.51)
P-Exp-14-HS					-0.017 (0.83)	-0.009 (0.91)
P-Exp-16-HS					-0.051 (0.51)	-0.044 (0.56)
Like School Q4						-0.105 (0.19)
Importance Grades Q4						0.019 (0.80)
Do homework Q4						-0.001 (0.99)
Read out of School Q4						0.003 (0.96)
Parent Help Q4						***0.188 (0.00)
Teacher Help Q4						0.008 (0.91)
Teacher Fair Q4						-0.078 (0.40)
Safe at School Q4						-0.060 (0.66)
N	346	346	346	346	346	346

Note: p -values in parentheses for discrete change of dummy variable from 0 to 1: * $p \leq 0.10$, ** $p \leq 0.05$, *** $p \leq 0.01$.

Table 12: Marginal effects of Probit of high school graduation, female aged 18 to 23 years, extreme estimations, Québec 2006-2007

	(1)	(2)	(3)	(4)	(5)	(6)
Age	**0.030 (0.02)	**0.030 (0.02)	***0.033 (0.01)	***0.037 (0.00)	***0.036 (0.00)	***0.030 (0.01)
Health	**0.074 (0.02)	***0.080 (0.01)	***0.084 (0.00)	***0.054 (0.00)	***0.051 (0.01)	***0.052 (0.00)
Two Bio-Parents	**0.168 (0.02)	0.118 (0.15)	**0.158 (0.04)	0.065 (0.24)	0.067 (0.21)	0.036 (0.43)
Two Parents	0.018 (0.79)	-0.011 (0.90)	-0.023 (0.77)	-0.053 (0.48)	-0.039 (0.56)	-0.059 (0.42)
P-Edu Primary)	-0.113 (0.48)	-0.048 (0.74)	-0.089 (0.43)	-0.109 (0.29)	-0.062 (0.54)	-0.093 (0.41)
P-Edu Secondary	0.070 (0.18)	0.091 (0.07)	*0.076 (0.07)	*0.055 (0.08)	0.040 (0.20)	0.033 (0.33)
P-Edu High School	0.035 (0.49)	0.024 (0.61)	0.027 (0.52)	-0.000 (0.99)	0.003 (0.94)	0.006 (0.88)
P-Edu University	**0.117 (0.02)	0.089 (0.08)	0.075 (0.09)	0.040 (0.29)	0.038 (0.25)	0.029 (0.37)
SP-Edu ≤High School	0.010 (0.85)	0.024 (0.63)	0.020 (0.64)	0.041 (0.20)	0.031 (0.32)	0.020 (0.50)
Family Income Q1		-0.142 (0.18)	-0.053 (0.42)	-0.024 (0.62)	-0.000 (0.99)	-0.005 (0.91)
Family Income Q2		-0.056 (0.34)	-0.015 (0.78)	-0.023 (0.61)	-0.010 (0.83)	-0.017 (0.70)
Com Size Rural			-0.000 (0.99)	-0.009 (0.79)	0.012 (0.69)	0.007 (0.81)
Siblings 2 or more			-0.076 (0.13)	-0.053 (0.19)	-0.019 (0.60)	0.015 (0.62)
Private school			***0.117 (0.00)	*0.064 (0.08)	0.051 (0.14)	0.051 (0.11)
Interaction Q1			0.027 (0.56)	-0.046 (0.31)	-0.055 (0.22)	-0.060 (0.17)
Consistency Q1			-0.053 (0.22)	-0.032 (0.35)	-0.036 (0.28)	-0.047 (0.16)
Aversive Q4			-0.056 (0.40)	0.001 (0.99)	-0.003 (0.93)	0.004 (0.91)
Ineffective Q4			0.017 (0.74)	-0.002 (0.95)	-0.005 (0.90)	-0.012 (0.78)
Family Functioning Q4			0.025 (0.58)	0.015 (0.70)	0.015 (0.67)	0.012 (0.75)
Hyperactivity Q4			0.034 (0.48)	0.047 (0.16)	0.054 (0.08)	**0.055 (0.05)
Conduct Disorder Q4			-0.050 (0.46)	0.000 (0.99)	-0.016 (0.73)	-0.033 (0.51)
Pro-social Q1			-0.053 (0.34)	0.000 (0.99)	-0.002 (0.97)	0.020 (0.53)
Reading Q1				***-0.198 (0.01)	-0.109 (0.13)	-0.100 (0.14)
Reading Q2				-0.028 (0.55)	-0.006 (0.89)	-0.011 (0.81)
Math Q1				***-0.242 (0.00)	***-0.172 (0.01)	**0.135 (0.04)
Math Q2				-0.015 (0.77)	0.003 (0.94)	-0.006 (0.89)
Self-esteem Q1				-0.042 (0.25)	-0.014 (0.67)	-0.021 (0.56)
Emotional Quotient Q4				0.022 (0.50)	0.029 (0.34)	0.020 (0.55)
P-Exp-10-HS					0.001 (0.98)	0.010 (0.72)
P-Exp-12-HS					-0.013 (0.72)	-0.008 (0.86)
P-Exp-14-HS					-0.087 (0.13)	-0.102 (0.13)
P-Exp-16-HS					*-0.132 (0.07)	-0.108 (0.11)
Like School Q4						-0.076 (0.24)
Importance Grades Q4						0.036 (0.25)
Do homework Q4						***0.059 (0.01)
Read out of School Q4						0.027 (0.42)
Parent Help Q4						-0.017 (0.61)
Teacher Help Q4						-0.001 (0.98)
Teacher Fair Q4						-0.124 (0.12)
Safe at School Q4						0.024 (0.59)
N	433	433	433	433	433	433

Note: *p*-values in parentheses for discrete change of dummy variable from 0 to 1: * $p \leq 0.10$, ** $p \leq 0.05$, *** $p \leq 0.01$.

Table 13: Non-linear gender gap decomposition estimations by reference group, Québec and Rest of Canada

Control variables	Québec						Rest of Canada					
	β	SD	β	SD	β	SD	β	SD	β	SD	β	SD
	Reference Male		Reference Female		Reference Pooled		Reference Male		Reference Female		Reference Pooled	
Newfoundland							0.000	0.000	-0.000	0.000	-0.000	0.000
Prince Edward I.							-0.000	0.000	-0.000	0.001	0.000	0.001
Nova Scotia							-0.000	0.000	0.000	0.001	-0.000	0.000
New Brunswick							-0.000	0.000	-0.000	0.000	0.000	0.000
Manitoba							-0.000	0.000	-0.000	0.001	0.000	0.000
Saskatchewan							-0.000	0.000	-0.000	0.000	0.000	0.000
Alberta							0.000	0.001	-0.000	0.001	-0.000	0.000
British Columbia							0.002	0.002	0.002	0.002	-0.001	0.001
Age	-0.005	0.010	-0.005	0.007	0.006	0.004	0.001	0.001	0.000	0.001	-0.000	0.001
Health	0.017	0.010	0.018	0.008	-0.021	0.007	0.003	0.002	0.002	0.002	-0.002	0.001
Two Bio-Parents	0.009	0.010	0.003	0.005	-0.005	0.004	0.001	0.002	0.003	0.004	-0.002	0.002
Two Parents	0.002	0.000	-0.000	0.003	-0.001	0.003	-0.000	0.001	0.000	0.002	-0.000	0.001
P-Edu Some PSE	0.000	0.000	-0.000	0.002	0.000	0.002	-0.000	0.002	-0.000	0.001	0.000	0.001
P-Edu College	-0.003	0.010	-0.004	0.004	0.003	0.004	0.003	0.002	-0.001	0.001	-0.001	0.001
P-Edu University	0.002	0.005	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.001	-0.000	0.001
SP-Edu \leq HSchool	0.001	0.005	0.001	0.004	-0.002	0.003	-0.000	0.001	-0.002	0.002	0.000	0.001
Family Income Q2	0.000	0.003	-0.000	0.002	-0.001	0.002	0.002	0.002	0.002	0.002	-0.002	0.002
Family Income Q3	-0.002	0.005	-0.000	0.003	0.001	0.003	0.000	0.001	0.000	0.002	-0.001	0.001
Family Income Q4	-0.004	0.006	0.000	0.003	0.002	0.003	0.000	0.001	0.002	0.003	-0.001	0.001
Com Size Rural	-0.002	0.006	-0.000	0.003	0.000	0.003	0.000	0.002	0.001	0.003	-0.000	0.001
Com Size Large	-0.001	0.003	-0.001	0.003	-0.000	0.002	0.001	0.001	-0.000	0.001	-0.000	0.001
Sibling 1	-0.003	0.003	0.000	0.002	0.001	0.002	0.000	0.001	0.000	0.000	-0.000	0.000
Siblings 2 or more	-0.000	0.003	0.003	0.006	-0.000	0.002	0.000	0.002	0.000	0.003	-0.000	0.002
Private School	0.000	0.003	-0.001	0.005	0.001	0.003	-0.000	0.002	0.001	0.004	0.000	0.002
Interaction	0.001	0.004	0.003	0.004	-0.002	0.003	0.000	0.001	0.002	0.002	-0.001	0.001
Consistency	-0.000	0.002	-0.000	0.003	0.001	0.002	-0.000	0.001	0.000	0.001	0.000	0.000
Aversive	0.019	0.011	0.005	0.007	-0.006	0.005	-0.001	0.002	-0.000	0.002	0.001	0.002
Ineffective	-0.019	0.012	0.002	0.010	0.003	0.009	0.005	0.004	0.003	0.004	-0.005	0.003
Family Functioning	0.000	0.004	0.002	0.004	-0.001	0.003	0.000	0.001	-0.000	0.001	-0.000	0.001
Hyperactivity	-0.002	0.013	0.009	0.013	0.002	0.010	-0.005	0.007	0.008	0.006	0.000	0.005
Conduct disorder	-0.005	0.012	-0.016	0.012	0.009	0.009	-0.009	0.004	-0.004	0.004	0.008	0.003
Pro-social	-0.002	0.008	-0.005	0.007	0.000	0.005	0.004	0.007	0.008	0.006	-0.007	0.005
Reading Q2	0.001	0.006	-0.000	0.005	-0.000	0.005	-0.001	0.001	-0.000	0.001	0.000	0.001
Reading Q3	-0.005	0.013	0.000	0.005	0.002	0.008	-0.000	0.001	-0.000	0.001	0.000	0.001
Reading Q4	-0.020	0.012	-0.007	0.007	0.014	0.007	-0.000	0.001	0.000	0.002	-0.000	0.001
Math Q2	-0.002	0.004	0.007	0.006	-0.003	0.003	0.000	0.001	-0.000	0.002	0.000	0.001
Math Q3	0.000	0.005	-0.005	0.007	0.003	0.004	-0.000	0.001	-0.001	0.002	0.000	0.001
Math Q4	-0.001	0.004	-0.006	0.007	0.004	0.004	0.001	0.002	0.002	0.003	-0.001	0.002
Self-esteem	0.003	0.009	-0.000	0.006	0.002	0.004	-0.000	0.001	0.002	0.002	-0.001	0.001
Emotional Quotient	0.000	0.003	-0.000	0.003	0.000	0.002	0.000	0.002	0.004	0.004	-0.002	0.002
P-Exp-10-PSE	-0.001	0.004	0.000	0.003	0.001	0.003	-0.000	0.002	-0.001	0.003	0.001	0.002
P-Exp-10-U	-0.009	0.009	-0.001	0.006	0.004	0.005	-0.004	0.003	-0.002	0.003	0.003	0.003
P-Exp-12-PSE	0.002	0.004	-0.000	0.003	-0.000	0.002	-0.000	0.001	-0.000	0.001	0.000	0.001
P-Exp-12-U	-0.002	0.009	0.001	0.007	0.002	0.005	-0.003	0.003	-0.004	0.004	0.003	0.002
P-Exp-14-PSE	-0.001	0.004	-0.004	0.006	0.002	0.003	0.000	0.001	0.000	0.001	-0.000	0.001
P-Exp-14-U	0.007	0.013	-0.015	0.013	0.004	0.007	-0.002	0.005	-0.001	0.006	0.002	0.004
P-Exp-16-PSE	-0.014	0.016	-0.029	0.013	0.014	0.009	-0.016	0.007	-0.014	0.008	0.014	0.006
P-Exp-16-U	0.002	0.004	0.002	0.007	-0.001	0.003	-0.001	0.003	-0.000	0.003	0.001	0.002
Like School	-0.010	0.010	-0.011	0.016	0.008	0.007	0.010	0.008	-0.004	0.008	-0.001	0.006
Importance Grades	-0.001	0.003	-0.000	0.002	0.000	0.002	-0.002	0.003	0.001	0.003	0.000	0.002
Do Homework	-0.005	0.008	0.018	0.009	-0.005	0.006	-0.012	0.005	-0.003	0.007	0.007	0.005
Read out of School	-0.006	0.008	0.000	0.011	0.003	0.006	-0.008	0.006	0.001	0.006	0.004	0.005
Parent Help	-0.002	0.004	-0.001	0.003	0.001	0.002	-0.000	0.001	0.000	0.001	-0.000	0.001
Teacher Help	-0.001	0.004	0.003	0.006	-0.000	0.003	-0.002	0.003	0.000	0.003	0.001	0.002
Teacher Fair	0.000	0.003	0.003	0.004	-0.006	0.005	0.001	0.003	-0.007	0.005	0.001	0.003
Safe at School	-0.000	0.003	-0.004	0.006	0.000	0.003	0.001	0.002	0.000	0.002	-0.001	0.001
Mean % gap (gap)	-0.062 (-0.134)		-0.039 (-0.134)		0.038 (0.134)		-0.030 (-0.056)		-0.0 03 (0-.056)		0.0172 (0.056)	

Table A1: Descriptive statistics of control variables by gender and high school status, Québec sample

Control variables	Female		Male	
	Graduate	Dropout	Graduate	Dropout
P-Edu Primary	0.04	0.19	0.02	0.07
P-Edu Secondary	0.22	0.13	0.20	0.25
P-Edu High School	0.19	0.23	0.17	0.18
P-Edu Some PSE	0.22	0.27	0.22	0.20
P-Edu College	0.13	0.12	0.21	0.20
P-Edu University	0.19	0.06	0.17	0.09
S-≤High school	0.32	0.24	0.33	0.41
One-parent	0.18	0.44	0.10	0.32
Two Bio-Parents	0.76	0.46	0.85	0.56
Two Parents	0.06	0.10	0.05	0.12
P-Immigrant	0.04	0.12	0.05	0.07
Sibling 0	0.18	0.21	0.16	0.16
Sibling1	0.51	0.34	0.45	0.56
Siblings 2 or more	0.31	0.45	0.39	0.28
Com Size Rural	0.21	0.26	0.20	0.29
Com Size Small	0.20	0.14	0.19	0.26
Com Size Large	0.59	0.60	0.61	0.55
Private School	0.22	0.05	0.25	0.15
Family income	\$64,759	\$46,750	\$69,867	\$43,470
Q1 Family Income	0.21	0.43	0.19	0.42
Q2 Family Income	0.24	0.23	0.22	0.37
Q3 Family Income	0.27	0.24	0.29	0.11
Q4 Family Income	0.29	0.10	0.31	0.10
Positive Interaction	11.7 (2.7)	11.4 (2.8)	12.0 (2.4)	11.4 (2.6)
Q1	0.31	0.32	0.26	0.36
Q2	0.20	0.32	0.29	0.27
Q3	0.36	0.19	0.28	0.21
Q4	0.13	0.17	0.17	0.37
Consistency	13.8 (3.0)	13.8 (2.7)	14.5 (2.5)	13.4 (3.2)
Q1	0.31	0.30	0.22	0.30
Q2	0.22	0.21	0.26	0.24
Q3	0.26	0.32	0.30	0.27
Q4	0.22	0.17	0.23	0.19
Aversive	8.2 (1.5)	8.1 (1.7)	8.3 (1.4)	8.5 (3.2)
Q1	0.28	0.29	0.24	0.19
Q2	0.28	0.23	0.27	0.25
Q3	0.22	0.26	0.26	0.33
Q4	0.21	0.22	0.23	0.23
Ineffective	8.5 (3.4)	7.3 (3.8)	8.7 (3.5)	10.3 (3.6)
Q1	0.26	0.47	0.23	0.14
Q2	0.26	0.24	0.27	0.17
Q3	0.27	0.13	0.34	0.28
Q4	0.20	0.16	0.16	0.41
Family Functioning	8.07 (4.6)	8.5 (3.7)	7.98 (4.2)	8.75 (4.0)
Q1	0.31	0.22	0.28	0.21
Q2	0.22	0.21	0.28	0.22
Q3	0.25	0.26	0.23	0.28
Q4	0.19	0.31	0.23	0.30
P-Exp 10 HS	0.16	0.38	0.21	0.45
P-Exp 10 PSE	0.20	0.16	0.20	0.20
P-Exp 10 U	0.64	0.45	0.59	0.35

Table A1 continued

P-Exp 12 HS	0.23	0.54	0.26	0.52
P-Exp 12 PSE	0.09	0.11	0.15	0.13
P-Exp 12 U	0.69	0.35	0.59	0.35
P-Exp 14 HS	0.12	0.51	0.28	0.47
P-Exp 14 PSE	0.18	0.22	0.18	0.18
P-Exp 14 U	0.70	0.27	0.54	0.35
P-Exp 16 HS	0.19	0.56	0.27	0.64
P-Exp 16 PSE	0.20	0.17	0.32	0.17
P-Exp 16 U	0.61	0.27	0.41	0.19
Age 18	0.14	0.29	0.17	0.16
Age 19	0.17	0.09	0.16	0.20
Age 20	0.17	0.12	0.17	0.18
Age 21	0.12	0.31	0.17	0.15
Age 22	0.19	0.17	0.15	0.16
Age 23	0.21	0.05	0.18	0.15
Health	1.98 (0.7)	2.41 (0.9)	1.72 (0.6)	2.02 (0.8)
Math Q1	0.14	0.65	0.23	0.42
Math Q2	0.26	0.13	0.23	0.36
Math Q3	0.33	0.12	0.21	0.14
Math Q4	0.28	0.10	0.33	0.07
Reading Q1	0.21	0.47	0.16	0.58
Reading Q2	0.21	0.26	0.26	0.25
Reading Q3	0.28	0.18	0.29	0.11
Reading Q4	0.30	0.09	0.29	0.06
Self-esteem	12.8 (1.9)	12.5 (2.3)	13.0 (2.2)	13.0 (1.7)
Q1	0.27	0.36	0.20	0.22
Q2	0.29	0.22	0.22	0.24
Q3	0.23	0.14	0.28	0.30
Q4	0.21	0.28	0.30	0.24
Emotional Quotient	32.3 (9.2)	29.8 (8.6)	31.8 (10.6)	30.4 (10.6)
Q1	0.23	0.32	0.29	0.31
Q2	0.23	0.34	0.20	0.30
Q3	0.29	0.22	0.27	0.16
Q4	0.26	0.12	0.24	0.23
Hyperactivity	4.1 (3.1)	4.7 (3.3)	5.0 (3.3)	7.54 (4.1)
Q1	0.35	0.26	0.22	0.11
Q2	0.27	0.31	0.27	0.14
Q3	0.20	0.25	0.26	0.25
Q4	0.18	0.19	0.24	0.51
Conduct Disorder	0.8 (1.1)	1.0 (1.7)	1.5 (1.3)	2.0 (1.9)
Q1	0.50	0.42	0.32	0.16
Q2	0.12	0.27	0.14	0.13
Q3	0.28	0.14	0.35	0.32
Q4	0.11	0.17	0.18	0.39
Pro-social	13.2 (3.4)	13.9 (2.9)	12.2(3.5)	11.9 (3.0)
Q1	0.18	0.31	0.30	0.35
Q2	0.27	0.19	0.24	0.20
Q3	0.24	0.18	0.25	0.28
Q4	0.30	0.31	0.20	0.16

Table A1 end

Like School	2.3 (0.8)	2.5 (1.0)	2.7 (1.0)	3.0 (1.0)
Q1	0.50	0.42	0.40	0.28
Q2	0.15	0.17	0.14	0.11
Q3	0.21	0.15	0.21	0.16
Q4	0.13	0.27	0.25	0.44
Importance of Grades	1.4 (0.5)	1.4 (0.6)	1.4 (0.5)	1.5 (0.6)
Q1	0.41	0.41	0.40	0.38
Q2	0.12	0.13	0.15	0.12
Q3	0.21	0.23	0.23	0.17
Q4	0.26	0.23	0.22	0.33
Do Homework	1.5 (0.5)	1.4 (0.5)	1.6 (0.7)	1.8 (0.8)
Q1	0.38	0.42	0.31	0.30
Q2	0.32	0.31	0.25	0.16
Q3	0.24	0.23	0.29	0.33
Q4	0.07	0.05	0.15	0.21
Read out of School	2.5 (1.5)	2.5 (1.4)	2.7 (1.7)	3.4 (1.8)
Q1	0.28	0.28	0.29	0.15
Q2	0.30	0.28	0.27	0.22
Q3	0.28	0.35	0.26	0.17
Q4	0.14	0.09	0.19	0.33
Parent Help	1.6 (0.9)	1.8 (0.9)	1.6 (1.0)	1.7 (1.0)
Q1	0.25	0.26	0.30	0.25
Q2	0.27	0.26	0.25	0.20
Q3	0.23	0.16	0.19	0.24
Q4	0.25	0.32	0.26	0.21
Teacher Help	1.9 (0.9)	2.2 (1.0)	2.0 (0.9)	1.6 (0.8)
Q1	0.25	0.15	0.24	0.31
Q2	0.31	0.24	0.24	0.31
Q3	0.19	0.25	0.29	0.23
Q4	0.26	0.35	0.23	0.33
Teacher Fair	1.4 (0.5)	2.2 (1.0)	1.6 (0.6)	1.6 (0.8)
Q1	0.38	0.20	0.30	0.33
Q2	0.29	0.21	0.21	0.27
Q3	0.24	0.10	0.36	0.20
Q4	0.10	0.50	0.13	0.21
Safe at School	1.5 (0.6)	1.5 (0.7)	1.53 (0.7)	1.7 (1.0)
Q1	0.27	0.24	0.32	0.20
Q2	0.21	0.30	0.21	0.30
Q3	0.43	0.36	0.35	0.31
Q4	0.09	0.10	0.12	0.19
N (un-weighted)	187,832 (365)	38,566 (68)	147,293 (246)	64,364 (100)

Notes: 1. Author's computation from cycles 1 to 7 data sets of the NLSCY with cycle 7 longitudinal weights.

2. Percentage may not add to 100 because of rounding.

Table A2: Descriptive statistics of control variables by gender and high school status, Rest of Canada sample

Control variables	Female		Male	
	Graduate	Dropout	Graduate	Dropout
Atlantic provinces	0.11	0.11	0.10	0.07
Ontario	0.48	0.47	0.47	0.48
Manitoba	0.04	0.07	0.04	0.07
Saskatchewan	0.04	0.05	0.04	0.06
Alberta	0.16	0.21	0.17	0.15
British Columbia	0.17	0.08	0.18	0.16
P-Edu Primary	0.02	0.09	0.02	0.11
P-Edu Secondary	0.12	0.21	0.10	0.26
P-Edu High School	0.20	0.17	0.17	0.17
P-Edu Some PSE	0.33	0.29	0.30	0.24
P-Edu College	0.18	0.21	0.25	0.13
P-Edu University	0.15	0.04	0.17	0.09
S-≤High school	0.26	0.37	0.26	0.33
One-parent	0.11	0.31	0.11	0.23
Two Bio-Parents	0.80	0.57	0.82	0.62
Two Parents	0.09	0.12	0.07	0.15
P-Immigrant	0.21	0.23	0.21	0.25
Sibling 0	0.10	0.04	0.10	0.10
Sibling 1	0.49	0.38	0.45	0.43
Siblings 2 or more	0.41	0.53	0.45	0.47
Com Size Rural	0.18	0.25	0.22	0.22
Com Size Small	0.22	0.24	0.20	0.23
Com Size Large	0.60	0.51	0.58	0.55
Private School	0.08	0.10	0.07	0.09
Family income	75,374	58,547	74,295	61,665
Q1 Family Income	0.22	0.52	0.20	0.40
Q2 Family Income	0.24	0.23	0.27	0.22
Q3 Family Income	0.26	0.12	0.28	0.17
Q4 Family Income	0.27	0.12	0.26	0.20
Positive Interaction	11.9 (2.4)	12.1 (2.7)	11.9 (2.6)	11.6 (2.9)
Q1	0.22	0.26	0.27	0.35
Q2	0.27	0.24	0.29	0.25
Q3	0.21	0.13	0.19	0.15
Q4	0.24	0.37	0.23	0.26
Consistency	15.4 (2.9)	15.0 (3.0)	15.3 (3.0)	14.5 (2.8)
Q1	0.25	0.35	0.25	0.37
Q2	0.24	0.20	0.27	0.29
Q3	0.25	0.23	0.27	0.16
Q4	0.25	0.22	0.25	0.18
Aversive	8.7 (1.7)	8.9 (1.9)	9.0 (1.7)	9.3 (1.7)
Q1	0.38	0.37	0.33	0.26
Q2	0.24	0.18	0.23	0.26
Q3	0.19	0.24	0.20	0.21
Q4	0.19	0.21	0.24	0.27
Ineffective	8.7 (3.6)	8.5 (3.8)	9.1 (3.5)	10.1 (3.9)
Q1	0.28	0.34	0.25	0.14
Q2	0.34	0.27	0.30	0.31
Q3	0.17	0.17	0.20	0.16
Q4	0.21	0.22	0.25	0.37
Family Functioning	8.4 (4.6)	9.3 (3.8)	8.4 (3.9)	9.2 (4.1)
Q1	0.30	0.16	0.29	0.23
Q2	0.19	0.35	0.23	0.25
Q3	0.26	0.21	0.27	0.21
Q4	0.25	0.28	0.22	0.31

Table A2 continued

P-Exp 10 HS	0.09	0.24	0.14	0.31
P-Exp 10 PSE	0.13	0.16	0.12	0.11
P-Exp 10 U	0.78	0.61	0.74	0.57
P-Exp 12 HS	0.14	0.29	0.20	0.38
P-Exp 12 PSE	0.10	0.12	0.10	0.16
P-Exp 12 U	0.76	0.59	0.71	0.46
P-Exp 14 HS	0.12	0.26	0.20	0.42
P-Exp 14 PSE	0.13	0.21	0.16	0.16
P-Exp 14 U	0.75	0.53	0.64	0.41
P-Exp 16 HS	0.12	0.36	0.19	0.48
P-Exp 16 PSE	0.23	0.26	0.26	0.23
P-Exp 16 U	0.64	0.38	0.55	0.29
Age 18	0.13	0.18	0.12	0.15
Age 19	0.18	0.07	0.17	0.13
Age 20	0.17	0.18	0.17	0.18
Age 21	0.18	0.22	0.18	0.17
Age 22	0.19	0.12	0.17	0.19
Age 23	0.16	0.23	0.18	0.17
Health	2.1 (0.7)	2.3 (0.9)	1.9 (0.8)	2.3 (0.9)
Math Q1	0.22	0.44	0.21	0.40
Math Q2	0.26	0.21	0.24	0.27
Math Q3	0.28	0.20	0.26	0.22
Math Q4	0.24	0.14	0.30	0.11
Reading Q1	0.21	0.35	0.25	0.42
Reading Q2	0.27	0.23	0.25	0.23
Reading Q3	0.26	0.18	0.23	0.21
Reading Q4	0.25	0.23	0.27	0.13
Self-esteem	12.9 (2.1)	12.3 (2.5)	13.2 (2.0)	12.4 (2.5)
Q1	0.22	0.37	0.22	0.36
Q2	0.26	0.26	0.24	0.19
Q3	0.24	0.25	0.28	0.24
Q4	0.23	0.12	0.26	0.20
Emotional Quotient	34.3 (10.0)	35.1 (11.0)	32.8 (10.2)	31.7 (12.4)
Q1	0.25	0.18	0.29	0.29
Q2	0.29	0.23	0.26	0.28
Q3	0.23	0.34	0.22	0.21
Q4	0.23	0.26	0.23	0.22
Hyperactivity	3.4 (3.0)	3.9 (3.4)	1.3 (1.6)	6.6 (4.0)
Q1	0.33	0.27	0.23	0.12
Q2	0.29	0.29	0.24	0.15
Q3	0.22	0.21	0.26	0.23
Q4	0.17	0.23	0.27	0.50
Conduct Disorder	1.0 (1.5)	1.4 (1.8)	1.3 (1.6)	2.3 (2.4)
Q1	0.40	0.40	0.33	0.19
Q2	0.35	0.22	0.29	0.26
Q3	0.12	0.17	0.19	0.18
Q4	0.13	0.21	0.19	0.36
Pro-social	13.9 (3.0)	13.9 (2.9)	12.2 (3.2)	12.0 (3.9)
Q1	0.15	0.12	0.34	0.35
Q2	0.25	0.31	0.23	0.26
Q3	0.27	0.31	0.21	0.16
Q4	0.32	0.26	0.17	0.23

Table A2 end

Like School	2.1 (0.8)	2.4 (1.0)	2.6 (0.9)	2.8 (1.1)
Q1	0.34	0.27	0.18	0.16
Q2	0.29	0.29	0.26	0.25
Q3	0.26	0.26	0.33	0.26
Q4	0.11	0.15	0.22	0.33
Importance of Grades	1.3 (0.4)	1.4 (0.5)	1.4 (0.5)	1.5 (0.6)
Q1	0.53	0.45	0.44	0.37
Q2	0.03	0.03	0.01	0.03
Q3	0.27	0.31	0.29	0.29
Q4	0.17	0.21	0.26	0.31
Do Homework	1.6 (0.6)	1.9 (0.8)	1.8 (0.8)	2.2 (0.9)
Q1	0.35	0.23	0.23	0.13
Q2	0.30	0.25	0.27	0.19
Q3	0.22	0.21	0.26	0.27
Q4	0.13	0.31	0.24	0.40
Read out of School	2.4 (1.5)	2.8 (1.7)	3.0 (1.7)	3.5 (1.7)
Q1	0.37	0.29	0.23	0.18
Q2	0.25	0.16	0.21	0.16
Q3	0.26	0.30	0.33	0.27
Q4	0.13	0.34	0.23	0.39
Parent Help	1.7 (1.0)	1.7 (1.0)	1.7 (0.9)	1.8 (0.9)
Q1	0.30	0.26	0.30	0.18
Q2	0.26	0.27	0.25	0.26
Q3	0.19	0.20	0.21	0.27
Q4	0.25	0.27	0.24	0.29
Teacher Help	1.9 (1.0)	2.0 (0.9)	2.1 (1.0)	2.1 (1.0)
Q1	0.29	0.22	0.25	0.25
Q2	0.25	0.21	0.20	0.18
Q3	0.28	0.31	0.31	0.28
Q4	0.17	0.26	0.24	0.29
Teacher Fair	1.6 (0.5)	1.8 (0.7)	1.8 (0.7)	1.9 (0.9)
Q1	0.28	0.22	0.22	0.24
Q2	0.36	0.30	0.30	0.24
Q3	0.21	0.20	0.23	0.16
Q4	0.15	0.29	0.30	0.36
Safe at School	1.5 (0.7)	1.6 (0.9)	1.7 (0.8)	1.8 (1.0)
Q1	0.28	0.27	0.24	0.27
Q2	0.21	0.22	0.22	0.22
Q3	0.34	0.31	0.37	0.26
Q4	0.17	0.20	0.17	0.25
N (un-weighted)	689,815 (1,605)	105,474 (228)	681,265 (1,436)	158,362 (289)

Notes: 1. Author's computation from cycles 1 to 7 data sets of the NLSCY with cycle 7 longitudinal weights. 2. Percentage may not add to 100 because of rounding.

Table A3: Graduation and drop-out rates for selected control variables by gender, Québec and Rest of Canada

	Québec		Rest of Canada	
	Female	Male	Female	Male
18 HS=0	28	29	18	24
HS=1	72	71	82	76
19 HS=0	10	36	6	15
HS=1	90	64	94	85
20 HS=0	13	32	14	19
HS=1	87	68	86	81
21 HS=0	34	28	16	18
HS=1	66	72	84	82
22 HS=0	16	32	9	21
HS=1	84	68	91	79
23 HS=0	5	27	18	18
HS=1	95	73	82	82
One-parent=1			29	
HS=0	33	59	71	34
HS=1	37	41		64
One-parent=0				
HS=0	12	25	11	17
HS=1	88	75	89	83
Two Bio-Parents=1				
HS=0	11	22	10	15
HS=1	89	78	90	85
Two Bio-Parents=0				
HS=0	32	56	24	33
HS=1	68	44	76	67
P-Edu≤High School=1				
HS=0	26	35	17	30
HS=1	74	65	83	70
P-Edu≤High School=0				
HS=0	17	30	13	19
HS=1	83	70	87	81
P-Edu University=1				
HS=0	6	19	4	11
HS=1	94	81	96	89
P-Edu University=0				
HS=0	19	32	15	20
HS=1	81	68	95	80
S-Edu ≤High School=1				
HS=0	13	35	18	23
HS=1	87	65	82	27
S-Edu ≤High School=0				
HS=0	19	28	12	17
HS=1	81	72	82	83
P-Immigrant=1				
HS=0	37	38	14	22
HS=1	63	62	86	78
P-Immigrant=0				
HS=0	16	30	13	18
HS=1	84	70	87	82
Family Income Q1=1				
HS=0	30	49	27	32
HS=1	70	51	73	68
Family Income Q1=0				
HS=0	13	13	8	15
HS=1	87	87	92	85

Table A3 continued

Family Income Q4=1				
HS=0	6	12	6	15
HS=1	94	88	94	85
Family Income Q4=0				
HS=0	21	36	16	20
HS=1	79	64	84	80
Com Size Rural=1				
HS=0	20	38	17	19
HS=1	80	62	83	81
Com Size Rural=0				
HS=0	16	28	18	19
HS=1	84	72	82	81
Com Size Large=1				
HS=0	15	28	11	18
HS=1	85	72	89	82
Com Size Large=0				
HS=0	20	34	19	22
HS=1	80	66	81	78
Sibling 0=1				
HS=0	16	35	15	21
HS=1	64	65	85	79
Sibling 0=0				
HS=0	19	26	11	17
HS=1	81	74	89	83
Sibling 2 or more=1				
HS=0	23	24	16	20
HS=1	77	76	84	80
Sibling 2 or more=0				
HS=0	14	34	11	18
HS=1	86	66	89	82
Private School=1				
HS=0	4	21	17	24
HS=1	96	79	83	76
Private School=0				
HS=0	20	33	13	19
HS=1	80	67	87	82
Consistency Q1=1				
HS=0	16	37	17	26
HS=1	84	63	83	74
Consistency Q1=0				
HS=0	17	28	12	16
HS=1	83	72	88	84
Aversive Q4=1				
HS=0	18	31	15	21
HS=1	82	69	85	79
Aversive Q4=0				
HS=0	17	30	13	18
HS=1	83	70	87	82
Ineffective Q4=1				
HS=0	14	53	14	26
HS=1	86	47	86	74
Ineffective Q4=0				
HS=0	18	24	13	16
HS=1	82	76	87	84

Table A3 continued

Family Functioning Q4=1				
HS=0	20	38	15	25
HS=1	80	62	85	75
Family Functioning Q4=0				
HS=0	16	28	13	17
HS=1	84	72	87	89
P-Exp 10 HS=1				
HS=0	33	48	29	34
HS=1	67	52	71	66
P-Exp 10 HS=0				
HS=0	13	23	11	16
HS=1	87	77	89	84
P-Exp 12 HS=1				
HS=0	33	47	24	31
HS=1	67	53	76	69
P-Exp 12 HS=0				
HS=0	11	22	11	15
HS=1	89	78	89	85
P-Exp 14 HS=1				
HS=0	47	42	24	32
HS=1	53	58	76	68
P-Exp 14 HS=0				
HS=0	10	24	11	14
HS=1	90	76	89	86
P-Exp 16 HS=1				
HS=0	38	50	31	38
HS=1	62	50	69	62
P-Exp 16 HS=0				
HS=0	10	18	10	13
HS=1	90	82	90	87
Hyperactivity Q4=1				
HS=0	18	48	17	30
HS=1	82	52	83	70
Hyperactivity Q4=0				
HS=0	17	22	12	14
HS=1	83	78	88	86
Conduct Disorder Q4=1				
HS=0	25	48	20	31
HS=1	75	52	80	69
Conduct Disorder Q4=0				
HS=0	16	25	12	15
HS=1	84	75	88	85
Reading Q1=1				
HS=0	32	61	20	28
HS=1	68	39	80	72
Reading Q1=0				
HS=0	12	18	11	15
HS=1	88	82	89	85
Math Q1=1				
HS=0	48	45	23	30
HS=1	52	55	77	70
Math Q1=0				
HS=0	8	25	10	15
HS=1	92	75	90	85

Table A3 end

Like School Q4=1				
HS=0	30	43	21	26
HS=1	70	57	79	74
Like School Q4=0				
HS=0	15	25	12	17
HS=1	85	75	88	83
Importance of Grades Q4=1				
HS=0	15	40	16	22
HS=1	85	60	84	78
Importance of Grades Q4=0				
HS=0	18	27	13	18
HS=1	82	73	87	82
Do Homework Q4=1				
HS=0	13	39	26	28
HS=1	86	61	74	72
Do Homework Q4=0				
HS=0	17	29	11	15
HS=1	83	71	89	85
How often Read Q4=1				
HS=0	12	44	22	28
HS=1	88	56	78	72
How often Read- Q4=0				
HS=0	18	26	12	16
HS=1	82	74	88	84
Parent Help Q4=1				
HS=0	24	22	14	22
HS=1	76	77	85	78
Parent Help Q4=0				
HS=0	15	33	13	18
HS=1	85	67	87	82
Teacher Help Q4=1				
HS=0	22	30	19	22
HS=1	78	70	82	78
Teacher Help Q4=0				
HS=0	15	30	12	18
HS=1	85	70	88	82
P-Edu University=1				
HS=0	51	42	23	26
HS=1	49	58	77	74
P-Edu University=0				
HS=0	10	28	11	16
HS=1	90	72	89	84
Safe at School Q4=1				
HS=0	19	41	20	25
HS=1	81	59	80	75
Safe at School Q4=0				
HS=0	17	29	12	17
HS=1	84	71	88	83

Notes: 1. Author's computation from cycles 1 to 7 data sets of the NLSCY with cycle 7 longitudinal weights. 2. Percentage may not add to 100 because of rounding.

Table A4: Marginal effect of Probit estimations of parental educational expectations at different ages of children, complete specification, Québec and Rest of Canada

	(1)	(2)	(3)	(4)	(5)
Female Québec					
P-Exp-10-PSE	0.0089	(0.78)			-0.003 (0.92)
P-Exp-10-U	0.070**	(0.05)			0.004 (0.92)
P-Exp-12-PSE			0.015	(0.71)	-0.026 (0.68)
P-Exp-12-U			0.065	(0.12)	-0.005 (0.89)
P-Exp-14-PSE				0.056** (0.03)	0.052** (0.02)
P-Exp-14-U				0.117** (0.04)	0.069 (0.29)
P-Exp-16-PSE				0.060*** (0.01)	0.060*** (0.01)
P-Exp-16-U				0.145*** (0.00)	0.130** (0.04)
N	433	433	433	433	433
Male Québec					
P-Exp-10-PSE	0.081	(0.30)			0.066 (0.42)
P-Exp-10-U	0.091	(0.21)			0.091 (0.24)
P-Exp-12-PSE			0.113	(0.19)	0.091 (0.32)
P-Exp-12-U			0.054	(0.50)	0.017 (0.86)
P-Exp-14-PSE				0.070 (0.57)	0.034 (0.80)
P-Exp-14-U				0.006 (0.94)	-0.066 (0.52)
P-Exp-16-PSE				0.076 (0.29)	0.077 (0.32)
P-Exp-16-U				0.066 (0.38)	0.087 (0.35)
N	346	346	346	346	346
Female Rest of Canada					
P-Exp-10-PSE	0.059***	(0.00)			0.051** (0.02)
P-Exp-10-U	0.078**	(0.03)			0.021 (0.57)
P-Exp-12-PSE			0.029	(0.30)	0.011 (0.75)
P-Exp-12-U			0.076**	(0.03)	0.038 (0.28)
P-Exp-14-PSE				0.014 (0.68)	-0.008 (0.82)
P-Exp-14-U				0.061 (0.08)	0.006 (0.87)
P-Exp-16-PSE				0.057*** (0.01)	0.050** (0.02)
P-Exp-16-U				0.120*** (0.00)	0.100** (0.02)
N	1,833	1,833	1,833	1,833	1,833
Male Rest of Canada					
P-Exp-10-PSE	0.093***	(0.00)			0.079*** (0.00)
P-Exp-10-U	0.124***	(0.00)			0.061 (0.14)
P-Exp-12-PSE			0.049	(0.13)	0.033 (0.35)
P-Exp-12-U			0.108***	(0.00)	0.045 (0.19)
P-Exp-14-PSE				0.055 (0.08)	0.013 (0.72)
P-Exp-14-U				0.090*** (0.01)	0.018 (0.60)
P-Exp-16-PSE				0.100*** (0.00)	0.081*** (0.00)
P-Exp-16-U				0.150*** (0.00)	0.124*** (0.01)
N	1,725	1,725	1,725	1,725	1,725

Notes: p -values in parentheses; for discrete change of dummy variable from 0 to 1. Statistical significance: * $p < 0.15$, ** $p < 0.05$, *** $p < 0.01$. The other control variables are those of specification 6 in Tables 5 to 8.

Table A5: Marginal effect of Probit estimations of parental educational expectations at different ages of children, extreme specifications, Québec and Rest of Canada

	(1)	(2)	(3)	(4)	(5)
Female Québec					
P-Exp-10-HS	-0.051	(0.18)			0.010 (0.72)
P-Exp-12-HS		-0.063	(0.17)		-0.008 (0.82)
P-Exp-14-HS			-0.124*	(0.06)	-0.102 (0.13)
P-Exp-16-HS				-0.128**	(0.04) -0.108 (0.11)
N	433	433	433	433	433
Male Québec					
P-Exp-10-HS	-0.123*	(0.10)			-0.089 (0.26)
P-Exp-12-HS		-0.079	(0.23)		-0.056 (0.51)
P-Exp-14-HS			-0.069	(0.34)	-0.009 (0.91)
P-Exp-16-HS				-0.082	(0.22) -0.044 (0.58)
N	346	346	346	346	346
Female Rest of Canada					
P-Exp-10-HS	-0.068	(0.07)			-0.036 (0.33)
P-Exp-12-HS		-0.044	(0.18)		-0.009 (0.78)
P-Exp-14-HS			-0.035	(0.29)	0.002 (0.96)
P-Exp-16-HS				-0.115***	(0.01) -0.103** (0.02)
N	1,833	1,833	1,833	1,833	1,833
Male Rest of Canada					
P-Exp-10-HS	-0.149***	(0.00)			-0.091** (0.05)
P-Exp-12-HS		-0.098***	(0.01)		-0.034 (0.36)
P-Exp-14-HS			-0.080**	(0.03)	-0.011 (0.75)
P-Exp-16-HS				-0.162***	(0.00) -0.120*** (0.01)
N	1,725	1,725	1,725	1,725	1,725

Notes: p -values in parentheses; for discrete change of dummy variable from 0 to 1. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The other control variables are those of specification 6 in Tables 9 to 12.