
Gender sorting in the Québec education system

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Abstract—This short descriptive paper studies gender sorting in Québec high schools using an administrative dataset from the Québec ministry of education. The analysis shows that regular public high schools in Québec have a 4 to 5 percentage point larger share of male students relative to private high schools. Moreover, regular public high schools also have a greater share of male students relative to public high schools with special streams like the international or arts programs. These results show that, on average, both genders are exposed to different academic environments for their high school education.

Keywords—Gender sorting, Gender education gap, Education

1 Introduction

Across the developed world, girls outperform boys in nearly all educational measures (OECD, 2024). Tremblay et al. (2023) present recent compelling evidence specific to Québec: Not only do girls have a higher propensity to eventually graduate from high school (90% versus 78%), but they also outperform boys in the PISA evaluation at the high school level. Even though some of these cognitive differences already exist at daycare (Simard et al., 2018), the secondary schooling environment could exacerbate them.

The secondary schooling environment in Québec is characterized by the co-existence of three main types of schools: regular public schools, public schools with special projects, and subsidized private schools.¹ Even though all these schools follow a very similar curriculum mandated by the province, some parents/students prefer private schools or public schools with special projects for a variety of reasons. For example, Massé (2005) shows that Québec parents choose private high schools for the quality of the pedagogical support, for the disciplinary supervision and for moral values transmitted by the school.

The low cost of private schools in Québec enables more parents to consider the possibility of sending their child to a private school. Indeed, unlike other provinces in Canada, Québec provides funding to subsidize private high schools which can therefore charge lower tuition fees (approximately \$5 000/child/year (La Presse, 2023)) than those of private

schools in other Canadian provinces (approximately \$20 000/child/year in Ontario according to Winton (2024)) and thus attract a substantial share of the student population (approximately 20% of grade 7 students). Students enrolled in these private institutions are selected based on the student's motivation and academic abilities, the school's selection mechanism and the parents' ability to pay tuition fees.

The social divide created by these different types of schools is well documented (Laplante et al., 2018). Indeed, parents of children enrolled in private schools tend to have more education and higher income than those in regular public schools (Massé, 2005). Unfortunately, little attention has been devoted to the gender sorting generated by the Québec education system. Evidence of gender sorting does exist in the American education system. For example, using data from the Common Core of Data Public Elementary/Secondary School Universe Survey both Long and Conger (2013) and Corcoran and Jennings (2018) find a significant over-representation of female students in American charter schools. These schools are very similar to public schools with special projects in Québec. Moreover, Perzigian et al. (2017) show a higher representation of female students in so-called innovative schools which are influenced by the Waldorf or Montessori philosophy. Based on this evidence, should we also expect gender sorting in the Québec education system?

The answer to this question is important, because gender sorting in the education system could partially explain the gender education gap for two reasons. First, the academic performance of male students suffers from the absence of female students in the classroom (Hoxby, 2000; Gong et al., 2021). The low representation of female students in public high schools could therefore harm male students and partially explain the low performance of students enrolled in public high schools. Second, Lefebvre (2018) shows that private

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¹There are also non-subsidized private high schools, but they are very rare (approximately 17) and expensive with cost similar to private high schools in Ontario. (Ministère de l'Éducation du Québec, 2025)

high schools have a positive causal impact on the academic performance of their students, which is especially important knowing that boys benefit more than girls from higher quality education (Autor et al., 2016). Gender sorting in the education system would therefore imply that boys are not exposed in the same proportion as girls to the beneficial impact of high-quality education, which could therefore contribute to the gender education gap.

This paper provides empirical evidence of gender sorting in the Québec education system. First, regular public high schools, those without any special program, have on average between 4 and 5 percentage points more boys in their school population in grades 7 to 9 relative to private schools. For example, while the representation of boys in grade 7 in private schools is 50%, it is 54% in public schools. Second, public schools that offer special programs like the international or arts programs attract more girls than boys thus creating gender imbalance within the public system.

In the remaining parts of the paper, we present the data obtained from the Ministry of Education and Higher Education of Québec, explain the methodology and show the results of the analysis.

2 Data

Following an access to information request at the Ministry of Education and Higher Education of Québec, we obtained the number of male/female/non-binary students per grade for each of the 2,699 high schools in Québec during the academic year 2023-2024. All schools are defined as public or private by the Ministry. The sample is restricted to schools with at least 20 students in the grade studied to avoid large variations due to small numbers. Overall, the sample therefore consists of 540 schools in the grade 7 analysis, 543 schools in the grade 8 analysis and 544 schools in grade 9 analysis.

Table 1 shows the distribution of males and females in both types of schools. In the grade 7 sample, there are 405 public schools with an overall enrollment of 42,215 boys and 38,713 girls (52.1% boys) and 135 private schools with 10,105 boys and 10,224 girls (49.7% boys) registered. A similar phenomenon can be observed for the grades 8 and 9 samples. At first glance, the greater proportion of boys in the population may seem surprising, but it corresponds to the overrepresentation of boys aged 14 in Québec in 2024: 51 003 boys versus 48 804 girls (51.1%) (Québec, 2024).

Within the subset of public schools, some select their students for special projects. First, the international program aims to provide academic enrichment to the students. In some cases, the whole school offers an international program. In the sample, there are seven such international schools. These schools were identified using their names combined with a verification on their website. In other cases, the international program is only offered to some students in the school who were enrolled in that specific stream. In the sample, seventeen public schools were identified as providing an international stream. These schools were identified using information provided by the school boards. Unfortunately, it is difficult to know the share of students who are enrolled in this specific program and therefore impossible to

establish to which extent the program affects gender imbalance within the whole school. Whether the whole school is devoted to international education or whether it only offers an international stream, it is coded as “international school” in Table A of the appendix.

Second, other public schools offer special programs related to arts (music, performing arts or fine arts). Similarly to the international programs, these schools select students and require they keep a certain level of scholastic achievement to stay in the program. Thirty-one schools provide arts programs according to information on schools’ and school boards’ websites.

Finally, 39 public high schools offer sports program using information provided by the Ministry of Education. Table A in the appendix shows the schools that offer these different programs.

3 Methodology

Using the limited information on each school, we conduct the following regression:

$$\left(\frac{Male}{Total}\right)_i = \beta_0 + \beta_1 Public_i + \beta_2 Int'l_i + \beta_3 Sport_i + \beta_4 Arts_i + \beta_5 Control_i + \varepsilon_i. \quad (1)$$

$\frac{Male}{Total}$ is defined as the ratio between the number of male students divided by the total student body in that grade in school i .

The variable *Public* is a dummy variable that takes the value 1 if school i is public and takes the value 0 otherwise. Regular public schools and those with special programs are both identified as *Public*.

The variable *Int'l* is a dummy variable that takes the value 1 if school i is a public school and offers the international program to all or some of its students. The variable *Sport* is a dummy variable that takes the value 1 if school i is a public school and offers a sport program to some of its students. The variable *Arts* is a dummy variable that takes the value 1 if school i is a public school and offers an arts program to some of its students. In a sense, all these variables are interaction variables, because all the schools offering these programs are also public schools.

Finally, a very limited set of covariates is included in the regression analysis. The only control variable susceptible to influence gender distribution within the school is the ratio of boys aged between 10 and 14 to the total population aged between 10 and 14 in the neighbourhood. Using the postal code of each school, information from the 2021 census was matched to each school using the first three digits of the postal code. If there are more boys than girls in the neighbourhood, one would expect more boys than girls in the schools of that neighbourhood. No other control variable seemed reasonable given the dependent variable.

As mentioned previously, this regression is conducted for all schools that have at least 20 students in the grade in question. By omitting very small schools, we avoid adding random noise in the analysis due to large variations of this ratio in small samples. For example, at the “École secondaire de Grosse-Îles” in the Eastern shores school board, all four students in grade 7 are male. In grade 8, however, the only two students in that grade at that school are female. These large

TABLE 1: DESCRIPTIVE STATISTICS

	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11
Number of males in public schools	42,215	41,649	43,608	36,375	31,124
Number of females in public schools	38,713	38,491	39,234	35,455	31,480
Share of males in public schools	52.20%	52.00%	52.60%	50.60%	49.70%
Number of males in private schools	10,105	9,784	9,716	8,959	8,601
Number of females in private schools	10,224	9,984	9,576	9,276	8,821
Share of males in private schools	49.70%	49.50%	50.40%	49.10%	49.40%
Number of public schools	405	399	406	376	354
Number of private schools	135	144	138	133	130
Number public schools with int'l program	34	34	34	34	34
Number of public schools with sport program	39	39	39	39	39
Number of public schools with arts program	31	31	31	31	31

random variations (from 100% in grade 7 to 0% in grade 8) would add noise and reduce the precision of the estimators.

We focus the analysis on grade 7, 8 and 9 students, because they are still under the obligation to attend school. Indeed, some students who have repeated a year may legally drop out after grade 9 and thus leave the sample. The results for grade 10 and 11 students are available in Table B of the appendix. As for grade 1 to 6 students, we unfortunately do not have any data for elementary schools. This data was not requested, because private elementary schools are less present in the Québec education system. Indeed, Castonguay-Payant and Maroy (2020) show that Québec parents generally choose to send their child to the neighbourhood public school at the elementary level. Only when the child reaches the high school level do parents seriously think about the possibility to send their child to a private school. Not surprisingly, only 6% of elementary students attend private school, while 21% of high school students attend private school (Plourde, 2022). Overall, private elementary schools therefore have a smaller impact on society.

4 Results

Table 2 presents the results of the regression analysis. The odd columns show the key coefficient and the control variable, while the even columns show the key coefficients, the control variable and the variables related to the type of programs offered by the public schools: international program, sports program or arts program.

In all specifications and for all grades from 7 to 9, public high schools have a significantly larger share of male students. The coefficients range from 4.09 (grade 7, column I) to 5.52 (grade 9, column VI). One reason why adding the variables related to specific programs increases the coefficient β_1 is that public high schools that offer international programs or arts program tend to attract more female students. Indeed, public high schools offering these selective programs have 2 to 5 percentage points fewer boys (international program) and 6 percentage points fewer boys (arts program) relative to regular public schools. When these variables are included (even columns), β_1 captures the impact of regular public schools without any special programs, which is larger.

It is important to keep in mind that some schools only offer the international/arts program to certain students within the school thus lessening the impact on overall gender dis-

tribution. In cases when all students are enrolled in these programs, the gender distribution is more unequal. For example, the school FACE in which 46 out of the 75 students in grade 7 are female (61% of the total population) and the school Robert-Gravel in which 66 out of the 91 students in grade 7 are female (73% of the total population) are both fully devoted to the performing arts.

Schools that offer sports program tend to attract more male students in grade 7, but this effect decreases from grade 7 to grade 9 and ultimately loses its significance in grade 9. Perhaps as students become older, these sports become more competitive and selective and thus no longer influence the general gender distribution of the grade.

Results for grades 10 and 11 are provided in Table B in the appendix. The coefficient of interest *public* is still significant in grade 10, but it loses some of its magnitude. It completely loses its significance for grade 11 students. One reason behind this phenomenon could be that boys have a higher propensity to drop out of high school (Tremblay et al., 2023), and that drop out rates are greater in public schools than in private schools (Hurteau and Duclos, 2017). In other words, many boys never make it to grade 11 in public schools, which explains why the differences between both types of schools disappears.

5 Discussion

This paper shows a significant difference in gender representation between public and private schools and between regular public schools and those with special programs. Unfortunately, it cannot answer the question why we observe this phenomenon. At least three channels are plausible.

First, since girls already have stronger results than boys in elementary school (Tremblay et al., 2023), it is likely that girls are disproportionately selected by private high schools or public schools with special projects. This selection process could therefore amplify the differences that can already be observed at elementary school.

Second, boys and girls may have different long-term goals and therefore different motivation in investing in their human capital. Indeed, Cobb-Clark and Moschion (2017) and Fortin et al. (2015) respectively show that girls in elementary and high school tend to be more confident to attend post-secondary education than boys. Correspondingly, girls would be more motivated to enrol in a higher quality school (private school or a public school with a special program) to

TABLE 2: IMPACT OF SCHOOL TYPES ON GENDER REPRESENTATION: GRADES 7 TO 9

	Grade 7		Grade 8		Grade 9	
	I	II	III	IV	V	VI
Public	4.09** (1.80)	4.47** (1.81)	4.68*** (1.78)	5.14** (1.80)	4.64** (1.88)	5.52*** (1.90)
International		-2.65*** (0.93)		-2.36*** (1.11)		-5.20*** (1.14)
Sport		3.02*** (1.12)		1.96** (1.00)		0.35 (0.96)
Arts		-5.89*** (2.00)		-5.90*** (1.83)		-6.84*** (1.81)
Share male	-4.06 (13.71)	-2.96 (14.53)	2.64 (12.57)	3.43 (12.64)	-5.20 (12.29)	-6.31 (12.07)
Constant	50.39*** (7.07)	49.83*** (7.46)	46.55*** (6.61)	46.15*** (6.64)	51.94*** (6.45)	52.50*** (6.34)
R-squared	0.02	0.03	0.02	0.03	0.02	0.03
Sample	540	540	543	543	544	544

Note: These regressions explain the ratio between the number of boys and the total number of children in a given school. They were conducted with the sample of high schools in Québec with at least 20 students in the grade. Robust standard errors are in parenthesis. Here is the significance of the results: * 10%, ** 5% and *** 1%.

reach this objective.

Third, the expectations of the parents may vary according to the gender of the child. For example, Rätty and Kasanen (2010) show that parents have a higher probability to expect their daughter to attend a program preparing for university than their son. In Canada, evidence from the Registered Education Saving Program (RESP) shows that parents tend to contribute more money towards the post-secondary education of their girls than their boys (ESDC, 2024). This difference in behaviour could be explained by differences in expectations. Indeed, if parents are more confident that their daughter will pursue post-secondary studies, they will be more likely to save more post-secondary education and to encourage their daughter to obtain a better high school education through a private high school or through a special program public school.

All in all, this descriptive study points to the fact that different genders are represented in different ways in the Québec education system. This phenomenon could contribute to a better understanding of the gender education gap observed in high school and throughout postsecondary education. Future research will provide a more thorough understanding of the channels explaining why we observe this selection into the different parts of the education system.

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TABLE A: PUBLIC SCHOOLS WITH SPECIAL PROGRAMS

Arts program	Sports program	International program
École de la Courvilloise	École secondaire Mont-Bleu	École Pointe-Lévy
Polyvalente Le Carrefour	École polyvalente Saint-Jérôme	École Paul-Hubert
École Le Sommet	École polyvalente Nicolas-Gatineau	École secondaire De Mortagne
École Jeanne-Mance	École Pointe-Lévy	École Louis-Philippe-Paré
École secondaire Paul-Arseneau	École sec. Antoine-de-Saint-Exupéry	École secondaire Le boisé
École secondaire Mont-Bleu	École Paul-Hubert	École secondaire de l'Île
École Pierre-Laporte	Académie les Estacades	École Saint-Gabriel
École Jean-Raimbault	École secondaire De Mortagne	École de la Courvilloise
École Dorval-Jean XXIII	École secondaire de la Cité-des-Jeunes	École André-Laurendeau
École Jean-Jacques-Bertrand	École Louis-Philippe-Paré	École secondaire Roger-Comtois
École secondaire Émilien-Frenette	École du Triolet	École secondaire de Neufchâtel
École de la Magdeleine	École de la Seigneurie	École secondaire de Robehelle
École secondaire de l'Aubier	École secondaire de l'Odyssée	Polyvalente Deux-Montagnes
École du Mistral	Polyvalente de Saint-Georges	École secondaire Henri-Bourassa
École secondaire du Havre	École secondaire Félix-Leclerc	École secondaire Rive-Nord
École secondaire du Grand-Coteau	École secondaire Le boisé	École secondaire Armand-Corbeil
Académie Royal West	École secondaire Laval Senior	École secondaire Jean-Baptiste-Meilleur
École secondaire de la Nouvelle-Ère	École secondaire de la Ruche	Polyvalente de Charlesbourg
École secondaire Henri-Dunant	Polyvalente Le Carrefour	École secondaire Charles-Gravel
École secondaire Camille-Lavoie	École Barthélemy-Joliette	École d'éducation internationale de Laval
École secondaire Pamphile-Le May	École secondaire d'Amos	École sec. polyvalente de L'Ancienne-Lorette
Centre éducatif Saint-Aubin	École polyvalente Arvida	École internationale du Phare
ÉcoleLe tandem Albert-Morissette	École Des Sources	École des Sentiers
École secondaire Paul-Le Jeune	École Édouard-Montpetit	École d'éducation internationale
École secondaire Rosemont	École Georges-Vanier	École secondaire d'Oka
École secondaire de l'Amitié	Pavillon Wilbrod-Dufour	École internationale Lucille-Teasdale
École Robert-Gravel	École secondaire de l'Île	École Mont-Royal
École Pierre-Dupuy	École secondaire John-Rennie	École Joseph-François-Perrault
École secondaire de Cabano	École D'Iberville	École internationale de Montréal
École FACE	École secondaire Fadette	École secondaire Laurier Macdonald
École Langevin-Saint-Jean	École Cardinal-Roy	Académie Internationale Marymount
	École secondaire Veilleux	École sec internationale de Saint-Lambert
	École secondaire Lester B. Pearson	École secondaire Hubert-Maisonnette
	École Saint-Gabriel	École sec Champagnat, Guillaume-Couture
	École Le Tremplin	
	École secondaire du Transcontinental	
	École Marie-Rivier	
	École secondaire Laval Junior	
	École Marguerite-Bourgeoys	

TABLE B: IMPACT OF SCHOOL TYPES ON GENDER REPRESENTATION: GRADES 10 AND 11

	Grade 10		Grade 11	
	I	II	III	IV
Public	3.73** (1.81)	3.90** (1.83)	1.87 (1.72)	1.80 (1.74)
International		-1.17 (1.00)		-2.38** (1.20)
Sport		1.86 (1.16)		4.26*** (0.97)
Arts		-3.34* (1.87)		-2.03* (1.53)
Share male	1.13 (11.83)	1.55 (11.91)	4.32 (10.83)	-3.72 (10.83)
Constant	46.93*** (6.31)	46.71*** (6.35)	50.25*** (5.62)	49.94*** (5.62)
R-squared	0.01	0.01	0.02	0.03
Sample	509	509	484	484

Note: These regressions explain the ratio between the number of boys and the total number of children in a given school. They were conducted with the sample of high schools in Québec with at least 20 students in the grade. Robust standard errors are in parenthesis. Here is the significance of the results: * 10%, ** 5% and *** 1%.