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Starting Right: Canadian Results from PISA 2000

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Abstract

A key concern from an international perspective is the extent to which education systems provide quality, equitable opportunities to students. Canada is no exception. In revisiting the PISA 2000 results for Canada, and this chapter presents an evaluation of the quality and equality of educational outcomes across the Canadian systems of education. In doing so, some key challenges are identified. The chapter is intended to provide readers with the baseline performance and antecedents for interpreting the results of the longitudinal analyses that are presented in subsequent chapters.

INTRODUCTION

Evidence suggests that educational outcomes and labour market success are directly connected to the early educational experiences of youth. Students at age 15 shared similar educational experiences, characterised by a progression through compulsory schooling. However, as they got older, their educational experiences diversified. Some youth successfully completed their secondary education and moved on to pursue post-secondary studies, while others did not and began employment at an early age. For others their pathways through education to employment were not linear at all, but were characterised by episodes of employment and education of various types. Some experienced various periods of time in unemployment.

While the majority of this report is dedicated to examining later educational and labour market outcomes as they relate to the competencies measured by PISA 2000 for a cohort of 15-year-olds, it is fitting to include an examination of the PISA 2000 results for Canada. These results provide a context for the subsequent chapters and will also illuminate those characteristics that are linked with higher achievement. The inference here is that both achievement and certain background characteristics can be expected to lead to higher participation rates in post-secondary education and more positive labour market outcomes. Subsequent chapters will also shed light on the pathways of low performers, whether they remained disadvantaged or started to recover lost ground.

Though post-secondary education is generally accessible to students with higher competencies, there are still troubling realities for certain sub-groups of the population. For instance, students from lower socio-economic backgrounds are still less likely to achieve higher PISA scores and to undertake post-secondary studies. Identification of those groups that perform poorly is a necessary first step in creating a more equitable and efficient education system. Therefore, research must also work to enable the development of policies that are successful in improving outcomes for these students. Evidence is not necessary only to continuously raise performance, but also to diminish the magnitude of the impact of disadvantage.

The large number of Canadian students – close to 30 000 – surveyed in PISA 2000 allows for provincial comparisons to be made with respect to the results, so that each provincial system can make independent decisions regarding their system.

The results for Canada are more complex than for other countries, since comparisons across linguistically and demographically diverse provinces are involved. A particular policy challenge in the case of Canada, in contrast to more culturally and ethnically homogenous countries, is to ensure the provision of high-quality education to all its children and youth, regardless of linguistic, ethnic, socio-economic background and geographic location and within a complex federated system. Nationally, it is vital to offer equal life chances to children regardless of the location in Canada.



This chapter addresses the following questions.

- How did Canada measure up compared to other countries in delivering a high-quality and equitable education to its Canadian youth?
- To what extent can the Canadian education system be considered excellent and equitable?
- Are there groups of students whose PISA results might give rise for concern and therefore be potential targets for intervention and support?

These are addressed by revisiting the results for Canada in PISA 2000.

CANADIAN PERFORMANCE IN PISA 2000

This section begins with a consideration of the performance of Canada as a whole with respect to a number of key indicators of quality and equity. Then, an overview of these key outcomes by province is provided.

Table 3.1 shows, for each of the three assessment domains, the mean scores, country ranking and variation in scores for Canada as a whole. It is evident that Canada's performance across all domains is high. Canada's mean on the combined reading scale (534) ranked second of all participating countries and Finland was the only country to score significantly higher. The average score for Canada for mathematics (533) was around a third of a standard deviation above the OECD average and only two countries – Japan and Korea – scored significantly higher. The Canadian mean for science, at 529, was similarly high and Canada was outperformed by just three countries – Finland, Japan and Korea (Bussi re *et al.*, 2001; OECD, 2001).

Table 3.1
Summary of Canada's performance in PISA 2000

Outcome	Reading	Mathematics	Science
Rank	2	6	5
Range of ranks	2 to 4	5 to 8	4 to 8
Number of countries significantly higher	1	2	3
Mean	534	533	529
S.E.	1.6	1.4	1.6
S.D.	95	85	89
Score at 10 th Percentile	410	423	412
Score at 90 th Percentile	652	640	641
90 th percentile – 10 th percentile	242	217	229
Rank of 90 th percentile – 10 th percentile	13	6	5
Proportion of variance between schools	17.6	17.3	16.2
Rank of between-school variance	6	6	7

Source: Chapters 2 and 3, OECD, 2001.

More important than country averages, however, is the nature and extent of the variation in scores. This can yield information about the relative equity of an education system. A country may have a high average score, but if the difference between lower and higher achievers is large, it implies that some students are lagging behind.

Relative to other countries, Canada is characterised by low variation in achievement. Scores at the 10th percentile in Canada are some 40-50 score points above the OECD average 10th percentile (for example, in reading, Canada scored 410 compared to the OECD average of 366) (OECD, 2001). Furthermore, the scores of Canadian students at the 90th percentile are in the region of a sixth to a third of a standard deviation higher than the respective OECD averages. This pattern of results suggests that Canada is successful not only in attaining high average results, but also in attaining higher results among the lower-achieving students.



However, although equitable, the difference between the 10th and 90th percentile scores is still significant – equivalent to two PISA reading proficiency levels.

A useful method for understanding the reasons for variation in student performance is to examine the between-school and within-school differences in student performance. Greater between-school variance indicates a greater gap between the achievement level of the highest performing schools and the lowest-performing schools, while greater within-school variation indicates a larger gap between the higher-performing students and the lower-performing students within the same school. Among other things, these measures provide an idea of the degree to which students are “sorted” (intentionally or otherwise) into different schools based on ability levels.

Unlike the majority of OECD countries, Canada had very little variation which was attributable to differences between schools where only 16% to 18% of the total variation in achievement was attributable to differences between schools across the three domains. Taking reading literacy as an example, the between-school variation was 17.6%, ranking Canada sixth lowest among participating OECD countries (OECD, 2001).

The relative equality across schools in Canada was true also in the case of students’ socio-economic status. This can be investigated by examining the extent to which students are “segregated” by socio-economic status into different schools. In other words, higher between-school variation in socio-economic status is indicative of higher social segregation in education systems.

In an analysis of factors related to student achievement in Canada and the United States, Willms (2004) found that the proportion of variation in socio-economic status that occurred between schools in Canada (rather than within schools) was 19.5%, making it one of the least segregated education systems, in line with the performance of Norway at 11.5%, the country with the lowest between school variation.

Taken together, the low between-school variances in achievement and in socio-economic status provide good evidence that Canada is successful in providing an equitable education system to its youth.

As noted in Chapter 2, in addition to an overall reading scale, the PISA results for reading were reported in terms of three reading subscales (retrieving information, interpreting information and reflecting on/evaluating information). In the case of retrieving information, Canada’s mean (530) was exceeded by only one country, Finland. Again, Finland was the only country to outperform Canada on the interpreting information scale (Canadian mean = 532). And Canada ranked highest of all countries on the reflecting on/evaluating texts scale (mean = 542). Thus, regardless of the reading process assessed, Canadian students’ performance was uniformly high. This consistency in outcomes was achieved despite 10 different systems of education in the country.

It is of concern internationally that male students tend to lag behind females in reading achievement, so it is useful to examine the pattern of gender differences in performance in Canada in PISA 2000. Gender differences in the three assessment domains in Canada were similar to the OECD averages. Female students in Canada outperformed male students by 32 points (OECD average gap = 32) in reading, while males outperformed females by 10 points (OECD average gap = 11) in mathematics and the minute difference in favour of female students of 2 points in science was not significant, again consistent with the OECD average gap of 0 points. The pattern of gender differences across the three reading subscales for Canada also revealed a pattern similar to the OECD averages, where smaller gender differences were associated with retrieving information (25 points in Canada) and interpreting information (29 points) compared to reflecting on/evaluating texts (42 points). The gender differences in reading are of significance when one considers that males are under-represented in post-secondary education, as will be shown in subsequent chapters of this report.

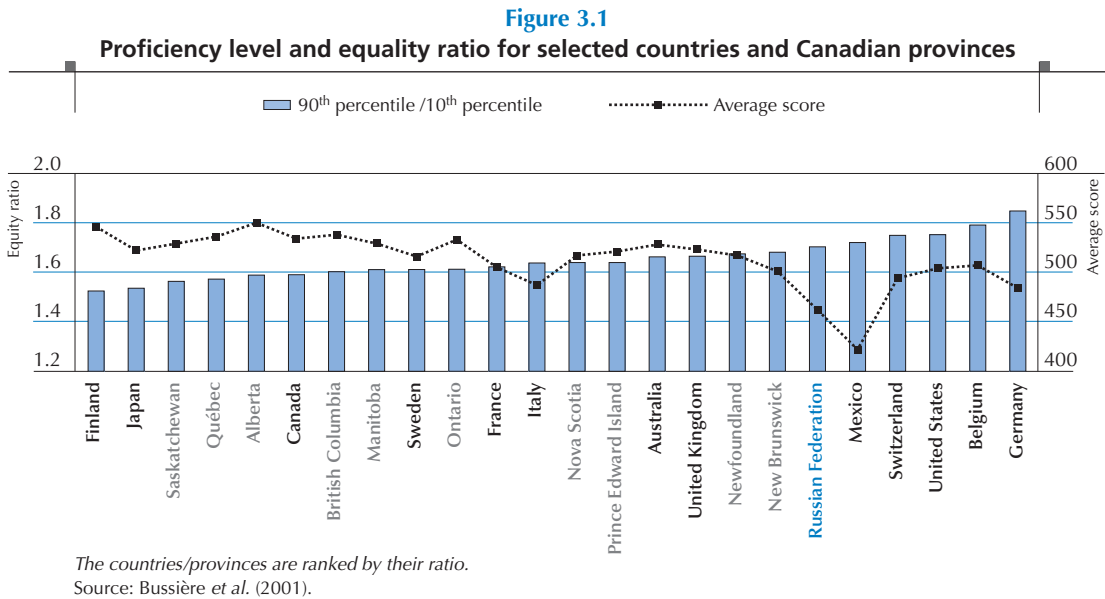
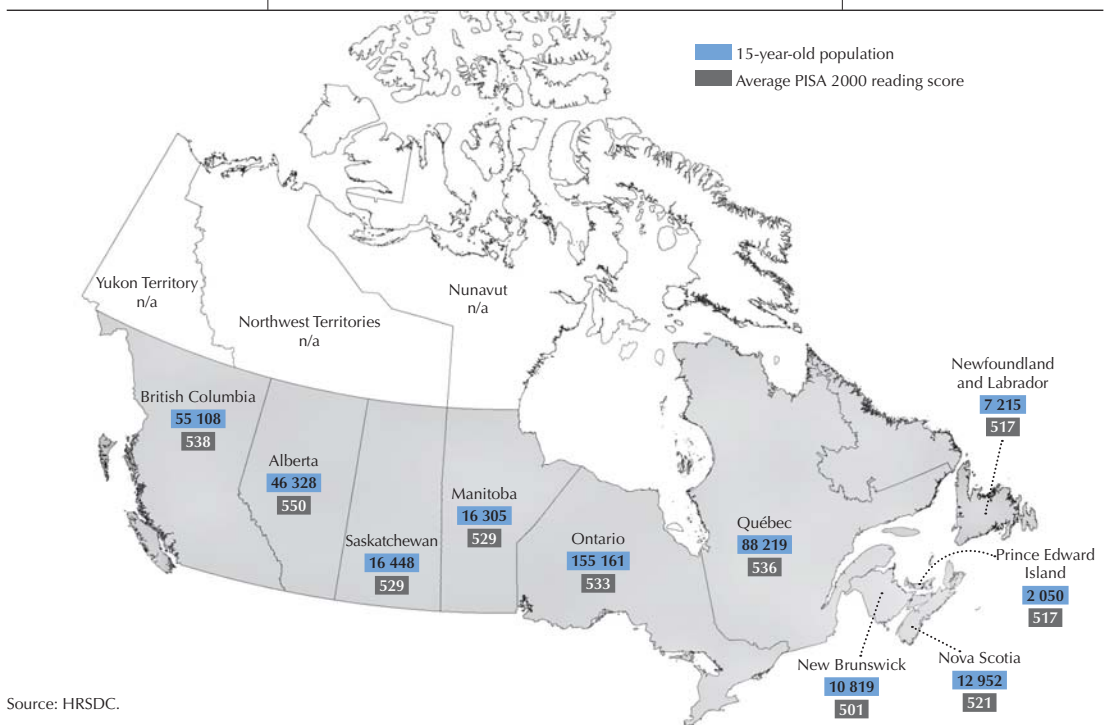


Figure 3.2
Performance in PISA 2000 and population



In order to provide equal opportunities to students across Canada, proficiency scores should not vary widely between provinces. However, results from PISA indicated that not all provinces performed equally well on measures of excellence (average scores) and equity (score differences between high and low achievement groups). This is shown in Figure 3.1, where mean scores and equality ratios¹ are plotted for Canada and selected PISA countries. Figure 3.2 illustrates the mean performance and population counts by province.



In addition, Tables 3.2 a, b and c show, for each province and for each domain (compared with data for Canada as a whole), average scores, scores at the 10th and 90th percentiles and gender differences on the achievement scales.

Table 3.2a
PISA 2000 key results for reading, by province and Canada overall

	Mean	S.E.	10 th Percentile	90 th Percentile	90 th Percentile – 10 th Percentile	Gender difference (F-M)
Alberta	550	3.3	423	672	249	38
British Columbia	538	2.9	410	657	247	32
Manitoba	529	3.5	406	654	248	35
New Brunswick	501	1.8	370	622	252	47
Newfoundland and Labrador	517	2.8	381	638	257	42
Nova Scotia	521	2.3	391	641	250	33
Ontario	533	3.3	405	653	248	30
Prince Edward Island	517	2.8	391	641	250	35
Québec	536	3.0	414	651	237	32
Saskatchewan	529	2.7	410	641	231	36
Canada	534	1.6	410	652	242	32

Source: Bussiere *et al.*, 2001.

Table 3.2b
PISA 2000 key results for mathematics, by province and Canada overall

	Mean	S.E.	10 th Percentile	90 th Percentile	90 th Percentile – 10 th Percentile	Gender difference (F-M)
Alberta	547	3.3	437	656	219	-10
British Columbia	534	2.8	422	642	220	-13
Manitoba	533	3.7	422	640	218	-3
New Brunswick	506	2.2	401	607	206	2
Newfoundland and Labrador	509	3.0	405	610	205	-6
Nova Scotia	513	2.8	403	621	218	-13
Ontario	524	2.9	416	629	213	-9
Prince Edward Island	512	3.7	405	614	209	-10
Québec	550	2.7	443	654	211	-9
Saskatchewan	525	2.9	425	625	200	-12
Canada	533	1.4	423	640	217	-10

Source: Bussiere *et al.*, 2001.

Table 3.2c
PISA 2000 key results for science, by province and Canada overall

	Mean	S.E.	10 th Percentile	90 th Percentile	10 th Percentile – 90 th Percentile	Gender difference (F-M)
Alberta	546	3.5	429	656	227	4
British Columbia	533	3.2	418	642	224	-2
Manitoba	527	3.6	412	638	226	-4
New Brunswick	497	2.3	386	611	225	15
Newfoundland and Labrador	516	3.4	401	630	229	11
Nova Scotia	516	3.0	401	624	223	3
Ontario	522	3.4	406	632	226	5
Prince Edward Island	508	2.7	400	619	219	5
Québec	541	3.4	418	653	235	1
Saskatchewan	522	3.0	412	626	214	-2
Canada	529	1.6	412	641	229	2

Source: Bussiere *et al.*, 2001.



Generally, higher ratios, as shown in Figure 3.1, were found in provinces that had lower average scores. This pattern was also evident in international comparisons (Bussière *et al.*, 2001). This also demonstrates that high performance and high equity are possible and indeed tend to co-occur.

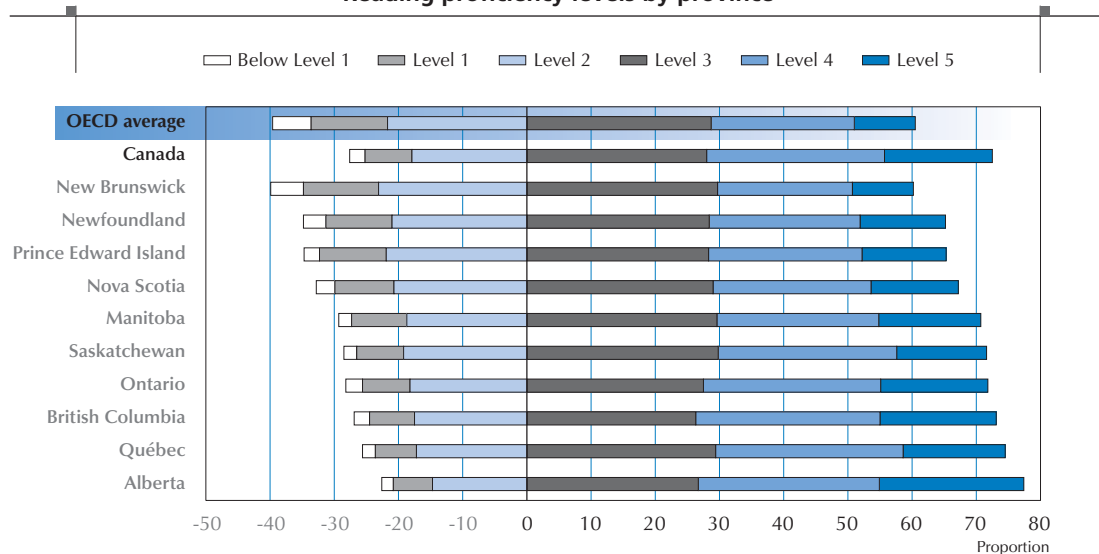
Provinces scoring a quarter of a standard deviation or more above the OECD average were Alberta, British Columbia, Québec, Ontario, Saskatchewan and Manitoba. Provinces performing in the mid-range were Nova Scotia, Prince Edward Island and Newfoundland and Labrador. New Brunswick was the only Canadian province with a mean score in reading (501) that was around the OECD average of 500. Similar provincial variations were evident for mathematics and science.

Reading scores at the 10th percentile ranged from a low of 370 in New Brunswick to a high of 423 in Alberta, while scores at the 90th percentile ranged from 622 (again, in New Brunswick) to 672 (Alberta). The range of scores at the 10th percentile across provinces for mathematics were narrower than for reading, ranging from 401 (New Brunswick) to an impressive 443 (Québec). Variation between provinces for scores at the 90th percentile on the mathematics scale ranged from 607 (New Brunswick) to 656 (Alberta). For science, scores at the 10th percentile ranged from 386 (New Brunswick) to 429 (Alberta). In terms of equality of scores, therefore, there was greater equity in science and mathematics.

Gender differences by province on the reading scale were consistent in that they all revealed a female advantage. However, the magnitude of the difference ranged from a low of 30 in Ontario to highs of 42 (Newfoundland and Labrador) and 47 (New Brunswick). The large gender difference coupled with the low average score for New Brunswick indicates that male students in this province constituted a low-achieving group relative to Canada as a whole.

Gender differences by province on the mathematics scale indicated that in seven of the ten provinces, male students had higher scores than did females, ranging from 9 to 13 scale points. In three provinces (Manitoba, New Brunswick and Newfoundland and Labrador) gender differences were smaller and not statistically significant.

Figure 3.3
Reading proficiency levels by province



Source: Bussière *et al.* (2001).



In the case of science, gender differences were generally small and not statistically significant, with two exceptions, where female students outperformed males by 11 and 15 points in Newfoundland and Labrador and New Brunswick, respectively. In these two provinces, gender differences in favour of female students on reading literacy were also the largest of the ten provinces.

Another way to examine achievement is in terms of proficiency levels in the case of reading. This allows one to benchmark performance in terms of the level of complexity of underlying tasks, as described in Chapter 2. Performance at Level 3 and higher is generally perceived as an important level of achievement for post-secondary educational success. Nearly 73% of Canadian students scored at Level 3 or higher. In international comparisons, this proportion ranked only behind Finland (Bussière *et al.*, 2001). Considerable provincial variation was evident here also. Proportions scoring at Level 3 or higher in the provinces ranged from a high of 77% in Alberta to a low of 60% in New Brunswick, though the greatest differences can be seen at the proportions scoring in Levels 4 and 5 (Figure 3.3).

These results show that many countries can look to Canada for a reference to a complex system that manages to achieve high excellence and equity. Moreover, the regional diversity of Canada provides examples of challenges that are likely to be similar to those faced by a very wide range of countries. For all these reasons, Canada is a particularly good choice for the study of the advantages of adding a longitudinal component to PISA.

SCHOOL SOCIO-ECONOMIC INTAKE AND PISA SCORES

In analysis equity across educational systems, it is important to consider not only the extent to which schools provide an equitable learning environment for students, but also the extent to which school achievement varies along a number of important background characteristics. Results of these types of analyses can point to inequities between schools that indicate a need for policy interventions to promote greater equity in achievement and background characteristics of schools. Generally, however, the relevance of school-level variables is lower in systems that do not segregate students to a high degree. Hence, in the case of Canada, there were few school characteristics that had a measurable relationship with PISA reading scores in Canada once student background characteristics were accounted for (Bussière *et al.*, 2001). The most important variable in this regard was the school's average level of economic, social and cultural status (ESCS)². A school's socio-economic intake had a positive association in Canada as a whole, as well as in many provinces (Bussière *et al.*, 2001).

Although school socio-economic composition was the most important of school characteristics in explaining achievement differences, its effects in Canada were smaller compared with those in many other countries. For example, Willms (2004) found that for a hypothetical Canadian student with an average socio-economic background (an ESCS index score of zero), attendance at a school with an above-average socio-economic composition (a school ESCS index score of 0.5) predicted a reading score that was 45 points higher than if the same student had attended a school with a low average socio-economic composition (a school ESCS index of -0.5). Comparatively, the same difference in school socio-economic status in the United States was associated with a larger increase of 63 points. The relationship of the school's average socio-economic status may be attributed to student peer effects, or it may be that greater school average socio-economic status is correlated with other supports such as parental involvement.

STUDENT CHARACTERISTICS AND PISA SCORES

Education is widely viewed as a means of reducing disadvantage and as a means of supporting upward mobility. There are many personal characteristics, attitudes and behaviours that were associated with PISA reading achievement. Certain variables are important to consider because they identify groups of low-achieving



students who are significant from an equity perspective, such as low income, single parent, or immigrant students. Other variables are of interest because they can be used to develop policy strategies that may increase reading proficiency and mitigate inequality in outcomes (King, 2009).

When considering whether or not a variable is related to reading proficiency, two concepts are important. The first is statistical significance, which indicates how much confidence one can have that a relationship exists. The second is the magnitude of the differences or the strength of the relationship used to gauge whether the relationship is strong enough to matter for policy relevance. Both concepts are applied in the following discussion. For this, consider that, for Canada a difference of 34 reading points was found to be equivalent to one year of education (Willms, 2004). Thus, a difference in scores of even 15 points constitutes a large variation in student ability.

Socio-economic status

Of all the factors that were found to be associated with achievement, an individual's socio-economic status had the most pronounced association, which is indicative of an intergenerational transmission of advantage (and, conversely, intergenerational transmission of disadvantage). Of interest in subsequent chapters, then, is the potential relationship between an initial advantage and subsequent educational and labour market outcomes, as measured in YITS.

Comparing the gap between the 5th and the 95th percentile on the economic, social and cultural status index provides an indication of equality in socio-economic status in each country. Canada had a value on this measure which was lower than the OECD average – 2.8 compared to the OECD average of 3 (OECD, 2001), meaning that Canada had greater equality in the distribution of socio-economic status of its students than other OECD countries.

It is not just the distribution of scores that is of interest, but also the extent to which an individual's socio-economic status is related to achievement outcomes. The weaker the relationship, the more equitable a system is in this respect. When the strength of the relationship between a student's socio-economic status (using the socio-economic background index) and their score on the PISA reading test was analysed, Canada performed better than the OECD average. Willms (2004) reported that a simple regression of PISA scores on students' socio-economic background explained approximately 11% of the total variation in PISA scores in Canada, while (by comparison) it explained 21% of the variation in scores in the United States. Furthermore, estimates showed that, in Canada, an increase of one unit on the ESCS index translated into an increase of 37 points on the combined reading score, which was some 10% below the OECD average of 41 points (OECD, 2001).

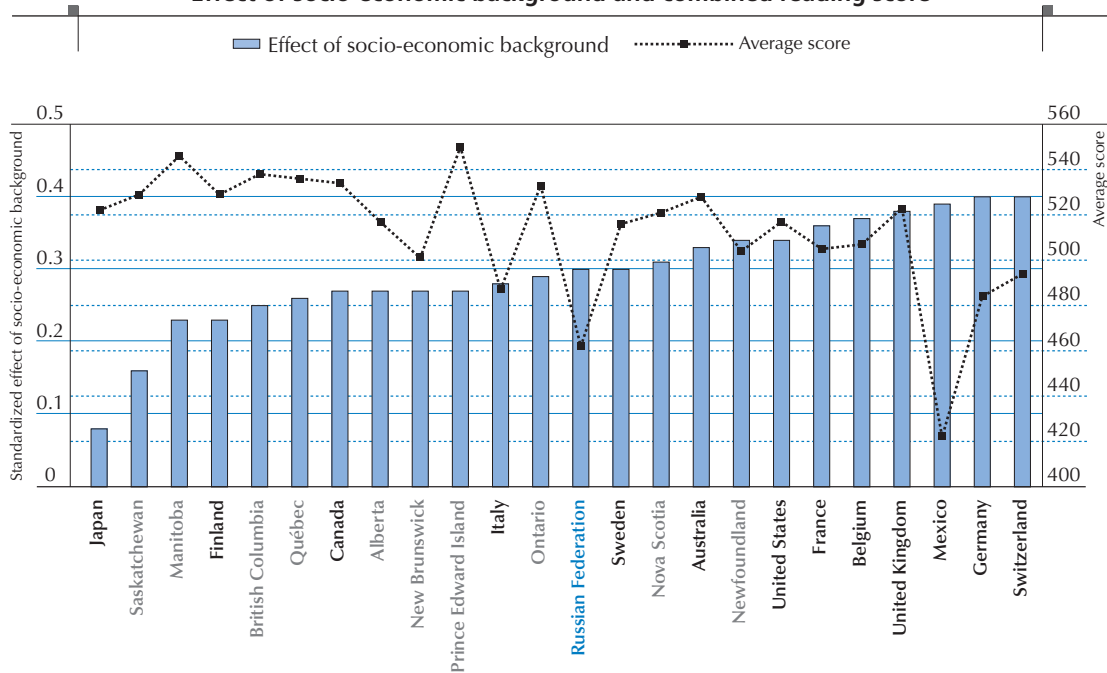
Figure 3.4 illustrates the relationship between the strength of the association between socio-economic background and performance and average reading scores for Canada, its provinces and selected PISA countries.

These findings suggest that Canada was able to mitigate some of the influences of socio-economic status through more equal learning opportunities and with a smaller degree of student sorting than in other countries. It also suggests that programmes targeted to low socio-economic background students have the potential to increase average PISA scores in Canada, though perhaps not to the same degree as in countries with stronger links between student socio-economic background and performance.

It is encouraging to note that results from both Canada and other OECD countries suggest that achieving greater equality in PISA scores (and weaker effects of individual socio-economic background on student performance) does not have to come at the expense of high student achievement. Of 12 countries that had above average reading scores, Canada was among six countries, including Finland, Iceland, Japan, Korea and Sweden, that combined above average achievement with above average equality in student socio-economic status (OECD, 2001).



Figure 3.4
Effect of socio-economic background and combined reading score



The countries/provinces are ranked by their effect.
Source: Bussi re et al. (2001).

Not every province performed equally well in terms of equity. There were some differences between Canadian provinces in the size of the relationship between socio-economic background and PISA reading scores. Saskatchewan and Manitoba had smaller effects while Newfoundland and Labrador and Nova Scotia had effects that were above the Canadian average (Bussi re et al., 2001).

Family structure

In recent years, substantial changes in family structure have occurred in industrialised countries, where dual-parent, nuclear families can no longer be taken as the norm. Furthermore, in some families headed by one parent only, there may be resource limitations for the children, both in terms of financial resources and also in the time that parents have to spend with and support their children. Therefore it is to be expected that Canadian youth from single-parent families were one group of students that were less likely to have high achievement on the PISA assessment. While 13% of students in the highest quartile of PISA scores belonged to a single parent family, 17% of students in the lowest quartile did so. Therefore, although a disadvantage was evident, it was of a small magnitude (Bussi re et al., 2001).

Country of birth

With high rates of immigration, successful integration is associated with equitable educational outcomes. However, the difference in reading scores between new Canadians and Canadian-born students was large. Students who were immigrants were twice as likely to be in the lowest quartile of PISA scores as they were to be in the highest quartile. Furthermore, after accounting for socio-economic status and parental and school factors, immigrants still scored 26 points below non-immigrant students (Frempong et al., 2006).



An in-depth review of this issue found that both length of time spent in Canada and the language spoken at home were key determinants of how well immigrants performed on the PISA assessment (Gluszynski and Dhawan-Biswal, 2008). Students who were recent immigrants to Canada (*i.e.* who arrived within the previous 5 years) and who spoke a language other than French or English at home scored 20 points below the OECD average (a score of 478) on the reading assessment. In contrast, immigrants who had been in Canada longer than 5 years had an average score of 521, even if English and French were not spoken at home. These findings may help to explain how many immigrants are able to overcome lower achievement in reading skills at an early age and achieve a high level of educational attainment through integration.

Rural-urban differences

The location of the school is an important determinant of performance in Canada and can help identify schools facing more challenging situations. It may be the case that students in rural regions have access to fewer resources in the local infrastructure; on the other hand, students in densely populated areas may be exposed to a higher number of negative influences in the local community, particularly if poverty and unemployment are widespread. In the case of Canada, lower reading scores were observed for students in rural communities. Students from a rural area had an average reading score of 523 compared to 538 for urban students, a difference of 15 points (Cartwright & Allen, 2002). This difference can be explained by the fact that rural students were more likely to come from a lower socio-economic background, to have fewer educational and cultural resources at home and were less likely to discuss political or social issues with their parents. Hence, urban-rural differences observed in Canada were mediated by socio-economic and cultural differences.

Language minority groups

In Canada, not all students share the same language both at school and at home. It is important, nonetheless, that the educational experiences of all students, regardless of mother tongue, allow for equitable outcomes. Francophone students in Manitoba, Ontario, Nova Scotia and New Brunswick and Anglophone students in Québec were attending schools in a language that was not the dominant language of that province. In all provinces except Québec, minority language students had significantly lower scores in reading than their majority language counterparts (Bussière *et al.*, 2001). Furthermore, minority language students in these four provinces had average scores that were below the OECD average. These findings suggest that educational policy in Canada should direct further efforts at bridging the achievement gap in these groups of language minority students.

Parental involvement

For the majority of children, parents are likely to have the largest impact on their children's development and acquisition of competencies – greater than the role of schools and of educators.³ The effects of parental income, educational attainment and cultural assets have already been identified as being important, but these characteristics alone say nothing about how skills are transmitted from parent to child.

Parental involvement with school activities, even in areas that are unrelated to cognitive development, is thought to reinforce the value of education and create healthier learning environments. Parents are instrumental in promoting healthy concepts of self-identity and educational aspirations which are important for school and non-school learning.

Parents' intellectual involvement in their children's learning has a direct effect on cognitive development through activities such as reading books together, having stimulating discussions or helping students with homework. The importance of these behaviours was well known before the PISA assessment in 2000. However, PISA made it possible to link parental behaviours to a direct assessment of student achievement.



Using data from PISA 2000, Frempong *et al.* (2006) considered four measures of family support that may be important for improving student achievement: academic interest, social interest, educational support and educational expectations. They found that students in the highest quartile of achievement were the most likely to have experienced the highest levels of parental academic interest and parental social interest and more often had parental expectations for higher education.

In contrast, students in the lowest quartile of achievement were more likely to receive a greater degree of educational support from their family. This finding may be explained by the greater likelihood of students who were having problems with school work to receive help from parents at home.

Not only was positive parental involvement associated with student achievement, it was also shown to mitigate some of the inequalities associated with certain personal characteristics, such as family socio-economic status (Frempong *et al.*, 2006). High parental academic interest was associated with an increase in reading scores of 11 points, parental social interest was at 4 points and parental educational expectations were at 27 points. These effects were found after accounting for socio-economic, family possessions and school characteristics. Therefore, some of the strongest policy interventions may entail the promotion of and support for parents' involvement in their children's learning.

STUDENT CHARACTERISTICS CONSIDERED TOGETHER

Bussière *et al.* (2001) considered the relative impact of various family and socio-economic characteristics with respect to achievement. This type of analysis can shed insight into those characteristics that are most relevant to policy intervention. The characteristics examined were family structure and size, socio-economic status, material and cultural possessions, books in the home, home educational resources, family educational support, parental academic interest and language spoken at home.

Of these characteristics, only five remained significant when considered jointly for Canada as a whole, *i.e.* socio-economic status, number of books in the home, student's cultural activities, family educational support and parental academic interest. This confirms the significance of parental involvement and a supportive home educational climate, over and above socio-economic status.

CONCLUSION

This chapter examined how Canada measured up in international comparison in delivering high-quality education and whether its system may be considered excellent and equitable. The results from PISA 2000 indicate that Canada fares very well in this regard. Few countries performed significantly better than Canadian students in PISA 2000 (for example, only one country, Finland, outperformed Canadian youth in reading). Additionally, Canada combined a high average score with a high level of equity in scores, displaying a comparatively low level of variation between high- and low-proficiency students. Having said this, the difference in scores of high and low achievers, although small by international standards, was nonetheless substantial, suggesting that there is still room to improve the achievement outcomes of lower achievers. The results also indicated that the Canadian education system, despite provincial differences in educational structures, segregated its students into different schools on the basis of achievement and socio-economic background considerably less than across the OECD as a whole. Furthermore, the association between students' socio-economic backgrounds and achievement, although significant, was substantially lower than that in many other countries. Taken together, these results generally confirm that Canada has succeeded in delivering an equitable, high-quality education to its youth, at least as measured by PISA.



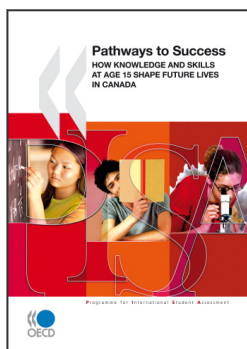
However there are, of course, still groups of students with poor performance in PISA who are therefore vulnerable. Students from certain segments of the population lag behind their classmates in reading, including recent immigrant students, students of lower socio-economic status, with less educational and parental support at home, in certain provinces and students in language minority schools outside Québec. Also, the reading scores of male students relative to females are a cause for concern. Furthermore, it was demonstrated that urban-rural differences were mediated by socio-economic disparities. Increasing performance of the lower-achieving students is necessary if Canada is to increase its overall ability levels and for the education system to overcome any intergenerational effects of lower skills, which in turn are likely to translate into inequalities in subsequent outcomes such as access to post-secondary education.

In conclusion, the three key challenges for Canada are, first, to maintain its track record of high performance and high equity under changing demographic conditions, especially with high immigration rates and increasing linguistic diversity; second, to mitigate intergenerational advantage, while raising educational aspirations among groups with low performance; and third, to ensure that linkages between home and school improve the learning experiences and outcomes of students.

The results presented in this chapter show the power of the types of analysis and policy insights that can be produced based on the cross-sectional content of PISA in Canada. These findings also highlight the consistency of PISA results despite the diversity of the Canadian educational system across provinces. The following chapters exemplify how these findings and conclusions on policy can be extended with the longitudinal component of PISA in Canada, the Youth in Transition Survey (YITS).

Notes

1. The equality ratio is the score at the 90th percentile divided by the score at the 10th percentile. Smaller ratios indicate greater equality.
2. Economic, social and cultural status was a variable created by the PISA Consortium to combine a number of related socio-economic measures, including parental education, income, and cultural resources, into one index. This measure was also used to create an average level of ESCS for each school (Adams & Wu, 2002).
3. Frempong *et al.* (2006) provide a good discussion of theory of family and social influences on child learning, as well as a thorough literature review.



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