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Boys, Girls, and Grades Academic Gender Balance in British Columbia's Secondary Schools

by Peter Cowley and Stephen Easton

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Executive Summary

Who does better in school: boys or girls? Earlier in the decade much was written about the disadvantages that girls faced in the classroom. More recently it has been suggested that, in fact, it is the boys who are getting short-changed. Importantly, we find no conclusive evidence in the research that suggests that boys and girls are destined to achieve at different levels in any aspect of the academic program. Further, the provincial Ministry of Education and the British Columbia Teachers' Federation both assert that in British Columbia's public schools the individual characteristics of students—including, presumably, their gender—are taken into account by teachers and by counsellors. So, by nature and by policy, boys and girls should achieve the same levels of academic success. But do they?

To answer this question, we first analyzed student performance across the province in the eight most popular Grade-12 academic courses. The results show that girls and boys do not, on average, fair equally well in our secondary schools. However, an important question remains: Are girls actually learning more or are school-based assessments systematically biased against boys?

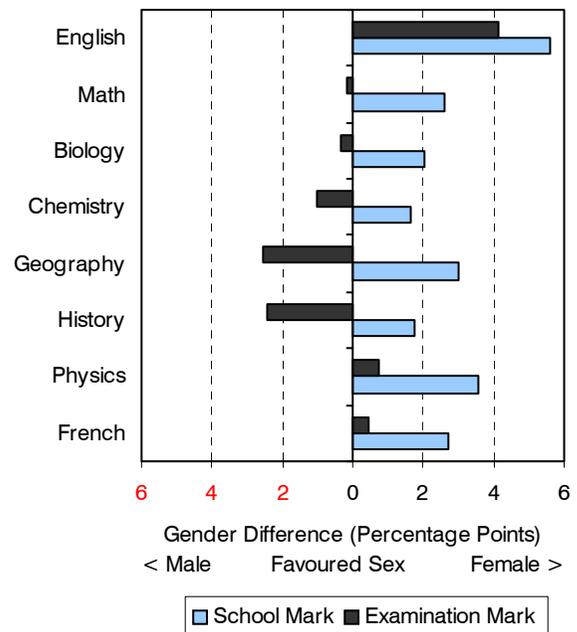
The final mark on these academic courses is a combination of a uniform provincial examination mark and a mark awarded by a student's school. On the provincial examinations, girls have consistently out-performed boys in English 12. In Mathematics 12, where girls previously trailed boys on the provincial examination results, the gap has been closed. These examination results offer some evidence that girls are actually performing at a higher level than are boys in these critical subject areas. Even so, on five of the eight

most frequently written provincial examinations boys have, on average, outperformed girls over the period of this study.

Analysis of the school-based marks shows an entirely different picture. Even though final examination results do not conclusively favour boys or girls, girls consistently earn higher average school marks on all eight of these same courses (see graph below). So, regardless of how they do relative to boys on the examinations, girls are consistently receiving higher marks at school. What are our schools measuring?

Other performance indicators—graduation rate and the proportion of each gender enrolled in specific courses—suggest that much improvement is needed in efforts by schools to maximize the potential of all students regardless of their gender.

Differences between Examination Mark and School Mark



When we examine the results from individual schools, we find that they are not equally effective in their efforts to take the needs of both genders into account. It is apparent that, while some school professionals have found success in this important endeavour, many more are either unsuccessful or, perhaps, unaware of the problem.

The results of this study suggest that every secondary school administrator in the province should consider these questions:

- 1 What programs do we have in place to ensure that the unique educational needs of both boys and girls are being met?
- 2 How successful are these programs?
- 3 What additional steps can we take to enable students of both genders to reach their potential?
- 4 Are the school-based assessments an accurate measure of each student's understanding of the curriculum?

Introduction

Why are girls systematically receiving higher marks from our schools than boys? In British Columbia, even if mastery of the subject matter—as revealed by provincial examination results—is the same, a young woman is more likely to be able to graduate or attend post-secondary education than a young man. Although “Sarah” failed her compulsory English 12 provincial examination she will likely graduate on time with her classmates, while her friend, “Kevin,” who got a slightly higher mark on the examination probably will not. Why aren’t boys and girls treated equally?

Boys, Girls, and Grades: Academic Gender Balance in British Columbia’s Secondary Schools provides insight into our schools’ relative success in meeting the individual needs of their students. It does this by comparing the performance, in a number of dimensions, of two identifiable sub-populations of the student body, boys and girls.

What Should We Expect from Our Schools?

The quality of a school’s academic program is defined to a considerable degree by its ability to help all its students reach their potential, regardless of their personal characteristics, background, aptitudes, and interests. An effective school will design its programs and their delivery to ensure that individual differences are taken into account. It makes little sense to develop highly sophisticated academic programs that are beyond the capabilities of the majority of students or to teach

courses in a manner entirely unsuited to their established patterns of learning behaviour. It is not enough simply to throw the ball. Sound educational practice also ensures that the intended recipient is able to catch it.

The concept of accounting for differences among students in the teaching process—teaching in context—is routinely touted as a critical component of the school system’s mission and as an achievable goal of effective teaching and counselling. It is a cornerstone of the mandate of British Columbia’s Ministry of Education:

The purpose of the British Columbia school system is *to enable all learners to develop their individual potential* and to acquire the knowledge, skills, and attitudes needed to contribute to a healthy, democratic, and pluralistic society and a prosperous and sustainable economy.¹

The British Columbia Teachers’ Federation (BCTF) is equally forthright. It maintains:

Children with economic disadvantages do not see those disadvantages perpetuated through the education they receive. Indeed, we consciously address that disadvantage by trying to ensure equal learning opportunities for all students in all parts of the province . . . Two of the key principles of public education are equity and inclusion. Public schools in B.C. have established strong guarantees that children with special needs have those needs met.²

1 *K-12 Policy Manual for BC Schools*. Digital document: www.bced.gov.bc.ca/policy/plcy_man.htm (May 3, 1999). Province of British Columbia, Ministry of Education, p.iii. Italics added for emphasis.

While we assume that the BCTF's statements speak to students with specific physical, mental, or social challenges, we suggest that *every* student has special needs—some quite probably associated with their gender—and that each student should be entitled to these same guarantees. We doubt that the Ministry or the BCTF would disagree.

How Can We Determine the Extent to Which Schools Take Student Context into Account?

Fortunately, there are data that reflect our schools' effectiveness in taking into account one aspect of context: student gender.³ These sub-populations—young men and young women—do not always fair equally well in every school.

This finding is not entirely a surprise. There has been tremendous public interest in recent years about the perceived difference in the academic accomplishment of male and female students. This interest was heightened by the 1992 publication of a study by the American Association of University Women (AAUW), *How Schools Shortchange Girls*.⁴ The report laid partial blame at the feet of the education system for a variety of shortcomings in girls' education. There were specific concerns about: opportunities for intellectual development; access to advanced education, specialized training and employment opportunities; and personal physical and psychological development. The ensuing debate led to a proliferation of so-called gender-equity programs. The

expressed purpose of these programs was to ensure a classroom atmosphere in which girls would have the same opportunities to succeed as boys had apparently always enjoyed.

The gender equity program introduced by British Columbia's Ministry of Education predates the AAUW's report by two years and survives to this day. Its mandate is as follows:

Program Goal

To improve the opportunities, access, and support for all girls and women in the British Columbia school system by promoting the principles of gender equity.

Program Objectives

To both inform about, and actively promote, gender equity in the education system through a consultative, collaborative process.

To support initiatives generated throughout the education community that actively promote gender equity.

To assist the education community in identifying and removing the barriers girls and women face in pursuing their education.

To provide learners with information about a wide variety of career options, and to encourage them to explore these options fully.

To recognize, value, and encourage the diverse ways women provide educational leadership.⁵

2 *Statement of Principles and Values of Public Education*. Digital document: www.bctf.bc.ca/parents/pubeduc.html (May 3, 1999). British Columbia Teachers' Federation.

3 A note regarding the use of the word, *gender*. In this paper we have used the word *gender* as a synonym for the word *sex*. This convention mirrors current usage in the education field. For example, the Ministry of Education has established a *gender* equity program, not a *sex* equity program.

4 *How Schools Shortchange Girls*. Washington, DC: American Association of University Women Educational Foundation, 1992.

5 *Gender Equity Opening Doors*. Digital document: www.bced.gov.bc.ca/equity/pgo.htm (May 3, 1999). Province of British Columbia, Ministry of Education.

While the program recognizes the value of equitable treatment of both genders, it remains single-sexed in its approach:

The negative consequences of stereotypical conceptions and discriminatory practices adversely affect males as well as females. However, in the short term, greater emphasis in the gender equity initiatives will be placed on improving conditions and attitudes as they affect girls and women. In the long term, these initiatives will also improve the situation for boys and men.⁶

Recently, the question of poor general school performance by male students has been raised among educators and parents alike. A particularly interesting challenge appeared in a recent issue of the BCTF's news magazine, *Teacher*.⁷ The author, Pat Clark, then an assistant director in the Federation's Professional Development Division, draws attention to the apparent absence of boys in school honours lists, in the ranks of student leaders, and among post-secondary entrance scholarship winners. More recent commentary, occasioned by the relatively poor showing of male students on literacy tests of the 1998 School Achievement Indicator Program, also sounds alarm bells. Nathan M. Greenfield, the Canadian correspondent for the *Times Education Supplement*, writes in *The National Post*:

Put simply, boys have been socialized to believe that it's cool to be semi-literate.

Nowhere in our culture does a 13-year-old boy find support for being a good reader. Schools used to provide this, but over the past 15 or so years, schools and educators have viewed boys as things to be contained, controlled and, to be blunt, made nice.⁸

A recent editorial in *The Globe and Mail* put it even more bluntly.

[I]t would seem that, at the very least, we as a society have been complacent about the less-than-literate boys of our culture. At the most, we have been practising a form of gender bias. What the disproportionate attention paid to girls' schooling problems says is: boys' deficiencies matter less, because boys matter less.⁹

However, it is Mr. Clark's challenge that put the matter into focus. After worrying about the emergence of a "growing underclass of rogue males," he asked his fellow teachers these questions: "Is this a problem or not? Is there anything teachers, schools, trustees, and government can do, or are we doing the best we can now?"¹⁰

As we will show in a later section, there appears to be no compelling evidence that girls and boys should, given effective teaching and counselling, experience differential rates of success. Thus, since neither nature nor policy lead one to expect them, it is important to determine the extent of gender-based performance differences.

6 *Gender Equity Opening Doors*. Digital document: www.bced.gov.bc.ca/equity/under.htm (May 3, 1999). Province of British Columbia, Ministry of Education.

7 So Where Are The Boys? Pat Clark, *Teacher* 9, 4 (Jan./Feb.), 1997.

8 Reading Skills Nothing to Celebrate [sic]. Nathan M. Greenfield, *The National Post*, March 18, 1999, p. A18.

9 Boys And Literacy: We Can Do Better. Editorial, *The Globe and Mail*, March 18, 1999, p. A14.

10 So Where Are the Boys? Digital document: www.bctf.bc.ca/ezine/archive/1997-01/support/Clarke.html (May 3, 1999). British Columbia Teachers' Federation.

How Do Girls and Boys Compare across the Province?

In British Columbia, gender-based differences in school performance do exist. They are systematic, extensive, and persistent.

The same data from the Ministry of Education upon which *A Secondary Schools Report Card for British Columbia* and *The 1999 Report Card on British Columbia's Secondary Schools*¹¹ were based may be used to measure gender balance in academic performance.

Results from the Grade-12 provincially examinable courses¹² show that, on average, girls outperform boys by statistically significant margins on nearly all of the Report Card indicators. Grade 11 enrollment patterns in Physics and other language studies suggest that the stereotypical course preferences (the very thing gender-equity initiatives were developed to combat) remain firmly entrenched. Recent results on the Ministry of Education's Provincial Learning Assessment Programme (PLAP) reading and writing tests appear to support the notion that girls outperform boys in lower grades as well.¹³ What specific conclusions can we draw from the province-wide data?

Girls Out-perform Boys in English 12

Girls, on average, receive significantly higher grades than boys on both school-based assessments and provincial examinations in the critical subject area, English language arts.

During the six years covered by this study, girls, on average, significantly out-performed their male counterparts in English language arts. Chart 1 provides the details. For each school year, the average school and examination marks in percentage points are shown. The columns plot the by-gender school marks and the lines plot the by-gender examination marks. As the chart shows, while over-all performance in English 12 has varied from year to year, results have remained strongly positive in favour of the girls. The consistency and strength of this female advantage is of particular significance when it is remembered that successful completion of English 12 is required of most students for graduation.¹⁴ Since participation is required, no self-selection is possible. Hence, results in English language arts provide the most complete picture of differential performance between boys and girls.

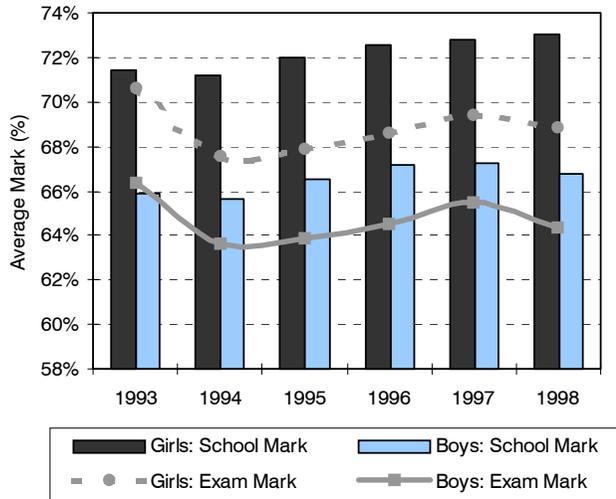
11 (1) *A Secondary Schools Report Card for British Columbia*. Peter Cowley, Stephen Easton, and Michael Walker, Public Policy Sources 9. Vancouver, BC: The Fraser Institute, 1998. (2) *The 1999 Report Card on British Columbia's Secondary Schools*. Peter Cowley, Stephen Easton, and Michael Walker, Public Policy Sources 22. Vancouver, BC: The Fraser Institute, 1999.

12 The Ministry of Education determines the final mark for each student in provincially examinable courses by combining the examination mark (worth 40 percent of the total) with the school mark provided by the school (worth 60 percent of the total). The Ministry does not release any student's examination mark before it receives the school mark from the school. This means that the school mark cannot be adjusted after the fact to compensate for a poor showing on the examination. The importance of this marking sequence will become clear in the discussion of the results that follows.

13 B.C. Students Score Well in Reading and Writing Assessment. Ministry of Education News Release NR82-98, November 13, 1998.

14 Exceptions to this requirement: (a) Programme Cadre students may use *Français Langue* 12 to fulfil their Grade-12 level Language Arts requirement; (b) a relatively small number of students take *Communications* 12, a less academically rigorous course; (c) another alternative, *Technical and Professional Communications* 12 was introduced as an examinable subject in the 1997/1998 school year.

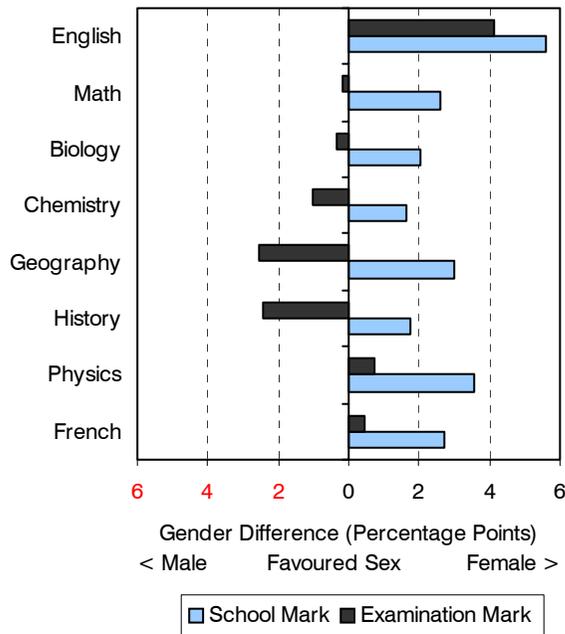
Chart 1: Average Marks (%) in English 12



Girls Receive Higher Grades on School-based Assessments

Girls receive higher grades on school-based assessments in *all* subjects regardless of their relative performance on the provincial examinations. The general rule seems to be that if an assessment or award is made at the school level, girls achieve better results than boys do. A close look at the relationship between school marks and examination marks in all subject areas is striking. Chart 2 compares examination and school marks for boys and girls during the same six-year period. It shows the difference between the results for boys and girls in percentage points for each of the eight most popular provincially examinable courses. One set of bars indicates the gender-based difference in the school mark awarded and the other indicates the gender-based difference in the examination mark awarded. A value of zero would indicate perfect gender balance in the result. Where boys are favoured by a difference, the bar extends to the left of zero. Where girls are favoured it extends to the right.

Chart 2: Differences between Examination Mark and School Mark



Girls substantially out-scored boys on the English 12 examination; girls were only marginally better on the French and Physics examinations; they were marginally out-performed by the boys in Mathematics and Biology; and they were more significantly out-performed in Chemistry, Geography, and History.¹⁵ Yet, the girls outperformed the boys on the school mark in every one of these subjects.

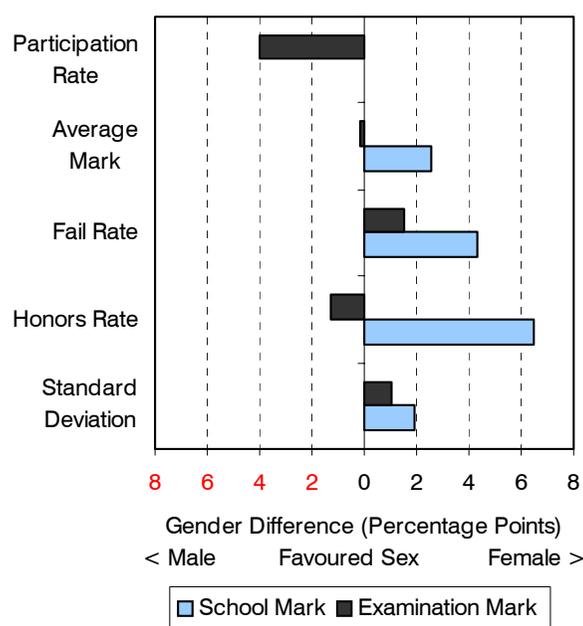
Girls and Boys Do about the Same in Mathematics

If the popular perception that girls do relatively poorly in Mathematics was ever true, the situation has certainly changed.

Chart 3 gives the details of the average by-gender results in Mathematics over the six-year study period. The difference between boys and

15 For the sake of clarity, eight of the 17 provincial examinations were considered for the purposes of this section. They account for over 85 percent of all the provincial examinations written during the five years covered by this study.

Chart 3: Differences in Selected Results in Mathematics 12



girls (in percentage points) is shown for each of the five specific results for Mathematics 12: Participation Rate, Average Mark, Failure Rate, Honours Rate, and Standard Deviation. (Note that the participation rate refers only to the provincial final examination.) Again, one set of bars indicates the gender-based difference in the school mark awarded and the other indicates the gender-based difference in the examination mark awarded.

While it is still the case that a greater proportion of boys take Mathematics 12 than do their female counterparts, the by-gender examination results are reasonably close. Indeed, the difference in examination marks has favoured the boys by less than one percentage point during the study period. While girls failed less frequently than did boys on the examination, the boys achieved a higher percentage of honours marks than did the girls.

Not shown in chart 3 is the improvement in girls' average examination scores relative to those of

the boys. Girls improved their average score faster than boys during the study period. In fact, in 1997 and 1998, the girls actually achieved higher average scores on the Mathematics 12 provincial examinations than did the boys.

As expected, the school-based Mathematics results favour the girls. Notice particularly the Honours rate. This measures the percentage of students receiving either an A or a B grade. While boys were awarded slightly more honours grades on the examinations, girls received considerably more honours grades on the school mark.

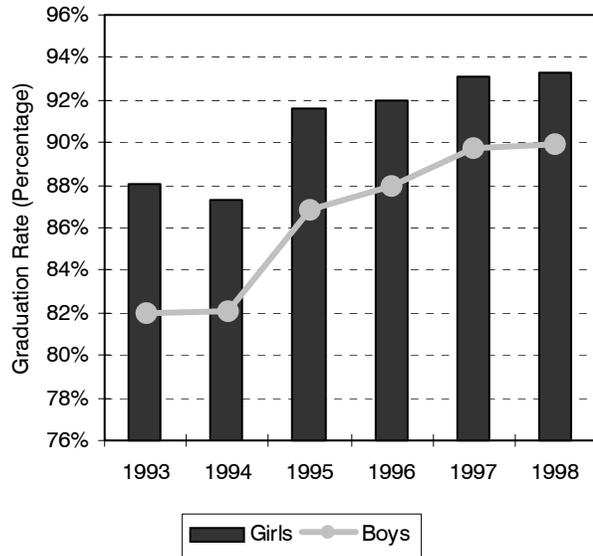
Boys Are Not Graduating with Their Class

In order to graduate, students in British Columbia must meet certain conditions set by the Ministry of Education. The determination of each student's eligibility to graduate is largely the result of school-based assessments. School marks account for 60 percent of the final mark on provincially examinable courses and 100 percent of the final mark in all other courses. Thus, if our previous findings hold—that female students fare better when the assessment or award is school-based—then females should graduate with higher frequency than males.

Chart 4 shows that this is the case. It plots the graduation rate (as a percent of enrollment) for each of the school years. The columns report the female results; the line reports the male results.

Females have had a significantly higher rate of graduation over the study period. The particular graduation rate illustrated here calculates that proportion of the Grade-12 students enrolled on September 30 who should, by reason of their previous success, and given normal progress through Grade 12, actually graduate with their class. A substantial difference in this outcome

Chart 4: Graduation Rates



based on gender is, for this reason, puzzling. Why are boys dropping out in their final year at a rate significantly greater than are girls?¹⁶

Languages for Girls; Physics for Boys

To what extent do our schools successfully encourage students to participate in important subject areas not traditionally popular with their gender? To answer this question we looked at by-gender enrollment over time in Grade-11 Physics, traditionally shunned by girls, and Grade-11 second-language studies, a subject area in which boys are routinely under-represented. We chose these two subjects because we believe that both have considerable value to students regardless of their post-secondary ambitions. Thus, they are not—or should not—be of interest solely to students anticipating entrance to university after high school.

Chart 5: Enrollment (%) in a Second Grade-11 Language



Chart 5 compares the percentage of boys and girls taking a Grade-11 language course. It shows the proportion of students enrolled in languages for the six school years. Female enrollment in languages is consistently between 15 and 20 percentage points higher than male enrollment.

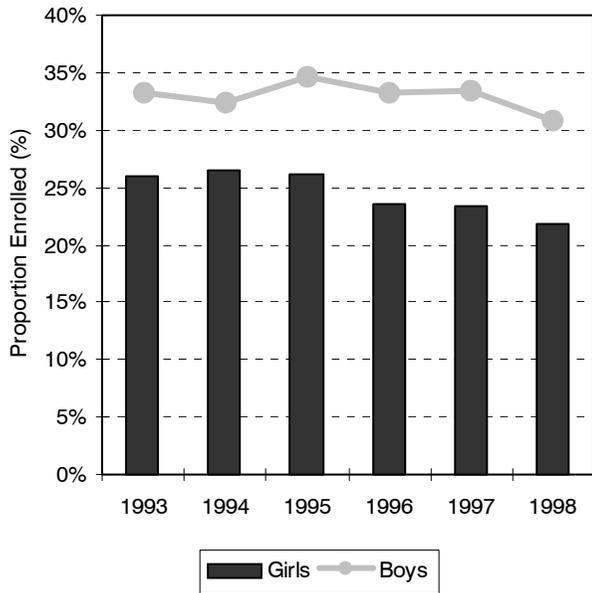
Chart 6 compares the percentage of boys and girls taking Physics 11. Across the province, despite nearly a decade of effort to encourage more girls to become involved in the sciences generally, female enrollment in Physics 11 is actually decreasing.

In short, there appears to have been no significant move toward enrollment parity in these two important subject areas.

While we agree that in those schools where a variety of courses are offered, their selection is each student's responsibility, we offer these

¹⁶ While boys still trail girls in their rate of graduation, the difference has decreased during the study period. In fact, both genders have enjoyed a significant increase in their graduation rates. System-wide improvement of this size and speed is rare enough to warrant further study. We hope that this race toward a perfect graduation rate reflects increased learning success rather than extensive grade inflation at the school level.

Chart 6: Enrollment (%) in Physics 11



observations as a stimulus for discussion. What role can and should schools play in equalizing the by-gender enrollment in these and other subject areas? It may be that, with more effective counselling and class design, students would select courses because of desired educational outcomes rather than on perceptions of gender appropriateness.

Significant Differences in Academic Performance Remain

It is apparent that, across the province, there are important differences between the academic outcomes of girls and boys. In the following pages, we propose a measure of school performance that will enable us to rate the schools with respect to academic gender balance. The accompanying school-performance tables tell us that in some schools those differences are smaller, in others, greater. For those who believe that all students should be enabled to succeed without being limited by their gender, we provide quantitative evidence that effective practices are being used in some British Columbian schools. It appears that some administrators, teachers, and counsellors may have found more effective means of taking into account gender differences in their school organization, lesson plans, and teaching styles. Those who have found successful techniques will score highly on this new rating. For those who are not aware of the gender-linked differentials in their schools, we provide some evidence to help them recognize the issue and assess their practices. In either case, the results of this study will be of value to parents who, along with their students, have a vital interest in the continued improvement of our schools.

How the Schools Are Measured

While this study adopts the general design of The Fraser Institute's *A Secondary Schools Report Card for British Columbia* and *The 1999 Report Card on British Columbia's Secondary Schools*, our task here is to produce a rating on a single parameter—we call it “academic gender balance”—whereas in the report card, we produced an overall academic rating. Relevant data from British Columbia's Ministry of Education are used to produce a number of indicators of school performance that are then combined into an overall school rating. The indicators are defined as follows.

Provincial Examination Mark

This indicator calculates the difference, in percentage points, between the provincial examination results achieved by male and female students in English 12 and Mathematics 12.¹⁷ It measures the extent to which the school enables students of both genders to master the curriculum and is derived by subtracting the average examination mark (in percent) for males from the corresponding mark for females.

For example, at Pacific Academy in Surrey, the average examination mark for English 12 achieved by female students in 1992/1993 was 73.9 percent. The corresponding mark for male students was 72.5 percent. The value reported for Pacific Academy on this indicator is thus 73.9 percent minus 72.5 percent, or positive 1.4 percent.

Even a seemingly small difference such as this is important because it represents a difference of one letter grade. The girls in the example obtained, on average, a B; the boys, a C+. Differences in letter grades are especially significant in circumstances such as certain post-secondary applications for admission and scholarships where a student's Grade Point Average (based on the letter grade) is considered.

Percentage of Provincial Examinations Failed

This indicator determines the difference in percentage points between the failure rates of girls and boys writing provincial examinations in English 12 and Mathematics 12 (failure rate = percentage of examinations written that were assessed a failing grade). Using these indicators, we can determine whether the school's teachers have helped all students to achieve at least a pass-level standard of subject mastery. The indicators are derived by subtracting the failure rate (in percent) for boys from the corresponding failure rate for girls.

For example, at Duchess Park Secondary, the failure rate for girls taking Mathematics 12 in 1997/1998 was 31.5 percent. The corresponding rate for male students was 22.6 percent. The value reported for Duchess Park Secondary on this indicator is, therefore, 31.5 percent minus 22.6 percent or positive 8.9 percent.

¹⁷ English 12 and Mathematics 12 are used in the indicators because, since they are the two most frequently written provincial examinations (accounting for 44 percent of all examinations written during the study period), virtually all schools have reportable results for both genders.

To put the result another way, for the year 1997/1998, of a group of 100 female students at Duchess Park, about 32 would fail the Mathematics-12 examination. Of a group of 100 male students, only about 23 would fail the same examination.

Difference between Examination Mark and School Mark

This indicator compares each gender's average provincial examination mark with its average school mark (derived from school-based assessments) for English 12 and Mathematics 12. We expect school marks to provide information about a student's mastery of the subject. This indicator shows whether this objective is successfully met for both genders. It is derived by first subtracting the average examination mark for female students from their average school mark in the same subject; then by making the same calculation for male students. Finally, the difference between the average school mark and the average examination mark of the boys is subtracted from the difference between the average school mark and the average examination mark of the girls.

For example, during 1994/1995, the female students at Killarney Secondary in Vancouver averaged 68.38 percent (C+) on school marks for English 12 and 63.20 percent (C) on their examination marks—a difference of 5.18 percent and one letter grade. On the other hand, the male students received an average school mark of 64.12 percent (C) and 60.07 percent (C) on the examination—a difference of 4.05 percent and no difference in average letter grade. Comparing the two, we see that girls at Killarney received higher school marks relative to their examination scores—by 1.1 percent—than did boys. This value appears in Killarney's results table.

Graduation Rate

This indicator compares by-gender graduation rates. It will reveal any differences in the success that counselling staff may have in encouraging boys and girls to complete their studies on time. The particular graduation statistic used is the same as that described on page 10 above.

For example, at Courtenay's Highland Secondary in 1995/1996, 90.9 percent of the female potential graduates graduated on schedule, while only 80.2 percent of their male counterparts were similarly successful. The difference 10.7 percent is shown in Highland's results table.

Academic Gender Balance Rating

While each of the indicators reflects a single aspect of the academic gender balance prevailing at the school, the combined indicators produce a more complete picture. We have developed an overall rating using the same technique as that employed in *A Secondary Schools Report Card for British Columbia* and *The 1999 Report Card on British Columbia's Secondary Schools*.

We determined each school's overall academic gender balance as follows:

- 1 For each of the three indicators based on the provincial examinations (average provincial examination mark, percentage of provincial examinations failed, and difference between examination mark and school mark), the results for English 12 and Mathematics 12 were combined.
- 2 For all four indicators, each annual result was converted into a score out of 10 using the following procedure. Results for the base-year (1992/1993) were sorted from lowest to highest (from greatest gender balance

to least) and divided into 10 ranges. Each range was assigned a score between 10 and 1: the range that included the lowest (least gender imbalance) results was given a 10; the next range, a 9; and so on. The results from all years were then assigned the number score corresponding to the range of values into which each fell. The resulting scores track school performance versus a constant (base-year) value. (It is important to notice that this technique allows all schools to improve their score over time.)

- 3 The four indices for each year were then averaged to produce an annual rating of academic gender balance for each school.

This overall rating answers the question, “All things considered, how is the school doing in terms of academic gender balance?” A full explanation of the conversion of the results to the overall rating is provided in the section, *Details of the Academic Gender Balance Rating*, on page 24.

Reading the Tables

At the bottom of this page, there is an example (table for Kelowna Secondary School) of the tables to be found in this report. The first line of the table lists the school’s name, its affiliation—public or independent school—and its Grade-12 enrollment as of September 30 of the school year

1997/1998. Note that the smaller the enrollment, the less reliable the results.

The school’s results for the six years are detailed in the body of the table. All numbers except the overall rating at the bottom are percentage points. (In all cases, the theoretically perfect—and seldom obtained—value is zero.) The higher the number, the greater is the imbalance between the results for boys and girls. Where the imbalance favours female students, the result is presented using white numbers on a black background; where the imbalance favours male students, the result is presented using black numbers on a white background. Where gender balance is achieved a value of 0.0 appears against a grey background. In those cases where data is not available, “NA” appears on the same gray background. The overall rating at the bottom of the chart is the school’s academic gender balance rating for the year; the highest possible value is 10.

The table offers a wealth of detail. In the example, the result that jumps out of the table is that 31 results favour the school’s female students and just 9 favour male students. Reflecting the general result, girls have benefited from higher school marks relative to examination marks in both courses, in all years. On the plus side, these differences are relatively small. The graduation rate, on the other hand, consistently and quite strongly favours the girls. As is the case in a great many schools, there is substantial variation in the

KELOWNA SECONDARY

Gender Differences in percentage points

English 12 Provincial exam mark
 Percentage of provincial exams failed
 School mark-exam mark difference
 Math 12 Provincial exam mark
 Percentage of provincial exams failed
 School mark-exam mark difference

Graduation rate
 Overall rating out of 10

		Grade 12 Enrollment 375					
		1993	1994	1995	1996	1997	1998
English 12 Provincial exam mark		4.4	2.4	0.9	3.4	2.5	3.1
Percentage of provincial exams failed		0.0	4.3	0.3	1.5	1.1	1.4
School mark-exam mark difference		0.7	2.7	1.5	0.2	2.0	1.5
Math 12 Provincial exam mark		3.7	0.4	1.0	1.4	2.5	0.4
Percentage of provincial exams failed		5.4	0.4	3.4	7.1	0.0	0.8
School mark-exam mark difference		2.6	1.5	4.3	2.5	1.1	0.4
Graduation rate		5.0	10.0	0.6	8.3	4.9	5.8
Overall rating out of 10		7.8	7.8	9.0	7.3	8.8	9.0

results across the years and across indicators. Study of the individual indicators will suggest the areas that are most in need of improvement.

Finally, the overall ratings at the bottom of the table give us an overview of the school's academic gender balance over time. Kelowna scored very well in 1997/1998 compared to other schools (seventh out of 228 schools) and has maintained a high overall rating over the six-year period.

In the interests of fairness and reliability, not all of the province's secondary schools could be included in the survey. Excluded are schools at which the Grade-12 enrollment is fewer than 50 students; centres for adult education and continuing education; schools that cater solely or largely to non-resident foreign students; certain alternative schools not offering a full program of courses; and, schools not offering a co-educational program. All other secondary schools are included.

Significant Findings

Our analysis of both the overall provincial data and the individual school results suggests two overriding conclusions.

First, we can see no evidence that a concerted effort exists in our secondary schools to ensure that the special educational needs of both male and female students are routinely being met. This general conclusion is supported by the following specific findings.

- 1 From the provincial data above, it is clear that in British Columbia's schools there is a substantial difference between the academic performance of boys and that of girls.
- 2 These data indicate that there has been no significant reduction across the province in gender-based differences reflected by five of the seven individual indicators during the six years studied. We did note a relatively small (but statistically significant) improvement in the indicator showing the difference between the Mathematics 12 Examination Mark and the Mathematics 12 School Mark. There was also a substantial improvement in the Graduation rate results.
- 3 The differences described by each indicator vary from school to school over a considerable range of values.
- 4 Within individual schools the differences described by the indicators vary considerably both among indicators and over time.

Second, where an assessment is made at the school, girls, on average, do better than boys. This difference is so pervasive as to suggest that there is a structural bias in favour of girls in the design and practice of school-based assessment.

Some of the implications of these findings are discussed below.

What Does the School Mark Actually Measure?

One of the indicators used in *A Secondary Schools Report Card for British Columbia* and *The 1999 Report Card on British Columbia's Secondary Schools* (and included in the present work) reflects the difference between the average examination mark obtained by the school's students and their corresponding school mark.¹⁸ The school mark is the accumulation of school-based assessments of work undertaken by the student during the year. It is our belief that this school mark should serve the students as a gauge of their progress through the course material. We contend that a student who consistently performs school work at a B level should reasonably expect to be sufficiently prepared to achieve a B on the final examination. The calculation of the difference between the two marks provides a reasonable measure of the school's effectiveness in providing an accurate feedback mechanism to its students.

¹⁸ The two courses from which data is used for this study are Grade-12 level provincially examinable courses. The Ministry of Education determines the final mark for each student in the course by combining the examination mark (worth 40 percent of the total) with the school mark provided by the school (worth 60 percent of the total). The Ministry does not release any student's examination mark prior to receipt from the school of the school mark.

Our use of this measure in *A Secondary Schools Report Card for British Columbia* and *The 1999 Report Card on British Columbia's Secondary Schools* prompted some commentators to assert that, since the school mark measured quite different aspects of the curriculum than did the examination mark, to compare them was not reasonable. Following this argument, one would expect that the average differences between the school and examination percentages would vary but one would also expect that the differences would be distributed around a mean approximating zero. Thus, in some schools, in some subjects, the school mark would exceed the examination mark while, in other schools, the reverse would be true. This is not the case. Average school marks tend to exceed average examination marks in all circumstances. For instance, overall, for English and Mathematics, average school marks exceeded the corresponding examination mark in 78 percent of the recorded instances.

There is some indication in the research that, in general, “girls tend to do better on essays and coursework requiring constant application, boys on multiple-choice questions and examinations, requiring occasional bouts of hard work.”¹⁹ However, it is unlikely that this tendency alone would account for the present study’s finding that, for girls in Mathematics—not a subject in which students are overwhelmed with essay work or oral presentations—the average school mark exceeded the average examination mark in 91 percent of the recorded instances.

Our current study suggests a new dimension in the question of school mark versus examination mark. As noted above, there appears to be sys-

tematic bias favouring female students in school-based assessments. In English 12, the difference between the average school mark and the average examination mark was greater for females than for males 76 percent of the time in schools with Grade-12 enrollments larger than 50.²⁰ In Mathematics 12, females were favoured to an even greater extent—in 81 percent of the instances. This prompts the question: what are school-based results measuring? Do they reflect mastery of the subject matter, work habits, attendance, behaviour, or some other characteristic of student activity? What is their purpose, and what is their value? Since it is not clear what it attempts to measure, we believe that a thorough review of the school-based assessment system in provincially examinable Grade-12 courses is in order.

Why Do More Boys Give Up in Grade 12?

The difference in graduation rates of boys and girls is particularly disturbing. A failure to graduate means that a student who is fully prepared to complete secondary studies at the beginning of the Grade-12 year, yet fails to graduate with his or her class. *Seventy-four percent of the school measurements taken in this study showed higher graduation rates for females.*

Given the considerable cost in wasted student time and educational resources that this failure to graduate represents, we feel that those schools not doing well in this area should make a concerted effort to identify and address the causes.

19 *Gendered Discourse in the Foreign Language Classroom: Teacher-Student and Student-Teacher Talk, and the Social Construction of Children's Femininities and Masculinities*. Jane Sunderland, unpublished PhD dissertation, University of Lancaster, Department of Linguistics and Modern English Language, 1998. Paragraph 1.1.5.4, quoted in personal communication.

20 Since, in schools with low enrollment, there is increased variability that may not be the result of practice in teaching or counselling but of the arithmetic of small numbers, we have limited our discussion here and in the following sections to the results of the larger schools.

However, as we noted in footnote 16, graduation regardless of the level of subject mastery achieved helps neither the student nor those attempting to interpret the transcript.

Female Strength in English 12

Because of the strength and consistency of these results, we suggest that two questions should be considered. First, do these results reflect a meaningful difference in communication skills between the genders? By way of confirmation, it might be useful to examine the by-gender results of the Language Proficiency Index (LPI), a test administered by the University of British Colum-

bia and other post-secondary institutions to most of their incoming freshmen to determine students' ability to communicate in written English. Second, what can be learned from the practice and experience of the English programs in those schools where the differential is relatively less significant? Are there teaching practices that are successful in raising boys to the performance levels measured for girls?

The previously cited PLAP reading and writing assessments suggest that the results presented here reflect the inability of the education system to correct, in the senior years, failures that become apparent as early as Grade 4.

Why Do Girls and Boys Achieve Different Results?

What are the reasons for the differences we have discovered? Are girls simply smarter? Is academic success predetermined at birth? Do certain aspects of culture and society assist or retard learning among children of one or both genders? Is it girls or boys who suffer most from poor or misguided pedagogical practice or school organization? Are girls more able or willing to “play the game” in order to maximize their post-secondary opportunities?

Equally as important, can good teaching and counselling overcome such differences or deficiencies as may be native to each of the genders?

Basic questions remain regarding the existence, nature, and strength of gender-based differences in learning ability. For example, in much of the research on second language learning, uncertainty seems to be the only constant.

Graeme Hirst reviews the research on innate gender differences in linguistic ability in a 1982 paper. His concluding statement indicates the state of confusion surrounding attempts to uncover such differences.

We have seen that there *may* be sex differences in both linguistic ability and functional brain lateralization, and the two *may* be causally related. If the differences do exist, they *may* be related more to handedness than sex and *may* be influenced by hormonal activity, or correlated with age of matu-

rity, or *may* perhaps be mostly induced by social factors.²¹

Rafik Loulidi weighs in with a catalogue of possible gender-based attitudinal and socio-cultural causes for differential success in language learning. Among the more unusual of the hypotheses is this (regarding England’s most widely taught second language):

It is true that in the popular imagination French is usually associated with fine wines, good cooking, haute couture, and luxurious perfumes—all either “domestic” or “feminine” in orientation . . . This, it has been suggested, may be seen by boys as incompatible with their emerging masculinity.²²

In a brief paper published in 1983, David Cross reports on his own experiment on differences between achievement by boys and by girls in language classes.²³ Cross found that where some of the language teachers were male, boys—who generally do not do as well in this area—performed at levels equal to, or higher than, girls. He suggests that this may in part be attributable to differing attitudes of boys toward teachers of the two genders.

Finally, Rebecca Oxford suggests that success as a language learner results from the application of specific learning strategies that can be adopted by the learner. She notes that, “research has repeatedly shown that the conscious, tailored

21 An Evaluation of Evidence for Innate Sex Differences in Linguistic Ability. Graeme Hirst, *Journal of Psycholinguistic Research* 11, 2 (1982), pp.95–113 at p. 110.

22 Is Language Learning Really a Female Business? R. Loulidi, *Language Learning Journal* 1 (1990), pp. 40–43 at p. 41.

23 Sex Differences in Achievement. David Cross, *System* 11, 2 (1983), pp. 159–62.

use of such strategies is related to language achievement and proficiency."²⁴

At least in this area of learning, differentials in outcomes between the genders have a wide range of suggested causes, each of which, independently, may not be of significance, but, taken together, can generate startling results. If such differences, regardless of their origin, do exist, is there anything that schools can do to mitigate their influence on students' achievement? It seems clear that the answer is yes. There is little in the literature to suggest that the genders are fated to perform at any pre-determined level. In their comprehensive research review, *The Psychology of Sex Differences*, Eleanor Maccoby and Carol Jacklin, write,

All the abilities discussed in this chapter [verbal, mathematical, spatial, and conceptual skills] improve with age, from early childhood to adulthood. Our educational institutions are dedicated to the proposition that these changes are not entirely (or even primarily) a result of simple maturation—that verbal, mathematical, spatial, and conceptual skills can be taught, and indeed if they are not taught, they will probably not be learned to an adequate level of proficiency. This is not to say that success in teaching is independent of a child's already-developed readiness to learn a given task, or that success in training does not depend upon genetic factors (including those controlling maturation) and previous learning. However, if any group of children have not acquired certain intellectual skills that other

children of their age possess, there is a reasonable presumption that at least part of the problem lies in deficiencies in the teaching they have received.²⁵

Successful teaching recognizes that individuals and groups of individuals come to their academic studies with differences that, if not attended to, may result in differential success. In those schools where attention is paid to these differences, the gap in achievement between girls and boys will be smaller.

It is not just in academic results where confusion exists regarding the bases of gender-related differences in behavioural patterns. As we shall see below, one can predict with some accuracy that more boys than girls will choose physics in the senior secondary years. Similarly, more girls than boys will choose to begin or continue their study of second languages. Is this in the genes? Is it a result of boys being brought up differently from girls?

In a study using the theory of planned behaviour to predict the enrollment intentions of secondary school students, F.E. Crawley and Carole B. Black concluded the following:

Of particular interest is the finding that gender does not have a significant impact on the personal beliefs that students form about the consequences of enrolling in physics. Personal beliefs are instrumental in the formation of students attitude toward physics enrollment, which in turn influences their enrollment intentions.²⁶

24 Language Learning Strategies: An Update. Rebecca Oxford. Digital document: www.ed.gov/databases/ERIC_Digests/ed376707.html (May 3, 1999). ERIC [Educational Resources Information Center] Clearinghouse on Languages and Linguistics, Washington, DC.

25 *The Psychology of Sex Differences*. Eleanor Emmons Maccoby and Carol Nagy Jacklin, Stanford, CA: Stanford University Press, 1975, p. 127.

26 Causal Modeling of Secondary Science Students' Intentions to Enroll in Physics. Frank E. Crawley and Carolyn B. Black, *Journal of Research in Science Teaching* 29, 6 (1992), pp. 585–99, 1992, at p. 595.

They note, however, that this result “contrasts sharply with the gender differences in physics preference and choice reported by Ormerod and Duckworth.”²⁷ The latter extensively review post-war research results and present a wide range of possible reasons for the male domination of the study of the physical sciences—and physics in particular—in England during the 1970s. Of particular interest is the observation— noted by a number of researchers—that in co-educational situations, the boys and girls become polarized in their choice of courses. Ormerod and Duckworth, citing other research, noted that

in such co-educational situations, “one sex—girls in the case of physics; boys in the case of French— became discouraged in the presence of the other gender by their superior performance.”²⁸ Such polarization tends to make each gender avoid further contact with the offending subject area.

Crawley and Black conclude with a detailed discussion of the remedial action that school counsellors and administrators can take to ensure that enrollment behaviour is characterized by more rational decision-making.

²⁷ *Pupils Attitudes to Science*. M.B. Ormerod and D. Duckworth, Windsor, UK: NFER Publishing, 1975.

²⁸ *Pupils Attitudes to Science*, p. 66.

Conclusion

Our findings suggest that the province's schools have great potential for improvement in the extent to which they enable learners of both genders to perform at their potential. There is scant evidence that this challenge has even been recognized, let alone accepted, by those operating the great majority of our province's schools. We encourage parents, teachers, counsellors, and school administrators to join in the design and implementation of plans to improve this essential aspect of school performance.

To provide a benchmark against which annual progress can be measured, we will include the gender balance performance indicator in future editions of The Fraser Institute's report card on secondary schools in British Columbia. We will look for a greater degree of continuity of result within schools, less variation between schools, and a general trend toward academic gender balance throughout the system.

Details of the Academic Gender Balance Rating

For the purposes of this explanation, the indicators will be identified by a digit as follows:

- 1 English 12: provincial examination mark
- 2 English 12: percentage of provincial examinations failed
- 3 English 12: difference between school mark and examination mark
- 4 Mathematics 12: provincial examination mark
- 5 Mathematics 12: percentage of provincial examinations failed
- 6 Mathematics 12: difference between school mark and examination mark
- 7 Graduation Rate

The Academic Gender Balance rating is derived as follows.

(A) For each school, for each year, six of the seven results were combined into four indicators, where I is the result identified by its subscript numeral, which refers to one of the seven indicators listed above.

$$1 \text{ SUM}(\text{ABS}(I_1) + \text{ABS}(I_4))$$

$$2 \text{ SUM}(\text{ABS}(I_2) + \text{ABS}(I_5))$$

$$3 \text{ SUM}(\text{ABS}(I_3) + \text{ABS}(I_6))$$

4 The absolute value of the Graduation Rate indicator $\text{ABS}(I_7)$ was calculated.

(B) For each of the four indicators produced by Step A above, the absolute values for the base year (school year 1992/1993) were sorted from lowest to highest and divided into groups of 10. Thus, 10 ranges of values were established (see below) and each range was assigned a score out of 10. Note that in all cases as the indicator gets higher—that is the school's performance deviates farther from gender balance—the score gets lower.

(C) The indicator values from all years are converted into a score out of 10 based on the range into which each falls. Note that in subsequent years, a school will get a score of 0 when its indicator value falls above the highest base year value contained in the range table.

(D) Finally, the four indicators are averaged to produce the overall Academic Gender Balance rating. Where less than four indicator values are available, no overall rating is calculated.

Range Score	Indicator: value noted is the highest that will receive the range score listed.			
	$\text{ABS}(I_1) + \text{ABS}(I_4)$	$\text{ABS}(I_2) + \text{ABS}(I_5)$	$\text{ABS}(I_3) + \text{ABS}(I_6)$	$\text{ABS}(I_7)$
10	4.7	4.4	2.8	1.1
9	5.7	5.5	3.8	2.4
8	6.6	7.3	4.7	3.7
7	7.6	10.7	5.5	5.0
6	8.3	12.8	6.3	6.7
5	9.2	15.1	7.6	8.1
4	10.3	18.4	8.2	10.4
3	11.8	24.2	9.9	12.9
2	15.1	30.8	12.4	19.2
1	23.6	60.8	26.5	44.4