HOW CAN ABORIGINAL BOYS BE HELPED TO DO BETTER IN SCHOOL?

by

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Abstract

This study analyses obstacles to aboriginal attainment in the BC K-12 system. Among the causes of the relatively poor performance of aboriginal children are several which would be addressed by the development of magnet schools specialising in a culturally-resonant ethos, curriculum, instructional techniques, and institutional structure. Though such schools risk intensifying negative peer externalities which are found to help explain underachievement, they promise to be effective on balance. Initiatives to mitigate adverse educational consequences of the high mobility of the aboriginal population are also recommended.

Aboriginal boys tend to fare worse than girls. The sources of the gender gap are investigated, with a view to enriching policy interventions to improve aboriginal education outcomes. The implications of an early male disadvantage in literacy suggest a key intervention point. Limited gender segregation appears a promising means of narrowing the gender gap.
Executive Summary

The poor educational outcomes that characterise Canada’s growing aboriginal population present an urgent problem for public policymakers. In British Columbia, only 46 percent of aboriginal learners graduate from public school within six years of entering Grade 8, compared to 81 percent of non-aboriginal learners. This study surveys the extent of such disparities (Part 1) and explores their causes (Part 2) in order to identify policy initiatives that promise appreciable improvements, in the context of BC’s K-12 education system (Parts 3 and 4).

Much of the gap is attributable to structural conditioners – parental education levels, family structure, economic engagement, income, health and so on – which education policy has limited power to address. A prominent exception is the relatively high mobility of aboriginal families, which adversely affects academic engagement and achievement. A ‘Mobile Learning’ strategy might respond to this obstacle by providing aboriginal students with laptops and connectivity, and by building a distance learning infrastructure that can sustain instruction and monitor engagement. The outline of such a strategy is developed. A parallel response is to break the link between residential address and school assignment. Magnet schools could promote continuous attendance by creating incentives (presently lacking despite limited provision for open boundaries) for parents and institutions to pursue or facilitate it.

Magnet schools, which are mandated to specialise in a culturally-resonant curriculum, foster a culturally-congruent ethos, and implement culturally-appropriate instructional techniques and organisational structure, are also suggested by the contribution to the education gap made by cultural ‘discontinuities’. While the public system is making a sincere effort to acknowledge and incorporate the importance of culturally-based education, there is a limit to how much more it can realistically accomplish. Dedicated institutions are better placed to implement further genuine cultural enrichment and build a sense of communal ownership and participation.

In this respect, magnet schools also respond to the relatively low parental engagement of aboriginal parents in their children’s education. Low parental engagement is found to be an important source of underachievement in its own right. Historical and cultural reasons for it are identified. The potential to mitigate it of the expanded parental choice and cultural congruence
represented by magnet schools is superior to the status quo framework, with the proviso that obstacles to the genuine exercise of choice, such as transportation, are neutralised.

Compelling evidence is presented that suggests that students do better when matched with teachers that share their ethnicity. By concentrating aboriginal students together, magnet schools permit the maximisation of teacher-student matching potential given existing human resource constraints. However, analysis of Foundation Skills Assessment data yields the finding that aboriginal students do significantly worse in school the greater a share of the student body they constitute. Other things, equal, therefore, the distribution of aboriginal students across neighbourhood schools appears preferable. However, in light of the other factors in underachievement, the active designation and development of magnet schools is on balance to be recommended.

The option of creating a separate, dedicated governance institution to support specialised schools is considered, but rejected as functionally redundant. As long as magnet schools – or any schools with significant aboriginal populations – are empowered to govern their affairs with greater local discretion and parental input than is presently provided for, the advantages of a separate aboriginal authority are found to be outweighed by the disadvantages.

This study also examines the causes of the educational gender gap. 82 per cent of girls, but only 75 per cent of boys, graduate from BC public schools within six years of entering Grade 8. Since aboriginal boys exhibit the poorest outcomes of virtually any distinguishable demographic category, it would be valuable to ensure that efforts to improve aboriginal outcomes are enriched by an understanding of the causes of male underachievement. The complex interaction of differential maturation rates (especially with respect to acquisition of literacy skills), differential sensitivity to prior performance, differential interest in and aptitude for common instructional materials and techniques, and the group socialisation enforced by peers, lead to the recommendation that BC accelerate experimentation with gender segregation on a limited scale – at early ages, and for certain specific subjects only.
Acknowledgements

Doug McArthur provided excellent supervision and many useful suggestions. He sparked my interest in these important matters and supported my research. John Richards has made a substantial contribution to the field; he offered many valuable ideas, entertained many helpful discussions, and was always available for consultation. The BC Ministry of Education extends admirable access to researchers, from which I benefitted. Barry Anderson at the Ministry was kind enough to discuss the issues with me at length. Charles Ungerleider was generous with his time and insights. Jane Friesen delivered a timely and incisive course in education policy. I thank them all. Whatever is useful in what follows owes much to their assistance. Whatever is not so useful is entirely the responsibility of the author.
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1 Two challenges for education policy

1.1 Purpose and scope

Aboriginal students fare significantly worse in school than non-aboriginal students, in British Columbia as in Canada generally. Appreciation of the serious implications of this problem has renewed political determination to address it. The primary purpose of this study is to construct and evaluate options for doing so in light of theory and evidence on the causes of aboriginal underachievement.

A separate concern in contemporary education policy is the fact that boys are not succeeding in school at the same levels as girls. A complementary purpose of this study is to determine whether interventions to address aboriginal underachievement might ‘add value’, by incorporating promising practices for boosting the attainment of boys. Aboriginal boys are subject to a ‘double gap’, exhibiting the poorest educational profile of virtually any distinguishable demographic category. The momentum behind a reconstruction of aboriginal education policy may present an opportunity to tackle the problem of male underachievement.

How can initiatives to help aboriginal children succeed in school, and any new institutional arrangements they might entail, be organised to maximise the achievement of aboriginal boys? While the relative underperformance of boys is an important issue, however, it is secondary in this discussion to the separate problem of the poor outcomes of aboriginal students generally.

The study is concerned with education policy in BC specifically, and the BC Ministry of Education is its intended beneficiary. Although the province has an interest in the educational attainment of all reserve children, the Ministry is not responsible for those who attend reserve schools operated by band councils under devolved federal jurisdiction. Policy to improve their educational prospects therefore does not fall within the present remit.

The focus is on K-12 exclusively. This is not to deny that problems surround the experience of aboriginal students in post-secondary education, but those are a separate set of challenges, and the performance of school-age children merits a detailed and dedicated focus. Also, while remediation and job training for young adults may be a component of any broad
strategy to enhance the educational qualifications and workforce readiness of young aboriginal people, they are beyond the scope of this project.

The aboriginal category encompasses a variety of populations that do not necessarily share the same educational profile, or face the same barriers to success. There is enormous variation in the attainment of ‘aboriginal’ students (Hallett, 2005), undermining the diagnostic value of the category. Idiosyncratic churn in self-reporting, and ‘ethnic mobility’ since Bill C-31, also suggest that the category may be approaching the point where it has outlived its usefulness to policymakers. However, many of the problems identified are pertinent across the different sub-populations embraced by the aboriginal category – sufficiently so that there is still some value in continuing to improve our understanding of them, and of the policy responses they might invite. In any case, the aboriginal population must unavoidably be treated as a whole entity in most of what follows, as this is the frame currently adopted by the Ministry for operational purposes.

The remainder of Part 1 illustrates the scale of the problems and explains why they constitute a legitimate and urgent policy concern. Part 2 adduces the relevant literature to explore the causes of the problems. Determinants of underachievement that appear most amenable to manipulation by education policy are identified, and their impact quantified where possible, with an emphasis on empirical research. That investigation is supplemented with original analysis of performance data from BC schools. Part 3 identifies the priorities that should be served by policy development, and Part 4 identifies a range of potentially responsive policies. The appropriate criteria against which to assess these are considered, and the alternatives analysed accordingly.

1.2 What do successful education policies succeed in doing?

1.2.1 Measuring success

The stated mission of the BC Ministry of Education 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.’ A conspicuous measure of the system’s success is the proportion of students graduating successfully from high school. A pre-eminent goal of education policy is to equip students with the certificate

---

1 Some differences between Métis and ‘North American Indian’ populations, and different characteristics of the latter according to whether they live on- or off-reserve, are surveyed to provide some insight at the very broadest level into the variation within the ‘aboriginal’ category, which is difficult to illustrate in finer grain with publicly available data. The ‘North American Indian’ population, as specified by the census, will henceforth be denoted as ‘First Nations’.
that opens up post-secondary opportunities and sends an important signal to employers that the appropriate ‘knowledge, skills and attitudes’ are in place.

The time students take to complete their schooling is also relevant, both directly, because of the cost to the system of failing to progress students and the cost to the student of postponing school-leaving, and indirectly, because retention-in-grade is associated with a greater likelihood of dropping out. Rate of progress also provides an insight into learners’ sense of inclusion in and engagement with the school environment, and mastery of the curriculum.

The quality of graduating records, which partly determines the range of post-secondary options realistically available, is another important component, measurable by the number and type of provincially-examinable courses taken and by levels of attainment in those courses.

Skills assessments, conducted in BC at Grades 4 and 7 (and, prior to 2003/04, at Grade 10), primarily serve an informational purpose, alerting students, parents, teachers, administrators, and superintendents to potential problem areas. They create an accountability mechanism: performance measurement helps track the quality of education children are receiving. Improved school quality, as observable in test scores, should translate into greater completion rates, with stronger qualifications. Tests, like transition through grades, are also strong predictors of future educational attainment (and beyond that, of income). Though these correlations are partly an endogenous function of the cognitive endowment tests measure, achieving higher scores may also directly lower drop out rates by encouraging students to persist – persuading them, effectively, that their investment will pay off in ultimate success.

The objectives of education policy can therefore be described, for evaluation purposes, in terms of: increasing school completion rates (or, conversely, decreasing drop-out rates);

---

2 Close to two-thirds of students who start secondary school at least one year late do not complete it, and such students account for half of all secondary school drop-outs (Brais, 1991). 33 per cent of eventual drop-outs, but only six per cent of completers, were retained in grade in elementary school (Bowlby & McMullen, 2002). Timely progress indicates underlying conditions that also make dropping out more likely but may also contribute materially to the increased drop-out risk, for example by engendering frustration or fixing expectations.

3 13 per cent of eventual drop-outs, versus 42 per cent of school completers, average A grades through high school; 14 per cent of drop-outs, versus two per cent of completers, average D grades (Bowlby & McMullen, 2002).

4 Hanushek (2002a) cites multiple studies that ‘find that the earnings advantages to higher achievement on standardized tests are quite substantial’; they also have ‘a dramatic impact on productivity and national growth rates’ (p.2). According to Lazear (2003), when test scores are ‘increased between eighth and twelfth grades, there is a direct positive effect on earnings. For every one-tenth of a standard deviation increase in [test scores]... there is an increase in earnings of about 1.2 percent per year’ (p.190).

5 Lazear (2003) finds strong evidence of a causal connection. Hanushek (2002a) reviews literature confirming ‘a causal relationship ... part of the return to school quality comes through continuation in school. There is substantial United States evidence that students who do better in school, either through grades or scores on standardized achievement tests, tend to go farther in school ... individual achievement scores are highly correlated with school attendance’ and there are ‘strong achievement effects on both continuation into college and quality of college ... the effects are larger when proper account is taken of the endogeneity of achievement’ (p.12).
accelerating progress through grades, for students that tend to fall behind; increasing participation
and attainment in provincially-examinable courses; and raising test scores. These objectives are
outlined here to validate the indicators selected for examination in what follows.

1.2.2 Relative versus absolute improvements

Education levels inform employers about prospective productivity relative to peers. If
that were all they did, efforts to improve everyone’s level might seem misplaced: if no-one’s
relative position changes, no real difference is made. But it is plausible that K-12 education is
genuinely productive of human capital. It is beyond the scope of this study to determine how
much of the observed return to high school completion reflects a signalling function, as opposed
to the formation of human capital. It is assumed that K-12 education is more than an expensive
sorting/signalling mechanism, and adds real value in terms of skills, knowledge and attitudes, so
that raising levels of educational attainment as widely as possible is the proper and valuable goal
of education policy.\(^6\)

However the concern of this study is to identify ways to improve the achievement of
certain sub-groups of learners, not that of the whole student body. That concern ought to be
clarified. Are we to target the achievement gaps between different groups of learners, or the
absolute levels of achievement of the ‘underperforming’ group? The answer is, a balance of both.
For the Council of Ministers of Education (CESC, 2003), a ‘key indicator of educational progress
in Canada is the extent to which schools can attain high achievement levels while at the same
time eliminating achievement gaps between various sub-groups of students’ (p.85).

In the case of the gender gap, the disparity is not in and of itself an object of concern.
Rather, it highlights possibilities for improvement: gaps draw attention to areas where gains can
be secured. Though helping boys do better is the objective, it need not be distressing if efforts to
that end happen to have the practical effect of also helping girls do better, such that the gap
persists – even if an effect is that girls do even better, so that the gap inflates.\(^7\)

In the case of the aboriginal/non-aboriginal disparity, unequal outcomes are arguably a
legitimate source of policy concern in their own right. It is desirable, primarily, to improve

\(^6\) In a global labour market, even if everyone in BC remains equally well-placed to benefit from their educational
attainment, relatively-speaking, after a hypothetical improvement of everyone’s attainment, they are better-placed
compared to people elsewhere.

\(^7\) As Younger and Warrington (2005) observe, ‘[w]hat such successful strategies [to promote male attainment] also do
... is to raise girls’ achievement too, and so in many instances the gap – at least in the short term – is potentially
perpetuated. We would not have it otherwise, for a fundamental parameter within which we have worked is that the
strategies ... should not in any way be detrimental to girls’ (p.148).
absolute levels of aboriginal attainment, but it is also desirable to reduce the attainment differential between aboriginals and non-aboriginals. Inequality *per se* may impair social and political cohesion, or produce other negative externalities, including for those at the top of the distribution (Krueger, 2003). The radically diminished educational prospects of aboriginal learners are a crucial source of persistent social disparities. Education is a key tool for reducing inequality, and equalising educational outcomes is indicated for that reason.

Again, despite this warranted preoccupation with closing the gap, if some interventions intended to close it by raising the achievement levels of the worse-off group also have the practical effect of raising the achievement levels of the better-off group, that is surely acceptable, providing that the gap is not exacerbated in this case. If absolute levels of aboriginal attainment can be elevated, the Ministry’s primary interest in improving educational outputs is satisfied. Initiatives that promise to raise one group’s performance should be undertaken without undue regard for their effect on the reference group, *as long as* there is no resulting deterioration expected in the reference group.

On the other hand, measures intended to improve educational attainment across the board (examples might, arguably, include attention to class size, teacher salaries, accountability, or parental choice) are beyond the scope of this study – even though they presumably entail absolute gains by underperforming groups – *unless* they promise to have a *disproportionate* impact on the underperforming group, and thereby help close the gap.

<table>
<thead>
<tr>
<th>Reference Group ...</th>
<th>Deteriorates</th>
<th>Stands still</th>
<th>Improves by x or less</th>
<th>Female: improves by more than x</th>
<th>Non-aboriginal: improves by more than x</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deteriorates</td>
<td>Unacceptable</td>
<td>Unacceptable</td>
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<tr>
<td>Stands still</td>
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<tr>
<td>Improves by x</td>
<td>Unacceptable</td>
<td>Acceptable</td>
<td>Acceptable</td>
<td>Acceptable</td>
<td>Undesirable</td>
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**Table 1  Increasing attainment, reducing inequality: potential outcomes of interventions**

1.2.3 **Transmission of culture**

Besides the ‘educational’ purposes of schools, they also function as crucial fora for the transmission of culture. The preservation of distinct cultural heritages is an important goal for many aboriginal people – in its own right, and apart from any possible tendency of a ‘culturally-congruent’ education to promote formal educational success. However it does not feature in the mandate of the Ministry of Education. It is excluded from this discussion, unless interventions
that preserve aboriginal cultures also promise to help aboriginal learners acquire the knowledge and skills that do fall within the Ministry’s mandate.\(^8\)

1.3 Educational attainment of aboriginal learners

On average, aboriginal young people in Canada drop out of school earlier and more frequently, and progress through the grades more slowly, than their non-aboriginal peers. They participate at lower rates in, and perform relatively poorly on, skills assessments and examinations. They obtain drastically fewer educational qualifications.

1.3.1 School completion

Among Canadians aged 15 and over in 2001, 48 per cent of those reporting aboriginal identity, but only 31 per cent of non-aboriginals, gave ‘less than high school’ as their highest level of schooling (calculated from Statistics Canada census data). There were marked disparities between the First Nations and Métis populations, and within the First Nations category according to whether respondents lived on or off reserve. 42 per cent of Métis and 51 per cent of First Nations individuals had not completed high school. 59 per cent of on-reserve aboriginals versus 44 per cent of off-reserve aboriginals had not completed high school.

In 2001, 48 per cent of off-reserve aboriginal people aged 20 to 24, but only 26 per cent (or a little over half that proportion) of non-aboriginals in this cohort, had not completed high school (Statistics Canada, 2004a). Improvement was visible since 1996, when 52 per cent of off-reserve aboriginals in this cohort had not completed high school, but it occurred only among the Métis and Inuit populations. 52 per cent of non-reserve First Nations youth had failed to complete high school in both surveys.

To determine school completion rates by province and on/off reserve residence, one may turn to the less precise but still useful grouping of 15 to 24 year olds (Figure 1). These figures are conservative with respect to the gaps (as comparison with the 20 to 24 cohort data confirms) – a higher proportion of non-aboriginal than aboriginal 15 to 18 year olds is destined to complete high school. Still, gaps are severe. Nationally, aboriginal students are failing to complete high

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\(^8\) Aboriginal communities, and educationalists in the field, may have alternative concepts of what constitutes success. The BCTF policy on First Nations education (9.D.39.4 of the Members’ Guide) ‘recognizes that Aboriginal communities have the primary responsibility for defining what constitutes success for Aboriginal students in the public schools’. On some views, underachievement according to formal ‘non-Native’ educational standards may even be a healthy sign of ‘Native resistance to cultural, spiritual, and psychological genocide’ (Hampton 1995, p.7). But the remit of this study is to judge outcomes against the Ministry’s mandate, and the measures of success conventionally used to interpret it. For these purposes, underachievement for any reason will be treated as dysfunctional.
school at half the rate again of non-aboriginal students. In every case, students on reserves are completing high school at the poorest rates. In the worst case, fully 84 per cent of the reserve population in this age group has not completed high school, as against 47 per cent of that province’s non-aboriginals. Although BC sees slightly more off-reserve aboriginals completing high school than the national rate, and the same proportion of Métis, it is outperformed in these instances by Ontario and Quebec. But BC displays the lowest failure-to-complete rate for aboriginals as a whole, at 59 per cent. The national rate is 65 per cent, the next lowest 60 per cent, the highest 72 per cent, and the average excluding BC 66 per cent. The gap between on- and off-reserve is also smallest in BC, at five percentage points. The equivalent national gap stands at 13 points, the largest at 31, the next smallest at seven and the average excluding BC at 15 points.9

Figure 1  Percentage of population aged 15-24 with less than high school, 2001.

Calculated from Statistics Canada data, tabulated online. Atlantic provinces excluded, but figures for ‘Canada’ derived from whole country.

9 It is possibly not coincidental that an unusually high proportion—about two thirds—of reserve children in BC attend provincial rather than band schools (Postl, 2005). The nation’s average is closer to one third.
Nationally, little convergence is taking place: aboriginals are proportionately further behind the education attainments of the aboriginal cohort ahead of them than non-Aboriginals are relative to the non-Aboriginal cohort ahead (Richards, 2006). BC trends give some ground for optimism, however. The number of aboriginals receiving a Dogwood (high school graduation) certificate more than doubled in the ten years prior to 2002-03, from 679 to 1,587 (BC, 2004a).

The graduation rate, for all those eligible to graduate from BC public schools in 2004-05, was 94 per cent. For non-aboriginals it must be a little higher, as for aboriginal students the rate was 89 per cent. The graduation rate for all first-time Grade 12 students was 75 per cent, but only 51 per cent for aboriginal students – aboriginal students who make it to Grade 12 are twice as likely to fail it at the first attempt (BC, 2005b).

Schoolchildren on reserves graduate from high school at well under half the rate of the non-aboriginal population (24 against 58 per cent, Figure 1). According to INAC (2004), the graduation rate in reserve schools, nationwide, was an appalling 30 per cent in 2001-02. There has been no improvement in this measure over the seven years charted – if anything, the trend is slightly downwards. The proportion of the whole on-reserve population with less than a high school certificate dropped from 63 per cent in 1996 to 59 per cent in 2001 (INAC, 2003) – remaining significantly worse, and showing no more improvement, than the equivalent proportion of the off-reserve First Nations population (51 to 46 per cent), or of all Canadians (36 to 31 per cent), according to 2001 census data. The drop-out rate of reserve residents in BC provincial schools stands at 65 per cent (Hallett, 2005).

The Auditor-General of Canada (2004) calculated that while the proportion of First Nations people aged 15 and over living on-reserve with at least a high-school diploma increased by almost five percentage points between 1996 and 2001, and the same proportion in the whole Canadian population increased by only three-and-a-half points, the rate of improvement by First Nations students had slowed, while the rate of non-aboriginal improvement accelerated slightly. The time it will take for the gap to close was projected at 28 years.

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10 Non-Aboriginal 15 to 24 year olds achieved 70 per cent of the high school and above level of the non-Aboriginal cohort ages 25-44. On-reserve 15-24 year old Aboriginals realized only 45 per cent, and off-reserve Aboriginals 57 per cent, of the comparable levels among 25-44 year olds.

11 Includes adults awarded the full Dogwood, however long they took to achieve it. The number of aboriginal students enrolled over that period grew by about 50 per cent.

12 For the cohort beginning Grade 7 in September 1995, “Drop-out” indicates failure to have graduated by June 2003, two years beyond the normal timeframe for this cohort’s graduation, to “capture only those people who were unlikely to graduate sometime in their high school career and not count as a drop-out those who simply moved more slowly through the system” (Hallett, 2005, p.37).
1.3.2 Timely progress through school

In 2002-03, 81 per cent of non-aboriginal students graduated successfully from BC public schools within six years of having entered Grade 8. Only 46 per cent of aboriginal students accomplished this (BC, 2004a). Aggregation masks wide variation between districts in how aboriginal students do. It is important to note that early school-leaving, and poor performance on other indicators, is not uniform across aboriginal communities, which may reflect important underlying differences in those communities. But aggregated outcomes remain a useful starting point for appreciating the problem.

In 2003-04, both aboriginal and non-aboriginal students in BC public schools made the transition up from Grade 6 (where social promotion may be preferred) in equal proportions (BC, 2005c), but the up-from-Grade 8 transition gap was eight points, the up-from-Grade 9 gap 11 points, the up-from-Grade 10 gap 13 points, and the up-from-Grade 11 gap 27 points (91 versus 64 per cent). The ‘progress gap’ is heavily compounded over the course of school careers, as aboriginal students are retained in grade in increasing numbers. According to Cowley and Easton (2004), ‘the likelihood that Aboriginal children enrolling in grade 8 will successfully complete their studies and receive their diploma [within five years] is just slightly better than one in five ... the non-aboriginal success rate is three times as high’ (p.13).

1.3.3 Participation and achievement on skill assessments and examinations

BC’s aboriginal students failed to meet expectations on over 40 per cent of Foundation Skills Assessments (FSAs) in 2002-03, a rate more than double that of non-aboriginals for every test in Grades 4 and 7 (Cowley & Easton, 2004). In Grade 4 there was a 13 to 17 percentage point gap (depending on skill tested) between aboriginal and non-aboriginal students meeting expectations, and a 15 to 23 point gap in Grade 7 (BC, 2004a). Aboriginal students participated at significantly lower rates: just over 80 per cent in Grades 4 and 7, as opposed to 91 per cent for all

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13 For the cohort leaving Grade 12 five years earlier, the aboriginal six-year completion rate was 37 per cent and the non-aboriginal rate 76 per cent. So, respectively, 9 and 6 percentage points have been gained. At this rate of progress, parity remains some 25 years off. Detailed figures for 2004/05 are unavailable at time of writing. However a recent Ministry press release refers to a ‘record 48 per cent’ of Aboriginal students now completing school (BC 2005f).

14 In 1999, for example, aboriginal youth in the Stikine school district recorded a five per cent graduation rate, those in Richmond a 66 per cent rate.

15 Less than half of the Grade 12 students in reserve schools nationwide have reached that stage in ‘normal’ progression; less than ten per cent graduate from Grade 12 in 12 years (Breaker & Kawaguchi, 2002). In 2001, 30 per cent of Quebec’s aboriginal students in Secondary 5 were at the modal age of 16, versus 75 per cent of non-aboriginal students. By that stage, 25 per cent of aboriginal students, versus two per cent of non-aboriginal students, were three or more years older than the modal age (Quebec, 2004).
students, including aboriginals (BC, 2005e). So the observed attainment gap gives a conservative impression of relative prospects overall.\(^\text{16}\)

In 2003, BC’s aboriginal students took an average of fewer than one senior examinable course; non-aboriginals took nearly three (Cowley & Easton, 2004). In 2005, only 36 per cent of aboriginal grade 12 students, versus 67 per cent of all students (including aboriginal students), participated in English 12 (BC, 2005d).\(^\text{17}\) However, those who did participate succeeded at roughly the same rate. Only eight per cent of aboriginal Grade 12 students, versus 35 per cent all students, participated in Math 12, where success rates were 79 and 88 per cent, respectively.

Provincial school completion comparisons suggest that BC is doing something right, but the prospects of aboriginal learners, in absolute terms and relative to others, remain unacceptably poor. There is enormous scope for improvement.

1.4 Educational attainment of boys, compared to girls

1.4.1 Timely progress and school completion

There is a significant gap in school graduation rates between boys and girls in Canada. In 2000, the female graduation rate of 83 per cent contrasted with the male rate of 73 per cent (CESC, 2003).\(^\text{18}\) This was an improvement on the 13 point gap observed in 1995: the female graduation rate was unchanged, while the male rate improved by three points. BC was among the provinces that saw the gap narrow somewhat in that time, from 11 to eight points.

By 2003-04, 82 per cent of females and 75 per cent of males were graduating from BC’s public schools within six years of entering Grade 8 (BC, 2005a). The gap was nine points five years previously.\(^\text{19}\) The graduation rate among all those eligible to graduate in 2004-05 was 96 per cent for females and 93 per cent for males, a gap unchanged over five years (BC, 2005b). The graduation rates among first-time Grade 12 students were 77 and 73 per cent, respectively.

Together, the preceding figures suggest that boys are significantly less likely than girls to reach Grade 12, and a little more likely to need more than one shot at it when they get there. Moreover,

\(^\text{16}\) An attraction for researchers of FSA results is that they are compulsory, in theory, suppressing selection biases. But special needs students on modified programs are excused from participation, and the disproportionate representation of aboriginal children in this category possibly explains the bulk of the participation gap.

\(^\text{17}\) A Languages Arts 12 exam is the only non-optional Grade 12 exam towards graduation, and English 12 is much more highly esteemed than the alternative of Communications 12 by most markets. English 12 is typically a requirement for university admission.

\(^\text{18}\) Canada is not unique - markedly higher female graduation rates are the norm in 17 out of 21 OECD countries (OECD, 2005). The current Canadian gap is the second highest among G-7 countries (CESC, 2003).

\(^\text{19}\) Cowley and Easton (1999) also observed the positive trend in the preceding several years.
they are outperformed by 50 per cent at the top end – one-and-a-half times as many girls as boys take honours amongst those eligible to graduate (58 versus 39 per cent).

97 per cent of both girls and boys make the transition from Grade 6 to 7 at the first attempt in BC public schools. Thereafter, boys’ progress decays very slightly relative to girls’: 81 per cent of girls and 79 per cent of boys move forward from Grade 11 at the first attempt (BC, 2005c). But even small differences compound over six years, culminating in the seven-point gap in six-year graduation rates observed above. Due to higher rates of retention in grade, boys who graduate are more likely than girls to do so after ‘typical age’. While Canadian girls had an 11-point advantage in typical-age graduation in 2001 (10 points in BC), boys had a two point ‘advantage’ in after typical-age graduation, in BC as in Canada (CESC, 2003).

Though drop-out rates for both males and females have been declining, males remain seriously over-represented. The 2004-05 proportion of Canadian 20 to 24 year olds not in school and without a high school diploma was 12 per cent for young men, compared with seven per cent for young women (Bowlby, 2005). In 1990-1991, these rates had been 19 and 14 per cent, respectively. Worryingly, 58 per cent of drop-outs were male in 1991, but by 2004-2005 that share had increased to 64 per cent.

Females may disproportionately take advantage of ‘second-chance’ initiatives: while the gap has been stable for 20-24 year olds, among 20 year olds it has narrowed. In 1991, their high school leaver (as opposed to completer) rates stood at 22 per cent for young men and 14 per cent for young women (CESC, 2003). By 1999, the respective figures were 15 and nine per cent (Bowlby & McMullen, 2002). The drop-out rate among 20-year-olds declined by a third over the nineties, with gains accruing disproportionately to males. However BC was a rare exception, according to these surveys: male drop-out rates did not appear to decline during this period (stuck at 17 per cent), whereas female rates did (from 14 to nine per cent). It is not clear how these results can be reconciled with provincial graduation figures; they should at least give us pause.

### 1.4.2 Participation and achievement on skill assessments and examinations

In 2004-05, girls in BC out-participated boys in English 12 by a serious margin, 71 to 62 per cent (BC, 2005d). They also participated more heavily in second languages – by eight percentage points in French 12, the most popular. Boys had a participatory edge of four points in Mathematics 12. In the sciences, girls and boys participated at equivalent levels in Chemistry and Geology 12, girls out-participated boys by about two-to-one in Biology 12, and boys out-
participated girls in Physics 12, by a similar margin. Ten percent more grade 12 examinable science courses were taken by girls than by boys.

These gaps have been reasonably constant since 2001. Overall, 82,366 Grade 12 examinations were taken by girls, compared to 74,919 by boys (91 per cent of the girls' total). Participation is a strong influence on post-secondary opportunities. It tells us about students' academic engagement. It is also tells us about how boys and girls tend to specialize or diversify. In the past it has been deemed important to mitigate gender-clustering around different subject areas: for example, to increase the number of females pursuing science courses. For the purposes of this study, such diversification will not be construed as an important goal in itself. The goal, rather, is to increase male participation in examinations that contribute to graduation, help them secure post-secondary places, and/or prepare them for productive future lives. Granted these parameters, the types of courses girls and boys choose to take will not be a concern per se.

The boys and girls that do write exams fare similarly in terms of pass rates (BC, 2005d). In 2005, girls edged boys by three to five points in English, Math and Physics, while boys edged girls by one to three points in French and social studies (largely consistent gaps going back several years). Underneath the pass rates, girls tend to collect more As and Bs. 47 per cent of female and 34 per cent of male writers took A or B in English 12 in 2004-05. In Math 12 the gap, on this measure, favoured girls by 4 points; in French, by three points. Even apparently small differences in scores can produce differences in letter grade (which have implications for post-secondary admission competitions).

Exam marks are also far from the whole story. Girls receive significantly higher marks than boys in school-based assessments in every subject, including those where boys do better in the final examination (Cowley & Easton, 1999). Graduation requirements are more heavily weighted towards school-based assessment than examinations, with 60 per cent of the final mark based on the course mark assigned by the teacher in the classroom, and 40 per cent based on the exam, for Grade 12. Consequently, girls on average receive higher overall marks than boys in virtually every senior subject area.

If boys, for whatever reason, retain some sort of advantage in high-stakes tests compared to class assignments, they are in effect compensating for relative underperformance through their preceding school careers – just not compensating enough. Low-stakes test results suggest the

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20 Roughly equal numbers were eligible to graduate, although male enrolment (all grades) that year was five per cent higher than female enrolment (BC 2004b). Higher attrition of boys means closer proportions enter Grade 12.
21 Boys had a slight edge in sciences, including physics (two points) and biology (one point).
22 Grade 10 marks towards graduation are typically split 80/20 in the same direction.
early onset of a gender gap in school attainment. In 2002-03, girls outperformed boys in FSAs of reading comprehension and writing by significant margins that (as a rule) increase over the course of school careers (Table 2). Boys score better on numeracy tests, but only a little better, and this gap does not inflate with time.

Table 2 Percentage meeting or exceeding expectations, BC FSAs, 2002-03

<table>
<thead>
<tr>
<th></th>
<th>Grade 4</th>
<th>Grade 7</th>
<th>Grade 10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reading</td>
<td>Writing</td>
<td>Numeracy</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>91</td>
<td>89</td>
</tr>
<tr>
<td>Female</td>
<td>80 (+5)</td>
<td>96 (+5)</td>
<td>86 (-3)</td>
</tr>
</tbody>
</table>

Source: BC, 2005e.

The reading gap between females and males is consistently significant across provinces, and internationally, as measured by standardised PISA scores. In 2003, the gender gap in reading stood at 32 points in Canada (546 to 514), and in BC (551 to 519); similar gaps were observed in all 28 participating OECD countries. More than twice as many boys as girls were judged of low proficiency, and more than one-and-a-half times as many girls as boys were judged of high proficiency. Gaps favouring boys have been both much slighter and more variable (CESC, 2003).23

1.4.3 Aboriginal gender gap

Aboriginal males in Canada’s cities fell further behind aboriginal females in terms of school completion between 1981 and 2001, although in Vancouver the gap held constant. There, 33 per cent of males and 22 per cent of females, aged 20 to 24 and not attending school in 2001, had not attained a high school certificate; in 1981, the figures stood at 45 and 34 per cent respectively (Siggner & Costa, 2005).

In BC, most public Ministry data break out male and female results, and aboriginal results, but not aboriginal male and aboriginal female results specifically. An exception (BC, 2004a) decomposes the 46 per cent six-year Dogwood completion rate for aboriginals: 50 per cent of aboriginal girls and 42 per cent of aboriginal boys completed high school within six years of entering Grade 8 in 2003.

23 There were no significant difference between boys’ and girls’ science scores, in Canada or internationally, on PISA 2000 or the most recent SAIP, although TIMMS 1999 found a slight advantage for boys. International math averages in PISA 2000 and TIMSS 1999 show males scoring a little higher than females; in Canada, males scored higher in PISA, but no significant differences were reported for TIMSS. Canada’s SAIP has found higher scores for 13-year-old girls in mathematical problem-solving, and no differences for 16-year-olds.
Aboriginal boys, then, are faring poorly. However the provincial aboriginal gender gap is no larger than the non-aboriginal gender gap. This observation comports with calculations from the 2001 Census: the gap between 15 to 24 year-old males and females with at least a high school certificate was 6 percentage points for both populations. 45 per cent of all males and 39 per cent of all females in this cohort had failed to complete high school. (BC matches these levels precisely). For aboriginal-identity males and females, the equivalent figures were 68 and 62 per cent. This may suggest that there is no extra magnification of obstacles to aboriginal boys owing to their being subject to a ‘double risk’. They simply share with aboriginal girls whatever problems are affecting aboriginal learners, and they share with non-aboriginal boys whatever problems are affecting male learners.25

1.4.4 Does the gender gap matter?

In 1999, Cowley and Easton determined that ‘gender-based differences in school performance do exist [in BC]. They are systematic, extensive, and persistent’ (1999, p.8). Their findings – that girls, on the whole, have a higher rate of graduation, participate in more exams, and score better on them – are borne out by surveys of more recent data.

Cohen (1998), citing evidence on native and foreign linguistic ability going back to the seventeenth century, claims that ‘boys have always “underachieved”’ (p.20), and proposes that the interesting question is, not why boys underachieve, but why their underachievement is now deemed an object of concern. However the first question is certainly a legitimate one for education policy-makers. Even if there are reasons to expect boys and girls to follow different academic trajectories on average, improvements in boys’ attainment seem possible: graduation rates for BC’s boys appear to have been improving steadily, even relative to those of girls. It is crucial to the economic prospects of males that this improvement is sustained and reinforced.

Boys’ academic aspirations are significantly lower than girls (see Section 2.3.1.2). If these aspirations continue to be reflected in ultimate attainment, significant numbers of young people will be unable to avail themselves of the opportunities opened up by education, where an adequate policy response may have made a positive difference.26 The existence of the educational

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24 The aboriginal gender gap is a little smaller on-reserve (78-74) than off (64-58), nation-wide. It is smaller in BC than nationally, at 63-59, and does not vary here by residence (68-64 on-reserve, 61-57 off).
25 Another way to put it is that the gap between aboriginal boys and non-aboriginal girls is additive rather than multiplicative. A recent detailed analysis of variation in educational gender gaps by race/ethnicity in the US (Coley, 2001) also finds more similarities than variations: gender differences barely vary from one racial group to the next.
26 Of 18-20 year-olds no longer in high school in 1999, 57 per cent of girls, but only 47 per cent of boys, had continued to post-secondary education (Bowlby & McMullen, 2002).
gender gap, and the appearance that it can be affected for the better, provide one obvious focus for policy-makers concerned to push educational outcomes upwards.

The most recent dropout statistics suggest that future success in dropout prevention will depend on our ability to reach out to particular sub-groups that continue to experience above average dropout rates (CCL, 2005, ¶26).

1.5 Why does educational attainment matter?

'The importance of a sound formal education is increasing with time. With the advent of the knowledge-based economy, jobs are becoming increasingly scarce for individuals without a diploma or a degree from a high school, college or university' (Statistics Canada, 2004a, p.11.) By 2007, some 70 per cent of new jobs in Canada will demand some form of post-secondary education. Less than seven per cent will be suitable for people who have failed to complete high school (HRSDC, 2000). High school completion is increasingly insufficient, but to the extent that it opens up post-secondary opportunities, it remains necessary.

These realities bear on all young people, male and female alike. If it was once the case that boys, as a group, were shielded from the full potential impact of their academic underachievement by the availability of alternative pathways to economic engagement, or by the relative propensity of females not to compete for employment opportunities, this promises to be progressively less the case as time goes on. The apparent potential to improve the school performance of boys presents a stark opportunity to improve the match between Canadian labour market demands and workforce preparedness.

A boost to educational achievement is particularly pressing for the prospects of aboriginal young people. Aboriginal people find themselves in dire economic circumstances relative to other Canadians. The proportion of total income comprised of government transfers is more than twice as large for Registered Indians as for others, and one-and-a-half times greater for Registered Indians on-reserve than off (2001 Census). The unemployment rate of Registered Indians is over three times the rate for others. The incidence of low household income is three times greater for Registered Indians. The median income of aboriginals was $13,593 in 2000; for non-aboriginals it was $22,431 (Treasury Board of Canada, 2005). Perpetuated educational disparities are likely to translate into increasingly exaggerated socio-economic disparities if the correspondence between educational credentials and rewarding employment continues to strengthen, as forecast. It is worth reminding ourselves of the central importance of education to economic engagement and security. Improving educational outcomes promises to be the most effective way to move these statistics in a healthier direction.
1.5.1 Private and social benefits of education

People with less than a high school education have relatively low labour force participation rates and high unemployment rates. Graduates find jobs more quickly than leavers, and spend less time unemployed. The unemployment rate among school drop-outs aged 20 to 24, at 19 per cent, is presently almost double the rate (10 per cent) for all 20 to 24 year olds, a relative proportion roughly steady over the past 25 years (Bowlby, 2004). The handicap is persistent: among 25 to 44 year olds, those without a high school diploma are unemployed at a rate of 12 per cent, while for those whose highest level of education was high school, the rate is seven per cent. At higher levels of education, the rate continues to drop.

Higher levels of education increase income, via their effect both on employment and on the earnings of those employed. According to Richards (2006; see also Hull, 2000), the median income of aboriginal people living off-reserve with less than a high school graduation certificate is about $10,000. With a graduation certificate, it rises to about $13,000; with completion of a trades certificate, to about $18,000; and with a university degree, to almost $30,000. The same pattern applies on-reserve (income rises steadily with level of education, though median incomes are lower at all levels) and to non-aboriginals (though median incomes are higher at all levels).

Brunnen (2003) calculates that aboriginal people in western Canada with less than a high school graduation certificate will most likely earn under $10,000. Those with a university degree will most likely earn over $40,000. In Saskatchewan, an aboriginal male who successfully completes high school can expect lifetime earnings about a half-million dollars greater than one who drops out, while female aboriginal lifetime earnings almost triple with a high school diploma (Howe, 2002). A study of aboriginal people in north-western Ontario (Jankowski & Moazzami, 1995) found that each year of elementary or secondary education added an average of 7.8% to their earnings, and a university education more than 30%.

Raising educational accomplishment levels is also in the interest of society as a whole. Education is crucial to economic growth and raising average living standards (Barro, 2001; Hall & Jones, 1999), perhaps partly because it produces positive externalities associated with

27 Despite the fact that drop-outs are more likely than completers at this age to be actively seeking employment: participation rates are 77 and 75 per cent, respectively.
28 Employment disparities are attributable, in part, directly to education level, not simply to individual characteristics associated with both likelihood to complete and employability. In New Zealand, a study finds that completion produces a 17.4 percent decrease in the probability of experiencing unemployment by the age of 21 controlling for parental occupational status, reading achievement, school involvement and delinquency (Caspi et al, 1998).
29 Off-reserve, urban private returns to education are at least one-and-a-half times greater than on-reserve returns.
innovation, technological advance and productivity spillovers (Davies, 2002). Plausible claims are also made (Riddell, 2004) for significant positive externalities in the areas of health (Wolfe & Haveman, 2001), crime (Lochner & Moretti, 2004), and civic participation (Milligan et al, 2003).

1.5.2 Demographic reality

The average annual rate of increase for the aboriginal population is projected in the immediate future to be more than twice that projected for the total Canadian population, and the aboriginal share of the population is projected to increase to over four per cent by 2017 (Statistics Canada, 2005). The median age of the First Nations population was 24 years in 2001, projected at 27 for 2017. Comparable figures for the total Canadian population are 37 and 41 years respectively. The aboriginal population more than doubled in most census metropolitan areas between 1981 and 2001; in Vancouver it increased by 140 per cent (Siggner & Costa, 2005). 42 per cent of Vancouver’s aboriginal identity population is 24 or younger, compared to 31 per cent of its non-aboriginal population. In 2004/05, over nine per cent of BC public school students (55,125 children) had identified themselves as aboriginal, an increase of over 50 per cent since 1995/96.

Aboriginal people will form an increasing share of the workforce. Prospective private and social benefits make the improvement of aboriginal education outcomes all the more urgent. Were aboriginal students to be immediately brought up to non-aboriginal levels of progress and graduation, up to 11,000 extra students would graduate from public schools within six years of entering Grade 8 in the next eight years in BC alone. Similarly, if boys were to graduate at the same rate as girls, over 12,000 extra students would meet that target.

Higher levels of education are associated with economic growth in all OECD countries; in some, increases in attainment are estimated to have accounted for over half a percentage point of the annual average growth rate in the 1990s, compared with the previous decade. (OECD, 2005). About half the growth is ‘demographic’, with the rest attributed to ‘ethnic mobility’. The current aboriginal birth rate is about one and a half times the overall Canadian birth rate.

Since 2003/04, a student has been considered aboriginal if s/he self-declared any time in the period 2003/04 forward. Previously, students were considered aboriginal in any given year only if they self-declared in September that year. This peculiarity does not account for much of the growth. Prior to 2003, the proportion of aboriginal students had been increasing at a rate of three or four percentage points a year, and had already reached eight per cent in 2003/04.

Gender gap estimation based on the difference between 75 and 82 per cent of half the projected Grade 8 public school enrolment from 2007 to 2014 (BC, 2005h). Ethnic gap estimation based on the difference between 46 and 81 per cent of projected aboriginal enrolment over that period, assuming growth of .3 of a percentage point per annum in the aboriginal share (i.e. a little under the average annual growth over last ten years). 20,000 total extra timely graduations would constitute an improvement of roughly 7 per cent over graduations at present levels over that period.
2 Sources of the problems

There is little prospect of transforming the observed patterns of attainment absent an understanding of their causes. A variety of determinants of educational underachievement have been hypothesised with respect to the two student segments of concern. A survey of the relevant literature is undertaken in an effort to identify those that are most influential, and which appear amenable to manipulation by education policy. The survey is supplemented by an analysis of BC FSA data, as and when it is suitable for testing the hypotheses encountered.

2.1 Data

2.1.1 Samples and sources

Foundation Skills Assessments test student proficiency at various points in their academic careers in BC schools. Students who participate are deemed either to have failed to meet, to have met, or to have exceeded expectations. By adding together the numbers of students who have met or exceeded expectations, and dividing the result into the total number of participants, one can construct a 'meet/exceed ratio' for a given school or for given populations within schools, which permit useful comparisons of the achievement of groups of students, of schools, of districts, and of students as a whole over time. The BC Ministry of Education supplied 2002/03 FSA results for each public and independent school in which any student had ever formally identified as aboriginal. This data was broken down by grade, by three skills tested, and by the gender and aboriginal/non-aboriginal identity of test takers. Of 1771 schools, the 616 which reported 15 or more test participations by aboriginal students were selected for analysis.34

Meaningful testing of many hypotheses related to educational outcomes demands control of socio-economic characteristics. These were sourced from the 2001 census, for the neighbourhoods in which schools are located, in two ways. First, data were drawn from Statistics Canada 2001 Community Profiles for those communities with only one secondary school and no

34 The 67th percentile for aboriginal participations was 15. If the school included only one testable grade, this guarantees at least five aboriginal test-takers. If it included two testable grades, it guarantees at least three. Henceforth, the 616 schools are referred to as the 'whole sample'.
more than two elementary schools (not including alternative programs).\textsuperscript{35} Second, Statistics Canada Census Tract data is online for seven metropolitan areas in BC.\textsuperscript{36} Variables equivalent to those in the Community Profiles were extracted for schools in those areas by postcode.\textsuperscript{37} Schools for which local socio-economic characteristics could be collected by these methods were divided in two, according to grade. 114 schools offered Grade 10, and 238 offered Grades 4, 7, or both.\textsuperscript{38}

### 2.1.2 Overview

Selected 2002-03 FSA results in the samples are described in Appendix A. Meet/exceed ratios (MERs) for any given category of students are the schools’ percentages of test-takers in that category who either met or exceeded expectations, averaged. In the whole sample, the gap between aboriginal and non-aboriginal MERs averaged across schools is 14 percentage points, and the equivalent gap between males and females is seven points. There is notably greater dispersion of aboriginal results. In the elementary/middle sample, there is an 11 point difference between the overall aboriginal and non-aboriginal MERs at their medians, but the aboriginal floor is more dramatically lower than the non-aboriginal floor: a tenth of schools show an overall aboriginal MER below 46 per cent (71 per cent for non-aboriginals), and the bottom tenth percentile for aboriginal male MERs cuts off at 40 per cent (63 per cent for non-aboriginal boys; Figure 2). In the secondary sample, there is a 14 point difference between aboriginal and non-aboriginal MERs at their medians, but a tenth of schools show overall aboriginal MERs below 34 per cent (65 per cent for non-aboriginals), and the bottom tenth percentile for aboriginal males cuts off at 20 per cent (56 per cent for non-aboriginal boys; Figure 3).

\textsuperscript{35} According to the Ministry’s list of schools (BC, 2005g). Where there is more than one secondary school the danger is that the student bodies are composed selectively, to some degree, so that the aggregate community profile data may describe neither very accurately. The same danger applies to elementary schools, but had to be accepted in that case, since almost all communities would have been eliminated otherwise. Results should be treated with appropriate caution. When two elementary schools from the same community appeared in the sample, the one with the largest number of aboriginal male students was retained and the other dropped.

\textsuperscript{36} Abbotsford, Kamloops, Kelowna, Nanaimo, Prince George, Greater Vancouver and Greater Victoria.

\textsuperscript{37} BC did not introduce open boundaries until 2003. However, postcodes are imperfectly matched with school catchment areas, which should generate some caution about findings. Where two schools shared a census tract, the one with the most aboriginal male test participations was retained. Where one postcode was associated with more than one census tract, that school was rejected, except in two instances where variable values for two associated census tracts in each case were virtually indistinguishable (average values taken).

\textsuperscript{38} This permits comparison of findings across two samples: it may also be interesting to discover whether different patterns obtained according to student age. A supplementary methodological rationale for the split was to ensure variance across independent variables – most secondary schools in the whole sample share a neighbourhood with an elementary school, meaning that associated socio-economic characteristics appear identical. For convenience, these will be referred to as the secondary and elementary/middle samples. Because the distribution of outcome variables is skewed by schools with small numbers of participants, those with fewer than 40 participations were filtered out of the elementary sample, and those where the whole school meet-exceed ratio fell below 50\% out of the secondary sample, depending on the dependent variable of interest.
Figure 2  2002-03 FSA Meet/Exceed Ratios (averaged across schools): elementary/middle sample

Figure 3  2002-03 FSA Meet/Exceed Ratios (averaged across schools): secondary sample
Gaps start early and grow. The widening of the gap as students progress is also observed between males and females: six points in the elementary/middle sample, ten in the secondary. The male MER is superior to the female in 21 per cent of elementary/middle schools, but in only nine per cent of secondary schools. However, the relative degeneration of aboriginal test performance over time is not similarly reflected in the proportion of schools where aboriginal students outperform others: the aboriginal MER is stable between samples, superior in 20 per cent of elementary/middle and 19 per cent of secondary schools featuring students of both types.

The aboriginal disadvantage is, notably, least pronounced in Writing; the gap is nine points in Grade 10, averaged across schools. It is most pronounced in Reading. The male disadvantage is most pronounced in Writing (17 points in Grade 10), but also stark in Reading (13 points), whereas where the gap favours males, in Numeracy, it is by a negligible one percentage point, on average.

2.1.3 Method

Relationships between selected educational outcome variables and independent variables of interest are analysed using an OLS regression technique. From the myriad potential outcome variables available for analysis (MERs of groups of interest, the gaps between those and reference groups, by whole grade/school or by skill tested) only those meeting tests for normal distribution were analysed. None of the models in what follows are seriously threatened by autocorrelation or multicollinearity. Inspection of residuals suggests that in the majority of cases variance of residuals is constant; those where some heteroskedasticity is suspected are indicated in footnotes.

2.2 Why do aboriginal children fare worse in school?

2.2.1 Socio-economic characteristics

The aboriginal population does not resemble the non-aboriginal population with respect to general socio-economic conditions: it is disproportionately subject to a range of factors with a strong observed tendency to undermine academic achievement. These are highly interrelated, and the existence, nature and extent of the actual causal influence of any given factor have not been firmly settled, and remain controversial. For present purposes it suffices to observe their correlation with poor educational outcomes, and their prevalence in aboriginal communities.

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39 The test applied was the Kolmogorov-Smirnov test.
40 Durbin-Watson scores never further than .3 from 2; VIFs virtually all (and always average) under 2.
2.2.1.1 Parental education

Education levels are significantly lower among aboriginal people than among others. Parental education is strongly associated with the eventual attainment of children (De Broucker & Lavallee, 1998), and may be its strongest single predictor (Cowley & Easton, 2004b). In the case of 27 per cent of Canadian drop-outs, but only nine per cent of completers, neither of the student’s parents had themselves completed high school; conversely, at least one parent of 31 per cent of graduates, but of only 11 per cent of drop-outs, has attained a university degree (Bowlby & McMullen, 2002). Over a fifth of non-reserve aboriginal children aged 6-14 whose parent had not gone beyond elementary school had repeated a grade at some point; of those whose parent held a bachelor’s degree, only six per cent had repeated a grade (Statistics Canada, 2004a).

Parental education levels in neighbourhoods surrounding sampled schools were estimated, very roughly, by calculating the proportions of the population over 20 in each area that had attained, or failed to attain, to certain levels: Drop-out Share (proportion that had not completed high school), Trades Share (had attained a trades qualification), College Share (had obtained a college certificate or diploma), and University Share (had attained a university certificate or degree).41

2.2.1.2 Family structure

Parental divorce, and birth outside marriage, are well-established risk factors for educational underachievement (Amato & Keith, 1991; Amato, 2001; Aquilino, 1996; McLanahan & Sandefur, 1994). PISA results in all subjects are significantly lower on average for Canadian students from one-parent than from two-parent families (Statistics Canada, 2001). About four-fifths of Canadian high-school completers live in two-parent households, compared to two-thirds of drop-outs. (Bowlby & McMullen, 2002); twice the proportion of drop-outs live in single-parent families (32 versus 16 per cent). Aboriginal women are more than twice as likely to be single mothers as other Canadians (Hull, 2001). According to the 1996 Census, one in three aboriginal mothers was a single mother. Over 30 per cent of aboriginal children under 15 were living in lone-parent families, compared to 16 per cent of the general population. 43 per cent lived in a married couple family (73 per cent for others). Of families with children in sampled communities, the proportions headed by lone-parents and female lone-parents were calculated to create two variables, Lone-parent Share and Female Lone-parent Share.

41 Education characteristics derived from postcode-linked census tracts are for the population aged 20 and over. Those derived from the Community Profiles are for the population aged 20 to 64. This introduces another rough edge to specifications, as over-64s lower the proportions of people attaining to higher levels of education.
2.2.1.3 Early parenthood

Early parenthood appears to constitute an obstacle to educational attainment. In the US, failure to delay childbearing reduces the likelihood that a woman will obtain a high school diploma by twenty percentage points (Hotz et al., 1997). In Canada, 28 per cent of female drop-outs, but only 3 per cent of female completers, have dependent children (Bowlby & McMullen, 2002). 16 per cent of female drop-outs subjectively identify pregnancy, or having a child of their own to care for, as the reason for their decision; among off-reserve aboriginal female leavers, a quarter give this reason (Statistics Canada, 2004b; see also McIntyre, 2001). First Nations teenage pregnancy rates are up to four times greater than the national rate, and the rate in girls younger than 15 is especially high, particularly on reserves, where it is about 18 times greater than the Canadian average (Health Canada, 2000).

2.2.1.4 Income and economic engagement

Aboriginal families earn less than other families. There is a strong correlation between poverty and educational attainment. Canadian school drop-outs live in households with an average total income of $51,000, compared to $69,000 for completers (Bushnik et al., 2004). Children from low-income families score lower on standardized tests when they enter school and throughout their school careers, miss school more often, drop out earlier and obtain poorer qualifications (Mayer, 1997; Duncan & Brooks-Gunn, 1997). Better off parents can afford to invest more resources in their children’s human capital; worse off parents face credit constraints which affect their ability to invest (Krueger, 2003). The median family income in sample-school neighbourhoods gives the variable, Family Income.

There is evidence that the true effect of income per se is small (Mayer, 1997); the apparent effect is largely an artefact of the correlation between income and other neighbourhood, family and individual characteristics. The source of income may also be relevant: there is evidence that children do better, educationally-speaking, when household income is derived from

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42 This study used teens who miscarried as the comparison group, thereby eliminating many potential confounders.
43 E.g. in the form of good housing, near good schools, in good neighbourhoods; books, computers, fieldtrips; adequate medical care and a high standard of nutrition that ensure children are ready to learn; tutoring.
44 Low income may also impair the ability to parent effectively, by increasing stress and depression. And low social status that goes along with low income may induce people to develop dysfunctional values and norms, which their children, to their educational detriment, adopt. If a culture disdaining educational investment develops in reaction to a (real or perceived) disadvantageous opportunity structure, low-income parents may not model the optimal roles. All such potential factors would appear to predict poor educational performance for aboriginal people in particular.
45 When parental income doubles, 'young children's test scores are likely to improve by one or two points' and 'a child’s eventual years of education [rise] by about a fifth of a year' (p.143-4). These are far removed from the large 'raw' differences observed between income levels. Hoddinott et al (2002) also find that though income is consistently associated with educational and cognitive attainment, the magnitude of the effect is small.
employment, compared to those in households where equivalent income levels are derived from welfare (e.g. Kornberger et al, 2001). In general, parental unemployment may predict poor educational performance, and aboriginal unemployment (and social assistance dependency) rates far exceed those of the general population. Employment and unemployment rates, and the proportion of local income derived from government transfer payments, were adduced for each neighbourhood in the sample.

2.2.1.5 Mobility

Frequent residential relocation – because it induces absence from and change of school – is hypothesised to seriously disrupt children’s educational careers (Harris, 1998; McLanahan & Sandefur, 1994). Aboriginal families are significantly more mobile than other families. Over a third of Vancouver’s aboriginal population changed residential address in the year before the 1996 census, compared to less than a fifth of its non-aboriginal population (Richards, 2001). Explanations may lie in socio-economic imperatives which are much more highly concentrated in aboriginal communities (family disruption, economic insecurity), and also perhaps in reasons peculiar to aboriginal communities: a greater reliance on dispersed extended families to care for children, connections and affiliations with possibly distant reserves, particular traditional or ceremonial demands, or even the preference of some band councils to boost headcounts with a temporary influx from the urban diaspora, when federal funding undergoes its annual assessment.

In interview, former BC Deputy Minister of Education Charles Ungerleider placed special emphasis on mobility as a probable explanation of differential attainment, if not the most significant. The variable, Mover Share, represents the proportion of census respondents in a neighbourhood that had lived at a different address one year previously.

2.2.1.6 Delinquency

In Australia, the experience of arrest reduces the probability of attending high school by 26 and 18 per cent for aboriginal males and females, respectively (Hunter & Schwab, 1998). Delinquency has a direct custodial effect, removing young people from their appointed educational environment, and speaks to socio-economic and peer-influential circumstances and dispositions that are not conducive to application. Canadian youths are 12 times more likely to be admitted to a facility if they are aboriginal – 22 times as likely if female (Clatworthy & Mendelson, 1999).
2.2.1.7 Location

Aboriginal communities are disproportionately located in rural and remote areas; people in such areas generally exhibit poorer educational outcomes. Local employment opportunities may be concentrated in sectors to which educational qualifications have, historically, been less relevant. Those who have obtained qualifications may have moved away to urban areas. Smaller populations may not be able to sustain a variety and quality of school courses equivalent to those in urban areas; they may find it harder to attract and retain the strongest teachers. Rural communities tend to experience more challenging socio-economic conditions than others. A ‘social capital’ gap may distinguish rural from urban communities.

2.2.1.8 Neighbourhood effects

The intensification of risk factors in extremely poor neighbourhoods may be a factor in academic performance not adequately captured by consideration of the usual socio-economic variables in isolation. Richards and Vining (2004) refer to literature emphasizing the possibility that, beyond some tipping point, the interaction of adverse conditions in the poorest neighbourhoods produces a multiplicative, rather than additive, effect on welfare outcomes, a local culture highly discouraging to academic engagement, and perhaps conditions that repel teachers with choice over assignments. They note that a sixth of the schools in the bottom quartile for aboriginal attainment (and none in the top quartile) are in such neighbourhoods. For the variable, Extreme Neighbourhood Poverty, neighbourhoods that reported more than double the overall Canadian incidence of economic families below the low-income cut-off (12.8 per cent in 2001) were coded one, zero otherwise.

2.2.1.9 Health

Many health challenges that disproportionately affect aboriginals are associated with poor performance in school (Ross, 1991). Some childhood and birth diseases directly impair cognitive function and the capacity to learn. For example, the prevalence of middle ear inflammations (chronic otitis media) is up to ten times higher amongst First Nations people than amongst the general Canadian population (Bowd, 2002). Conductive hearing loss has severe educational implications. Even when mild and transient, it can delay development of speech and language

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46 As they define them, Richards and Vining (2003) find that very poor neighbourhoods tend to shave five or six percentage points off aboriginal test scores, but are only very weakly significant, other things equal.

47 This proxy is preceded by Richards & Vining (2003, 2004). Incidence of low income families was only available for the schools in the seven urban areas where socio-economic data could be collected against postcodes. In the elementary sample n=161, and in the secondary sample n=61, for models that incorporate this dummy variable.
skills, especially if resulting poor performance and lack of attention in class are not quickly recognized as symptoms. Students with a history of chronic otitis media score lower than otherwise similar on tests of vocabulary, language, reading and IQ (Bowd, 2003).

Rates of fetal alcohol spectrum disorder (FASD) are far higher among First Nations communities than the national average. Estimates of prevalence range from .5 up to 5 per 1000 live births in the general North American population, compared to up to 16 per 1000 live births among Canadian aboriginal groups (Canadian Centre on Substance Abuse, 2006). FASD condemns children to diminished educational prospects by impairing mental capacity (the average IQ of people with FASD is 63), fostering behavioral disorders and learning disabilities, and damaging social skills. According to the BCTF (2002), teachers observe serious drop-out rates, developmental delay, absenteeism, and violence among students suffering from FASD.

Some serious health conditions may lead to extended/recurrent absences from school. Inadequate diets may hamper capacities for attention and concentration. As a result, students may fall behind in their studies, or become disinterested, and are at a higher risk for dropping out. Aboriginal young people are also likely than others to abuse many substances that impair educational performance.

2.2.1.10 Economic incentives

There is a clear and significant economic return to education for aboriginal people, but if it is not equivalent to the return enjoyed by non-aboriginal people, it might be hypothesised that the incentive to invest in education will be correspondingly lower.

There is certainly a raw earnings gap – of about 11 per cent on several estimates (George & Kuhn, 1994; Pendakur & Pendakur, 1996) – and a similar employment gap (George et al, 1994; Hull, 2000). Much of the former may be attributable to the education levels, youth and occupational preferences of aboriginals. In the US, economic returns to education do not appear to vary by race or ethnicity (Barrow & Rouse, 2005). However Hull claims that, in Canada, such factors ‘do not completely account for the differences in labour market and income characteristics’ (2000, p.109). The figures for income at different education levels collated by Richards (2006) show suggestive differences by ethnicity. Siggner and Costa (2005) find that in

48 In 2000, the incidence of tuberculosis was six times higher on reserves than elsewhere in Canada, on the most conservative estimate (INAC, 2004; see also Health Canada 2003). About six and a half per cent of Aboriginal youth report disabilities which limit normal daily functioning, over half the proportion again of other youth.

49 In the North West Territories, for example, Aboriginal residents aged 15 years or older are almost 3 times more likely to use marijuana/hashish, 3.5 times more likely to use LSD, speed, cocaine, or heroin, and 11 times more likely to sniff solvents or aerosols than non-Aboriginals (1996 Northwest Territories Alcohol and Drug Survey).
the metropolitan areas where 80 per cent of urban Aboriginals live, they are employed at the same rate as others only as long as they attain a university degree. At other levels of schooling they lag. 19 per cent of aboriginal former college and university students in the BC College and Institute Student Outcomes Survey (2001) reported unemployment, as against 12 per cent of non-Aboriginal former students; the median aboriginal monthly income was $2500, that of non-aboriginals $2600.

George and Kuhn (1994) find that the earnings gap shrinks by only about half when education and other relevant observable characteristics are accounted for. Patrinos and Sakellariou (1992) similarly find that holding constant years of schooling, experience, unionization, occupation, province and marital status banishes only 41 per cent of wage variation. The unexplained portion 'may include the effects of differences in ability, health, the quality of education, labour force attachment, culture', or 'wage discrimination against Indians in the world of work' (p.263). The increase in earnings associated with an extra year of schooling was slightly greater for non-aboriginal (at 6.5 per cent) than for aboriginal people (5.7 per cent).

Discrimination might be due to a conscious 'taste' for it on the part of employers, or an artefact of informational signalling contingencies in the labour market (Spence, 1974). Groups which are observationally distinguishable may theoretically settle in different equilibria with respect to the productivity perceived by employers to be signalled by different education levels, even given no correlation between group membership and productivity: because they are distinguishable, they may (logically speaking) reach equilibrium configurations independently of one another. High-productivity people in one group may then find themselves in a 'lower-level equilibrium trap', and have to invest relatively more in education to persuade employers of their high productivity. The opportunity sets facing the two groups could differ, regardless of their average productivity and absent an active taste for discrimination per se.

It is not clear to what extent any type of discrimination prevails in the Canadian labour market. But aboriginal students can apparently anticipate slightly poorer returns to education than their non-aboriginal counterparts, and this may affect their academic attachment.50 If so, this is not necessarily rational. Though they may not enjoy equal returns to similar levels of education, aboriginal people tend to see equal (or greater) increments between education levels than others (Howe, 2002). The absolute returns to educational investment should be powerful motivators.

50 Conversely, it may be hypothesised that returns to very low levels of education are superior for some aboriginal people than for non-aboriginals, if, for example, it is easier for reserve residents than for others to access social assistance for extended periods. Or the tax-exemptions for Registered Indians there may reduce the relative incentive to accrue the education necessary for more highly paid work.
The unemployment rate of aboriginals aged 20 to 29 falls from 40 per cent, for those without a high school diploma, to 23 per cent for those who complete secondary schooling and to ten per cent for those with a university degree (1996 census data cited in Thiessen, 2001).

Perhaps an effect operates via cultural attitudes of aboriginal youth: an apprehension of discrimination that nourishes disaffection with and alienation from 'mainstream' society in general, with rejection of the expectations of formal education as a corollary. Unemployment rates for non-aboriginals were approximately half those of aboriginals for corresponding education levels. Aboriginal youth may consequently underestimate the difference that education can make for them. According to Schwab (2001), Australia's aboriginal students are more likely to be motivated by the prospect of employment than by strictly educational goals, and student retention improves when learning goals are connected to employment. An explicit and early focus on the employment-relevance of education might be expected to help Canadian aboriginal students persevere with their education.

2.2.1.11 Impact of socio-economic characteristics

In both samples, each socio-economic variable constructed (with the exception of Mover Share and, in the elementary sample, Trades Share) found significant correlations with school meet-exceed ratios, their signs consonant with the preceding discussion. Aboriginal MERs show similar patterns. Multiple regression attempts to ascertain the impact of some of the above factors on aboriginal test scores are compromised by collinearity. When only variables that do not present such problems are included (excluded variables not appearing significant in any case), Extreme Neighbourhood Poverty and Lone-parent Family Share continue to have negative impacts on the MERs of aboriginal boys in the elementary/middle sample when neighbourhood education levels, unemployment, and mobility are held constant (Appendix B, Table 7, Regression 1). But effects are small, and the model explains essentially none of the variation in test scores. Living in a very poor neighbourhood is associated with MERs a tenth of a per cent lower, while for every percentage point increase in the prevalence of lone-parent families, MERs drop by half a percentage point. The secondary sample shows negative effects on aboriginal MERs of Lone-parent Family Share and Drop-out Share (Appendix B, Table 8, Regression 1). Effects are somewhat more pronounced, and the model more powerful.

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If this is the case, and given the real and significant material rewards of education for aboriginal people, the educational prospects of aboriginal youth might be better served by erring on the side of playing down any potential racial discrimination in the labour market, rather than playing it up.

The irrelevance of Mover Share greatly diminishes confidence in the construction of the socio-economic descriptors.
Results from the OECD’s PISA program also suggest only moderate effects of socio-economic status on test scores – and they are generally smaller in Canada than elsewhere (Statistics Canada, 2001). However, the socio-economic disparity between aboriginal and non-aboriginal communities overall is sufficiently dramatic that some non-negligible portion of the education gap is likely attributable to it. A study of selected educational outcomes of First Nations reserves and comparable communities (in terms of size and location) against national figures found that although 18 percentage points separated the proportion of reserve residents with a highest level of schooling less than Grade 9 from the national proportion, the difference between reserves and comparable communities was 11 points: about 40 per cent of the headline disparity was accounted for (INAC, 1997). Grissmer et al (2004) claim that family characteristics account for roughly half of the Native/White educational attainment gap in the US.

2.2.1.12 Early childhood education

Targeted early childhood education has attracted attention as a promising instrument for mitigating the effects of children’s socio-economic backgrounds. Investment in human capital appears not to be substitutable across all periods of childhood, but is complementary and self-productive in nature; and early childhood is a sensitive period for the development of most skills, and a critical one for the development of many (Cunha et al, 2006). Skills produced at one stage augment skills attained at later stages, and investment at early stages raises the productivity of investment at later stages. In the absence of the early development of the requisite skills and abilities, later educational interventions can have only very limited effects (though they remain necessary to make early investment pay off).

Children from less advantageous backgrounds start school already significantly behind other children on measures of cognitive skills (and of non-cognitive skills relevant to learning). Grissmer et al (2004) observe that Native American children in the US start school with significantly lower reading, mathematics and general knowledge achievement scores than white, Hispanic or African-American children.

Threats to healthy child development are found across the entire socio-economic status spectrum, though at increasing intensity as one goes from high to low SES. Inequalities in child development emerge over the first five years of life, according to family income, parental education, parenting style, neighbourhood

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53 Neighbourhood variables, however well they track the characteristics of a student body, track the characteristics of aboriginal students much less well. They are likely to be worse off on any given measure, on average, than their neighbours. Modelling of the gap in what follows uses variables that appeared most promising in preliminary regressions on the gap, rather than those that were most significant in regressions on aboriginal MERs.
safety and cohesion, neighbourhood socio-economic characteristics, and access to quality child care and developmental programs (Hertzman, 2004, p.5).

Early developmental interventions might help children whose home environment is not conducive to development of the relevant skills, in effect substituting for parental inputs. Health Canada’s Aboriginal Head Start program is partly motivated by these considerations, and offers locally designed and controlled programs to enhance school-readiness amongst Aboriginal children at 126 sites.

The theory is strong. However, though early intervention results in appreciable improvements at the completion of the program, at least for ‘children who are poor or near poor and/or have mothers with a high school education or less’ (Brooks-Gunn, 2003, p.9), they appear to dissipate over time (p.7). Evidence is mixed about continued effects on school achievement. Further exploration is merited, but is beyond the scope of this study, which will be confined to the regulation of K-12 institutions: the point of reviewing the early and persisting disadvantage of aboriginal children is to form a realistic image of what K-12 can accomplish.

2.2.2 Peer characteristics

The racial composition of classes affects students’ educational outcomes. In the US, Hoxby (2002) estimates that every ten percentage point increase in the proportion of black students costs black students a quarter of a percent on reading scores. Hanushek et al (2002c) find that a higher percentage of black schoolmates has a strong adverse effect on black achievement, with a ten percentage point increase in the proportion of blacks producing a cost to achievement of a fifth of a standard deviation; the effects are particularly severe for higher achievers. Friesen and Krauth (2005) find significant peer spillovers between and within linguistic groups in BC schools, both positive and negative depending on skill tested and group interaction in question.

It might be hypothesised that aboriginal peers tend, for one reason or another, to hurt each others’ school performance. There are anecdotal grounds to suspect the operation of such a negative peer externality in Canada. For example, one survey of aboriginal students found that over a third had heard of aboriginal students who do well in school suffering rejection for that reason. ‘Within the community [there is] lots of joking if somebody’s trying to better themselves

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54 Caution should be exercised regarding the positive effects reported in the early development literature, which rely almost exclusively on only two, extremely well-provisioned programs.
55 First Ministers at the Kelowna summit (November 2005) pledged that aboriginal high school completion rates would equal those of other Canadians by 2016. The children in question have already entered the system, and almost certainly entered it at a disadvantage. The target will almost certainly not be met, for that reason if for no other.
they're trying to be white, that's a real common thing that I hear’ (Silver et al, 2002, p.28). If aboriginal young people face a trade-off between popularity and achievement that others do not – the more they invest themselves in their education, the more they are stigmatised as ‘disloyal’ – then their outcomes are likely to be dragged down, and the ethnic education gap aggravated.

2.2.2.1 Impact of peer characteristics

In both the secondary and the elementary/middle samples, aboriginal MERs are highly (negatively) correlated with the number of tests taken by aboriginal students as a fraction of all tests taken in a school (‘Aboriginal Share’). Regression analyses were undertaken to estimate the impact of this apparent externality. Ideally, school effects would be fixed by analysing the effect of exogenous variation in peer composition on the achievement of the group of interest in successive grade cohorts within schools. The data available to this study permits no such sophisticated specification. Instead, in case aboriginal students tend to be concentrated in schools that are of lower than average quality, various proxies for school quality are introduced; and in case aboriginal students tend to exhibit a poorer socio-economic profile on average (peers of low socio-economic status per se may exert a negative influence) selected socio-economic variables are also held constant. The models are not entirely satisfactory as a result; findings are intended to be suggestive rather than conclusive.

In the elementary/middle sample (Appendix B, Table 7, Regression 3), the gap between aboriginal and non-aboriginal MERs grows by almost a quarter of a percentage point for every extra percentage point of the student body that is aboriginal (to the extent that tests taken by aboriginal students track that). The Aboriginal Male Share has twice as large an impact (Regression 4).66 The overall school MER is here intended to account for differences in school quality, and it matters: a school’s ethnic education gap closes by half a percentage point for every point increase in its overall MER.

If aboriginal share has a negative effect on non-aboriginal as well as aboriginal students, its effect on the gap between the two will understate its effect on aboriginal students.57 No raw correlation was apparent between Aboriginal Share and non-aboriginal MERs in the elementary/middle sample, but there is a significant, negative correlation in the secondary sample. To estimate the potential peer externality there, the effect of Aboriginal Share on

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66 In the elementary/middle sample, the ‘aboriginal share’ ranged from 2.3 to 86.2 per cent, averaging 16.5 per cent. In the secondary sample, it ranged from 1.6 to 100 per cent, averaging 15.6.
57 Friesen and Krauth (2005) find that an increased proportion of Aboriginal peers is significantly associated with lower scores for non-aboriginals in numeracy (Grades 4 and 7) and reading (Grade 7). However they do not investigate the effect of cohort composition on aboriginal students.
aboriginal MERs was analyzed. Deploying the non-aboriginal MER as a proxy for school quality, a percentage point increase in Aboriginal Share shaves a third of a percentage point off aboriginal MERs (Appendix B, Table 8, Regression 3). Also, the better non-aboriginal students do, the better aboriginal students do, in roughly equal measure.

To the extent that non-aboriginal MERs are affected by aboriginal share, this will be a less than satisfactory estimation of parameters. Replacing non-aboriginal MERs with the school graduation rate for eligible (Grade 12) students in 2002-03 may put the school quality proxy at a further remove from the Grade 10 aboriginal share (although a school’s aboriginal share is likely to be somewhat stable over time, and graduation rates likely to covary somewhat with MERs). Aboriginal Share continues to predict lower aboriginal MERs, although the effect is a little smaller (Regression 4). Taking the gap as the dependent variable, and bearing in mind the likelihood that this will understate the effect on aboriginal outcomes, the Aboriginal Male Share increases it (Regressions 7 and 8); Aboriginal Share is significant on the gap when Graduation Rate is entered, but not when School MER replaces it (Regressions 5 and 6).

2.2.2.2 Understanding the peer effect

These tentative findings hint that part of the explanation for the underachievement of aboriginal learners is due to some negative influence they exert on each other. The mechanism through which this operates remains undetermined, but several theories have been proposed.

Peer effects may include the direct effects of students teaching and supporting one another, while students with high ability or motivation may produce knowledge spillovers and positive effects on academic and disciplinary standards and expectations in the classroom (Hoxby, 2002); conversely, disruptive students may detract from the attention and teaching resources available to other students (Lazear, 1999). Parental endowments of time and money may vary the supply of public goods from which all children in a class or school might benefit. In these cases, the aboriginal identity of some peers who produce negative externalities for other students is in a sense accidental – it operates as a proxy for socio-economic status, and

58 To illustrate the implication: if a school, where 6 out of 10 aboriginal students in a student body of 200 are presently meeting Grade 10 FSA expectations, were to increase its aboriginal Grade 10 intake the following year to 80 out of 200, and they resembled the previous intake in every relevant way, then about 9 of those students would fail to meet expectations purely because of the peer effect: 39 (49%) rather than 48 (60%) would meet expectations.

59 May be a function of school quality or of the beneficial influence of higher ability peers. The foregoing results echo those of Richards and Vining (2004): FSA results decline, for aboriginal and other students, as aboriginal share rises; the aboriginal share of poorly performing schools is twice that of schools doing well in terms of aboriginal scores. Regressions 5 to 8 (Table 8) prone to heteroskedasticity.

60 Or who fail to produce positive externalities at the same rate as other students do. (This alternative explanation of the observed phenomenon is effectively identical to the negative-externality explanation, for policy purposes.)
behavioural disorders, among other things. But there may also be unique cultural factors that contribute to a detrimental peer culture among aboriginal students, qua aboriginal students – suggested by the larger negative effect of aboriginal share on other aboriginal students than on non-aboriginals (the MER gap grows with aboriginal share), and also by the earlier observation that aboriginal students who do well may risk a certain degree of peer ostracism.

Silver et al (2002) explain the problem in terms of resistance to an historically oppressive educational system, which failed aboriginals in the past and continues to be perceived as alien, even hostile. An early assumption of the ‘inferiority’ of aboriginal people, on the part of incoming Europeans, is internalized by Aboriginal people themselves, leading them to seek alternative cultural self-concepts. These contrast themselves with the white culture to which they stand in opposition, with educational application one of the qualities assigned to ‘white’ culture.

If oppression is directly associated with abusive educational practices, resistance to it may be directed at educational institutions. The residential school system is often cited as paradigmatic of cultural oppression – a source of the identification of education with enforced assimilation that prompts its rejection (Silver et al, 2002; Milloy, 1999; RCAP, 1996; Haig-Brown, 1988; Barman et al, 1986). Many aboriginal people have relatives who were processed through the residential system. Resentment and suspicion lingers: ‘Schooling, for most Aboriginal people, produced little other than pain, in return for which it produced no long-term gain. School was a losing proposition … the only rational result has been a legacy of ill-feelings directed by Aboriginal people at the Canadian education system’ (Silver et al, 2002, p.34).

The perception that education benefits only non-aboriginals may remain engrained after it ceases to be entirely accurate, accentuating an oppositional stance to education among aboriginal youth. If this stance partly constitutes aboriginal youth-cultural identities – part of what it means to be aboriginal is to resist schooling – then peer pressure to be careless of education may be a consequence. The dynamic may be further fuelled by cultural discontinuity between the home and school environments: schools ‘do not sufficiently reflect and honour their culture’ (Silver et al, 2002, p.35), and ‘there is a cultural/class/experiential divide between [aboriginal students], and largely white, middle class schools and teachers. Many aboriginal students are responding by simply rejecting school, and in some cases may even be putting pressure on other aboriginal students to do likewise’ (p.28).

62 In BC in 2003/04, aboriginal students were twice as likely as others to be diagnosed with learning disabilities, four times as likely to be diagnosed with behavioural disorders, and four times as likely to be assigned to the ‘intensive behaviour interventions/serious mental illness’ category (BC 2004; see also McBride & McKee, 2001).

63 44 per cent of North American Indian people off-reserve report that at least one family member had attended a residential school (Statistics Canada, 2004b).
This analysis bears resemblance to the oppositional-culture interpretation of the ‘acting white’ stigma amongst US blacks (Fordham & Ogbu, 1986), stylised by Fryer and Torelli (2005):

(1) white people provide [black people] with inferior schooling and treat them differently in school; (2) by imposing a job ceiling, white people fail to reward them adequately for their academic achievement in adult life; and (3) black Americans develop coping devices which, in turn, further limit their striving for academic success ... black Americans subsequently began to doubt their own intellectual ability, began to define academic success as white people’s prerogative, and began to discourage their peers, perhaps unconsciously, from emulating white people in striving for academic success (p.28).

Tatum (1997) argues that racial identity is more salient for visible minority young people than for their white schoolmates, due to their being observably distinct from the ethnicity that dominates and is validated by mainstream culture, and subject to experiences of racism. As they begin to explore and construct their personal identity, they begin to associate predominantly with members of their own race, who are better placed to empathise with their experiences. Ethnically-oriented peer selection motivates concepts of appropriate ethnic behaviour through which children, and especially adolescents, can signal their commitment and authenticity. Their peers ‘know how to be Black. They have absorbed the stereotypical images of Black youth in the popular culture and are reflecting those images in their self-presentation’ (p.60). As ‘a developmental process in response to an environmental stressor, racism’, racial grouping is:

‘a positive coping strategy. What is problematic is that the young people are operating with a very limited definition of what it means to be Black, based largely on cultural stereotypes. ... [which] do not usually include academic achievement. ... Being smart becomes the opposite of being cool’ (p.62).

‘[T]he peer group's evaluation of what is Black and what is not can have a powerful impact on adolescent behaviour’ (p.61). Behaviour viewed as falling within a white cultural framework is negatively sanctioned. Behaviour viewed as characteristically ‘un-white’ is adopted instead, and ultimately embraced as ‘authentically black’. This model may be relevant to the situation of aboriginal young people, the effect aggravated by particular cultural experiences.

Fryer and Torelli (2005) confirm large racial differences in the relationship between popularity and achievement in the US. But they also find that the phenomenon does not appear

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64 Other things equal, Hispanic students have steadily fewer friends the higher their grade point average (GPA), above a GPA of 2.5, and the highest achieving Hispanic students are the least popular. Black students begin to have fewer friends as their GPA passes 3.5. But the popularity of white students increases with GPA without interruption, and the most popular white students are those with the highest academic scores. ‘[A] one standard deviation increase in grades is associated with a roughly .103 standard deviation decrease in social status for Blacks and a .171 standard deviation decrease for Hispanics. For students with a 3.5 GPA or better, the effect triples’ (p.4).
in predominantly black schools, and is most problematic in schools where less than 20 percent of the students are African American. '[R]acial differences in the relationship between social status and academic achievement ... tend to be exacerbated in environments with more interracial contact' (p.27). The effect disappears in ethnically monolithic schools, and blacks in schools where there are fewer interracial friendships also incur a less severe tradeoff between popularity and achievement. There is 'growing evidence that there can be significant pressure in racially heterogenous schools to toe the racial line' (p.22). Tatum (1997) also observes that the 'acting white' stigma is a post-desegregation phenomenon, so not inevitable. Previously, positive attitudes to education were found in the south, where there was active encouragement and role modelling to pursue it: 'in the context of a segregated school, it was a given that the high achieving students would all be Black. Academic achievement did not have to mean separation from one's Black peers' (p.65). Black staff and curricular heroes, lacking in integrated schools, would all have been commonplace.65

Fryer and Torelli propose that the observed popularity/achievement trade-offs among US blacks are best explained by the rational choices of peers to make friendship investments according to whether those friendships are likely long to survive school, with high-achieving students rejected by black peers who on the whole do not expect their own achievements to lead them into similar life courses. This explanation is essentially race-neutral – peer cultures of contempt for achievement could theoretically have taken hold among any race. But as the latter is really a proxy for aggregated economic prospects, they have in fact taken hold among non-whites.

'Bad equilibria' in academic group-identity, arrived at for whatever historic reasons, are likely to be extremely tenacious. It is characteristic of many welfare gaps, and certainly of both education gaps under review, that they intensify over time. This may be an inherent function of the way peer groups constitute themselves as groups – i.e., largely in opposition to other groups, particularly in childhood and adolescence (Harris, 1998). By contrasting conspicuous qualities, such as academic attachment, groups define the ones that distinguish them – prizing those in which their group excels, denigrating those excelled in and prized by the reference group. On the

65 Fryer and Torelli take all this to imply that the education gap is not about cultural dysfunctionality. It contradicts a prediction they impute to the oppositional-culture explanation: the trade-off between popularity and achievement should be observed amongst black students regardless of peers' racial composition, since the oppositional culture is generated by discrimination that lowers the marginal benefit of educational investment, and the resulting opportunity structure is germaine for all blacks, whatever the composition of their school. However the contribution of labour-market discrimination may be exaggerated by this critique. Exposure to racism, and lack of exposure to alternative models for 'authentic' ethnic behaviour, may also be important factors in fostering oppositional cultures, which can then take root in some environments but need not do so in every environment.
other hand, ‘[w]hen there is no other group around, competition within a group increases’ (p.235), and the salience of inter-group differentiating characteristics decreases.\footnote{According to social identity theory, ‘when group identity is salient and their group is devalued or compares unfavorably with other groups, people strive to achieve a positive in-group identity by emphasizing the desirable aspects of their group, redefining negative stereotypical qualities as positive’ (Twenge & Crocker, 2002, p.373).}

‘When teachers divide up children into good readers and not-so-good readers, the good readers tend to get better and the not-so-good ones to get worse. A group contrast effect is at work. The two groups develop different group norms … [The poor readers] might recognize they are not very good at reading, but devalue the importance of reading … Being a poor reader may cause a child to categorize himself with the poorer students in the class even if the teacher doesn’t formally acknowledge such groups. The child then adapts to the norms of that group and takes on its attitudes, and the attitudes are likely to be anti-school and anti-reading. The consequences are harmful and they are cumulative. Group contrast effects between quick learners and slow ones result in the slow learners adopting norms that … cause them to avoid doing things that might have made them smarter. Group contrast effects act like a wedge … They force themselves into any little crack between two groups – any little difference between them – and make it wider.’ (Harris, 1998, p.242)

It is obviously important to understand whether the observed peer effect is driven predominantly by ‘behavioural’ factors, which may tell against concentrating aboriginal students, or by a ‘cultural’ dynamic which might – in theory – be mitigated by concentration (since ethnic identity might be less salient, and more frequent exemplars of high-achieving aboriginal students might prevent the formation of an ethnic identity that deems low achievement ‘authentic’).

2.2.3 Cultural characteristics

According to findings from the PISA, ‘family socio-economic status does not stand alone as the predominant factor’: ‘participation in cultural activities, and parental academic interest also continue to be strongly related to student performance, particularly among Canadian provinces’ (Statistics Canada, 2001, p.36). The aboriginal student population differs from non-aboriginal students, not only in terms of socio-economic characteristics, but also in terms of cultural characteristics, in several ways which may condition education outcomes.

2.2.3.1 Unfamiliar cultural norms

Aboriginal educational outcomes are hypothesised to be adversely affected by intercultural discontinuities. Demmert (2001) finds a consensus in the literature that ‘congruency between the school environment and the language and culture of the community is critical to the success of formal learning’ (p.9). When the culture in which First Nations students are nurtured,
and which dominates their home life, is not smoothly interchangeable with the culture of their school, children may fail to adapt, lose precious time adapting, or resist adapting.

Without ascribing uniformity of cultural practice across aboriginal traditions, one generalization grounded in the literature may shed some light on difficulties students can have with the school system, and vice versa. First Nations child-rearing is ‘self-exploratory rather than instructive’; children are given considerable latitude to make their own mistakes, and ‘are trained to be self-directed and self-reliant by being given the freedom to make many of their own choices and decisions’ (Henry & Pepper, 1988, p.73; see also RCAP, 1996 and Brant, 1990). The traditional form of education and acculturation is observational, imitative and participatory. Asking questions is an ‘interactive strategy found in and reserved for schools’, and not otherwise characteristic of interpersonal communication (p.75). Henry and Pepper cite ‘a growing body of research to suggest that distinct child-rearing practices – one stressing observational learning and another emphasizing learning through verbalization – have fostered the development of very different styles of acquiring knowledge and skills among Indian and European-American children’ (p.75). Outside school, learning is driven by direct experience; in school it is orientated around indirect experience, mediated by instruction. Outside school, learning is a visual-spatial process; in school the verbal dimension is stressed. Outside school, First Nations children enjoy remarkable (by Euro-American standards) freedom of movement; in school, movement is restricted and hedged by rules. The individualist/competitive orientation of education may be at odds with a collectivist/co-operative ethos traditionally prevalent in First Nations communities.

There are direct classroom implications. Teachers may be deeply engaged in the verbal-instructional mode, and reliant upon the imperative case for communication with students. Normal classroom management style, even the offering of assistance, can appear to aboriginal children as interference: ‘[t]he student may resent the involvement of outsiders in what they perceive as their affairs – that is, their learning tasks’ (p.74), and the resentment can be misinterpreted in turn. ‘The regimentation of the classroom experience, the emphasis on individual achievement, and the exertion of the teacher’s authority constitute a rupture with the child’s home environment’ (RCAP, 1996, p.26).

As a result, ‘Indian children who attend the typical highly-verbal school may find themselves in a culturally-incongruent situation with an effect approximating culture shock’ (Henry & Pepper, 1988, p.76). Many aboriginal students already face significant upheaval, for example, when they leave a reserve to attend a provincial school (Wilson & Napoleon, 1997, p.39): ‘[t]hey are homesick. They are in large classes with people they don’t know. They are
living in new circumstances. The pace of their academic work quickens and the expectations differ. Any student moving to a new school encounters some of these challenges, but they may be intensified for aboriginal students by unfamiliar cultural norms, and also, for some, by a challenging linguistic transition. MacKay and Myles (1995) find that difficulty with English language skills is a recurring factor in aboriginal failure to complete high school. English may be a student’s second, weaker language, or when it is not, the prevalence outside school of ‘non-standard’ English can still be an obstacle. There may be ‘little previous exposure to the academic English commonly used in textbooks and classrooms. Insensitivity by the school community to the students’ variety of English … may further undermine these Native students’ already fragile sense of identity and self-esteem’ (p.164).

Aboriginal children may be also more likely than others to have to contend with racist abuse or bullying (Silver et al, 2002; St. Denis & Hampton, 2002). This is not conducive to identification with the school community, and undermines the sense of belongs that promotes academic attachment and attainment.67

Besides the style of its delivery, the content of education may affect the ability and motivation of aboriginal students to sustain an interest in it. The enrichment of curricula with aboriginal languages, history and perspectives is widely advocated. ‘The students who feel the safest, the most comfortable, and the most enthused are those who receive some form of cultural education in school’ (Wotherspoon & Schissel, 1998, p.11).

The hypothesis, in summary, is that children whose home culture is not congruent in relevant ways with the culture of the school they attend will do worse in school. Intercultural discontinuity therefore explains some portion of the education gap. Interventions to sensitize schools to the cultural background of students and to incorporate culturally resonant components into curricula and institutional design ought to shrink the gap by promoting ‘cultural comfort’ (Richards & Vining, 2004). In Bell’s summary (2004):

‘Schools serving the needs of Aboriginal learners have far more complex roles than those serving the mainstream student population. In particular, they must build effective bridges between the different cultures, and frequently languages, of the home and the school. Additionally, they must recognize and validate the student’s own world-view while introducing him/her to the linear way of thinking and knowing that comprises Canadian education. … they must assist students to meet specified learning outcomes while respecting a community’s priority to preserve its language and cultural heritage …’ (pp.29-30).

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67 Kehoe and Echols (1994), using an instrument designed to measure school ‘sense of belonging’, found that aboriginal children report lower levels than all other groups; however their sample is miniscule.
2.2.3.2 Cultural continuity

Separate from the hypothesised problem of intercultural discontinuity, it may be hypothesised that intracultural discontinuity – the destructive effects of the disruption of traditional ways of life – also makes a contribution to the educational underachievement of aboriginal young people.

Chandler and Lalonde (1998), observing that the dramatic aggregate suicide rate amongst First Nations people masked enormous variation between different First Nations communities, find a strong linear relationship between ‘cultural continuity’ and incidence of suicide. In communities that had undertaken six initiatives to ‘repatriate’ control of important community services and symbols (construed as markers of an attempt at cultural rehabilitation, reflecting a premium on the persistence of culture), no suicides occurred during the five-year period examined. Where none of these initiatives had been undertaken, there were 137.5 suicides per 100,000 people, a rate that descended steadily the more markers of cultural continuity were in place. The authors conclude that cultural continuity is prophylactic against the risk of suicide.

Their proposed explanation appears directly relevant to school outcomes. Vulnerability to the contemplation of suicide is heightened when individuals fail to identify with their future selves – are unable to conceive of the person they will be in the future as the same person as the person they are now. Suicidal adolescents are distinguishable by the utter failure of ‘their efforts to find any personally persuasive means of warranting their own self-continuity in time’ (p.195). At such vulnerable stages, in between workable conceptions of the grounds of their personal identity, they are ‘temporarily left without a proper sense of care and concern for the person they are otherwise in the process of becoming’, and suicide ‘becomes a “live option” for the reason that the dead person in question would scarcely count as them’ (p.193). But those that enjoy a stable cultural identity are more likely to weather transient crises of personal identity: cultures ‘work in the service of self-continuity by holding our noses to the grindstone of social responsibilities and cultural promises during ... moments of developmental transition’ (p.197).
Less dramatic manifestations of unconcern for one’s future well-being must also be predicted by this model. Individuals not in possession of the identity convictions necessary to motivate appropriate care for the future may self-sabotage, even if they do not self-destruct: they may be more likely to abuse harmful substances or commit crimes, and less likely to invest themselves in their education. But communities offering a transhistorical sense of extra-personal identity, represented by attempts to preserve and rehabilitate their cultures, might suppress these effects, as they appear to suppress suicide.

The hypothesis, in summary, is that poor education outcomes are partly a function of a failure to identify appropriately with one’s future self, and that aboriginal youth are more likely to lack the cultural resources that mitigate this failure, because their cultures have been disrupted or disassembled. Cultural disruption may explain some portion of the education gap, and the promotion of cultural continuity ought to shrink it.

2.2.3.3 Parental engagement

The interest taken by parents in children’s educational activities directly affects their performance (Friedel, 1999; Kavanagh, 2002). Children from families who involve themselves in the life of the school and promote cognitive development at home achieve higher grades, have better attendance rates, complete more homework, and are less likely to drop out and more likely to proceed to higher education. These correlations seem not to be entirely attributable to the presence of other factors associated with both parental engagement and educational outcomes (Statistics Canada, 2001). One literature review suggests that family involvement in learning is more important to student outcomes than income or parental education, and that for at-risk students, it is the single most important determinant of success (Kavanagh, 2002).

Aboriginal children are less likely than others to benefit from parental interest in their education, measurable by attendance at parent-teacher events (MacKay & Myles, 1995). Since mitigation of this problem promises to narrow the education gap, it would be valuable to understand the causes of relatively low engagement. Explanations could appeal to socio-economic characteristics: worse-off families tend, for a variety of reasons, to be less engaged in their children’s schooling (MacKay & Myles, 1995), and aboriginal families are

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72 Potential pathways: children do better with parents who monitor and enforce homework completion; parents who understand what their children are expected to accomplish, and how accomplishments relate to future payoffs, are better placed to motivate and support children; parents who participate in the life of the school set an example, and contribute to its tone such that it becomes more welcoming for their children; parents who have met teachers and other students can converse with children about school in a way that folds school life more closely into the life of the family; children whose parents are active advocates are more likely to have their needs catered to; schools with higher levels of parental engagement tend to be safer, which promotes achievement.
disproportionately represented in this group. Explanations could appeal to institutional characteristics: access to formal avenues for parental involvement is more restricted for aboriginal parents, and this undermines engagement in a more personal capacity, perhaps by sustaining a perception that educational institutions are alien and do not prioritise their interests.

Or explanations could appeal to unique home-cultural characteristics, which are suitable to discuss here. Friedel (1999) conjectures that conventional avenues for involving aboriginal parents are unavailable, because effective participation depends on specific cultural knowledge. Parents must be acquainted and comfortable with the procedures and avenues for participating in school and relating to staff, but aboriginal parents, who themselves may not have attended mainstream schools, do not always enjoy that acquaintance or comfort. Schools can project an exclusive aura, appearing inaccessible or reserved for the mainstream culture.73

This problem is perhaps compounded by the legacy of residential schooling: negative cultural experiences may have alienated many parents from formal educational institutions, and fostered an unwillingness to support the aims of education. Any perception of persisting racism in educational institutions would make matters worse.74

The state’s historic assumption of responsibility for raising aboriginal children may also be hypothesised to have disrupted the transmission of parenting skills in aboriginal communities: ‘parents themselves began to question their own capabilities of being able to raise their children. Gradually, it becomes accepted that schools and administrators do a better job – they are the “experts” and their assumed positions of power are not to be questioned’ (Friedel, 1999, Section 2; also Milloy, 1999).

Friedel (1999, Section 10) further connects poor engagement to ‘the belief that [children] have little reason to excel because society has relegated them to a menial position regardless of their efforts.’ Students ‘choose to fail’ as a result of (and in order to signal) their disaffection from a system of expectations identified with an ‘oppressive’ culture, and parents can be more inclined

73 Focus groups with aboriginal parents report common reactions to school visits: ‘not being able to work up the courage to go through the door, trembling, anxiety attacks, or being unable to speak, or not feeling they have the right to ask questions, to speak up or to advocate for their children ... many of today’s schools continue to appear to them as unwelcoming places where there is little understanding of their fear’ (McBride and McKee 2001, p.41). Such steps as creating a comfortable parents’ room, where the principal comes to meet parents – as opposed to summoning them to the principal’s office, to be seated on the other side of a desk – may foster parental buy-in and confidence.

74 See e.g. Cardinal (2000, pp.64-66): ‘One reaction to education, a system that colonized Aboriginal peoples, is apathy ... due to “system discrimination” and a “curriculum [that] is geared to a non-native population.” One respondent stated that he or she “does not see the purpose” in the methods and approaches that are taken to educate the child. One participant stated that “if teachers treated our children the same as white children maybe our children would try harder.” These sentiments reflect the current situation but also the past ... within that [residential] system [people have] experienced failure. When a person has experienced failure within an education system, they are less likely to promote the educational experience to their family or other people.’
to allow this to happen. ‘Resistance as a response to oppression and alienation has become a symbol of group identity for Aboriginal peoples’; counterproductively, this ‘sends an implicit message to Native students that will serve to further marginalize and alienate them and ultimately lead to further resistance.’ It is not necessary for the oppression to be real and/or ongoing, only that perception of it be a defining component in cultural identity. A potential source of underachievement for children from poorer backgrounds is exacerbated in aboriginal families not only by perceived differences in opportunity sets but also by home-cultural experiences.

Reluctance to get involved, or uncertainty about how to, require an effort on the part of the school system to overcome. But poor communication can persist despite the best intentions. In the case of reserve-resident students, for example, teachers may have dealt with Native students for many years without ever visiting the reserve from which they come. For non-Native educators, the reserve, its history, dimensions, reasons for existing, pattern of social life, internal structure, and its relationship to Canadian society at large is virtually unknown. Some non-Native educators were also puzzled about which authoritative figure to contact on a reserve, how that contact might be made, and with what expectation of success (MacKay & Myles 1995, p.168).

Psychic distance impedes successful parental engagement. Physical barriers do too: First Nations children who leave reserves to attend school may be bussed a great distance, or board. In more compact areas, aboriginal parents are more likely lack their own means of transport, or may not have a telephone at home. What contact occurs between parents and school is often unidirectional, authoritative rather than consultative, and reactive (motivated by disciplinary or academic problems). ‘Negative encounters between parents and school staff tend only to reinforce negative mutual opinions’ (MacKay & Myles, 1995, p.168).

Aboriginal parents may be more likely to prefer not to interfere in their children’s educational decisions, even if they are deciding to drop-out. Some may be ambivalent about educational success, which may be feared to lead to severing of emotional and cultural ties, or to children moving off-reserve permanently, for example.

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75 ‘If parents believe that their children cannot succeed in school, not valuing education will reduce feelings of failure. Since children tend to model their own values and behaviour on those of their parents, parents’ “dysfunctional” values and behaviour are transmitted to their children. As a result, poor parents are “bad” role models for their children. If generations of irregular employment and discrimination result in street skills seeming more valuable than academic skills, parents will be more likely to encourage their children to acquire street skills...’ (Mayer, 1997, p.51).

76 Breaker and Kawaguchi (2002, p.50) point out that ‘long bus rides have negative effects on family life, the ability of students to perform well in classes, and students’ ability to fully participate in the school experience’.
The hypothesis, in summary, is that aboriginal parents are less likely than comparably-situated non-aboriginal parents to take an active role in their children's education, and that this has severe implications for their outcomes. The problem connects with cultural tension in general:

Parental participation in schools is low, as the schools are often viewed as hostile places. The curriculum lacks relevant culture and language content, and there is low representation of Aboriginal faculty in schools and higher education. As a result, the Aboriginal students keep falling behind the mainstream students in performance and employment prospects (Binda, 2001, p.181).

Low parental engagement explains a portion of the education gap, and strategies to improve it would narrow the gap appreciably."

2.2.3.4 Impact of cultural characteristics

'Successful schools are culturally affirming places of learning for all students. Students learn better when their environment strengthens a positive sense of identity. Security and pride in belonging nurtures motivation to learn. Parents and community, active in shared decision-making, add new capacity to the life of the school.' (Saskatchewan, 2005, p.3)

Given the stress laid on parental engagement in the literature, and the culture-specific barriers identified, failure to engage may reasonably be thought to be among the more influential of the determinants of the ethnic education gap.

With respect to the intracultural discontinuity hypothesis, Hallett (2005) explores the relationship between metrics of cultural continuity and metrics of school attrition (the drop-out rate and the 'never-grade-12' rate) for students from BC reserves in provincial schools. The drop-out rate varied between students' bands, from 18 to 93 per cent in those with ten or more children in the cohort: school attrition is a major problem in some communities, and barely problematic at all in others. The presence of all six continuity factors:

reduces the drop-out rate from 73 to 63 per cent ... the never-grade-12 rate dropped from 52 to 44 per cent. Although importantly short of providing anything like a complete account of the problem, such a reduction in drop-out and never-grade-12 levels would be counted as an unqualified success had it resulted from some kind of policy intervention (p.44).

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"Educators may have an interest in evading accountability by relating the cause of poor student performance to levels of parental support. 'Such an apparently cogent explanation can enormously comfort educators, because it places responsibility for a student's behaviour firmly with the parents and releases the school system from both blame and remedial action' (MacKay & Myles, 1995, p.166). This does not detract entirely from the cogency of the explanation."
However the Pearson correlation between the number of continuity factors and dropping out was small, and not significant ($r = -.047, p = .093$), though that between continuity factors and never-grade-12 rates was somewhat stronger, and significant ($r = -.061, p = .030$). In logistic regression, modest but statistically significant overall effects on both outcomes were observed, but only one continuity proxy (initiation of land claims) predicted decreased dropping out, and only two (land claims and control of health care) predicted increased continuation to Grade 12. The study does not account for socio-economic differences between students from different bands, nor for the quality or composition of schools attended (although there is no reason to expect these to covary with bands’ cultural continuity).

The intercultural discontinuity hypothesis is difficult to assess empirically, and rigorous analysis lacking. But many of the policy responses entertained, such as creating a culturally congruent school environment, enriching the curriculum with culturally-resonant content, or directly involving elders in schools, might be assumed to have been incorporated into the design of the reserve schools which have come under band control over recent decades – this rationale featuring prominently as part of the argument for ‘Indian control of Indian education’. Such features might also be hypothesised to promote parental engagement.

This natural experiment does not appear to vindicate the notion that attending to cultural congruity makes much of a difference. The (scant) publicized outcomes of band schools remain dramatically inferior to aboriginal outcomes in public systems, never mind those of non-aboriginals, although there is doubtless enormous variation, and some evidence of isolated success stories (e.g. Kehoe & Echols, 1994).

It is possible that band schools have simply failed, as a whole, to implement the culturally appropriate programs that would make a difference, so that the underachievement of their students does not tell against the hypothesis. But their efforts arguably represent the closest approximation available in administrative reality, so that in practice, the implementation elsewhere of responses suggested by the hypothesis may also be unlikely to deliver the anticipated results.

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78 ‘[T]he fundamental reason for exercising jurisdiction [is] delivering quality and relevant education to First Nations students’ (Morgan 2002, p.3). 119,000 students in 494 (of 502) reserve schools were under band management in 2003.

79 See e.g. Koens, 1989. ‘Immediately after an Indian school comes under local control, there is a burst of enthusiasm leading to a superficial increase in symbolic cultural content such as dancing. When these changes fail to reduce chronic absenteeism and other problems, the effort to increase Indian content evaporates and the school program becomes “a pale reflection of the provincial curriculum”. Indian authorities are simply administering a non-Indian school system.’
Alternatively, the apparent failure of local jurisdiction to transform education outcomes, and the inferred negligible influence of hypothesised cultural factors, could be attributed to differences in levels of funding (Assembly of First Nations, 1988; Matthew, 2000; Postl 2005), or of accountability, or in relevant characteristics of the student bodies and their communities, which are typically more remote than average and worse off on socio-economic dimensions, with relatively impoverished social capital resources. In the absence of detailed performance data from band schools, there is no way to assess the real relevance of these potential confounders (a policy argument in its own right for greater transparency).

Band-operated schools in BC can opt for independent status in the public system, which circumstance may permit some limited insight into the effect of cultural congruence, with funding and accountability aspects at least somewhat comparable to public schools. Several schools determined (by consulting their websites) to be governed and operated by band councils appear in the sample. Table 9 (Appendix C) compares the MERs of the band-operated schools (in one case, the average of two independent schools located in one district) with the average aboriginal MER of the other schools in the districts where those band-operated schools are located. In only one of 11 cases do aboriginal students in a band-operated school do better than the average for public schools in their surrounding district.

Analysis detects no significant effect of band operation on aboriginal MERs in the elementary/middle sample (Appendix B, Table 7, Regression 2), and a small negative effect in the secondary sample (Table 8, Regression 2). The aboriginal share and selected socio-economic characteristics of schools' neighbourhoods are held constant. Important caveats apply. In the case of band schools, socio-economic characteristics are drawn from the Community Profiles of the reserves that supply their students, creating a more accurate depiction of aboriginal students there than in the public schools, where measures of social exclusion are probably underestimated for aboriginals. Second, the numbers of band-operated schools analysed are small (eight and four, respectively). Third, several factors that may disproportionately affect band schools are not specified and accounted for, such as social capital resources, or remoteness. Finally, the extent and quality of efforts to implement cultural congruity in any given case are not known, so whether the influence of this is being measured is uncertain. The findings are intended to be suggestive rather than conclusive – any expectation that cultural congruity will be a panacea that raises aboriginal education outcomes is not borne out, as far as test performance is concerned.

80 Schools are from both the secondary and elementary/middle samples, mixed to enhance anonymity. The same school may feature more than once where it offers tested grades at both levels.
2.2.4 Institutional characteristics

Certain aspects of the organisation of educational institutions may be more or less conducive to the learning prospects of aboriginal students. Reorganisation would have systematic implications beyond those for aboriginal outcomes, but it is worth isolating factors relevant to the underachievement problem. General issues of the quality of schools and teachers are not considered, however; it is assumed that whatever policies promise to promote institutional quality overall will be pursued independently of their benefit to aboriginal students.\(^8\)

2.2.4.1 Teacher interactions

Aboriginal people are under-represented on teaching staffs. In 1996, their average teacher employment share across Canada was 1.3 per cent, while the aboriginal share of children under 14 was 6.4 per cent (Archibald et al., 2002). Moreover, 60 per cent of aboriginal teachers in Saskatchewan, where such data are available, are Métis; a much smaller proportion is First Nations. Off-reserve, only a third of First Nations 15 to 24 year-olds have encountered an aboriginal teacher or aide (Statistics Canada, 2004).\(^9\)

There is decent evidence that teachers’ ethnic identities matter to student performance. Hanushek et al (2002b) detect a positive value of matching students and teachers by race: ‘black students who have had both a black and white teacher perform better relative to classmates during the year in which they had the teacher of their own race’ (p.22). Dee (2001) exploits the random assignment of Project STAR, and finds that assignment to an own-race teacher significantly increased the test scores of both black and white students – three to six percentile points for a year with an own-race teacher, depending on skill and race. Dee (2005a) also finds that the odds of a student being (perceived by the teacher as) disruptive are 1.36 times as large with a teacher of another race, with similar effects on the odds of (perceived) inattentiveness and of rarely completing homework. Effects are concentrated among students of low socio-economic status.\(^\text{10}\)

Explanations for what Dee (2001) characterises as the ‘conventional wisdom’ that students will likely do better with same-race teachers he classifies as either passive or active –

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\(^{8}\) Aboriginal students appear do better in schools where other students do better (e.g. the ethnic gap diminishes as the school MER rises), suggesting that school quality makes an important difference to aboriginal outcomes. But it is unknown whether these are treatment, as opposed to selection, effects.

\(^{9}\) This is still almost double the contact for 25 to 44 years and almost five times that for 45 to 64 year olds.

\(^{10}\) Ehrenburg et al (1995) find significant variation in subjective assessments of students according to whether teachers and students are matched by race, but no effects on objective measures. Dee (2001, p.6) points out the vulnerability of that research design to omitted or endogenous regressors: ‘if minority faculty sought out or were more likely to be assigned to at-risk minority students, naïve estimates of their effect on student outcomes would underestimate the true effects.’ Evidence from the random-assignment experiment is more reliable in this respect; Dee’s method also includes specification checks to assure that teacher-student pairings were unrelated to potentially confounding unobserved traits.
triggered merely by the teacher’s racial presence, or by particular behaviours they are more (or less) likely to engage in. The first category encompasses the comfort and focus provided by the own-race teacher’s presence, the role-model effects that engage student effort and confidence, the reassessment of prior beliefs about the value of education, and the mitigation of stereotype threat, whereby when students apprehend that stereotypes might attach to them (e.g. black students with white teachers), they respond with detachment that retards achievement. Though these factors are frequently assumed, there is little direct empirical support for them, apart from the reality of stereotype threat (Steele, 1998). The second category encompasses the possibility that teachers’ allocations of attention and resources might be partly driven by student race/ethnicity. Dee (2001) cites ‘extensive empirical evidence’ of such biases (p.5): black students with white teachers receive less attention and praise than white counterparts, for example. Dee’s analyses confirm the educational value of own-race teachers, but do not clarify which explanations are to be preferred. 

The transferability of teacher-race-effect findings to Canadian aboriginal learners has not been verified. Apart from anything else, it is not certain that ‘aboriginality’ would be sufficient in itself to generate the sorts of benefits observed in other contexts; perhaps a teacher’s specific cultural/traditional background matters. However it may plausibly be hypothesised that, in general terms, the sensitivity brought by aboriginal teachers to the challenging adaptations aboriginal students may be undergoing might help the latter settle and feel ‘at home’ (Archibald et al, 2002). They may hold higher expectations, serve as concrete symbols of the benefits of education, enrich the curriculum with tailored cultural and cognitive strategies, or their teaching style may be more consonant with home environments of aboriginal students. They may modify the perceptions of non-aboriginal students, with beneficial knock-on effects. Conversely, ‘dominant-group’ teachers may have negative perceptions of minority students, or treat those from their own group preferentially. 

An obvious policy implication is to maximise the number of aboriginal learners matched with aboriginal teachers, as long as this does not compromise the average quality of teaching aboriginal learners receive. This implies increased hiring of aboriginal teachers. Current failure 

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84 The explanation of the stereotype threat effect that suggests the teacher matters may not be the correct explanation, however. The evidence of lower test scores when students are reminded of their racial/ethnic/gender categories is consistent with the possibility that the salience of that category, and thereby membership of a group with anti-educational norms and values, is being evoked – the effect is due to stereotypes peer groups hold about themselves, not to stereotypes individuals suspect that others hold (Harris, 1998, p.251).

85 Riley (2005) finds that teachers who are led to believe that hypothetical students are of aboriginal ancestry consistently under-rate them, when recommending assignment to remedial, average or advanced programs, in comparison to their (fictional) non-aboriginal counterparts, regardless of (constructed) prior academic records.

86 Ehrenberg and Brewer (1995) find positive same-race and negative other-race matching effects (in a US dataset from the 1960s), but also reason to worry that quality differentials of black teachers might overwhelm matching benefits.
to recruit and retain at proportionate levels is attributed by Archibald and colleagues (2002) to rurality, social and economic conditions, the extra responsibility of role-modelling, an in-school us/them dynamic, the lack of aboriginal people in governance, leadership and administrative positions, and collective agreement barriers to affirmative hiring. The disproportionately low education levels of aboriginal people presumably establish a problem of supply, too. Since the impact own-ethnicity teachers appear to promise is so challenging to capture and administer in reality, there may be extrapolated policy implications: segregation of aboriginal students would maximise the matching potential of existing human resources.

2.2.4.2 Accountability

Measurement of the performance of various units (teachers, schools, districts) within the education system could in theory help them improve their performance through a variety of mechanisms. It supplies an informational tool for management. Units that are underperforming can be identified by the relevant management layer, and the underperformance made an issue. Where there are plausible exogenous reasons for the underperformance, the influence of these can be more precisely evaluated. The scope to play down or explain away suspected problem areas is constrained, and solution-oriented dialogue can be initiated. Practices that yield genuine improvements can be identified for mobilisation elsewhere.

Measurement enables the application of sanctions to underperforming units, which may range from the pressure created by publicity for poor performance (‘name and shame’) to the threat of closure for poorly performing schools (however defined), the provision of vouchers to students in ‘poor’ schools that enable them to attend elsewhere, reassignment or dismissal of teachers and administrators, and so on. There is evidence, albeit highly contested, that such measures may produce gains in student attainment (Hoxby, 2001; Jacob, 2002; Hanushek & Raymond, 2004).87

Performance measurement also supplies an informational resource for parents, which can inform parental monitoring and, if combined with some level of parental choice over the schools their children attend, generate competitive incentives for schools to attend to problem areas.

87 They may also risk creating ‘perverse’ incentives and unintended consequences. Costs and benefits must be weighed carefully if these cannot be ‘designed out’. Examples include reallocation of resources to the marginal students (in terms of ‘cut-offs’ implicit in accountability measures) at the expense of lower (or higher) achieving students; reallocation of resources away from untested to tested subject areas; an in-class emphasis on skills directly relevant to tests, at the expense of other skills and knowledge-sets; withholding of poor prospects from tests, by assignment to special categories, suspensions, or ‘constructive expulsion’; and an increased likelihood of cheating and corruption. It is not obvious that all of these ‘problems’ really are problems, but it is beyond the scope of this report to investigate them.
BC has implemented a substantial accountability infrastructure through regular testing of students, district accountability contracts, and public dissemination of a variety of school-level performance indicators. Targets are established at local level, reflecting district-identified priorities, but they will not be oblivious to conspicuous problem areas or to Ministry suggestions about where attention is merited. The BC accountability framework does not apply explicit sanctions for failure to meet targets, so implicitly relies on the power of ‘naming and shaming’, trust in the dedication and competence of district and school staff, and the motivating career aspirations of individual agents in the system. The recent introduction of open boundaries may complement this infrastructure, with expanded parental choice within the public system perhaps generating some marginal competitive pressure.

Accountability of educational institutions in general may benefit underperforming groups of students in particular, perhaps because they draw attention to specific, persistent problems (Cowley & Easton, 2004b), focus organisational energy on areas where gains look attainable, and prevent institutions from coasting on the reliable success of the ‘easy-to-teach’ students. Anderson and Postl (2000, 2001) find positive effects for Aboriginal students of school performance assessment: ‘it has been shown to be effective in supporting improved education for Aboriginal students’ (Postl, 2005, p.38). Aboriginal ‘school attainment is better in provinces that encourage results-based practices, conduct assessments of basic skills in elementary grades, and require provincial examinations in specified high school subjects’ (Bell, 2004, p.296).

Accountability comprises the central plank of BC’s strategy for improving aboriginal outcomes. BC has pioneered the separate identification of aboriginal students and public tracking of their attainment, and targets for improving their outcomes feature regularly in accountability contracts. An instrument of particular interest is the Aboriginal Education Enhancement Agreement, which ‘establishes a collaborative partnership between Aboriginal communities and school districts that involves shared decision-making and setting specific goals to meet the educational needs of Aboriginal students’ (BC, 2003, p.8).

Enhancement Agreements are intended to improve performance partly through ‘the integration of Aboriginal perspectives into learning experiences’ with stress upon:

- the integral nature of Aboriginal traditional culture and languages to Aboriginal student development and success. Fundamental to EAs is the requirement that school districts provide strong programs on the culture of local Aboriginal peoples on whose traditional territories the districts are located (p.8).
The active and formal involvement of the local aboriginal community, where it is sufficiently organised as such to participate effectively, is expected to help assure the relevance of education to the aboriginal population. Educational success 'requires strong and flexible ties between formal education institutions and Aboriginal communities, taking into account not only wider diversity, but also effective ways in which to bring Aboriginal people into the school planning and delivery process' (Wotherspoon & Shchissel, 1998, p.10).

But such 'enrichment' value is supplementary to the accountability strategy that motivates the agreements, and might be expected to be chiefly responsible for any resulting impact on outcome patterns. Schools in the samples were coded (1 or 0) according to whether an Enhancement Agreement had been in place in their district for at least a year. In the elementary sample (Appendix B, Table 7, Regression 9), the ethnic education gap is diminished in schools in Enhancement Agreement districts, holding school quality, aboriginal share and socio-economic indicators constant. However the size of the effect is very minor. No statistically significant difference is detected in the secondary sample (Table 8, Regression 9).

This constitutes somewhat informal evidence that Enhancement Agreements show some promise, at least for students at earlier stages of their careers (where educational institutions have been observed to be generally less resistant than high schools to change initiatives), but that they are unlikely to suffice to produce the drastic improvements sought. Of course, such initiatives may require a longer time to show results. Any interpretation will also depend on which precise aspects (accountability, cultural enrichment, community involvement) are thought to be doing the heavy lifting. Accountability in general may be regarded, on the casual basis of the performance of aboriginal students in BC relative to other provinces, as having had a beneficial effect for aboriginal learning; but the measures embodied in Enhancement Agreements may need to be strengthened if they are to make a really appreciable difference.

2.2.4.3 Governance

Established channels for parental and community input are partly intended to help ensure that school systems continually adapt to the needs of different children. The expression of aboriginal concerns and perspectives may be relatively prone to frustration. For example, school districts are typically overseen by boards of elected representatives from the local population, with individuals rather than groups serving as the electors. Aboriginal people rarely form enough

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**88** If, in districts that have signed EAs, aboriginal students are *more* badly off (in socio-economic terms) compared to their non-aboriginal peers than aboriginal students in non-EA districts are relative to their non-aboriginal counterparts – as is quite plausible – then the effect of EAs might be understated. Regression 9 (Table 8) prone to heteroskedasticity.
of the population in a given district to elect a candidate of aboriginal origin and/or who explicitly prioritizes aboriginal education (Brady, 1992, 1995). There is also evidence that aboriginal parents feel marginalized by the structure and activities of Parent Advisory Councils, the primary formal arenas for parental influence (McBride & McKee, 2001).

If 'the Aboriginal parenting community has been, and continues to be, marginalized in the public education system' (Mattson & Caffrey, 2001, p.5), and governance bodies do not reflect the composition of schools, it may be hypothesized that direct parental engagement with their children’s education may be correspondingly damaged, that local knowledge and preferences about what is wanted and what would work better are failing to filter upwards, that opportunities to reach out to potential aboriginal staff are being missed, or that community engagement with and respect for the education system in general is being undermined. Some slight portion of the education gap may be hypothesised to derive from these circumstances. Policies facilitating the engagement with schools of local aboriginal communities – putatively, by promoting governance participation – may accordingly be preferable, other things being equal.

2.2.4.4 Calendar

There is some evidence that the long summer lay-off of North American schools is a factor in the diachronic outcome divergence of students at opposite ends of the achievement distribution. Krueger (2003) describes how those who are already at risk fall further behind over layoffs – though children from high and low socio-economic backgrounds make equivalent gains on exams during elementary school years, the achievement level of the latter group stagnates or deteriorates over the summer, while the former group continues to improve.

Children from poor families enter school with a gap in achievement compared to those from well-off families. But the entire subsequent increase in that gap results from periods when school is out of session (p.32, emphasis added).

Relative ‘summertime fadeout’ may, speculatively, be due to the continuing academic enrichment of more advantaged students, who are more likely to read for pleasure (or visit summer schools and tutors). Their skills continue to develop, while those of already disadvantaged students atrophy. The latter benefit disproportionately from the supervision, assignments and enforcement provided by schools. Krueger concludes that:

students from poor families are particularly badly served by America’s comparatively short 180-day school year; they receive little academic enrichment when school is not in session (p.32).
Aboriginal learners are disproportionately represented in the attainment and family background categories that are put at further risk by extended layoffs. Wotherspoon and Schissel (1998) also emphasize the relevance of calendar flexibility to aboriginal students, in so far as they are significantly more mobile than average, and may face particular cultural demands on their time. An obvious policy implication, other things equal, is to prefer those options that would facilitate greater flexibility in calendar design, so that aboriginal students can receive instruction in ways that are more sensitive to their particular needs and vulnerabilities.\(^8^9\)

Initiatives that keep students academically engaged out of session may also be indicated. Distance learning is not dependent on the availability of local staff and facilities, and the provision of appealing technologies to support it may simultaneously stimulate student interest. Less engaged students will reap disproportionate benefits from having the means, motive and opportunity to pursue academic activities outside school.\(^9^0\) This sort of option may also have application to the problems encountered by highly mobile students, or those with other causes of intermittent attendance, enhancing the continuity of their education and its monitoring.

### 2.2.4.5 Curriculum and classroom configurations

A popular recommendation for promoting a sense of cultural comfort and school-belonging is the implementation of a culturally-resonant curriculum. Integrated attention to First Nations history, culture and language may be hypothesised to mitigate felt marginalization and ‘culture shock’, to blunt the distinction between a student’s ethnic and academic self-concepts, and to signal institutional respect and commitment that invites student and parental engagement. This facet of ‘culturally-based education’ appears to be at a fairly advanced level of implementation in BC. The Curriculum Branch has undertaken to ensure that aboriginal perspectives are reflected, and provides technical resources for the preservation of languages; First Nations Studies 12 is now an examinable course towards certification. Whether any further gestures that are feasible within the confines of the public system will make an appreciable difference to outcomes remains uncertain at this point. Other things being equal, however, the regulatory framework that best facilitates further exploration of such curricular possibilities may be preferable on that score.

\(^8^9\) The conventional school calendar is an accidental legacy of obsolete social pressures (e.g. to supply labour at harvest time) or environmental considerations that can now be neutralised (e.g. by air conditioning). Institutional inertia notwithstanding, there appears to be no rational basis for it in contemporary education policy. And though the interests of some stakeholders (e.g. teachers) may tell in favour of preserving it, the interests of others (e.g. parents) may be served by restructuring it.

\(^9^0\) Alberta’s Sunchild First Nation claims a doubling of credit and course submissions to Alberta Learning pursuant to its introduction of an E-Learning model.
In response to some of the cultural differences between aboriginal and other students discussed earlier, advocacy has arisen for more informal and flexible organisation of classrooms, and for more emphasis on group work, peer-directed and collaborative learning practices, and open-ended questioning, and less reliance on primarily verbal instruction or competitive activity structures. Classroom styles differentially targeted at specific types of student are challenging to implement in practice, as long as different types of students are mingled and teachers remain predominantly comfortable in the styles in which they were trained and have practiced. The actual benefits of their introduction are essentially unknown. Other things being equal, however, the policy regime that best facilitates student-sensitive classroom configuration is to be favoured on that account.

2.2.4.6 Class size

Evidence on the effect on attainment of reducing class sizes is mixed. Quasi-experimental econometric analyses may suggest on the whole that there are no beneficial effects (Hanushek, 2002a, c), but this interpretation is strongly contested (Krueger, 2002), and unable to convincingly account for the real possibility that the size of a given class is not independent of the ability of students assigned to it. A random assignment experiment should overcome such difficulties, and one such (Project STAR in Tennessee) appears to show the production of gains. These are sufficiently modest and one-time that a single experiment will not necessarily be decisively persuasive to policy-makers (Hanushek, 2002c). However positive effects appear significantly more pronounced for black than for white students (Krueger & Whitmore, 2001).

The educational situations of Tennessee blacks with Canadian aboriginals should not be automatically equated: it is simply not known whether they resemble each other in whatever respects are responsible for the observed benefits for the former of reduced class size. However the possibility that class size controls could help aboriginal students approach the attainment levels of their white peers cannot be dismissed. Harris (1998) speculates that ‘it is easier for the teacher to make a smaller class into a united group. The kids are less likely to divide up into contrasting groups with contrasting attitudes towards schoolwork if there aren’t very many of them’ (p.249). If this is part of the explanation for the benefits to black children of small class sizes – they attenuate the potential for oppositional peer cultures to develop – then similar benefits for aboriginal children might be anticipated. If a policy, pursued for independent reasons, were to offer the possibility for a genuine experiment on the class size effect, that would be an option worth considering, both from a policy and from a research perspective.
2.3 Why do boys do worse in school than girls?

If the sources of aboriginal underachievement are only imperfectly understood, the sources of male underachievement are if anything less clear, with fewer obvious candidates for relevant differences between the target- and the reference-group. Still, several strands of theory and data may be teased out to identify several factors that may be responsive to intervention.

2.3.1 Socio-economic characteristics

Males and females will not differ overall in their socio-economic profiles, but the impact of these may differ by gender. For example, early parenthood has an appreciable negative impact on female educational prospects, but barely any on males. (This built-in 'head start' makes the relative underperformance of boys in general all the more perplexing.) Certain socio-economic factors may be suspected of impacting male academic prospects disproportionately. Though the impact of these looks slender, and they are barely amenable in any case to policy manipulation, it is worth clearing them away before more important determinants are considered.

2.3.1.1 Family disruption

While children from lone-parent families are known to be at higher risk of poor attainment, boys may be hypothesized to be more susceptible than girls to ill effects. In that case, the steep escalation of family disruption in recent decades might be expected to have entrenched male underachievement. In the secondary sample, male MERs are negatively correlated with Female Lone-parent Share, while female MERs are not significantly correlated. The female-male MER gap correlates significantly, but slightly, with Lone-parent Family Share.

Although the literature does indicate that effects of disruption are stronger for boys in the areas of social adjustment (Amato & Keith, 1991) and conduct problems (Amato, 2001), no hypothesised differences in academic achievement have been validated (Amato, 1994, 2005). Males and females are precisely equally represented among the 32 per cent of Canadian high school drop-outs who lived in a single-parent household (CESC, 2003), also suggesting no differential impact. When other variables are held constant, family structure does not appear to influence the gender gap in either sample (Appendix B, Table 7, Regression 6 and Table 8, Regression 10).

91 Proposed pathways (Amato, 1994): loss of contact with the same sex parent and deprivation of positive role models; greater exposure to conflict or lesser provision of support, if boys are believed to be 'tougher'; being 'picked on' by custodial mothers, if they resemble fathers. In 5 years previous to one study, 23% of separated fathers had no contact with their children; an additional 20% had none during the preceding year (Marcil-Gratton & Le Bourdais, 1999).
2.3.1.2 Economic incentives and constraints

Canadian girls aspire to half a year more of education than do comparably-situated boys. Three out of four girls, compared to three out of five boys, aspire to obtain at least one university degree; more boys would be satisfied simply to complete a high school diploma, or not to complete high school at all (Looker and Thiessen, 2004). Even among 15 year-old future drop-outs, girls perceive postsecondary education positively compared to boys: a higher proportion aspire to college or university, and a higher proportion believe they would enjoy it (Bushnik et al, 2004). Not only should different aspirations be expected to translate into different levels of application, but among those who do hold high aspirations, girls ‘put in greater effort than boys as the means to achieve their goals’ (Looker & Thiessen, 2004, Section 3.2).

Why are girls more aspirational, and why is their behaviour better suited to realising their aspirations? One finding (Looker and Thiessen, 2004, confirming what they discovered elsewhere in the literature) is that attainment is more determinative of boys’ aspirations – they are more likely to adjust their aspirations based on academic performance, while girls are more likely to behave as if they believe they can transcend the prospects their current achievement levels indicate. Low academic attainment:

has the strongest influence on the decision to drop-out. Poor marks do not compel one to leave school, since at worst they simply require one to repeat a grade. Hence it is reasonable to assume that students whose academic performance is poor use their marks as a strong signal that continuing their education will not improve their labour market outcomes. Perhaps students who receive low marks change their minds about the value of education, concluding that it will not pay off with respect to their occupational futures. This would arguably be a wrong conclusion for them to arrive at … a policy issue is how to ensure that students with low marks continue to see the relevance of education for their future labour market outcomes. The role of career counsellors and school-sponsored work experience programs are relevant (Section 3.2).

Boys’ achievement is in any case lower overall, but rational calculations about their investment in education are compounded by their apparent greater tendency to ‘defeatism’ (or ‘realism’, as the case may be).

Boys’ lower aspirations, and weaker tendency to be motivated by the aspirations they have, may be a function of a poorer average capacity for patience and long-term forward planning. They may be less conscious than girls of the importance of education to their economic prospects, or more likely to be unrealistically confident that they will be exceptions to the rule. Career and personal planning instruction focussing on the link between school achievement and
economic prospects, and helping students to chart and follow a course of action, might mitigate relative male insouciance by beginning earlier, before aspirations are entrenched.

It might also be hypothesised that boys are more likely to aspire to occupations to which they believe educational qualifications will have limited relevance. In that case, when the proportion of employed people in neighbourhoods surrounding schools who work in the primary industry and resource sectors (the variable, Primary Industry Share) is introduced (in an attempt to gauge the extent of local opportunities to which education might be perceived as less relevant and which are relatively lucrative), the gender gap might be expected to sensitive to (expanded by) it. But this does not seem to be the case (Appendix B, Table 8, Regression 10).

More immediate economic constraints may be relevant. Boys much more often cite wanting, or having, to work as a reason for dropping out of high school (Bushnik et al., 2004), even though girls are equally likely to be working while still in school (Bowlby and McMullen, 2002). Different propensities for patience and planning may be relevant here also, or boys may be under (or assign themselves) greater responsibility to provide for other family members, or heavy involvement in paid work may be symptomatic of academic withdrawal among boys but a motivator or facilitator for girls, who seem better able to integrate paid work with school work. Whatever the explanation, strategies that keep working boys attached to school, if any such can be devised, could be expected to narrow the education gender gap.

Male students may be more inclined to stay in school if they can see a direct connection between schooling and near-term employment opportunities. School-to-work programs including co-operative education and apprenticeships are extremely valuable in this regard (CCL, 2005, ¶ 33, emphasis added).

The ‘academic turn’ of contemporary education, and the emphasis (possibly driven in part by parental aspirations) on post-secondary continuation, may be less conducive to male than to female success in school, if boys do (as they seem to) require more concrete and present reminders of the near-term relevance of education in order to motivate them.

2.3.2 Peer characteristics

In BC, peer gender has ‘strong explanatory power for exam scores even after controlling for school fixed effects’ (Friesen & Krauth, 2005, p.13): the presence of greater numbers of male peers lowers Grade 4 numeracy and Grade 7 reading scores (although it does not have a

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92 Weekend working is associated with lower academic aspirations for boys, but higher aspirations for girls (Looker and Thiessen, 2004.).
statistically significant effect on either Grade 4 reading or Grade 7 numeracy scores). Hoxby (2002; see also 2000) finds that both boys and girls perform better in reading and math when they are in classes with smaller shares of boys: boys’ 3rd grade reading scores rise by about .05 points for every 10 percentage point increase in the female share of their class, for example, and an all-female class would score a fifth of a standard deviation higher, all else equal (effects for 4th, 5th and 6th grades are similar). These peer effects are characterized as ‘substantial’.

The contribution such findings make to explaining the gender gap may not be obvious, at least within the classroom: since boys and girls are fairly evenly distributed overall, the externality imposed by males affects all students. However, peers might exert a harmful influence not merely by disrupting class or otherwise absorbing disproportionate teacher attention. The influence of peer groups on attitudes, behaviour and plans may also affect academic attachment:

Compared to continuers and graduates, a lower proportion of dropouts reported that most or all of their friends felt that completing high school was important (65% versus 86%), that furthering education after high school was important (54% versus 79%), and that it was “okay” to work hard at school (50% versus 71%). ... dropouts were much more likely than continuers and graduates to report that their friends engaged in negative behaviours. When compared to the proportion of continuers or graduates (12%), more than double the proportion of dropouts (29%) reported that most or all of their friends skipped class once a week or more. Additionally, more than half of the dropouts reported having a friend who was also a dropout, compared to 20% of continuers and graduates. And finally, 25% of dropouts compared to 9% of continuers or graduates said that most or all of their friends had a reputation for causing trouble (Bushnik et al, 2004, pp.12-13).

These findings ‘underscore the importance of the role that peers play in the long-term educational choices of young people’ (p.12). Males appear more susceptible to negative influences: ‘compared to male dropouts, lower proportions of female dropouts had close friends with reputations for causing trouble or who encouraged negative behaviour’ (p.15). Bowlby and McMullen (2002) confirm the preceding findings, and adorn them: peers of drop-outs were about three times more likely than those of graduates to have used marijuana at least once a week, with twice as many males as females reporting use by associates.

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93 In the data I analyse, grade- and school-level (as opposed to class-level) aggregations, and the associated minimal variation in gender shares, would not lead one to expect to be able to detect any hypothesized difference in outcomes due to peer effects, and no such differences are found.
2.3.2.1 Peer effects in the context of group identity

Students obviously select themselves into groups that exhibit certain attitudes and propensities. Observations of the sorts of peers drop-outs associate with do not establish causality. But once peer-group memberships have been inaugurated, definitive norms and characteristics may be magnified over time, so that members of some groups are multiplicatively bad for each other in terms of scholastic attachment. It might be hypothesised that boys are particularly susceptible to this tendency.

A gap between boys and girls is already observable at very early stages of their school careers, and may in theory prompt children to develop in-group norms based on their perceived relative strengths, with associated disdain for the strengths of the group they are distinguishing themselves from – with the groups in question defined along the gender lines that are so salient for younger children94: ‘girls become more like their stereotype of a girl, boys become more like their stereotype of a boy, and the differences between them are exaggerated by contrast effects’ (Harris, 1998, p.234). Subsequently, the group-contrast phenomenon discussed earlier may be helpful in understanding the entrenchment and widening of the gap.

When children categorise themselves as girls or boys, and when these self-categorisations are salient, the differences between the sexes widen. Even if there hadn’t been differences to begin with – and in this case there were differences to begin with – the mere existence of two dichotomous social categories is enough to produce them (Harris, 1998, p.237).

By the time students begin to associate across gender lines in their teens, and the salience of gender to identity construction diminishes, academic self-image may be fixed, and existing records of attainment a strong determinant of outcomes in any case.

The negative externality imposed by male peers, then, may be entirely due to ‘behavioural’ issues – male peers absorb disproportionate teacher attention and other classroom resources – or it may also owe something to a ‘peer-cultural’ phenomenon whereby boys exert a pressure on each other to express definitive ‘masculine’ values, constructed in opposition to traits associated with girls, such as trying to do well in school. Hoxby finds (2002) that a larger share of females in a class benefits females, but benefits boys appreciably more. Such non-linearity could be interpreted as evidence that both the behavioural and the peer-cultural models have some validity.

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94 According to Brophy (1985), numerous studies confirm ‘the universal tendency for children to segregate themselves on the basis of sex for virtually all social and academic activities’ (p.168).
2.3.3 Individual characteristics

Boys and girls might be hypothesised to differ from each other, on average, along dimensions that affect their academic preferences, capabilities, and prospects, and consequently the methods of teaching and learning that are respectively optimal – dimensions related not to their interactions with peers or to their social and family backgrounds, but to average differences in individual capacities and propensities which are conditioned (statistically speaking) by gender.

Whether such differences have mostly biological sources, or are somehow socially constructed, is disputed, but not especially relevant, since in either case the differences are there, they are educationally-influential, and they are impervious to re-engineering, at least by school policy. Schools, at any rate, do not socialise the relevant differences in attitudes, which are found to be pre-existing and not exacerbated by teacher or institutional biases or expectations (Eccles & Blumenfeld, 1985). But it is possible that schools that are cognisant of the differences might be able to mitigate any detrimental effects on male achievement arising.

The extent of the differences is also controversial. Some researchers deny any significant average differences in many characteristics relevant to education outcomes, even if they no longer deny that there are any differences at all, in any area (Shibley Hyde, 2005); or they attribute apparent differences in education-relevant characteristics to measurement biases rather than real qualities (Spelke, 2005). It is beyond the scope of this study to assess the arguments in this area, but the bulk of the literature appears to indicate that some important differences are significant enough to be suspected of influencing educational outcomes. The educational implications of those differences which are in least dispute are discussed in this section.

2.3.3.1 Early disadvantage and the importance of literacy

Consistent education-relevant differences between girls and boys are noticeable at an early age. For instance, boys are already five times more likely than girls to be expelled from pre-kindergarten programs (Froschl & Sprung, 2005). A female advantage is already apparent in the UK when children enter school (National Literacy Trust, 2006):

Girls arrive in primary school with a much stronger grasp of the alphabet, numbers and every other aspect of early learning .... An analysis of baseline tests during the first term at primary school showed girls outclassing boys in every department (¶ 17, ‘Achievement by gender’, emphasis added).

Possibly the most important early difference is in reading aptitude. According to Froschl and Sprung (2004, p.10), it is ‘accepted knowledge’ that boys develop the skills relevant to
reading and writing later than girls. Willms (2002) confirms that sex differences in language ability are evident amongst Canadian children when they enter kindergarten.

Torgesen (2004) observes that because even modest early reading weakness impedes enjoyment and deters practice, the problems have a strong tendency to spiral into serious and persistent ones: those who are poor readers at the end of first grade almost never acquire average-level skills by the end of elementary school. It is plausibly speculated that when boys don’t do well in school they disengage to avoid feeling shame, devalue doing well in school, and enforce disengagement and devaluation amongst their peers as signals of authentic masculinity (Froschl & Sprung, 2004). Reading is the dominant academic skill around which education at early stages of school revolves, and upon which successful engagement with all subject areas depends. The disproportionate gender distribution of early reading weakness would therefore be expected to have sustained and cumulative consequences for the attainment of boys compared to girls.

There is a very robust and partly causal association between reading achievement and anti-social behaviour, and it has been determined to start early and to be much stronger for boys than for girls. Moreover, whereas amongst girls the causal relation is unidirectional (from antisocial behaviour to reading achievement), a reciprocal connection has been established for boys: poor reading leads to antisocial behaviour, and vice versa (Trzesniewski et al, 2006). For boys, their anti-social behaviour is likely to feed back into progressively poorer relative reading skills (and other poor educational outcomes) This suggests that boys are more sensitive than girls to the already devastating effects of early reading difficulty – for them, the problems are more likely to compound over time, and their self-image is more susceptible to fixation by the levels of accomplishment they attain to in the early years.

The relatively greater sensitivity of boy’s self-evaluation and resulting effort and outcomes has been observed on a range of dimensions: girls are on average more resilient with respect to risk factors. The school experience of female dropouts tends to be more positive than that of male dropouts, suggesting that enjoyment of school affects boys’ attachment more than girls; female dropouts had better grades, were more academically engaged in school, and had higher reading scores (Bushnik et al, 2004), adding weight to the common finding, that past performance accounts for much more of the variance in boys’ academic self-perceptions than that in girls’ (Eccles & Blumenfeld, 1985). As Looker and Thiessen (2004) emphasise, the effects of academic performance measures are consistently stronger among boys than girls: prior academic performance is strikingly more determinative of both future attainment and aspirations for males than for females. Bowlby and McMullen (2002) observe that, compared to female drop-outs,
male dropouts are less engaged in school, more likely to have trouble with their teachers, less likely to complete assignments, and have lower grades (and these gaps are larger than the equivalent baseline gaps among school completers). In summary: boys’ performance and engagement are typically lower than girls’ in any case, and though poor performance and low engagement will tend to predispose any student to be more likely to drop out, they are more likely to predispose boys to do so (or, less visibly, to tune out).

It appears probable, then, that educational gender gaps at later ages owe a considerable amount to the cumulative and disproportionate effects of the early appearance of gaps, particularly in literacy. The gap in literacy skills is substantial and grows with every year of a cohort’s career. As curricula become progressively more oriented around verbal skills, the ‘salience’ of the gap (to peer groups) continues to increase, too.

Early (pre-school) intervention appears vital to explore in this context, as it did in the context of aboriginal underachievement, due to its promise of substituting for various parental goods among low socio-economic status populations, preventing the early appearance of gaps which then inevitably expand with time, and representing the most cost-effective intervention point in light of the complementary and dynamic nature of educational investments. Froschl and Sprung (2004) conclude that ‘there is, indeed, a growing crisis in boys’ education, and that early childhood, a high risk time for boys, is an opportune time to intervene’ (p.14). Trzesniewski and colleagues (2006) also recommend intervention before school begins, and note that ‘interventions aimed at improving reading achievement through improving behavior problems, or vice versa, will likely be more beneficial for boys … given the low prevalence of reading problems and behavior problems in girls, it may be more cost effective to focus these interventions on boys’ (p.84). Torgesen (2004) is confident that ‘if we intervene early, intensively, and appropriately, we can provide these children with the early reading skills that can prevent almost all of them from ever entering the nasty downward spiral’ (p.4).

It would be valuable to determine what lies behind the early gap, and whether it is policy-pliable. Pre-school interventions are beyond the scope of this study, but measures to boost male reading achievement may still be available in K-12. They appear to be central to current BC strategies to improve male outcomes, reflecting acknowledgement of the centrality of literacy:

The Alberni school district is helping boys in grades 3 to 5 with their reading skills. According to district data, the percentage of Grade 3 boys reading at grade level has increased to 81 per cent from 72 per cent in 2002-03. The district has launched intervention programs to provide boys with even more support (BC, 2006, p.1).
2.3.3.2 Maturation rates and other biological differences

Brophy (1985) argues that ‘boys’ problems with reading seem to be primarily motivational – many boys acquire the idea that reading is primarily for girls and that they will not enjoy it’ (p. 140). Social gender roles and expectations beyond the reach of education policy may play some role in this; the influences of individuals’ and peer-groups’ identification of their strengths and desirable qualities, and subsequent contrast effects, take root early and are certainly likely to be important. Certain biological differences may also be influential, establishing different base levels of motivation and ability on which the latter effects find a purchase, and circumscribing the types of instruction that will be effective for different students.

Areas of the brain involved in language skills mature about six years earlier in girls than in boys, while those that are involved in targeting and spatial memory mature about four years earlier in boys (Sax, 2005). The pace of development matters – though boys and girls may be destined to enjoy roughly equal capacities, other things equal, the fact that they mature into those capacities at different rates will threaten their full and healthy, successful development if children in the same early cohort are expected to perform the same tasks, in the same ways, at the same levels, and if one sex’s tendency to fail to perform to the same level as the other’s leads them to devalue that skill, or leads them and their teachers to affix low expectations. The typical scholastic emphasis on verbal accomplishment will tend to hurt the group of students that is relatively underequipped to excel; meanwhile, the male maturation advantage in other areas is not as valuable in terms of meeting early school expectations, and establishing a corresponding sense of engagement and rewarding prospects.

The pace and expectations of the education of very young readers may unintentionally be geared more closely to the development of the female brain, and boys who fare poorly develop negative perceptions of their competence that are difficult to reverse (Sax, 2005). Froshl and Sprung (2004) complain that though ‘boys generally develop the skills necessary for reading and writing later than girls ... no accommodation is made. Instead, the early childhood curriculum grows ever more academic and pays less attention to critical issues of child development’ (p. 10).

Boys also appear to be so constituted, at all ages, as to be less likely on the whole to be engaged by the exercises and materials typically employed to instil and practice verbal skills, to

95 Sax (2005, p. 93) argues that ‘[s]ex differences in childhood are larger and more important than sex differences in adulthood’. In general, sex differences are not large and persistent enough in the long term that they should lead us to expect appreciably different educational trajectories on average: Cowley and Easton (1999) 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’ (p. 3, emphasis added). The worry is rather that when sex differences are appreciable, at early ages, failure to cater to them establishes attitudes, beliefs and patterns of behaviour that do have lasting consequences.
the extent that are strongly orientated around relational issues, or call on students to identify with depicted situations and describe emotional responses. Young female brains process emotional information in the same region that processes language; young male brains separate emotional from verbal functions (Sax, 2005; Gurian, 2001). This may partly explain the widely-observed detachment of boys from reading instruction, compared to experiments with more conventionally ‘male-oriented’ material.96

Other neurological and physiological differences that appear potentially relevant to understanding the different educational profiles of girls and boys are fairly well-attested. Apart from development and maturation differences, male and female brains exhibit a wide range of structural, chemical, hormonal and functional differences (Gurian, 2001).97 Explanations are inferred from these for claims in the following areas (pp.44-7). Boys and girls exhibit average differences in the broad learning styles in which they exceed or to which they are best adapted: males generally prefer to apply general principles, and are better at rapidly drawing deductive implications from those, while females prefer to work with concrete examples and build theory upwards. Females benefit from digressive and contextual instruction, while boys prefer to subject conversation to logical rules, and benefit from logically sequential instruction. Boys bore more easily, with the result that they are more likely to give up, or act out, and be written off. Boys use space differently – they prefer to spread their work out. Girls master collaborative learning earlier, and are better at learning when it entails attention to codes of social interaction; boys prefer to focus exclusively on the task at hand, and are more likely to prefer (and to perform well when) working alone. Boys are more affected by their status in peer-group pecking orders, performing more poorly the lower they rank relative to comparable-status girls.

Boys are more ‘kinetic’ than girls – they need to move around more than girls do, and movement helps them stimulate their brains, and manage or relieve impulsive behaviour, much more than it helps girls (Gurian, 2001). Any erosion of recess time or increasing inaccessibility of sports and physical education programs and facilities would therefore be expected to have a disproportionate effect on boys: ‘boys at the age of 10 need five recess periods per day, but the typical punishment when a boy misbehaves is taking away recess, and … many schools are doing away with recess altogether’ (Froschl and Sprung, 2004, p.9).

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96 According to Froschl and Sprung (2004), Porche (at Harvard’s Graduate School of Education) advocates addressing literacy difficulties through the reading materials designed to be of high-interest to gender-specific audiences.

97 For example, girls collect more sensory data. Of particular interest, their hearing is up to seven times more acute. Sax (2005) cites evidence that 11 year old girls are distracted by noise levels ten times softer than those needed to distract boys, and takes this to provide further grist for his single-sex education agenda. The less drastic expedient of seating boys at the front of classes might pay dividends.
It was noted in Part 1 that boys perform better in high-stakes tests than their overall grades, prior attainment and other indicators would lead one to predict. Jacquelynne Eccles (Director, Gender and Achievement Research Program, University of Michigan) speculates that boys' apparent advantage reflects gender differences in test-taking strategies rather than competency, and notes that girls report higher anxiety and are more cautious than boys when taking standardized tests (Price, 2006). Students not only react to tests with different levels of stress according to gender, but respond differently to similar levels of stress. Stress enhances learning and performance in boys, but impairs it in girls (Sax, 2005).

The shift to weighting grades progressively more heavily on coursework and/or class assignments at the expense of test scores may therefore be contributing to the relative underachievement of boys — their comparative advantage in one dimension has been eroded. It is also feared that '[b]asing grades on turning in homework on time guarantees lower grades for boys' (Whitmire, 2006, p.16). Boys are less likely to be punctual with assignments, and though meeting deadlines is a valuable skill to cultivate, the value may be outweighed by the otherwise-needless harm caused by receiving poor grades (recalling that boys are much more sensitive in their academic self-image, and construction of educational aspirations, to such things).

2.3.4 Institutional characteristics

Explicit tracking of boys' performance is permitting the construction of targets for which districts and schools can be held accountable. The Ministry has begun incorporating an emphasis on 'narrowing the gap in performance between boys and girls' into many accountability contracts with school districts (BC, 2006). An outstanding issue is whether 'soft' sanctions will prove sufficient, or whether the bite of more robust incentives would produce more impressive gains.

97 per cent of eligible Grade 12 girls, and 96 per cent of boys, graduate from BC independent schools (a one point gap, instead of the three point gap in public schools observed earlier). The gap is slightly narrower in independent schools (and the absolute rates very significantly better) for first-time Grade 12 students, as well — 92 and 89 per cent, respectively (three points rather than four).\(^9\) If the smaller gaps are meaningful, they suggest that in schools where students do better as a whole, boys also do better relative to girls. This intuition was pursued for public schools, and in both the secondary and the elementary/middle samples, the gender gap narrows appreciably as the whole school MER rises (Appendix B).

\(^9\) The BC Ministry of Education publishes public school Grade 12 graduation figures, and figures for public and independent schools combined (BC, 2005b, p.3), so one can calculate the differences in student numbers to derive average graduation rates for independent schools.
This may indicate that school ‘quality’ makes a difference — good teachers and administrators, while they tend to pull up everyone’s performance, disproportionately pull up the performance of lower-achieving students. It is also possible that the narrowed gap is a function of peer effects produced by the congregation of particular sorts of students. At any rate, the elasticity of the gender gap indicates that it is not inevitable at its worst extent, and can be mitigated if the explanation for the upper-end narrowing can be properly identified and mobilized. Pending clarification, one or two features of educational institutions should be mentioned as potentially explanatory with respect to the gender gap.

2.3.4.1 Teacher interactions

If boys do better with male teachers, and girls do better with female teachers, then the fact that teachers are predominantly female may explain some of the gender difference in average outcomes. In Canada, the male proportion of the full-time educator workforce fell from 41 to 38 per cent between 1990 and 2000, and the proportion of male teachers is lowest among younger educators: they form 33 per cent of teachers aged between 30 and 39, and only 22 per cent of those between 20 and 29; 40 per cent of male teachers, but only 30 per cent of female teachers, are over 50 and likely to retire in the coming decade (CESC, 2003). 68 per cent of teacher full-time equivalents in BC are female (BC, 2005). The imbalance is even greater at elementary level.

Dee (2005b) finds that in the US, though the implications of teacher gender for girls are mixed and subject-specific, boys’ achievement is uniformly harmed by assignment to a female teacher, other things equal.\footnote{Dee (2005b) finds reasons to suspect that ‘boys with an observed propensity for low achievement are more likely to be assigned to male teachers’ (p.16), which may explain why previous studies had not detected teacher-gender effects.} Student engagement with academic subjects, and teacher perceptions of student performance, are also compromised by assignment to other-sex teachers, compared to own-sex teachers. Dee (2005a, p.162) reports that ‘the odds that a student was perceived as inattentive or disruptive are respectively at least 19- and 37-percent higher when the teacher is of the opposite gender’. The odds of a student rarely completing homework were 15 per cent higher when assigned to an other-sex teacher. According to Younger and colleagues (1999), teachers as a whole perceive girls as:

- better organised, with more sophisticated communication skills, more articulate, more confident, far better at independent learning ... as self-learners, spending more time on homework, adopting a more rigorous and carefully planned approach to coursework and revision, able to anticipate and conform to the demands of the school ... [boys present] an opposite image, more disordered, more demotivated, less willing to prioritise school work ... more vocal, more
boisterous, less advanced for their years, more easily distracted ... more concerned with peer-group image, sullenly challenging both the relevance of the education they were offered and the ethos of the school (p.328).

These impressions are doubtless derived from experience, and grounded in real average differences. But if these pre-existing perceptions are accentuated when students and teachers differ by sex, low expectations or stereotype threat may present an additional problem that explains part of the achievement gap – a problem mitigated by same-sex teacher assignment.

Brophy (1985) reminds us that ‘male and female teachers are much more similar than different, both in their general approaches to instruction and in their interactions with male and female students’, and reviews multiple studies finding that ‘teachers do not systematically discriminate against students of the opposite sex’ (p.137). Eccles and Blumenfeld (1985) concur: that boys and girls show different educational profiles is ‘as much a consequence of pre-existing differences in the students’ behaviour as of teacher bias’ (p.112). But the empirical evidence indicates that something is happening, so either even very small differences in active teacher approaches matter, or ‘passive’ teacher interaction effects are responsible.

The size of the achievement effect excavated by Dee (2005b) – assignment to a female teacher lowers the achievement of boys by a statistically significant .05 of a standard deviation – may not appear especially striking, but implies that ‘just one year with a male English teacher would eliminate nearly a third of the gender gap in reading performance among 13 year olds’ (p.25). However, this gain would be delivered by both the improvement of boys’ performance and the deterioration of girls’ performance; so a male teacher recruitment drive, for example, ‘could have the unintended and undesirable consequence of harming students who do not share the teachers’ demographic traits’ (Dee, 2005a, p.164).

2.3.4.2 Calendar

No direct evidence illuminates whether boys are more severely affected than girls by extended off-session periods (analogously to the disproportionate effect on aboriginals inferred earlier). To the extent that boys are from the beginning more concentrated at the bottom of the attainment distribution, the ‘wedge effect’ of layoffs may be hypothesised to apply. Since boys appear somewhat more likely to be prone to distraction from academic matters by peer influences and paid work, they may be more likely to benefit from ‘continuous’ education arrangements that sustain focus and enable consistent monitoring.
3 From insight to policy

3.1 Determinants of aboriginal underachievement – policy implications

3.1.1 Socio-economic characteristics

There is little scope for educational policy to respond directly to the structural conditioners of low academic attachment and engagement. As Richards concludes, ‘[m]uch of the explanation for Aboriginal education outcomes probably lies in social dynamics beyond the reach of any feasible education policy’ (2001, p.23). Incremental improvements may improve outcomes for ensuing generations, in so far as they gradually improve the socio-economic profile of aboriginal communities. But such effects are well beyond a desirable timeframe for improvement.

One or two mitigating interventions may suggest themselves. Schools may be well-positioned to partner with local agencies in delivering joined-up parental and community education on prevention, early detection and treatment of particular health problems. Teachers could be trained to make early diagnoses of otitis media, and to mitigate its negative effects.\textsuperscript{100} In-school initiatives might attempt to address behaviours and attitudes that contribute to pregnancy or delinquency, perhaps through sexual health education, or relations with local constabularies.\textsuperscript{101} But the effect of such initiatives, even if positive, is likely to be extremely modest.

3.1.1.1 Mitigation of adverse neighbourhood effects

Any negative influence that can be attributed specifically to the student’s residence in an extremely poor neighbourhood is only of interest to education policy-makers if it matters whether or not the student’s school is located in that same (or a relevantly-similar) neighbourhood. In that case, the policy-maker might consider extracting target children from extremely poor

\textsuperscript{100} The New South Wales education ministry implements an Otitis Media Strategy to improve the health and education status of aboriginal people, providing culturally appropriate programs, services and resource materials.

\textsuperscript{101} The government of Nunavut intends to subsidize the full cost of daycare for mothers 18 years of age and younger, provided that they stay in school, in order to neutralize the effect of youthful pregnancy on educational attainment. For all we know, however, this could have the consequence of further normalising youthful motherhood and raising its incidence, with the incremental retention of some mothers outweighed by the increase in total mothers, more of whom find continuation too onerous regardless of supports. Consequences should be monitored by other jurisdictions.
neighbourhoods and assigning them to schools elsewhere. But if some negative local-community culture with regard to education is responsible for the neighbourhood effect, must it somehow carry over into the local school? If the student is sent out of the neighbourhood to learn, is the culture left behind? The answers are not obvious. Sanbonmatsu and colleagues (2006), however, have found that random (lottery) assignment of vouchers encouraging relocation to neighbourhoods with lower poverty rates makes no empirical difference to the math and reading attainment of lottery-winners' children. If the importance of the neighbourhood effect has therefore been overestimated, it is that much less likely that the relative location of the school makes a difference: if relocating families out of hypothesised education-hostile neighbourhoods makes no difference, a fortiori, extracting students for day-schooling would not be expected to, other things equal.

Since evidence on the policy question at stake is slender or countervailing, and since the implied intervention carries so many broad and possibly unforeseeable consequences, it is recommended that mitigation of adverse neighbourhood effects be treated as beyond the scope of education policy, and no priority actions extracted.

3.1.1.2 Implications of mobility: specialist schools?

An important exception to the limited policy relevance of structural determinants is the very high mobility of aboriginal students. Aboriginal families are much more likely than others to change residence frequently. The continuity of the education of aboriginal learners suffers disastrously as a consequence, along with their attendance. School is an ever-changing carousel of strangers rather than a solid, familiar feature in the centre of their lives. Their attachment to any given institution is resultingly low, and they are less willing to invest in relationships with students and staff, given expectations of further dislocation.

The consequent priority to mitigate the effect of high mobility might be addressed in two ways. First, the connection between residential address and school assignation could be broken for aboriginal students. It has already been weakened in BC, for all students, with the introduction of open boundaries. However, schools must have available spaces after serving local students before out-of-catchment students are considered; administrators then exercise considerable discretion, and highly transient aboriginal students may not be the strongest prospects from their perspective; and the families in question are in any case unlikely to be well-informed about opportunities, and poorly-equipped to wade through the process.
In practice, there is no institutional promotion of continuous attendance by aboriginal students in what may, after relocation, be distant schools, since neighbourhood schools are essentially interchangeable. Any expense and trouble of supporting continuation is not justified by relevant differences in the features of the school, and parents little motivation to prefer continuous attendance. The relevant difference that continuity itself helps children’s learning is not sufficiently salient to any party – it is much easier simply to transfer.

If aboriginal students were able continuously to attend a given school regardless of their address, and if there were a clear motivation for doing so, then mobility (within a metropolitan area, at least) need no longer precipitate the educational disruption it does now. Thus it may be desirable to introduce a greater element of parental choice into the system (to address the capability issue), and to offer schools that specialise in local aboriginal culture and in teaching methods tailored to aboriginal students (to address the motivation issue). Students would be more likely to continue to attend specialist schools regardless of residential relocation, presuming that address is not a decisive criterion in student assignment. Specialist academies might take the form of ‘magnet schools’ – this becomes an option to explore in Part 4.

3.1.1.3 Implications of mobility: ‘mobile’ learning?

Transient students face the problem of different levels of expectations and paces of instruction between schools – of slotting into rigid programs that are already underway, when their own levels of knowledge and skill development is ill-matched or unclear. Poor attendance, associated with transiency, exacerbates this problem. A more ‘modular’ structure of courses, and greater flexibility for students to slot into them at levels suiting their situation and progress, could respond to this problem, as might the availability of staff and facilities outside conventional sessions, to ‘catch up’ students who have encountered attendance and continuity obstacles. If the student is only intermittently available, what availability they have should, ideally, be fully exploited by increasing the availability of instruction. Calendar flexibility and course modularity are priorities, and policy options will be judged, in part, on their capacity to facilitate them.

An alternative (or complementary) means of promoting ‘continuous’ learning is an instruction-delivery system that does not depend on the availability of local staff and facilities. Permanently-available, centralised teaching and administrative support can be delivered electronically. Accessible distance learning, assigning mentors to at-risk students to provide instruction and monitoring between schools, could be an effective response to the mobility issue. ‘Mobile learning’ becomes an option for consideration in Part 4.
3.1.2 Peer characteristics

Conflicting conclusions can be drawn regarding the policy implications of peer externalities for the education of minorities. In the US, Hanushek and colleagues (2002b) contend that segregation of students by race would be highly deleterious to black achievement, whereas equalising the distribution of black students across schools in Texas should, for example, reduce the Grade 7 achievement gap by a quarter. But since Fryer and Torelli (2005) find that the popularity penalty for achievement vanishes with segregation, it might be tempting to expect segregation to break the peer-cultural connection between achievement and ethnic ‘inauthenticity’. Hoxby (2002) notices that peer effects differ according to the level of racial concentration: ‘the negative peer effect of black students on black students’ own scores is largest in cohorts that are between 33 and 66 per cent black’, and ‘the negative effect of Hispanic students on Hispanic students’ own scores only appears in cohorts that are 0 to 33 per cent Hispanic. In fact, Hispanic students have a statistically significant, positive effect on the achievement of Hispanic students in cohorts that are 66 to 100 percent Hispanic’ (p. 10).

There is no reason to presume that aboriginal peer-effect patterns in Canada will resemble those of any particular ethnic group in the US. For example, it is simply unknown whether there is a point beyond which the aboriginal share begins to help rather than hurt aboriginal outcomes. The sole finding from the analysis of FSA data in the foregoing that induces conviction is the confirmation that aboriginal students do worse the greater a share of the student body they comprise. If this is a function of the resource-absorption of students who are faring poorly, with ‘aboriginality’ a proxy for that and not a factor per se, then policies that concentrate aboriginal students together – that collect in a smaller number of facilities students that are already exhibiting poor outcomes and are at greater risk for conduct disorders – run the real risk of making matters worse for them. Such policies raise the prospect of a ‘sink school’ dynamic, shunned by families whose children could be beneficial peers and facing difficulty in attracting the strongest teachers. Instead, a more even distribution of aboriginal students would be indicated.

Alternatively, if the observed peer effect is at least partly due to an aboriginal youth-cultural peer dynamic (reliant on a contrast with higher-achieving non-aboriginal students), then high concentrations of aboriginal students might dilute the negative peer effect, since ethnicity would not be salient to the high/low achievement distinction in that immediate context: the promotion of ‘authentic’ qualities with which students must identify to win acceptance and maintain status being, arguably, partly dependent on contrast with the conspicuous qualities of the salient differentiating group.
The fact that non-aboriginal MERs are negatively correlated with aboriginal share is evidence for the first interpretation; the fact that the negative correlation with aboriginal MERs is larger is evidence, perhaps, that there is something to the second interpretation also. Firmer evidence on the relative importance of these phenomena is required, since among the directions advocated for aboriginal education are some which entail greater concentration of aboriginal students together. Magnet schools, for example, might help aboriginal students by constraining the salience of ethnicity-contrasts with respect to academic effort – especially if they are better able than other schools to enrich the curriculum with resonant content, increase the visibility of positive role models, and remove the potential for racism to be experienced in and associated with school. Youth-cultural ‘opposition’ to education may stem in part from the ‘intercultural’ tensions identified earlier, and may therefore be somewhat mitigated by policies that address those.

But it might also be a function of beyond-school factors – ethnic youth-cultural norms in the community and wider society, or beliefs about economic opportunities – which might sustain resistance regardless of cultural accommodation in school. Peer norms, and the desire to conform to them, are likely to be somewhat resistant to institutional reform. And any beneficial effects might well be outweighed by negative ‘behavioural’ peer externalities. Prudence indicates that interventions that increase the concentration of aboriginal students should be contemplated only with great caution.

3.1.3 Cultural characteristics

There is little that education policy-makers can do with the insight that students from more ‘culturally continuous’ communities tend to do better in school, though that hypothesis and the evidence for it might merit the attention of other branches of government.

3.1.3.1 Implications of low parental engagement

Strong evidence on the importance to children’s outcomes of parental engagement combines with evidence of relatively low engagement among aboriginal parents, and reasonably convincing explanations for the reasons for that low engagement, to provide a plausible explanation of some significant portion of the ethnic education gap. Boosting active parental engagement

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102 Any apparent success of magnet experiments may be misleading if due to a selection, rather than a treatment, effect, with more highly motivated parents seeking out magnet schools, for example. It is possible that their children would have done just as well elsewhere – and that they would have exerted a beneficial effect on other aboriginal students elsewhere that is now lost. The concentration together of those who are more academically-inclined in the first place may intensify any oppositional culture of those remaining in the mainstream system, and make them worse off.
involvement in the schooling of their children and in the life of schools should have an appreciable effect on education outcomes.

Socio-economic dynamics responsible for the disinclination or inability to participate in school life or monitor and support children’s participation are largely beyond the influence of decision-makers. Methods for promoting engagement therefore tend to revolve around making the school a more ‘culturally’ welcoming institution for aboriginal people. This would be intended to banish any engrained negative associations and overcome suspicion or apprehension. It might also enhance cultural congruence between schools and aboriginal communities, stimulating a greater sense of stake and ownership among aboriginal parents: ‘schools in communities with significant Aboriginal populations could better reflect that cultural reality and thereby augment parental interest in monitoring school performance’ (Richards, 2001, p.23).

Greater numbers of aboriginal staff would be helpful in this context, and they might be expected to have a better sense of how to reach out to the local aboriginal community. Given the low proportion of aboriginal teachers and administrators, their contact with parents can be maximised via their contact with students: in principle, if aboriginal students are concentrated together, more of them can be taught by aboriginal teachers, so more aboriginal families will feel confident about and included in the school environment.

An explicit ‘aboriginal’ identity for the school – its name, design, mandate, curricular specialisation, ceremonial framework, and so forth – may be expected to invite greater parental interest and participation. Schools that are sensitive to the requirements of aboriginal families with regard to out-of-school cultural commitments, acceptable reasons for absence, and the most appropriate and effective ways to communicate with the aboriginal community will do better in this regard. Governance arrangements that provide for substantial parental participation and ensure that aboriginal parents are included/represented in the process might enhance engagement.

Some of these elements may be realisable within public schools with significant aboriginal populations; others might depend for optimal realisation on dedicated institutions with a tailored mandate.

3.1.3.2 Implications of intercultural tensions

Closely related to the obstacles to parental engagement is one set of determinants of student failure to attach – the apprehension that education is a hostile imposition of limited relevance to the youth’s life and values (perhaps aggravated for some individuals by direct
experiences of racism). If this is an important factor, then the same desiderata as those listed above might be constructive – directly, by signalling institutional respect, commitment and inclusivity, and indirectly, by signalling these things to parents, whose influence on their children’s attitudes (the values and norms they transmit) is then more likely to be positive than otherwise. Again, while some promising practices are potentially available (and some now provided) in the context of standardised public education, other might be optimally produced in specialised institutions.

### 3.1.3.3 Implications of intercultural discontinuity

Distrust of formal education (‘intercultural tension’) and relative cultural ill-adaptedness to its conventional format (‘intercultural discontinuity’) overlap, and may feed into each other, but it is worth holding them separate conceptually. A lack of congruence between the culture, approach and characteristic style of formal education and the home-cultural environment of aboriginal learners is a probable culprit in their relative underachievement.

Cultural and linguistic socialization is found by Demmert and Towner (2003) to be central to learning. The more closely aligned classroom interaction styles and norms are with community ones, the more likely a school is to reach its goals. This leads them to advocate for ‘culturally based education’. It is unusually difficult for aboriginal children to adapt to the school environment: it should be adapted to them, so they feel welcomed and integrated. They assemble six critical elements of culturally based education: recognition and use of aboriginal languages; pedagogy stressing traditional cultural characteristics; teaching strategies that are congruent with the traditional culture (opportunities to observe, practise and demonstrate skills); a curriculum that draws and is based on traditional culture and affirms aboriginal spirituality; strong community and parental engagement; and sensitivity to community social and political mores.

Policies to facilitate the implementation of these elements may help close the education gap. According to Schwab (2001), Australia’s aboriginal students express a greater sense of ownership of programs that are visibly tied to their home communities, which leads to greater engagement and more successful outcomes. Acknowledging cultural heritage and designing courses and materials that suit learning styles enhances retention. (Schwab cautions that it remains important to maintain high attendance, participation, and achievement expectations.)

The scale of resulting improvements remains far from clear, however. Thiessen (2001, Section 2.1.2) concurs with the literature that a unique factor in the low attainment of aboriginal youth ‘concerns the incompatibility of their cultural knowledge with that promulgated in school’
but stresses that it is 'unknown how strong, how prevalent, or how much of a barrier such cultural incompatibilities might be.' In light of stubborn underachievement in band-operated schools, it seems prudent to be sceptical that culturally-based education will reap the dividends sometimes anticipated. Cultural congruity may also be more relevant for some communities than for others, so that indiscriminate policy interventions will not universally produce the hoped-for outcomes. Particularly unclear is the relevance of cultural characteristics to contemporary urban aboriginals, a significant and growing constituency with a tendency to be overlooked in much policy-oriented theorising about the education gap.

With these caveats in mind, it is fair to say that culturally-based enrichment is worth exploring further. Inferred initiatives include teaching styles and classroom organisation that are sensitive to preferred learning behaviours, opportunities to carry linguistic and cultural practices from home to school, enrichment of the curriculum with culturally resonant content, and institutional arrangements that accommodate special cultural demands – greater calendar flexibility, for example. Options that facilitate these priorities will rate higher than otherwise. They may be most challenging to implement/administer in ethnically-diverse schools, where they may also be disfavoured by non-aboriginal parents.

3.1.4 Institutional characteristics

Apart from the desirability of whatever institutional arrangements best promote student and parent attachment (provision for governance participation, classroom and curricular implications, and so forth), two typical features of educational institutions that appear policy-pliable were identified as potentially bearing responsibility for some portion of the ethnic gap

3.1.4.1 Implications of the summertime fadeout effect

Evidence leads us to suspect that low-achieving segments of the student body are disproportionately harmed by the (arbitrary) extended off-session summers typical of the BC school system. The priority to control the gap by mitigating the fadeout effect could be served in two main ways. First, schools with significant numbers of aboriginal students could be encouraged (incentivised and funded) to experiment with alternative calendar design, that spreads instruction sessions and breaks more evenly over the year. Second, instruction-delivery systems that do not depend on the availability of local staff and facilities – i.e., the availability of distant instruction and monitoring – would support continuous education. These same implications were drawn with respect to the mobility problem, above.
3.1.4.2 Maximisation of positive teacher-interaction potential

In the case of both aboriginal and male students, strong evidence leads us to expect that teacher-student demographic matching will produce appreciable gains to attainment and attachment. The negative effects of other-race and other-sex teachers are disproportionately harming the target groups compared to their reference groups because teachers are very disproportionately non-aboriginal and female, but a potential solution – aiming for proportional demographic staff-representation – faces two challenges. Policy-makers have extremely limited influence over obvious supply issues, and equity constrains the subjection of reference group students to equivalent negative effects. These challenges appear to best be overcome (considered in isolation) by segregating students according to ethnicity and gender: the productivity of the given supply of human resources is optimised, and the equity issues do not arise.

The priority to maximise the potential of positive teacher-student interactions implies that specialist academies, which concentrate aboriginal students together, may be desirable. These would be likely to attract aboriginal teachers, and could be permitted to prefer to hire aboriginal teachers, other things equal. Ongoing efforts to increase the supply of aboriginal teachers are here taken as a given – methods of improving those efforts are beyond the scope of this study.

3.2 Determinants of male underachievement – policy implications

A central problem in male underachievement is characterised by Froschl and Sprung as the ‘limited definition of masculinity that boys have available to them, namely physical strength and competition, with boys of color having even fewer options. Boys tend to define themselves in opposition to others and see anything female as not acceptable’ (p.6). The source of the unhelpful ‘definition of masculinity’ is said to be social, in the broadest sense:

- boys are socialized from early childhood to conform to a societal conception of what it means to be a man. ... an ideal of masculinity that limits their emotional and relational development. ... the consequences of operating outside the “box” are severe. Boys who do so are labeled in ways that leave them feeling isolated, shamed, and vulnerable to teasing and bullying (p.3).

It is worth pausing to explain that two polar schools of thought on the underachievement of boys, which dominate much of the discourse, need not pollute the deliberation of policymakers. In caricature, these positions claim that: boys are subject to social norms of masculinity that constrain them to behave in ways that are detrimental to school success, with the solution being to ‘problematise masculinity’ to help boys deconstruct conventional norms, and construct
new and more appropriate ones (e.g. Cohen, 1998); or, alternatively, that precisely the effort to accomplish this has distressed boys in the ways now becoming visible, while their norms of masculinity are not socially constructed in any important sense and should, in any case and on the contrary, be celebrated and harnessed (e.g. Hoff Sommers, 2000).

The source and desirability of constructs of masculinity need not concern policy-makers, who do better to take those constructs as a given, since it has become clear that schools cannot reconstruct them in any meaningful way. Instead the policy focus should be on what is both solidly known to be problematic and appears to be amenable to intervention:

The female [reading] advantage is about 30 points [equivalent to about one year] ...and does not differ for youth from differing socioeconomic backgrounds. This is a sizeable difference ... females tend to do especially well compared with males on tasks requiring critical evaluation and the ability to relate text to personal experience, knowledge and ideas. Analyses of data from Canada's NLSCY have shown that gender differences in language ability are evident when children enter kindergarten. It may be that a disproportionate number of boys fall "off-track" in their reading development during the primary grades, and subsequently develop negative attitudes towards reading. The PISA results call for further research and attention by policy makers (Willms, 2004, p.26).

The centrality of literacy, the special difficulties boys encounter with it, and the enduring consequences of early failure (measured against unrealistic expectations) comprise the most promising arena for concerted policy responses.

Supplementary explanations of the phenomenon in question are aptly summarized in the literature review conducted by Younger and Warrington (2005, p.17): brain differences and the biological construction of masculinity; 'boy’s disregard for authority, academic work and formal achievement, and the formation of [at least partly socialized] concepts of masculinity which are in direct conflict with the ethos of the school': differences in attitudes to work, and aspirations; the related context of changing labour markets and deindustrialization; girls’ greater maturity and more effective learning strategies, especially their emphasis on collaboration; ‘differential gender interactions between pupils and teachers in the classroom’; the importance of peer acceptance and adherence to group norms ‘often dependent on ... laddishness of behaviour and risk-taking’, which ‘often runs counter to the expectations of the school’, but is seen by boys as ‘a reasonable cost ... if it allows them to protect their macho image, and to ensure their acceptance’.

The actual influence of any given factor remains contentious, and can only be ascertained by going forward with interventions suggested by diagnoses, and evaluating the results.
3.2.1 Mitigating the effect of relatively poor early literacy

A key theme that emerged from the literature is that boys are hurt by the early emphasis on acquisition of literacy skills, given gender-indiscriminate methods and expectations. While girls may be ready to become engaged in and perform highly on reading and writing tasks in kindergarten, boys on average are much less ready. A complementary theme is that boys are more likely to take their cues from their performance evaluations. The combination of these factors appears to go some way towards explaining why boys are more likely to form the impression that academic success is not for them, switch off from learning, and proceed to devalue it. The salience of sex in the formation of peer groups at young ages, and the contrast-effect dynamic discussed at length, is the next important explanatory layer.

According to Eccles and Blumenfeld (1985), 'the link between achievement beliefs and academic performance has been amply documented', and '[s]tudents start school with sex-differentiated goals and attitudes' (pp.79-80). However, 'general classroom climate may play an important role in reinforcing sex differences in achievement, attitudes, beliefs and performance. Certain kinds of education environments may facilitate boys' achievement while either dampening or having little positive effect on girls' achievement' (Eccles & Blumenfeld, 1985, p.111). The elements they are referring to include public recitation, student volunteers, competitive goal structures, and co-education: the main point is that 'boys and girls respond differently to similar experiences ... similar treatment may not yield equitable outcomes' (p.112).

Brophy (1985) concurs: 'if teachers are to counteract existing sex differences, it is not enough for them merely to treat boys and girls the same way in the same situations, because sex differences in student behaviour create differences in the types of situations with which teachers are presented ... the teachers would have to treat boys and girls differently' (p.139).

The differences between boys and girls need not be over-emphasised. There is enormous overlap in education-relevant characteristics between boys and girls, so the interpretation and implications of average differences must be treated with caution. On the other hand, it is also easy to draw the following wrong conclusion from the greater variation within than between genders:

should we educate boys and girls differently so that each experiences the educational environment best suited for his or her needs? Probably not, since variations within sex make identification of such ideal environments for each sex impossible (Eccles & Blumenfeld, 1985, p.111).

In an ideal world, each student would receive personally-targeted instruction honed to be sensitive to their individual development rate, capabilities, interests and so forth. That is not
feasible, and averages matter when deciding how children should be divided up for instruction. Children in any given grade might vary from each other, as individuals, more than they vary from children in neighbouring grades on average, but it is still reasonable to sort children by age, since on average the sorted groups will be much more similar to each other in ways useful and germane to educators. Similarly, if there are important average differences in the rates at which boys and girls develop and in their early capacities and interests – and it appears that there are – then policy structures that respond to these should produce gains overall. Regardless of the fact that they are not finely attuned to all students, they are by construction better attuned to most students. ‘[N]ot all girls are alike and not all boys are alike. But girls and boys do differ from one another in systematic ways that should be understood and made use of’ (Sax, 2005, p.25).

Special, tailored attention to one group may come at the cost of attention to the other group. Structures that are optimal for boys’ learning may be sub-optimal for girls’ learning. If the obstacle has in fact been well-defined, and explains a significant portion of the gender gap, an obvious implication is to explore separate educational arrangements for boys and girls.

3.2.2 Gender segregation, for and against

One explanation of the gender gap was found in the paucity of male teachers, given that students do worse when matched with a teacher of the other sex. More boys could be matched with male teachers if students were segregated by gender. Segregation might also be inferred as a promising practice from the analysis of the formation of peer-group identities: it may have beneficial consequences for boys, since the salience of the conspicuous average qualities of their peers (e.g. less competent in reading, or more rebellious with respect to discipline) is greatly diminished. Though conceptually compelling, empirical scrutiny of that analysis is lacking. Were it to be vindicated, its strength relative to the observed and contrary negative effect of male peers would still be an issue: the option of segregating students by gender appears to run afool of the implication of the peer effect literature that, since more males tend to drag down everyone’s attainment (perhaps through disruption and resource-absorption), girls would do better and boys worse, and the gap between the two would expand.

Just as the causes of the aboriginal peer effect are unclear, so too is the relative importance of ‘behavioural’ and ‘youth-cultural’ factors murky with respect to boys. The most even possible distribution of male amongst female students would mitigate the adverse effect of male peers (for boys), if it is driven by a greater propensity of boys to disrupt class or monopolise attention. Segregation of boys might also concentrate ‘dysfunctional’ masculine norms and
attitudes to school, and limit opportunities for boys who wish to evade prevailing peer expectations and norms to do so. But oppositional male peer culture might also depend on a contrast with the engagement of girls. The absence of girls would mean that high achievement is not assigned to ‘femininity’ – a high-achieving ethos could take root among at least some boys, and effort would be a viable option for others, incurring no inherent cost to the projection of masculinity. This possibility is rather speculative, compared to the ‘behavioural’ effect. It would be valuable to determine what dynamic is most important, at what ages.

One might venture that early sex-segregation would be desirable, but later segregation less so – to capture the benefits both of establishing positive attitudes to school engagement when gender is most salient, and of the positive influence of female peers (avoiding the negative influence of too many male peers) when gender is less salient to self-identification.  

3.2.2.1 Evidence on segregation and attainment

A recent review of the literature on same-sex education (Thompson and Ungerleider, 2004) finds that unsatisfactory research methods – which fail to take appropriate account of the differences between students in segregated, compared to co-educational, regimes – are widespread, and that among the more reliable studies, the majority fail to detect any significant differences in academic achievement. Moreover, though there is ‘substantial agreement throughout the literature that girls taught in a single-sex environment benefit psychologically and socially … this was not … the case for boys’ (p.13). A complementary finding, however, is that single-sex schooling may produce achievement gains for certain, ‘typically disadvantaged’ groups of students (p.16): suggestive, if hardly decisive, with respect to aboriginal students.

The Raising Boys’ Achievement project in the UK has also found the evidence on whether students in public school single-sex settings perform better (on examinations and other indicators) to be conflicted. However, teachers report greater participation in lessons, better behaviour, and increased confidence amongst both sexes in single-sex groups (Cambridge University Faculty of Education, Section 2, 6). The overall conclusion is that:

There is emerging evidence … that many girls and boys feel more at ease in such classes, feel more able to interact with learning and to show real interest without inhibition, and often achieve more highly as a result … Evidence in favour of the

103 Originally, ‘one of the main reasons for promoting co-education was that girls would provide incentive and ‘ emulation’ for boys to work harder’ (Cohen, 1998, p.30).
104 Arnot and Grey (1998) echo the likelihood that the apparent superiority of single-sex institutions is effectively due to the superior ability and motivation of their intake, and not to the single-sex treatment.
105 Harris (1998) points to evidence that in ‘contexts where gender is less salient, girls and young women do better in science and math’ (p.252).
development of single-sex classes for *some* subjects, from both students’ voices and from an analysis of levels of academic achievement, is … persuasive (Younger & Warrington, 2005, p.12, emphasis added).

The authors caution that segregation is not a 'panacea': ‘in some schools, boys-only classes have become very challenging to teach, or stereotyping of expectation has established a macho regime which has alienated some boys’ (p.12). Merely implementing single-sex education (whether on the level of schools, or of particular classes within schools) is not likely to make a difference in the absence of broad institutional and community buy-in and commitment. Selection of appropriate ages and subjects for segregation must be carefully weighed, and accompanied by appropriate design of instructional programs and materials.

The weakness of existing evidence for performance benefits of segregation may be due to the failure of experiments to maximise its potential through attention to classroom management and programmatic adjustments that segregation makes more viable. For example, same-sex education combined with teacher matching might show more impressive results than it otherwise appears to (studies have not typically accounted for teacher gender, and teacher-student gender matching only rarely accompanies segregation experiments). Considered in isolation from other-than-educational criteria, there appears to be sufficient reason to hope that gender segregation will produce gains for male performance (matched or exceeded by gains in female performance) at least to motivate experimentiation that is designed, comprehensively, to maximise the potential of single-sex classrooms, and also to enable the appropriate distinguishing by policy researchers of selection from treatment effects.

Single-sex education may have broader individual and social implications than educational attainment alone, however, that may tell against experimentation in the final analysis. There is little evidence to support this worry, but this may be because it has not been adequately researched. 106 It may be assuaged by targeting segregation at specific age groups and for specific subject areas. Programs sensitive to maturation rates are most appropriate at young ages – the sensitive or even critical stages where they hold the most promise of preventing the negative spiral of underachievement that disproportionately affects boys. Segregation at younger ages may also best diminish the salience of gender stereotypes to students and their peer groups. The limited-purpose classroom segregation of kindergarten and early-elementary children, with reintegration to follow, may not provoke plausible fears about long-term inter-gender socialisation effects.

106 Sax (2005) sketches a plausible narrative, but supplies only meagre evidence, for the opposite position. that segregation is good on virtually all accounts.
3.2.3 Miscellaneous recommendations

3.2.3.1 Customised grade-weighting

A couple of promising interventions that have emerged are recommended here for further exploration, but will not be discussed beyond these cursory observations.

One general feature of contemporary educational institutions that may be suspected of unintentionally working against the attachment and attainment of boys is the trend towards continuous assessment. There is strong evidence that boys do better than girls on high-stakes tests than their baseline attainment in other spheres predicts. A greater weighting emphasis on the examined component (of Grade 10, for example) would produce higher marks for boys that should have a marginal effect on retaining some in school who would otherwise be discouraged – recalling how sensitive male academic attachment is to their measured performance. Increased prospects of future success should inform boys’ calculations about the value of continued effort in school, leading to improved outcomes in terms of completion.

Policy-makers need not turn away from continuous assessment, towards a concentration on exam performance. This would be to the detriment of girls’ attainment, on average, and there may be other educational and administrative reasons to retain a substantial ongoing-assessment component. However, performance in a high-stakes environment is a legitimate and valuable skill. Since success is disproportionally motivational for boys (and failure disproportionately discouraging), the possibility that students could have some choice over the weighting of elements that contribute to grades should be considered. Students would choose, individually, between a range of weighting options for their final mark in Grades 10 and 12. For Grade 10 courses, for example, the typical 80/20 coursework-exam weighting could be accompanied by a 60/40 alternative, which we would expect rather more boys than girls to take up. (Counsellors could also provide guidance to individual students as to where their strengths lie.)

It is beyond the scope of this study to draw out the systematic ramifications of such a change, but the diagnosis of the factors underlying male attachment, achievement and motivation leads to the recommendation that it be seriously examined. If that study proves positive, the Ministry would identify several willing districts to test-run the concept, and track the effect on boys’ graduation rates.
3.2.3.2 Vocational dimension of education

The dwindling of ‘shop’ program options, the evidence suggests, might disproportionately affect male attachment to school. Staffing such programs is a challenge in a tight market for vocational skills: it is difficult to attract instructors if they must first dedicate years of unpaid work to piling up expensive qualifications, and existing provision to overcome that problem (Letters of Permission, Developmental Standard Term Certificates) may be insufficient. Alternate certification tracks for vocational programs are worth considering but are beyond the scope of this report. The issue should be considered in this explicit context, and any other-than-market barriers to program staffing and implementation re-evaluated.

The significant costs of operating in-house vocational tuition have been generating a preference for out-sourcing it, via apprenticeship programs. An example of this sensible response is the initiative, supported by the Industry Training Authority, to expand apprenticeship programs for Grade 12 students. The main observation to be made, in light of the earlier analysis, is that Grade 12 may be too late to make a real difference – many boys have already dropped out by that stage. Earlier implementation of apprenticeships, where work experience counts towards graduation requirements, would be expected to increase male school attachment and perseverance, and should be explored on that account.

3.3 Review of policy implications

Tables 3 and 4 supply a heuristic summary of the preceding discussions. Column 2 presents a rough attempt to quantify the negative difference made by factors identified as partly responsible for underachievement, based on the limited empirical research located or conducted. Column 3 notes the reliability of the evidence for the surmised effect of the identified factors. Column 4 notes the interventions suggested, in isolation from any broader considerations.

Table 3 Review of explanations for aboriginal underachievement

<table>
<thead>
<tr>
<th>Factor in underachievement</th>
<th>Magnitude of effect</th>
<th>Quality of evidence</th>
<th>Potential responses inferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-economic characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental education, income, family structure, health, neighbourhood, economic incentives</td>
<td>Substantial</td>
<td>Strong</td>
<td>Very limited applicability. Early career planning and targeted expansion of apprenticeship programs may enhance appreciation of relevance of education.</td>
</tr>
<tr>
<td>High mobility</td>
<td>Substantial</td>
<td>Good</td>
<td>Specialist schools may help break link between residence and school assignment. Flexibility</td>
</tr>
<tr>
<td>Factor in underachievement</td>
<td>Magnitude of effect</td>
<td>Quality of evidence</td>
<td>Potential responses inferred</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------------</td>
<td>---------------------</td>
<td>---------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Mobility, continued</td>
<td></td>
<td></td>
<td>(modularity) of instruction; flexibility of calendar; continuous (distance) learning provision (&quot;mobile learning&quot;).</td>
</tr>
</tbody>
</table>

**Peer characteristics**

| Negative in-class peer effects of disproportionate aboriginal disruptiveness | Significant        | Decent               | Avoid concentrating aboriginal students. Avoid specialist schools.                                                                                           |
| Negative peer-cultural influence on academic attitudes, attachment; operation of contrast effect | Large               | Informal, strong; theoretically compelling | Segregation may minimise contrast salience and effect. Increased cultural resonance (welcoming school environment to create a sense of ownership, inclusion). Specialist schools may therefore mitigate. |

**Cultural characteristics**

<table>
<thead>
<tr>
<th>Intracultural discontinuities (linguistic, cultural, pedagogical practices and expectations)</th>
<th>Appreciable</th>
<th>Fair</th>
<th>Very limited applicability.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercultural tension: suspicion of education, experiences of racism (interacts with peer effects?)</td>
<td>Significant</td>
<td>Fair</td>
<td>Increased cultural resonance. Specialist schools may therefore mitigate.</td>
</tr>
</tbody>
</table>

| Intercultural discontinuities                                                               | Unclear; appreciable? | Modest | Appropriate classroom and teaching style modification (sensitive to preferred learning behaviours); opportunities to carry linguistic and cultural practices from home to school; enrichment of the curriculum with culturally resonant content; time and calendar flexibility; greater community and parental input and involvement. |
| Low parental engagement                                                                     | Substantial | Strong | Increased parental choice. Welcoming institutional environment; increased community outreach and engagement; increased aboriginal staffing including administration; curricular and institutional affirmation of aboriginal perspectives; enhanced governance representation; may support specialist schools. |

**Institutional characteristics**

| Teacher interaction effects | Significant | Fair, inferential | Match aboriginal learners with aboriginal teachers; may support specialist schools. |
| Disproportionately harmed by 'summertime fadeout'                                           | Appreciable | Fair             | Experimentation with alternative calendar structures; continuous learning initiatives (mobile learning). |
Table 4  Review of explanations for male underachievement

<table>
<thead>
<tr>
<th>Factor in underachievement</th>
<th>Magnitude of effect</th>
<th>Quality of evidence</th>
<th>Potential responses inferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inappropriate early reading expectations</td>
<td>Large</td>
<td>Strong</td>
<td>Pace and expectations tailored to gender averages; may imply preference for early segregation by gender?</td>
</tr>
<tr>
<td>Inappropriate reading material assignment</td>
<td>Unclear</td>
<td>Informal; decent</td>
<td>Gender-specific material designed to evoke and sustain interest.</td>
</tr>
<tr>
<td>Disproportionate sensitivity to prior performance (dynamic interaction with above factors compounds obstacle)</td>
<td>Significant</td>
<td>Strong</td>
<td>Avoid unnecessary early diagnoses of low ability; tailor expectations to gender averages.</td>
</tr>
<tr>
<td>Group contrast effects and devaluation of academic engagement (interaction with above factors compounds)</td>
<td>Potentially significant?</td>
<td>Theoretical; informal; compelling</td>
<td>Early-years segregation by gender, at least for language arts</td>
</tr>
<tr>
<td>Negative peer influences otherwise enforcing unhelpful norms of masculinity</td>
<td>Unclear</td>
<td>Informal; fair</td>
<td>Limited applicability; co-education may be mitigating.</td>
</tr>
<tr>
<td>Negative in-class effects of male disruptiveness</td>
<td>Potentially large</td>
<td>Strong</td>
<td>Distribute boys and girls evenly (controls gap partly at expense of girls).</td>
</tr>
<tr>
<td>Boys do worse with female teachers</td>
<td>Substantial</td>
<td>Very good</td>
<td>Match male students with male teachers; by extension, segregate by gender.</td>
</tr>
<tr>
<td>Declining value of comparative high-stakes advantage</td>
<td>Unknown</td>
<td>Fair</td>
<td>Some extent of student discretion over weighting of grade components.</td>
</tr>
<tr>
<td>Economic motivations and aspirations</td>
<td>Unquantified but likely appreciable</td>
<td>Decent</td>
<td>Earlier career and personal planning connections between school and success; in-school vocational instruction; school-employer links and apprenticeships.</td>
</tr>
<tr>
<td>Disproportionately harmed by ‘summertime fadeout’</td>
<td>Unknown</td>
<td>Slight; inferential</td>
<td>Calendar restructuring or flexibility; continuous learning initiatives (mobile learning)</td>
</tr>
<tr>
<td>Institutional inhospitality to ‘kinetic’ requirements</td>
<td>Relatively minor?</td>
<td>Fair</td>
<td>Preserve/enhance recess that enables high-energy activity; structured physical activity; preserve physical ed. programs; classrooms mcre friendly to student mobility (may imply segregation)</td>
</tr>
</tbody>
</table>
4 Responses to the problems

4.1 Objectives and criteria

A key objective of the BC Ministry of Education is taken to be increasing the graduation rates of aboriginal students, with the ultimate intention of equalising them with those of other students. A second objective is increasing the graduation rates of male students. These objectives are best realised by enhancing the measurable performance of these groups throughout their careers, and by enhancing their attachment – their sense of belonging in the school environment, the value they attach to formal educational success and the aspirations they develop.

Analysis of policy options for achieving these enhancements focuses on the provincial regulatory framework. Individual schools and districts may be implementing or neglecting any given promising practice, as the case may be. The policy layer which the analysis is intended to inform is the regime within which schools and districts must operate. How can they best be encouraged, guided or legislated into implementing or experimenting with promising practices to improve aboriginal education outcomes and address the struggle of some boys? Should provision be made for any departure from the status quo in terms of the options available to BC’s families?

4.1.1 Efficacy

The dominant criterion is the effectiveness of a given policy option in improving the outcomes of aboriginal students. How effectively do options promote the priorities identified in the discussion of Section 3? Policies are to be preferred to the extent that they:

- mitigate the effect of high mobility
- mitigate adverse peer effects
- increase the engagement of aboriginal parents
- mitigate intercultural tension and discontinuity
- maximise the benefits of demographic student-teacher matching
- mitigate the effect of summertime fadeout
Once promising strategies for improving aboriginal outcomes have been identified, recommendations will follow on how they might add value by also addressing the issue of male underachievement.

An explicit emphasis on performance measurement appears to be helpful for the target populations, and is already institutionalised. The question of whether existing 'soft' incentives should be bolstered with tougher sanctions and/or tangible rewards is beyond the scope of this report. It is assumed that the accountability framework will not in the near-term come to incorporate mechanisms carrying more ‘bite’, whether or not these are promising, given their political volatility. Those alternatives that operate most effectively within the existing accountability framework, best realising the potential of the incentives, choices and management expectations now in place, will be preferable for that reason.

4.1.2 Cost

Social returns to an education that helps students attain to a high school graduation certificate justify significant public investment, even apart from the equality of opportunity rationale generated by private returns. However, the marginal benefits of the sorts of policies to be considered here – the efficiency of the investments – are not foreseeable with any degree of precision. A cost-benefit analysis would be guesswork. Instead, it is presumed that the identified objectives are sufficiently socially valuable as to justify some increment of additional expenditure, but that, other things equal, the lowest cost option is to be preferred. There is no reliable way to define an upper boundary beyond which investment is inefficient, so a strong weighting for cost-minimisation must substitute.

4.1.3 Equity

The objective of raising the achievement of disadvantaged groups of students appears intrinsically equitable, as that criterion is conventionally understood. Still, an alternative that would be effective in helping the group(s) of interest may also have implications for other groups of students. If those tend to be detrimental, that will tell against the policy in question. If they are certain and more than negligibly detrimental, that may be decisive against it. Since envisaged benefits are relatively uncertain, any trade-off would run an unacceptable risk of producing more harm than good. Such a redistribution of student attainment would at any rate be a) inequitable on its face, and b) unacceptable to parent-stakeholders.
Implications within the target groups matter too. They are not homogenous, and if an intervention tends to help weaker aboriginal or male students at the expense of their average- or high-achieving counterparts, the trade-off should be made explicit so that its overall desirability can be adequately assessed.

Broader equity issues may arise than the immediate distribution of resources or attainment patterns. For example, the sustainability of the ‘neighbourhood school’ ideal is a value closely (and not necessarily implausibly) intertwined in some minds with the ultimate sustainability of an equitable society. It is very strongly to be preferred that the availability of public, high-quality local education is not threatened (both on its own account, and as an aspect of political viability). But one of the problems is precisely that ‘high-quality’ education is not presently available in all locales. Efforts to address this must be undertaken. It is, ceteris paribus, taken to be desirable that these do not impair the long-term sustainability of the neighbourhood system in general, but only of its poor quality elements. Striking the right balance in this highly complex context is at the heart of many contemporary education policy challenges.

4.1.4 Political viability

Deeply invested and potentially competing interests – parents, taxpayers, unions, administrations, political parties and their constituencies – hold strong positions on and expectations of public education policy. Particularly in the present context of interminable labour unrest and agitation, major upheavals or pioneering strategies will have unpredictable consequences and carry political risks.

4.1.5 Administrative feasibility

This criterion is intended to encompass a number of factors. Does an alternative make unrealistic assumptions about resources (e.g. availability or motivation of staff), or about agent behaviour, that tend to undermine objectives or compromise effective administration? Are there likely unintended consequences, within the educational system, which complicate administration and implementation, or threaten the Ministry’s mandate? Does an alternative represent such a shift away from familiar practices that serious mistakes and missteps should realistically be anticipated? Is an alternative likely to generate undue administrative complexity, both raising the probability that unexpected events will confound objectives or introduce unwarranted costs, and lowering the probability of effective implementation due to the disruption of established interests
and practices?\textsuperscript{107} Does an option require bureaucratic layers that introduce more scope for error, miscommunication, interest group capture, institutional lethargy or decelerated responsiveness? Other implementation issues and challenges are also addressed under this heading.

4.1.6 Social cohesion

Unintended ‘in-system’ consequences fall under administrative feasibility. Possible unintended consequences for society more generally must also be explored. For example, interracial relations might be pressurised by aboriginal education initiatives in a number of ways. Avenues that entail increased segregation might limit opportunities for cross-community contact and friendship, so that stereotypes held by both groups become more durable; alternatively, preferential allocation of resources might evoke resentment in un-preferred communities, which might be manifested towards the recipient group. Such possibilities should be accounted for: if ‘social cohesion’ appears with some degree of probability to be threatened by a given alternative, this will count against it. At the same time, highly speculative fears cannot be decisive against policies that promise important educational gains, which are highly socially desirable in their own right, which will tend to promote social cohesion, and which yield the mandate of the Education Ministry. ‘Social engineering’ considerations must take a back seat in Ministry deliberations.

4.1.7 Research potential

Answers to a variety of pressing questions would greatly enlighten decision-makers about the real effects of various education policies. What are the relative contributions of behavioural and cultural factors to the observed aboriginal peer externalities? Will greater concentrations amplify the problem, or do they reach a point where they tend to diminish it? Do smaller classes improve attainment, and if so is the effect pronounced for particular vulnerable groups of learners, and what scale of reduction actually makes a difference? Can students vulnerable to mobility issues use technology intelligently to overcome some of those issues? Does gender segregation improve attainment for either or both genders, or for different levels of achiever within genders; does it have other, hard to foresee effects? Does formal provision for parental participation promote the informal engagement of parents generally in their children’s schooling? What other techniques accomplish this latter priority? The empirical evidence in these and other areas is thin and contested. Interventions that produce answers to such questions have a real value to future education policy-making, even if they do not in the event lead to the desired results.

\textsuperscript{107}Richards and Vining (2004) take this as a strong reason to prefer incremental reform, other things being equal.
This criterion should constitute a ‘bonus’ -- it is an appealing element of a strategy that offers it, but is far outweighed by all other priorities. It is troublesome to conceive of students as experimental subjects. Only research-driven experiments with very high expectations of success are acceptable for this reason. On the other hand, it is in the nature of education policy innovation that an element of experimentation is unavoidable. so it is worth identifying the key research issues, and favouring innovations that can be designed to generate reliable evidence about them.

Incidentally, answers would be so valuable to other jurisdictions that an enterprising negotiator might be able to secure some funding contribution and/or evaluation capacity from the Council of Ministers of Education to support initiatives that will illuminate them.

4.2 Policy options

4.2.1 Mobile Learning

Comprehensive distance learning resources might enable mobile, disaffected and otherwise-vulnerable students to keep up with and sustain an interest in their studies across school transitions and off-session layoffs. Models for centralised instruction, electronically distributed, have been widely developed, but before students can access ‘continuous instruction’, they need access to computers and connectivity.

The personal provision of laptops to all grade 6 and 7 students in the Peace River North District is intended to improve achievement, attitude, motivation, confidence, and learning, organisational and technology skills, through the integration of technology with writing instruction. Since implementation of this ‘Wireless Writing Program’, the previously substantial (21 per cent) gender gap in writing has disappeared; the gap between aboriginal learners and the total population narrowed from 17 per cent in 2003 to five per cent in 2004. More than half the students involved credit the program with improvements in their attitudes toward school; both teachers and parents observed an especially positive impact on the attitudes and confidence of children who were struggling with their motivation and attention (Jeroski, 2005).

The program appears to be succeeding in its objectives, and producing disproportionate benefits for precisely the segments of the student body of present concern. This is decent evidence that the provision of laptops would be beneficial even in the absence of access to dedicated distance-learning resources. But those resources would add enormous value to laptop provision, especially for at-risk students.
Under the Mobile Learning alternative, it is proposed that students from Grade 6 upwards are assigned personal portable computers (the school retains ownership), pre-loaded with appropriate software, and are assigned vouchers for home broadband connections for the duration of their school careers. Continuous distance instruction then supports conventional school instruction according to the following general format.

Normal school instruction is supplemented by electronic reading and learning resources, student-accessible records and expectation outlines, and assignment prompts. For schools on the conventional calendar, students (Grade 6 upwards) who are identified as at risk for off-session fadeout are assigned an academic project, designed to entail about 25 hours’ work, at the student’s preferred pace, which counts towards (replaces) future assignments or catches up missed/failed assignments. A knowledge and skills test is also assigned. Students are financially incentivised to complete the distance project and test: $20 for a genuine project attempt, $40 for a successful project attempt, $20 for a test completion that improves on their previous performance level on an equivalent test.108 Instructors are permanently available off-session to answer questions and provide advice and guidance regarding assignments and tests. Any other student who wishes can opt in to off-session assignments, to get ahead on the coming session. Practice tests are also available on an optional basis. (There is no financial reward in this case.)

Students who drop from a school registry – for example, because they are moving residence – are assigned an individual distant mentor, who is supplied with their student record and informed of their current level of progress. This instructor assigns projects that count towards future requirements, and teaches the necessary material, while the student is in transition between schools and for as long as they are not enrolled anywhere. The financial rewards for engagement are applicable. The mentor ultimately hands over to the responsible tutor in the next school, supplying an update on progress and issues.

4.2.1.1 Efficacy

The Mobile Learning strategy ranks highly for expected efficacy, offering significant potential for sustaining the attachment and improving the performance of students generally – but of aboriginal students in particular, because it mitigates the effects of high mobility and summertime fadeout, and also of students from adverse socio-economic backgrounds, because it

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108 Harvard economist Roland Fryer is conducting an experiment in 15 of the poorest-performing New York schools which pays students in the test groups (but not control groups) $20 for improvement as measured every month. Early results are said to be very encouraging. Intuitively, this is the most obvious intervention to increase student performance yet to be seriously contemplated. It also reinforces a concrete connection in students’ minds between academic effort and financial payoff.
equalizes their access to technology with that of more ‘advantaged’ students who may already benefit from technological resources. The Sunchiltl E-Learning Community provides accessible education to Grades 9 to 12 aboriginal students in remote and rural communities through e-learning delivery, a mix of live instruction and archived tutorials, with flexibility in the pace at which individuals may learn. Students are supported in-class by a mentor to ensure that those learning from remote locations are not disaffected by ‘faceless’ delivery. The scheme has had significant success: high school graduation rates of 80 per cent, compared to an estimated on-reserve graduation average of 20 per cent (Conference Board of Canada, 2005).

Assurance of early facility with information technology appears likely to grow in profile as a necessary investment in human capital. Mobile Learning essentially accelerates this process, first concentrating on the groups that will benefit the most.

4.2.1.2 Cost

Provision of laptops is expensive, educational discounts notwithstanding. However, schools are now expected as a matter of course to provide substantial desktop capacity. If periodic capital reinvestment in upgrading desktop capacity is dedicated instead to personal laptop provision, additional costs may not be prohibitive. Rather than having access only to fixed equipment during the school hours they spend in suitably appointed labs, students would have permanent, portable access, both out of school, and in every class where the teacher decides laptop use is appropriate.

On this principle – incremental introduction as existing desktop stock exhausts its value – the investment appears worthwhile, even if maintenance costs prove slightly greater. Nevertheless, it may be problematic to publicly supply quality technology to those students whose families can comfortably afford it, and would otherwise be purchasing it in any case; targeted provision would control costs. On the other hand, discrimination between students within schools may be contentious. This suggests that moving forward with Mobile Learning will be smoothest, on a trial basis, if selected whole schools can be targeted, and correspondingly that if the aboriginal population one hopes initially to reach through Mobile Learning is concentrated in particular schools, this aspect of the strategy will be greatly simplified.

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109 One intriguing possibility merits exploration but is beyond the scope of this report. The One Laptop Per Child project is on course to develop a $100 laptop suitable for ultimate distribution to all students in partnered developing nations. Canada could commission a duplication of that open-source process to develop a minimal and ultra-cheap portable machine for distribution to all its school-children.
Paying for student connectivity will incur significant expenditure. If provided universally, the cost would be prohibitive. The education budget would be subsidising a cost that a majority of families already, properly, assume. Home connectivity is also employed for an enormous variety of other-than-educational family purposes, including commercial enterprises, which the Ministry has no business subsidising. Universal provision is a clear non-starter. Provision targeted to educationally at-risk students starts to come closer to affordability, especially if that category significantly overlaps with the category of households that would not otherwise be connected. However if we take 20 per cent as an estimate of the at-risk population, this still represents up to 70,000 BC public school students in grades 6 to 12. Even at a discounted rate of, say, $350 per household, the $24.5 million annual expenditure may be prohibitive.\textsuperscript{110} Restricting experimental roll-out to specific schools where at-risk populations are concentrated – 20 ‘magnet’ schools across the province, as an example – the annual expenditure of $3.5 million (on the basis of an average 500 students) is less prohibitive. In-school complications that may be produced by selective provision are also avoided by vouchering a whole school’s population.

Costs to build the distance-learning infrastructure are not negligible. Instructive, administrative and technical capacity to support a phase-in anticipating off-session use by 60 per cent of 20 school populations (say a top end possible 6000 students) might require 200 teachers (assigned to monitor and support 30 students each), 5 administrative and 5 technical roles, for two months of the year (before accounting for more skeletal, year-round support), and therefore a staff budget in the ballpark of $2.5 million per annum. Teachers can work from home in this model, but capital costs and further operating costs might still add $500,000 to the rough estimates.

To cost the financial incentive to remain engaged off-session or between school, assume that 20 per cent of students in the whole public school population are designated ‘at risk’: 60,000 students in Grades 6 to 11 (Grade 12 is excluded because it is not followed by an off-session interlude). If 80 per cent make a genuine effort on the project, 70 per cent produce a successful project, and 80 per cent improve their test score, total expected annual expenditure is $2,640,000. If Mobile Learning is implemented instead only in 100 select public schools (those with a certain high concentration of aboriginal students, or of a particular specialised type, where the at-risk category might run to 60 per cent, for estimation purposes) the cash-for-attainment incentive might cost $1.8 million, or $360,000 in 20 ‘magnet’ schools.

The appeal of Mobile Learning is strong, but the option is undeniably costly. To supply students at 20 designated schools with hardware, connectivity, financial incentives and a distance-
learning infrastructure will run to $7 million annually (at high estimates of student numbers and at-risk share). This supposes that personal portables replace existing stock that would be replaced with fixed units otherwise – add a further $1.5 million capital investment amortized over 3 years for discrete, extra portable units (equipment transferred to incoming from outgoing students).

4.2.1.3 Equity

The empowerment of vulnerable students with the access, technology and incentives already available to some other students, and the promise of narrowing attainment gaps through sustained attention to the educational careers of vulnerable students, certainly appear to satisfy the equity criterion. Still, in order to avoid complicated in-school dynamics of preferential, perhaps means-tested, targeting of some groups, and possibly stigmatising Mobile Learning as a ‘bottom track’ initiative, the selection of appropriate trial schools seems to be the best first step.

4.2.1.4 Political viability

90 per cent of Peace River North teachers surveyed now believe strongly that schools should provide laptops in high school. With such strong teacher support, the union can be anticipated to be supportive. Parents have also been found to be highly supportive of the precedent initiative. The taxpaying public may balk at universal hardware and connectivity provision, but incremental introduction on a limited scale, under the conditions described and given the expectations of greatly enhanced student success, are not likely to stir controversy. The perception of favouritism towards aboriginal students may be an issue: while help for vulnerable students generally will find support, major resources for aboriginal students only may be more controversial. The scale is dwarfed by the earmarked funds already budgeted for aboriginal students, which do not appear to inflame opinion. All the same, this may be a reason to prefer targeting schools that are not exclusively aboriginal, and retain a ‘neighbourhood’ character. In summary, it is difficult to imagine any significant, politically-resonant opposition to the Mobile Learning plan, or at least any that can not be assuaged.

4.2.1.5 Administrative feasibility

The Wireless Writing experiment generated some common teacher complaints: the use of hardware for ‘off-task’ behaviour, and classroom distraction from educational tasks due to the new availability of games, music, messaging, and internet; inappropriate uses of technology (‘cyber-bullying’, unsuitable sites); the vigilance required to monitor and enforce appropriate use.
Technical failure and unreliability may pose problems, although early training in the challenges of managing data is a positive feature.

It is necessary for families to be responsible for replacement of lost or stolen equipment—the liability for the system is otherwise very large, and perverse incentives to sell equipment must be avoided. While many families may be covered by their existing home insurance, families of the vulnerable students really targeted here may not be. It is not clear how this potential obstacle may best be mitigated.

Significant numbers of new ‘seasonal’ roles may be challenging to fill. But many qualified teachers are likely to be available for off-session employment opportunities, and since geographical location within BC does not matter to eligibility, it is assumed an adequate pool exists. There is also a large pool of teachers on-call that might be encouraged to specialise in Mobile Learning. The extra opportunities would mitigate their difficulties with remaining committed to teaching when assignments are thin—helping retain them in the profession.

Mobile Learning is partly motivated by the desirability of sustaining the engagement of students who frequently move school. This will complicate the school-based targeting of the suggested roll-out phase, as students move to schools where other students do not benefit from participation and the resources that accompany it, but is too central a feature to be dropped.

Administrative challenges do not appear insuperable. Their costs remain outweighed by the benefits. And again, since the ubiquity of electronic learning tools appears inevitable, these challenges will have to be ironed out sooner or later in any case.

4.2.1.6 Social cohesion

There are no apparent negative implications for this criterion. By narrowing the ‘digital divide’, the measures collected together in the Mobile Learning strategy in fact mitigate any future stark division between a class of people who enjoyed early substantial access to technology, and are equipped to access the many related benefits, and a class that did not.

4.2.1.7 Research potential

Mobile Learning offers enormous research potential on a key looming issue for education decision-makers: how intelligently can students of various ages use distance learning resources? Does access improve their performance? Is there an ‘impersonality’ effect that undermines students, or does impersonality, on the contrary, liberate them from perceived teacher and peer
expectations? How does an enhanced command of technology translate into job-readiness? Can summertime fadeout be mitigated by off-session assignments and supervision? Also of interest: do vulnerable students respond to nominal financial incentives?

4.2.1.8 Assessment

The strategic direction of provincial education must be informed by the possibility of exploiting the promise of evolving information technologies. Mobile Learning is a strong candidate for exploring the advantages, in a way that speaks directly to the problems that appear to be affecting aboriginal (and to a lesser extent, male) achievement. There is also enough direct evidence that individual components of Mobile Learning are showing success to justify the expectation that the package described will produce real gains. Significant expenditure is entailed, but can be controlled if a limited number of schools are selected to participate. This may imply that the creation of the appropriate types of schools would complement Mobile Learning. Administrative challenges are inevitable, but not fatal. Overall, the Mobile Learning strategy is to be recommended. This option is not in competition with the following options, but might complement one better than another.

4.2.2 Specialisation, enrichment, and choice

What regulatory framework (for assigning students to schools and dictating the function of schools) best meets the challenges identified as responsible for aboriginal underachievement? Options are surveyed for their capacity to enhance cultural congruence, parental involvement and student attachment, to mitigate mobility issues, to mitigate the potential for adverse peer effects, and to maximise effective deployment of aboriginal human resources.

4.2.2.1 Status quo (plus)

One option is to avoid any significant changes: persevere with the status quo. The prevailing system of integrated, neighbourhood education would continue, including the following elements intended to improve aboriginal outcomes: a certain degree of choice beyond catchment areas; the existing accountability framework, and development of Enhancement Agreements in particular; ongoing enrichment of curricula with culturally-resonant content; the strengthening of formal avenues for parental input, which should be designed with outreach to aboriginal parents an explicit priority; the per capita, earmarked extra funding for self-reporting aboriginal students; the availability of district co-ordinators and school assistants for aboriginal
education; and the continued exploration of more peripheral means of engaging aboriginal students and communities, such as ‘Elder in Residence’ programs. Additional ‘cultural’ enrichment of school programs would be pursued in appropriate schools and districts.

4.2.2.1.1 Efficacy

A weakness of the integrated neighbourhood school ideal is that families are captive to their local school regardless of how well it is performing. It was pointed out earlier that open boundaries are unlikely to be exploited by the families of vulnerable aboriginal students.111 If a local school continues to fail to improve aboriginal outcomes, there is no genuine alternative, and the cycle of disaffection from education proceeds. The school is subject to no competitive pressure that might translate into more concerted, quality effort and the taking of responsibility.

By being distributed throughout the public system, aboriginal students may avoid the ‘behavioural’ peer effects they appear to impose on each other. Of course, in reality, some level of undesigned concentration is inevitable. But the further concentration of aboriginal students runs the risk of concentrating dysfunction. Avoiding this threat is an advantage of the status quo. However, ‘cultural’ peer effects may (speculatively) be aggravated by communal integration.

The status quo does not maximise the matching potential of existing and projectable human resources to exploit positive teacher-interaction effects. It is not well-suited to the Mobile Learning initiative, which would have to be universally applied (a significant expense for an unproven method), and offers no mechanism for mitigating the effect of mobility, as constituted. However, there is the possibility of reintroducing a prohibition against students changing school in the middle of a school year. (This would probably help aboriginal students, but might be resisted by other constituencies.)

The status quo has limited potential to mitigate intercultural tensions and discontinuities, as those have been defined. It is arguable that the many good faith measures to do so are reaching the limit of their realistic scope without having produced gains on the scale and at the pace desired. It is difficult to conceive of further enrichment measures within the integrated, multiethnic public system which would not begin to be unwelcome to non-aboriginal parents, or simply inefficient to implement in mixed settings.

The status quo has limited potential to increase parental engagement for similar reasons, although the discernible policy preference for enhancing the control of schools over their affairs

111 In any case, Cullen et al (2000, 2003) produce fairly reliable evidence that open enrolment in the US is not empirically associated with increased academic achievement (although greater access to career academies is a possible exception). This is not necessarily generalisable to the situation of Canadian aboriginals, but is suggestive all the same.
and directions may be relevant in the future if it can be harnessed appropriately – this question is discussed later, under governance options.

### 4.2.2.1.2 Other criteria

Any deviation from the status quo student-assignment structure, despite the well-intentioned motivation to promote the attainment of aboriginal students, may attract opposition on equity grounds: that it threatens the long-term sustainability of the neighbourhood-school ideal, introducing a selective element which will produce greater disparities between schools. On this argument, those serving impoverished and vulnerable student bodies, and families facing barriers to exercising choice, will be assigned an increasingly vulnerable population, as the students and parents whose presence and monitoring would have helped sustain school quality increasingly exercise choice in order to congregate together elsewhere. Of course, the status quo is not free of selection trends and pressures with a tendency to congregate high achievers in some schools and leave low achievers in others – factors, such as house price escalation surrounding high-performing schools, which are beyond the control of education policy.

The status quo may command support on the speculative basis that it represents the optimal way to promote intercommunal contact, understanding and respect, and therefore long-term social cohesion; or on the basis that any preferential resourcing associated with specialised schools, or expansion of choice accorded some parents but not others, will generate resentment.

The cost is the baseline against which other options are contrasted. There are no important administrative issues. ‘No revolutionary change’ is the safest political approach. Zero new research potential is generated.

### 4.2.2.2 Magnet schools

Publicly-funded ‘magnet’ schools are distinguished by a mandate to concentrate on a certain style of instruction, on excellence in a particular field, or on serving the needs of a distinct group of students. The government is encouraging school boards to develop magnet schools ‘wherever possible’, on the grounds that diverse student needs and interests are better served by assigning them to schools on the basis of specialisations, rather than exclusively of geographic location. A specialisation in local aboriginal cultures and serving the unique requirements of aboriginal learners would be a natural development of the concept.

Since provision is already made for magnet schools to be established, and for families to disregard catchment areas and district boundaries, it may appear that this option is accommodated
by the status quo. However, boards and schools may be reluctant to risk specialisation, may not feel that they have the capacity or support to effectively do so, or may fear that the existing school community will not buy into conversion of existing schools. And parents may be uninformed about choice, or unable or under-motivated to exercise it.

The notion of this alternative is to address these twin obstacles. The Ministry would work with districts to identify suitable facilities and prioritise their designation as aboriginal academies, in each district where the aboriginal population would sustain one or more such academies – consulting the administration and community, but ultimately overriding opposition, on the basis that specialised institutions promise significant improvements to aboriginal outcomes. Rather than waiting in hope for school- or community-driven action, the policy is to instigate change. The introduction of these academies will then motivate parents to consider the option of exercising the (now high-profile) choice to send their children to them.

An assumption of the analysis is that the option of constructing dedicated new premises is foreclosed by enrolment trends combined with costs, especially in the present exorbitantly tight construction market. Discussion of implications is premised on the repurposing of extant capacity. However, where new schools are to be built for independent reasons, the possibility of designating them as aboriginal academies should always feature in planning.

4.2.2.2.1 Making choice genuine

One fear is that specialist schools would predominantly attract families that are relatively motivated and organised, and place a premium on educational success. If a magnet school becomes a de facto selective mechanism – a means for such parents to sort their children together without buying into an expensive neighbourhood, of the sort that parents are always on the lookout for112 – it is likely to do well by the students that attend, as a function of their ability and motivation, and of the home support they benefit from. But those students might have done just as well, on the whole, in non-specialist schools, where their presence and parental monitoring clout would have helped their more vulnerable classmates. Meanwhile, families that are less organised, less able to afford transportation, less informed about choices, or who place a smaller premium on education would pool, to their overall detriment. This 'two-tier' scenario possibly informs much of the philosophical resistance to the development of magnet schools in general.

The fear can be partially disarmed if efforts are made to neutralise transportation obstacles, and if the Ministry and boards, when designating aboriginal academies, undertake a

112 French immersion is the classic example.
concerted program to inform all self-identified aboriginal families of what may be an attractive new option for them (at the same time explaining how they are assuring that this is a genuine option). A barrier to genuine exercise of choice is distance – the time and resources required to ferry children to the preferred school. It may not be feasible or cost-effective to bus students to the envisaged academies from far-flung corners of a metropolitan area. This problem can be solved by the provision of free, or heavily-subsidised, public transport passes. Young students should not take transit alone; passes for parents who are accompanying children could also be considered (e.g. with a special class of school-student pass that includes a photo of parent(s) as well as child). Existing school bus routes for other schools could be plotted to find ways to connect students to the academy through them. Drive-in teachers can also be matched with students near their route (with a nominal mileage compensation-incentive). Deals can be struck with local cab companies.

4.2.2.2 Admission policy

Should non-aboriginal students be eligible to attend the mooted public aboriginal academies, or would those be entitled to draw their intake exclusively from aboriginal communities? The exclusive option would preserve capacity for aboriginal students, and perhaps better guarantee the production of the sort of culturally-congruent institutions hypothesised as valuable to aboriginal student and parental engagement. However, it entails the ejection of existing students in the designated schools. Even if existing students are grandfathered, many who may prefer to leave under such a scenario, as well as all future neighbourhood students, would have to be bussed elsewhere. The provision of a choice for one type of family but not for others is politically unsustainable. It is to be preferred that any student is eligible to attend the specialist academies.113

In that case, how is assignation determined if and when the magnet is oversubscribed? Should magnet schools continue to prioritise local (‘catchment’, then ‘district’) students over others, and/or should they prioritise aboriginal students over others? It is not desirable to deprive local non-aboriginal students of the option of the neighbourhood school, but it is desirable that specialist schools are able to accept as many aboriginal students as possible. To strike the best

113 It is also preferable that there is no compulsory assignment of aboriginal students to specialist schools. Compulsory ethnic segregation carries politically unacceptable and socially undesirable overtones. It requires a bureaucracy to undertake the extraordinarily undesirable enterprise of determining whether a student is or is not an ‘aboriginal’ for the purposes of school assignment, since parents could otherwise evade compulsion simply by changing their reported identity. It requires an unrealistic planning capacity to precisely match ‘demand’ with supply, to ensure that sufficient specialist schools are providing places. It squanders the potential of parental choice to hold schools accountable for results – it shares with the status quo the weakness that schools that are performing poorly nevertheless benefit from a captive market. It appears diametrically opposed to the preferred Ministry approach of expanding parental choice.
balance between serving a neighbourhood equitably and creating the desired, specialised school conditions, it is proposed that admission to specialist academies be awarded as follows.

First, local aboriginal students are guaranteed a place. Second, local non-aboriginal students are guaranteed a place. Since many may prefer to study elsewhere given the new regime and its focus, and since genuine choice (ease of attending elsewhere) would make it more likely that they do so – thereby preserving capacity for aboriginal students and optimising the potential for creating the desired institutional environment – families in the immediate magnet catchment should be supported with the same transport accommodations that are envisaged to help dispersed aboriginal students attend the magnet. The expectation is that although de jure segregation is avoided, a significant measure of de facto segregation will occur. This is not a bug, but a feature.

Third, priority should be given to aboriginal students in the catchment of schools that are performing poorly in terms of aboriginal outcomes (taking account of the student, family and neighbourhood characteristics that constrain what the schools can achieve). This may create some pressure on ‘failing’ schools to improve. It is an appropriate mechanism for targeting the students for whom the specialist academy strategy is really designed to make a difference.

The next priority placement groups are aboriginal students from other district schools, followed by aboriginal students from beyond the district, followed by all others.\textsuperscript{14} It is important to emphasise that, once enrolled, residential relocation does not raise any institutional question of continued attendance, which should be the default unless parents choose to apply elsewhere (and this choice could be regulated away for in-area movers, except possibly between years).

4.2.2.2.3 Evaluation of candidate facilities

In the areas where the aboriginal population would sustain at least one specialist academy, identification of suitable facilities for designation as specialist academies could be guided by the size of the aboriginal population in the school and immediate community, and the distribution of aboriginal population in neighbouring areas, by transit access to the facility (the more convenient for travelling to from across the metropolitan area, the better), by its potential for expansion (to grow with demand), and by the ‘reputation’ of school. The designation of schools perceived as poor performers may deter the families and students that might make a difference to the ethos and success of the school, which rebranding and a ‘fresh start’ will only partially mitigate. Other things equal, schools that already enjoy a reputation for good community

\textsuperscript{14} If a magnet school is oversubscribed by equal-priority students, a lottery should determine admission. This is a signal that the district needs to begin planning for another magnet school to serve demand. It also signals that the school is doing well: if that problem arises, it would be something of a luxury problem.
ties and adding value to student performance would be preferred candidates. Similarly, the reputation of the school’s neighbourhood should be taken into account.

4.2.2.4 Efficacy

Magnet schools compete for students against a background of declining enrolment, and they compete for aboriginal students who represent a growing share of enrolment. In theory, heightened competition should motivate schools to redouble their efforts to show good outcomes for aboriginal students. If so, this would be a bonus, and policy researchers would welcome evidence one way or another. But the expected benefits do not depend on a competition effect.

Schools that specialise in local aboriginal culture, and in teaching methods tailored to aboriginal students, should produce better results for aboriginal students. Magnet schools would be superior to the status quo in terms of mitigating cultural tensions and discontinuities, and thereby enhancing parental engagement and student identification and motivation.

Magnet schools would have more freedom to redesign their calendar in innovative ways that respond to the needs of their communities, and are therefore better placed to attempt to mitigate summertime fadeout. Combination with the Mobile Learning strategy should enhance their effectiveness for the most vulnerable students. If students can attend a given school regardless of their address, mobility (at least within metropolitan areas) should be greatly mitigated as an issue in the continuity of education. This priority is poorly-served by the status quo, whereas magnet schools create a motivation for parents and administrations to sustain same-school attendance, especially if adequate transport provision is in place.

To the extent that magnet schools concentrate aboriginal students together, and prove attractive to aboriginal teachers, they are better placed than the status quo to realise the benefits of teacher-student ethnic-matching.

It was observed earlier that, while magnet schools may risk a ‘cream-skimming’ effect (and students left in less desirable schools may then fail to benefit from high-ability/high-motivation peers and well-resourced parent-advocates, so that gaps endure or widen), the status quo invites selection-by-house-price. A greater degree of parental choice may level the field for parents who are financially constrained from moving to be near the ‘better’ schools. Meanwhile, the assignment-priority enjoyed by students in ‘failing’ schools would mitigate the problem.

A contrasting scenario is that magnet schools develop a reputation for concentrating dysfunction, and fail to attract the quality of family and student that benefits all students and the quality and ethos of the school. However, it is reasonable to expect that they could not reproduce
sink-school dynamics to any worse extent than some existing schools disproportionately attended by aboriginal students. It is reasonable to hope that the specialised mandate of aboriginal academies, a strong institutional commitment to their success on the part of the Ministry and districts, and the enrichment provided by the Mobile Learning initiative will attract a diverse community of families, and grant the academies a self-productive window of opportunity to build thriving communities and produce results that generate further future success.

A related outstanding issue for how specialist academies would affect outcomes is whether the behavioural or the cultural pathway is more important in producing negative peer externalities. The danger is that high concentrations of aboriginal students would also concentrate the learning challenges and conduct disorders that may harm the performance of all students. An associated danger is that, even if aboriginal academies in theory mitigate oppositional peer cultures by normalising aboriginal academic attainment, in practice the school environment is only one input into the construction of ethnically ‘authentic’ behavioural expectations. Academies may also retain significant numbers of non-aboriginal students, as a consequence of the admission format, and the proportion of ethnic concentrations that make a difference to the relevant dynamics are simply not known. There are no empirical grounds for confidence about outcomes.

4.2.2.2.5 Cost

Given the working assumption that no new schools will be built to accommodate magnet schools, costs incurred by the policy will mainly consist in the administrative transactions involved in redesignating schools, and in the transportation costs associated with making choice genuine. Projecting the former is beyond the scope of this project; it is assumed that they are not prohibitive. To estimate incremental transport costs, assume that 30 per cent of students, in 20 magnet schools averaging 500 students each, require financial support that would not otherwise be afforded. At $5 a day for 200 days, transportation costs may then amount to $3 million. The development of magnet academies is slightly more expensive than persisting with the status quo.

4.2.2.6 Equity

The format has been designed to be as sensitive as possible to equity concerns, especially the provisions for creating genuine access – both for target families who wish to avail themselves of the choice, and local families who wish to avail themselves of other choices. This strategy to narrow a severe educational gap appears sufficiently conducive to the promotion of social equity in the long-term that any systematic inequities that may be perceived are tolerable.
4.2.2.7 Political viability

Political opposition might derive from two main sources. First, the institution of magnet schools might be seen as a step away from the neighbourhood school ideal that undermines its sustainability. The Ministry is committed to exploring the possibilities of magnet schools in any case, but their by-order, widespread establishment could raise the profile of the debate and motivate opposition to mobilise. While it is difficult to predict the course of that debate, it seems likely that the hope of improving aboriginal outcomes would defuse much of this opposition. Arguments for cultural congruence are likely to be resonant with the sorts of constituencies dedicated to preserving the public system in its familiar form. This is an exceptional case, and the desirability of changing the patterns of aboriginal educational outcomes is widely acknowledged.

Second, the appearance of favouring one ethnic constituency may be problematic. However the magnet school concept does not inherently entail significant extra resources for the communities involved. And choices are being otherwise expanded for all parents: the opportunity to specialise is not restricted to aboriginal schools. This is not a case of unequal opportunity, but only of government action to ensure that new and equally-available opportunities are developed for and taken up by communities that need assistance in overcoming some particular obstacles. The option requires sensitive management of issues arising, but appears politically viable.

4.2.2.8 Other considerations

The major administrative challenges consist in the development of workable transport options for magnetised families (as well as for local families that prefer non-specialist-concept schools). It has been suggested that these are not insuperable. Any administrative hurdles that do present themselves would, in any event, be encountered by any magnet school. Since the Ministry is committed to facilitating the magnet concept in any event, the opportunity to explore real-life administrative implications is welcome.

Separate education, even de facto, may work against healthy intercommunal relations if children need regular exposure to members of other ethno-cultural entities in order to be able to deal fairly and comfortably with them in their future lives. On the other hand, the provision of quality education and the opening up of improved economic prospects is almost certainly much more important to healthy intercommunal relations.

The magnet school alternative creates valuable research potential. For example, does cultural congruence make a real difference, and if so, is that through the engagement of communities, parents or students? And, how do families respond to these new opportunity sets?
4.2.2.3 Assessment

An implicit premise of the neighbourhood school system is that communities are primarily geographical entities. But the reality is that other types of communities are important, and they cross-cut geography. Some communities have the wherewithal and motivation to establish their own schools – hence Catholic schools and Khalsa schools, for example. For aboriginal people, a problem may be that there is often no cohesive, unitary or organised community as such, particularly in urban areas. Moreover, aboriginal communities have not, for historical reasons, typically been as invested in the importance of education as other communities. Where non-aboriginal ethnicities view education, correctly, as a highway to success in the heart of the Canadian mainstream, aboriginal communities may be less interested in ‘assimilating’ to the Canadian mainstream or in success as the mainstream defines it.

The neighbourhood school depends and thrives on the social capital of the community that it serves, and it builds and sustains that social capital in turn. Aboriginal communities suffer a relative lack of the social capital necessary to launch this virtuous circle. Dedicated institutions would help to build it, and to confirm the desirability of education as a central communal value. Such institutions are unlikely to arise in sufficient numbers under their own steam, as long as communities are not equipped to take the lead. Policy must actively intervene to break the vicious social-capital cycle. To make a real difference to aboriginal education outcomes, it is time to establish institutions that can be a real and vital part of the community.

This suggests the conversion of schools to specialist academies. Where magnet schools are now a peripheral possibility, they would become a concrete and common reality. The analysis suggests that magnet schools, as described, are superior to the status quo, however enriched, in terms of responding to almost all the identified priorities. Magnet schools are motivated, essentially, by the limited capability of integrated schools to implement cultural resonance to any significant incremental degree, regularising existing segregation in a way that better harnesses the possibilities of congruent teaching styles and materials, better creates a welcoming and productive school ethos, and better extends genuine choice to aboriginal families. Despite some extra costs, and a certain amount of attendant political controversy, that option appears to be the most promising means of addressing severe and stubborn educational underachievement amongst aboriginal students that is consonant with the existing policy framework and its strategic direction.

The main advantage of the status quo is that it may better mitigate adverse peer effects; concomitantly, magnet schools may exacerbate them. This is a serious risk, but it is outweighed
by the benefits. The recommendation is that the risk be taken, but that close ongoing evaluation is
cognisant of it. The cultural congruence of the school may any dysfunctional youth-cultural
attitudes. Responsibility for exorcising them attaches to families and broader communities, as
well as to institutions.

4.2.3 Governance options

The Ministry appears on recent reports to be adopting a strategic posture of subsidiarity – a gradual movement towards empowering schools with a certain level of independence and control presently vested in boards. The content of this approach is not clear even in outline, but in light of the potential of increased formal local input to help aboriginal students, some model of school-level boards, including parent-governors elected by enrolled families, appears appropriate for implementation in the proposed magnet schools, with the details of their powers yet to be determined. The question is whether such boards would work in partnership with, and draw institutional capacity from, the (geographic) local board, or from a new, dedicated board, established to support the network of specialist schools – on a ‘thematic’ rather than a geographical basis, analogously to the Conseil Scolaire Francophone.\(^{115}\)

4.2.3.1 For a separate authority

In favour of a separate ‘Aboriginal Education Council’, it is possible that such an entity would mobilise culturally-relevant knowledge to enhance educational practices better than the alternative. It is possible that it would create a powerful institutional signal of ownership that would better stimulate the confident engagement and participation of aboriginal parents and communities. Also favouring the model is the potential it might create for collaborative policy development with the federal government to improve the educational prospects of children on BC reserves. Its existence could enhance the attractiveness to band schools of foregoing thorough independence and instead opt for ‘independent school’ status \textit{within} the provincial framework, if they would have access to the support of the new authority. Existing band schools operating as independents in the provincial system could draw on the new institutional capacity, an absence of which might be hypothesised as impeding their success at present.

A separate argument might be made that jurisdiction equivalent to that afforded to francophone BC is equitable and merited by the special politico-legal relationship of aboriginal

\(^{115}\) The institutional capacity function of boards refers to staff training and human resource development capacity, inspection and standards assurance, and curricular development, as well as to research, legal, administrative, public relations, facility management, information technology and other technical support.
communities with the Canadian state. However, the Ministry of Education should not be influenced by such considerations. The question for the Ministry is whether a separate authority is a rational response in contemporary educational terms. In those terms, it has the noted advantages, but also the following notable disadvantages.

4.2.3.2 Against a separate authority

The otherwise-needless duplication of administrative resources incurs very significant costs. Strong school-level boards with the power to represent their stakeholders' interests at district level arguably realise the same potential for community engagement and incorporation of aboriginal perspectives and cultural congruence imputed to separate authorities. The capacity of the existing First Nations Education Steering Committee might also be harnessed to provide specific cultural research, curricular and staff development, and to mobilise knowledge and promising practices in partnership with the schools and their districts. If the separate authority is functionally redundant, the value of an expensive gesture must be in question – particularly if it alienates segments of the non-aboriginal community, undermines the residual neighbourhood character of magnet schools, and makes them less attractive to local non-aboriginal families.

It is not unreasonable to be concerned that the institution of a separate authority to supervise and support 'aboriginal-specialist' schools might dilute the focus of conventional school boards on the progress of the many aboriginal students inevitably remaining under their care. Jurisdictional proliferation and the potential for confusion of responsibility (to innovate, prioritise and so on) are to be disfavoured, other things being equal. The potential for a new authority to develop other-than-educational priorities, or to be captured by other-than-educational agendas, must be a concern. The flexibility to effect future desirable change may be impeded by the establishment of new bureaucratic interests. In general, the creation of new authorities trends against the perceptible Ministry preference to decentralise educational decision-making.

Finally, the heterogeneity of 'aboriginal' people is not served by a homogenous representative body. But an alternative, of multiple aboriginal education councils to serve distinct traditions, communities and affiliations, is impractical, yet more expensive, and at any rate virtually collapses into the original idea of significantly-empowered governing boards for individual academies.

A narrow decision against the institution of a separate authority is indicated. This recommendation is conditional on the presumption of individual school boards enjoying a measure of independent governance, a policy that is consonant with apparent governmental
preference. It is beyond the scope of this project to detail the mandate of such boards. At a minimum, however, they would be represented at the highest level of relevant decision-making panels in the district; this, to neutralise the problem of the inevitable low representation of aboriginal communities on elected boards in the wider community.

4.2.4 Limited gender segregation

4.2.4.1 Efficacy

The discussion of Section 3.2 suggests that if the Ministry proceeds to develop magnet schools to cater to aboriginal students, it might simultaneously address the gender gap by requiring the segregation of students by gender in early (K-2) grades, at least for the purposes of literacy instruction. This suggestion is prompted by the impact of relatively poor early literacy skills in the highly- and increasingly-verbally oriented early school environment, the evidence on biological differences that affect ability at given ages, levels of interest in reading, and the sorts of materials that prompt interest, the evidence of male sensitivity to performance measures, the theoretical framework of peer-group differentiation and the evidence on teacher interactions.

The benefits of matching students with teachers by gender can be captured, equitably and efficiently, in a segregated system. But the principal point of separating boys and girls on the limited scale envisaged is to enable literacy programs to be more closely tailored to the average development of relevant cognitive skills, and to better incorporate the teaching styles and materials that are more effective for boys, without at the same time compromising the optimal instruction of girls. The hope is that boys who can learn at a more realistic pace and are engaged with more appropriate classroom styles, expectations and materials will not be as likely to feel that they are failing at reading, to conclude that it is a ‘feminine’ pursuit, and/or to launch into the cycle of alienation and underperformance identified in the literature as a key threat to literacy.

Somewhat more speculatively, a naïve model of the differentiation strategies of male peer groups also suggests that segregation could dampen a negative dynamic that undermines boys’ effort to succeed as readers. One hypothesised problem with streaming students by ability is that by ‘labelling’ students as low-achievers, streaming fulfils its own prophecies. Whether or not early readers are streamed, this variety of stereotype threat can gain a foothold if students nevertheless perceive that some groups tend to be high achievers and others don’t. If (as is true on average) there is a significant correlation of achievement with gender, and if (as appears to be inevitable) gender is central to young students’ sense of identity, boys may begin to make
connections that can also, progressively, fulfil themselves. Segregation may prevent the perception of a correlation between literacy and femininity, and perhaps also reduce the general salience of gender to children's mental inventories of their attributes.

An implication is that, though some individual boys may be suited to inclusion in ('promotion' to) the female instruction group, scope for allowing this would somewhat vitiate the point of the intervention. It is vital, on the hypothesis, to create no perceived connection between performance and gender, such as is publicly emphasised if the better male readers are assigned to the 'female' class. The stigma and separation from friends would work against boys' effort.

The greatest potential threat to efficacy also arises in connection with peer externalities: the appeal of segregation is tempered by the apprehension that behavioural peer effects may thereby be concentrated. If boys distract each other and their teachers appreciably more than girls do, then concentrating boys may be good for girls, but bad for boys at a sensitive age when their attitudes to school and beliefs about their own capacities are being formed. There is presently no way to project the relative impacts of this possible factor against the preceding considerations with any real confidence. In general, the appeal of segregation is undermined by the lack of good evidence about its effects. However, evidence will always be lacking as long as a lack of evidence proscribes experimentation. An incremental approach to this innovation would begin to build the evidence that is sought. A reasonable approach is to encourage early segregation, but not later segregation, and to track the effects closely. However, schools that wish to experiment with any type of segregation should continue to be allowed to do so.116

4.2.4.2 Cost and administrative feasibility

In schools where the enrolment of each grade only supports one class, with one class teacher, segregation would entail significant costs for extra teachers, and impose significant administrative challenges in terms of finding space for separate instruction sessions. These costs are not justified by the essentially experimental nature of the intervention – it is not known with any degree of confidence whether or how much outcomes will improve. Instead it is recommended that only schools where at least two conventional (gender-integrated) classes worth of students are enrolled should separate boys and girls for reading instruction in the K to 2 years. This proposal can be accommodated, by and large, by existing staff and facility. In that case, there are no significant systematic costs associated with the proposal, and the administrative challenges are likewise minimised.

116 A small number of BC schools are now experimenting with single-sex settings within schools.
4.2.4.3 Equity

A challenge to the equity of the proposed intervention is that though the redistribution of peers is expected to help the average boy (and should be better for all girls), relatively high-achieving or boys would be expected to do worse overall due to assignment to a class that, by construction, exhibits lower achievement and is customised for slightly less ambitious near-term targets. These boys may be resilient, in terms of their ultimate proficiency and attachment. But the possibility that marginal cases will be ‘sacrificed’ remains a painful consequence of interfering with the social provision of any goods, including education. On the whole, because the proposed intervention would raise the achievement of the more vulnerable student (and is also likely to help girls), the equity criterion is satisfied. The gap between boys and girls may not be affected, but the absolute performance of each group is raised.

4.2.4.4 Political viability

Executive-mandated gender segregation is certain to generate extensive comment, debate and opposition. The careful communication of the clear and focussed educational rationale may mitigate opposition, as would the limited scale of the suggested intervention – which is confined to a certain type of instruction, for a limited age range, within schools which are otherwise integrated. However, parent-communities that are ardently opposed should not be compelled. It is likely that many school administrations and their families will be happy to engage with this initiative. Those that are not could be exempted if, after consultation and internal discussion, they remain firmly opposed.

The professional and union reaction is unpredictable. If it were sufficiently strongly opposed to make a political and bargaining issue out of the proposed early segregation experiment, the Ministry might consider linking separate instruction to class size. Class size controls are already stricter for the younger grades, but if additional resources to target: literacy instruction by shrinking classes further were made conditional on the segregation of boys and girls – at first, say, in schools that are on the margin of being able to support two classes per grade – then the interests of both sides could be furthered, and political opposition muted.

4.2.4.5 Social cohesion and research potential

The co-educational ideal, like the neighbourhood school ideal, has a potent grip in some constituencies that partly depends on a model of social cohesion that requires frequent and enforced mixing of students of different demographic profiles. Apart from the political salience of
this model, the question of how well-grounded its fears are is entirely open to empirical question. It is not clear that there is a genuine risk, and quite unclear what the magnitude of that risk (or even how it is to be measured) is supposed to be. An intervention limited in the ways described and subject to school-community opt-out is therefore justified by the expected benefits. The long-term effects can then be more readily understood. In general, the research potential of this policy is enormous, and directly addresses a key question for education policy-makers under pressure to find ways to improve male outcomes: in what ways, if any, does a single-sex educational environment change the behaviour, attitudes, attachment and performance of boys and girls?

4.2.4.6 Assessment

Segregation represents the most efficient and equitable method of applying different methods and expectations to boys and girls, in order to intervene in the escalating cycle of poor performance and detachment that disproportionately harms boys. It should produce appreciable gains to boys’ attachment, leading them to cultivate healthier attitudes and ultimately achieve more. It is therefore recommended that sufficiently large elementary magnet schools be required to separate boys and girls for literacy instruction in the early (K-2) grades, and match students with same-sex teachers where possible (now, in many more instances than before), unless schools prefer not to comply after appropriate consultation with parents. In the absence of magnet schools, the proposed segregation regime could be introduced on an experimental basis. The effect should be carefully tracked and periodically reviewed, by measuring the test score performance and attendance of participants and the subjective reports of their parents and teachers (and equivalents of comparable non-participating students). Costs, administrative challenges and broader risks are minimal. Political opposition is manageable.

While the Ministry could opt simply to continue to allow discretionary same-sex experimentation, the promise of early, subject-specific segregation, and the reality of the social challenge created by disproportionate male illiteracy, justify a slightly more aggressive policy to ensure that a promising experiment is broadly undertaken. Just as with magnet schools, it is desirable to adopt and utilise the existing policy framework but also to kick-start change rather than awaiting its organic development. Policies recommended here are intended to combine the advantages of incrementalism with the necessity of more active, targeted policy innovation.
## 4.3 Recommendations

Table 5  Summary of policy options

|                        | A                     | B                      | C                               | D                               |
|------------------------|-----------------------|------------------------|                                 |                                 |
| **Mobile Learning**    | **Governance options**| **Structural options** | **Limited gender segregation**  |                                 |
|                       | Status quo            | Separate authority     | Status quo                       | Magnet Schools                  |
| **Enhance parental engagement** | Good                  | Good, but redundant    | Modest                           | Good                            |
| **Mitigate cultural discontinuities** | Good                  | Better?                | Modest                           | Good                            |
| **Mitigate aboriginal peer effects** | --                    | --                     | Least risky                       | Risky                           |
| **Address mobility**   | Excellent             | --                     | Poor                             | Good                            |
| **Mitigate off-session fadeout** | Excellent             | --                     | Poor                             | Good                            |
| **Maximise teacher-interaction benefits** | --                    | --                     | Poor                             | Good                            |
| **Enable appropriate literacy programs** | --                    | --                     | --                               | Excellent                       |
| **Mitigate male peer effects** | --                    | --                     | --                               | A risk and an opportunity?      |
| **Overall efficacy**   | Strong                | Equivalent             | Inadequate                       | Good                            |
| **Cost**               | Substantial           | Modest                 | Substantial                       | Lower                           |
| **Equity**             | Good                  | --                     | Less risky but not performing ideally | More winners than losers; at-risk students win |
| **Political viability**| Viable                | Viable                 | Contentious                       | Safest                          |
| **Administrative feasibility** | Feasible              | Feasible               | Riskier?                         | Viable                          |
| **Social cohesion**    | Fair                  | Neutral                | Neutral                          | Good                            |
| **Research potential** | Strong                | --                     | Poor                             | Strong                          |
| **Interoperability with recommended A** | Poor                  | Good                   |                                 |                                 |
| **Interoperability with recommended B** | Fair                  | Better                 |                                 |                                 |
| **Recommended?**       | Yes                   | Yes                    | No                               | No                              |

* Assuming enhanced individual school boards, as discussed in Section 4.2.3: significant powers devolved from district to school level, with parental representation, and input to relevant district policy-making.*
This has been an exploratory study of the two challenges for education policy. Each individual element identified as an important factor in aboriginal or male underachievement, and each promising practice, merits detailed further analysis in its own right. Instead, the intention has been to build an overview of the desirable strategic policy directions with respect to the groups of interest, in the context of the mission, mandate and resources of the BC Ministry of Education.

A preliminary recommendation concerns the usefulness of the aboriginal category for diagnosis of student difficulties and design of responses. Evidence on the significant variation within that category renders ‘one-size-fits-all’ responses suspect. Not all ‘aboriginal’ students will respond in the same way to an intervention. Though a number of conspicuous barriers to success for the ‘typical’ aboriginal student have been identified, refinement of student demographic identification would enable more fine-grained policies to be developed in future.

The recommended interventions should be subject to close scrutiny that measures outcomes by tracking performance in skills tests and examinations, attendance, progress through grades, and ultimately graduation rates. A particular research challenges is to identify the observed effects that can properly be attributed to the treatments, rather than any extrinsic factors. The details of the policy architecture should be drawn up with such research issues in mind, in order to facilitate the identification of the relevant characteristics of students and their families.

A weakness of the recommendations is that they are unresponsive to the needs of aboriginal students in areas that cannot sustain the envisaged magnet academies (of which there might be scope for (very roughly) three on Vancouver Island, a dozen in the Lower Mainland, and perhaps four elsewhere in BC (e.g. in the Cariboo and the Okanagan). A strength is that the capacity of Mobile Learning is developed and tested, offering good potential in future for adaptation to help those aboriginal students who reside outside major metropolitan areas, where access to a magnet school is feasible for sufficient numbers.

4.3.1 Recommendation: Magnet Schools

The key recommendation is that the Ministry make it a priority to identify a demographically-appropriate number of suitable facilities, in areas with large numbers of aboriginal students who are not performing well under current conditions, to be converted into specialist academies. These are to be fully public funded, and are expected to implement culturally-based education initiatives. They are also expected to be attractive to aboriginal teachers, and may be permitted to incorporate aboriginal identity into hiring protocols, other things being equal and depending on union bargaining acquiescence. Immediate neighbourhood
students will be eligible to attend, but aboriginal students will be prioritised, and only aboriginal students from beyond immediate catchment will be eligible, with those from poorly-performing schools (appropriate metric to be defined) preferred. The aboriginal parenting community across the widest appropriate area will be targeted with an information campaign designed to encourage them to consider the alternative. Every effort is to be made to facilitate attendance (i.e. to neutralise transportation barriers). At least some of the academies should be encouraged to implement an unconventional calendar structure that smoothes the distribution of instruction sessions across the year. All academies should establish independent governing boards including parents, administration, teacher representatives and a district liaison appointee, with precise powers to be determined by further study.

4.3.2 Recommendation: Mobile Learning

In the new specialist academies, all students should be provided with laptop computers, and vouchers for home internet connectivity. A dedicated distance infrastructure will support the academy network and mentor in particular those students who leave the rolls and those identified as vulnerable over extended breaks.

4.3.3 Recommendation: Early Segregation

The Ministry should institute the expectation that magnet elementaries with upwards of 30 students in Grades K to 2 will separate girls and boys for literacy-related instruction, and implement differential techniques and materials to be developed on the basis of the current scientific and pedagogic knowledge. School-communities that prefer not to follow this advisory may opt out.
### Appendices

#### Appendix A

**Table 6**  
Sample FSA results, 2002-2003

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<th>n</th>
<th>Mean</th>
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<td>64.9</td>
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</tr>
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</tr>
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Appendix B

In the following tables, significance levels of co-efficients are denoted by *** for the .01 level, ** for the .05 level, * for the .1 level. The column heading gives the dependent variable.

Table 7   Regressions: Elementary/middle sample

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<th>4 Ethnic gap</th>
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'Ethnic gap' refers to the difference between non-aboriginal and aboriginal meet/exceed ratios and 'Gender gap' to the difference between female and male meet/exceed ratios. The ethnic gap expands as parental education rises, and shrinks as unemployment rises, almost certainly because these variables are describing the schools' non-aboriginal populations.
Table 8  Regressions: Secondary sample

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Dependent variable in Regressions 1 to 4 is the Aboriginal Meet/Exceed Ratio; in Regressions 5 to 9, the 'Ethnic Gap' in meet/exceed ratios; and in Regression 10, the gender gap.
Table 9  Band-school MERs compared to their district averages, 2002-2003

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Bibliography

Works Cited


British Columbia Teachers’ Federation (2002). *A Brief to the Ministry of Education Student Achievement Task Force*.


**Interviews**