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**ACCESS TO POST-SECONDARY EDUCATION
AMONG UNDER-REPRESENTED AND MINORITY GROUPS:
MEASURING THE GAPS, ASSESSING THE CAUSES**

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ABSTRACT

This paper provides an empirical analysis of access to post-secondary education among under-represented and minority groups in Canada based on the uniquely rich Youth in Transition Survey (Reading Cohort). We first treat the groups individually and then together to see how membership across different groups affects the identified gaps. We then add other sets of explanatory variables available in the YITS-A (high school grades and engagement, PISA reading scores, etc.) to see what portion of the gaps are related to these variables – and how much still remains after taking them into account. Not having a family history of PSE attendance is the most important (independent) factor, followed by being disabled, further followed by being an Aboriginal, coming from a rural area, or being in a low income family. Conversely, the children of immigrants are much more likely to go to PSE (especially university), as are (official) language minorities, while coming from a single parent family appears to have no effect of its own.

JEL Classification: I23, J24.

Keywords: college, university, under-represented minority groups, post-secondary participation, parental effects, parental income, parental education, provincial differences, rural gap, attendance predictors, grades, academic engagement, social engagement, parental expectations, multinomial logit models.

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I. Introduction

Ensuring access to post-secondary-education (PSE) for all those with the desire to attend and the talent to do so, without regard to background, is key to Canada's future economic competitiveness and equally important from an equity perspective.

For many young people, there is little doubt that they will attend PSE. Research has, for example, shown that those from families with higher incomes, and even more so those with higher levels of parental education, are likely to attend PSE, especially university. But the situation is not so clear for others, including not only those from lower income families or those whose parents have lower educational attainment, but also those belonging to other potential risk groups. Increasing the participation of these groups is especially important in a context where some of them are also growing in numbers and represent a sizeable share of the future labour force.

The contribution of this paper is to employ the uniquely rich Youth in Transition Survey, Cohort-A ("YITS-A") to provide new empirical evidence on the PSE participation rates of those belonging to a number of under-represented and minority groups that have been identified as being of concern – and interest – to policy makers and others in terms of accessing PSE. These include individuals from low income families; those from families with no history of attending PSE; those living in rural areas; linguistic minorities, including Francophones living outside of Québec and Anglophones living in Québec; first and second generation children of immigrants; those from single parent (or other "non-traditional") families; those of Aboriginal or First Nations ancestry; and those with a physical or mental disability. Some of these represent minority groups that in fact turn out to be *over*-represented in PSE. We refer to them as "under-represented and minority groups" (URMGs) henceforth.

While some of these groups have been treated in other studies, this paper is the first to address the situation of each of these groups in a single analysis, which takes account of how these groups cross-cut each other, as well as other factors that affect access rates, thus providing a comprehensive perspective that is unique not only for Canada, but also, as far as we know, in the international literature on access to PSE.

Furthermore, the YITS data employed are particularly strong for such an analysis of access to PSE – including differences in the patterns for each of the groups treated.

We begin the analysis by outlining the PSE access rates of students from each of the identified groups as compared to their counterparts in the general population (i.e., those from low income families compared to those from higher income families, those without a family tradition of PSE to those whose parents have such a background, etc.) We then place these participation rates in a multinomial logit regression framework, which allows us to take these various factors into account simultaneously, and thus identify the “net” access gaps for each of the URMGs being examined (for example, the access rates of those from low income families taking into account parental education, rural versus urban location, and so on).

We then extend the analysis by adding a range of additional explanatory variables available in the YITS-A to the model, including high school grades and engagement measures, and Programme for International Student Assessment (PISA) reading test scores. This permits us to see how the access gaps are related to these factors, and what proportions of the gaps remain once they are taken into account. Results are broken down by sex, and comparisons are made across regions of Canada.

In this way we paint a simple but useful empirical portrait of these URMGs in Canada. The results are interesting, and sometimes surprising. For example, some access gaps almost disappear when membership in the other groups is taken into account, while others barely change. Similarly, some of the differences in access rates are strongly related to the additional explanatory variables (grades and so on), while others are not. Some intriguing gender patterns emerge. And finally, some of the patterns across regions are very similar, while in other cases they are quite different. Taken together, these results have important implications for provincial and federal policy-makers as they seek to increase overall PSE participation rates, and equalise opportunities among all Canadians, regardless of their backgrounds.

The paper is organized as follows. The next section contains a review of the pertinent literature. Section III discusses the econometric model employed. The data are described in Section IV. The results of the analysis are the topic of Section V. Section VI

concludes the paper, summarizing the major findings and identifying some of their policy implications.

II. Literature

II.1. The Evolution of the Literature on Access to PSE

This analysis takes place in the context of a general trend where the literature has been moving beyond a narrow focus on financial factors (tuition fees, student financial aid, family income, etc.) towards increased consideration of a fuller set of factors, including family background, high school experiences, and other early influences. This progress has been in large part due to the availability of longitudinal surveys that have allowed researchers to make these connections, including the YITS-A in Canada.

These recent findings present a fundamental challenge to previous thinking about barriers to PSE. In particular, the earlier focus on the relationship between family income and participation in PSE was typically interpreted within the economists' standard rational choice model in which schooling decisions were assumed to be the result of comparisons of the future returns of PSE to the up-front costs, and income effects were typically thought to represent financing barriers (or liquidity constraints) that stood in the way of some youths' participation in PSE.

But more recent evidence suggests that this interpretation of family income effects was misplaced, and it is rather that household income is highly correlated with parental education (which was previously omitted from many studies), which is actually the greater effect. Not only is the effect of family income – and the financial barriers it was thought to represent – now understood to be smaller than previously thought, the (stronger) link between parental education and access to PSE is less explicable using models based on those same kind of financial factors.

The main drivers of PSE participation now appear to be “cultural” factors, which appear to be complex, interconnected, largely rooted in the family and start early in life (Finnie, Sweetman and Usher, 2009). These factors influence a youth's preparation for PSE and the formation of values, including the general orientation towards PSE, as well as impact PSE decisions directly at the end of high school. It is thus not so much that those from low income families are not *able* to go to PSE, but that they face *other*

disadvantages which may have little to do with income per se; it is no longer a story of “barriers” so much as who *wants* to go to PSE and who prepares themselves to do so.

Reinforcing these developments, the effects of tuition levels and student financial assistance are also typically found to be small when measured directly¹, while other family background factors increasingly point to the kind of “cultural” factors referred to above². The American and international literature has been going in similar directions as these developments in Canada.³

The policy implications of these results are potentially far-reaching. Instead of putting resources into addressing financial constraints (e.g., keeping tuition levels down, providing more generous and accessible loans, and so on), we should perhaps be turning more of our attention to improving student motivation and performance during (or even before) high school, providing better information to youth and their families about the costs and benefits of education from an early age, and other interventions which get at the early-rooted and family-based factors that seem to be the main determinants of access.

Belonging to one of the under-represented or minority groups considered in this analysis can thus be seen to be associated with the costs and benefits of attending PSE, and therefore fit the old analytical framework, including the role given to financial barriers in determining who participates, but may also reflect a range of other influences regarding the *perceptions* of the benefits and costs of PSE, the values attached to attending PSE, the early preparation for PSE, and other such influences – including, of course, any special barriers members of these URMGs may face (e.g., the physical challenges that youth with a disability may face). Our analysis cannot precisely identify which of these effects are driving the gaps we identify, but it does identify some of the

¹ See Coelli, 2009, Johnson, 2009, and Neill, 2009 for recent studies of the effects of tuition fees, and Day (2009) on student financial aid.

² See various papers in Finnie, Mueller, Sweetman and Usher, 2009, and Finnie, Frenette, Mueller, and Sweetman, 2010.

³ See Christphides et al (2001), Drolet (2005), Finnie, Lascelles and Sweetman (2005), Finnie and Mueller (2008, 2009a), Frenette (2009), Johnson (2009), Lefebvre and Merrigan (2009), and other papers in Finnie et al (2009, 2010) for recent Canadian work on this; Cameron and Heckman (1998, 2001), Carneiro and Heckman (2002), Cunha et al (2006), Cunha and Heckman (2007), Ermisch and Francesconi (2001), Heckman (2000, 2007), Heckman and Masterov (2007), Plug and Vijverberg (2003), and Sacerdote (2002) for recent U.S. work; and Mueller (2008, 2009) for a general review of the literature.

measurable factors to which the gaps are related, at least moving us a step along that pathway.

II.2. Specific Groups

Coming from a *low income family* should be viewed in the framework (and extensive literature) just discussed, as should being a *first generation PSE student* (i.e., youth whose parents have no PSE).⁴ To repeat, the consensus that has emerged in the literature is that parental education is a much better predictor of PSE participation than is parental income, and that *culture* trumps money where culture is a shorthand term for the myriad and multi-faceted family-based influences that appear to be related to parental education (and other family characteristics) which affect a young person's attitude to, and preparation for, PSE.

The literature regarding the other groups treated in this paper is sparse in comparison to the extensive work on family income, parental education, and related factors discussed above. We briefly review each of these in turn.

Previous studies (see HRSDC, 2004 for an earlier bibliography on the subject) find that *rural students* tend to have lower PSE participation rates than their urban counterparts. This is generally thought to be due to the more limited PSE opportunities they face, including related costs factors at least partly due to the increased distance that rural students have to travel to attend PSE (Frenette, 2004, 2006). It is, however, difficult to separate *ruralness* – and the cultural differences it may represent (including attitudes to PSE) – from these “pure” distance factors, so the precise determinants of the observed urban-rural differences are still not fully understood. Looker (2010) finds differences in PSE participation rates of rural students across regions in Canada, especially for university, but reports that to a large degree these gaps are explained by other factors with which rural residence is correlated, although some residual effects do remain (e.g., a smaller urban-rural divide in university attendance in Québec).

⁴ We refer to these youth as “students” in terms of their high school situation (i.e., “first generation PSE students” to denote youth whose parents have no history of PSE) since whether they go on to PSE – and become “first generation PSE students” – is of course the outcome of interest. The same is true for other groups, including “low income students”, and so on.

A number of studies (Aydemir, Chen and Corak, 2008; Aydemir and Sweetman, 2008; Bonikowska, 2007) find that the educational attainment of *first and second generation children of immigrants* is higher than that of non-immigrant Canadians, although Finnie and Mueller (2009a, 2010) show that there is considerable variation in these patterns by source region, and that while some portion of some of these gaps can be explained by factors such as parental education and high school behaviour and outcomes, sizeable differences remain unexplained.

The study of the PSE decisions of *Aboriginal Canadians* has faced a particular set of data challenges relating to coverage, sample sizes, and so on. In one recent piece, Frenette (2010a) uses a decomposition approach to explain the differences in educational attainment (including PSE) between off-reserve Aboriginals and non-Aboriginals, finding that most of the gap can be explained (or at least accounted for) by the variables available in the YITS-A dataset, although some of the measures included in his analysis are themselves potentially endogenous to schooling decisions (particularly high school grades). Frenette (2010b) again uses the YITS-A while Walters *et al* (2004) use data from the 1995 National Graduates Survey to find that the returns to PSE are at least as great for Aboriginal students as others, thus eliminating this as a potential explanation of their lower PSE participation rates.

HRSDC (2004) uses data from the YITS to identify differences in the educational aspirations for *minority language groups* and others in Québec and the rest of Canada. Numerous other studies, include controls for language, and typically find systematic differences in their PSE access rates, and that these are, in turn, at least partly related to differences in the underlying characteristics that generally affect access rates (family income, parental education, parents' aspirations, etc.). Most such studies, however, confound language effects with province effects. Finnie and Mueller (2008, 2009a) account for these differences, and find that Francophones outside Québec have higher college attendance rates and no statistically significant differences in university participation, while Anglophone Québécois are more likely to go to university than their Francophone counterparts.

There are no Canadian studies of which we are aware that focus on the PSE access rates of students from *single parent families*, although numerous studies do include an indicator of this status. As an example, Finnie and Mueller (2008, 2009a) find no effect once family income and parental education are included in the model. Sen and Clemente (2010) discuss the impact of family size on access to PSE, but their focus is on the number of siblings in the student's family, not the number of parents or guardians.

Homes (2005) provides a descriptive picture of the PSE participation of Canadian *students with a disability* using data from the 2001 Participation and Activity Limitation Survey (PALS). In a somewhat related piece, Hollenbeck and Kimmel (2008) estimate earnings functions and returns to education using U.S. data. Despite enjoying higher returns to schooling relative to individuals without disabilities, overall earnings of disabled graduates of PSE programs are lower overall.

III. The Model

This research uses a multinomial regression framework developed in earlier work (Finnie and Mueller 2008 and other papers) for estimating access to PSE and differences in access across identifiable groups. In this approach, access is taken to be a function of membership in the various groups of interest and other explanatory variables which, when taken into account, can help identify how the observed overall group differences are related to these other factors.

The model may be expressed as follows:

$$Y = X_1\beta_1 + X_2\beta_2 + X_3\beta_3 + \mu$$

where Y is the access measure of interest (participation in college or in university as opposed to no PSE), The X_i are vectors of covariates that influence Y, the β_i are the coefficients associated with each set of X, and μ is the classical stochastic error term.

X_1 comprises the indicators of membership in the groups of interest listed above – low family income, no family history of PSE, rural, and so on. In the simplest models these indicators are entered individually (along with a very basic set of controls for gender and province of residence) in separate regressions in order to capture the overall differences in access rates between members of each of these URMGs and others. We then include all group indicators together, which identifies the different access rates

associated with each group when they are all considered jointly. To the degree the various factors are related (e.g., low income students are also more likely to have parents without PSE, to live in rural areas and so on), we would expect the “estimated separately” and “estimated jointly” effects to differ, perhaps substantially.

We then include regressors that represent other measures available in the YITS-A that are related to access to PSE. X_2 includes one element of these: high school grades. X_3 includes another set: measures of high school engagement, the student’s sense of self-efficacy, parents’ behaviour regarding monitoring and disciplining their children, and others (defined below). The international (PISA) reading score is also included in this group. The full model includes all these entered together.

These additional influences do not necessarily have an econometrically-correct ordering (i.e., representing strictly exogenous influences) in terms of their inclusion. For example, students who have decided they want to get into PSE may work to get higher high school grades in order to be able to do so and to do better when they get there. Hence, grades do not necessarily *explain* participation in PSE so much as represent a jointly determined outcome. What is most important to the current analysis, however, is that: (i) these variables are all determined before the entry into PSE, since they are measured during the earlier pre-PSE cycles of the YITS-A, (ii) they are empirically related to access to PSE, and (iii) they may be related to membership in the groups under consideration. In particular, it will be interesting to see how the group differences change when these additional variables are added, thus telling us if the differences are *related to* grades, engagement, and so on, or exist *even after taking such factors into account*. This exercise will provide us with a better understanding of the group differences, if only from a descriptive perspective.

We use a multinomial logit set-up to differentiate between access to college and university. This allows the regressors in our models to have different effects on college and university participation, while allowing these processes to be related.

IV. The Data

IV.1. The Youth in Transition Survey and the Measurement of Access to PSE

This paper uses data from Cohort A of the Youth in Transition Survey (or “YITS-A”). The YITS-A is ideal for this application since it follows a representative sample of Canadian high school students born in 1984 through their later high school years and beyond. The longitudinal aspect of the survey allows us to examine the impact of belonging to each of the under-represented and minority groups (as defined at age fifteen) on subsequent PSE outcomes, and to do so taking other important factors affecting PSE access into account.

In March and April of 2000 (Cycle 1), the YITS-A began with the completion of a written survey by those youth selected into the dataset. Interviews were also conducted with the parents of these students, and with officials of the high schools they attended. The YITS-A also contains the youths’ PISA reading scores (an international standardized test in which Canada participated).⁵

The students themselves (although not their parents or school administrators) were surveyed again in 2002, 2004, 2006 and 2008 (cycles 2, 3, 4 and 5). We use the respondents’ PSE status in the 2006 (Cycle 4) survey as the optimal compromise between the ability to identify participation in PSE (which increases with age) and sample size (which decreases with each subsequent cycle of the survey). In this wave of the survey, the young people were 21 years of age (as of December 2005 – the reference point for cycle 4), a point at which they have made at least their initial choices about entering PSE.⁶

The dependant variable in our study represents whether the individual enrolled in college or university at any point over the four cycles of the survey, regardless of whether they continued in their studies after that. This is the standard definition of access to PSE used in the literature; continuing on to graduation and other aspects of persistence are

⁵ See Motte *et al* (2009) for a general description of the YITS.

⁶ Access rates change only moderately after age 21, and the *structure* of access with respect to the variables included in our models appears to change very little. In short, our results would hold were individuals followed over a longer period of time.

normally thought of as being a separate process. We differentiate access to college and university, arbitrarily counting the latter if the individual attended both.

All results shown below were generated using the weights constructed by Statistics Canada for the YITS-A, which are designed so that the samples, and any analysis based on them, should reflect the underlying population of youth born in 1984 and thus age 15 and living in Canada in December, 1999.⁷

IV.2. Under-Represented and Minority Groups

Partly in consideration of sample size issues, the strategy in this paper is – especially in the case of the smaller groups – to define membership in the URMGs fairly broadly. That said, we also aimed at keeping the groups sufficiently homogeneous and representative of individuals with the relevant characteristics.

For the purposes of defining *students from low income households*, we turn to the parent survey. The interviewed parent was asked to provide a comprehensive total of pre-tax income for both parents (or guardians) of the student. We define low income households to be those with a total household income⁸ of less than \$50,000.⁹ This represents an arbitrary cut-off, but the sample distributions shown in Table 1 indicate that this includes exactly one-third (33.2 percent) of the YITS national sample. By region, which represents a component of our analysis, Ontario has the lowest proportion of 15 year olds from low income families by this definition (26.4 percent), Atlantic Canada the highest (47 percent), Québec the next highest (40.2 percent), followed by Western Canada (32.5 percent).¹⁰

⁷ Although the YITS is subject to attrition, an analysis carried out by the MESA Project indicates that this attrition does not appear to be a problem, at least for the analysis of access to PSE, since the sample weights appear to do a good job of compensating for the attrition.

⁸ In the YITS parental questionnaire, the student is identified as Person 1, the parent who responds to the survey as Person 2 and their spouse or partner as Person 3. The income measure used here is the combined income of persons 2 and 3.

⁹ The small number of students with parental incomes below \$5,000 have been dropped from this analysis due to suspicion of respondent error. Most of these cases report zero for all income categories (which include government transfers directed at low income families), while the behaviour of these youth with respect to access to PSE is not at all like that of other low income families. This group represented about 1.3 per cent of the sample.

¹⁰ Incomes are adjusted neither for family size nor the cost of living in order to keep the measure simple and easy to interpret. Adjusting for these factors could change the results, but probably not greatly.

First generation PSE students are defined as those high school students whose parents did not attend any form of PSE. This captures 30.2 percent of the Canadian sample. Using this measure of parental education, we do not find large differences across the regions except for Québec, where 37.8 percent of the sample comes from a family with no history of PSE.

Rural students are classified according to the community in which they were living when they attended high school at age 15. Urban high schools fall within the Metropolitan Influence Zone of an urban centre, which is defined by the proportion of households that have an individual who commutes to the urban core. The national rate is 23.0 percent. Ontario is the most urbanized province by this definition, with only 16.2 percent of the YITS-A cohort attending a rural high school. Again Atlantic Canada is the outlier, with a much higher rate of 46.5 percent. Québec and Western Canada lie between these.

To identify the respondents who are a **linguistic minority**, we again turn to the parental questionnaire. Students living outside of Québec who learned French as their first language and still understand it are considered members of one group, Anglophones in Québec the other. The French minority groups ranges from 1.1 percent in Western Canada, to 4.2 percent in Ontario, to a high of 10.2 percent in Atlantic Canada. The English minority in Québec comprises 8.4 percent of the youth in that region.

What we refer to as students from **single parent families** includes all those from anything but a two parent family (of which actual single parent families are the great majority). We include step-parents and other guardians as parents when determining the number of parents in the household. Students from “single parent” households make up 17.2 percent of the national sample, and between 15 and 20 percent across the regions.

To determine **first and second generation children of immigrants**, we once more use the parental questionnaire. Parents were asked which country they and the student were born in. We consider any student born outside of Canada to be a **first generation immigrant**, and any student born within Canada but with at least one parent born outside of Canada to be a **second generation immigrant**. Because all first generation immigrant students must have been enrolled in a Canadian high school at age 15 in order to be

included in the YITS, our first generation immigrant group represents what some have called the “1.5 generation” of immigrants (e.g., Aydemir and Sweetman, 2008) since they immigrated along with their parents at an early enough age that they completed their high school schooling in Canada. At the national level, first generation students represent 8.3 percent of the sample; second generation children of immigrants, 18.8 percent, thus making them 27.1 percent together. Ontario has by far the highest proportion of immigrants (38.1 percent), Atlantic Canada the lowest (6.7 percent), with Québec and Western Canada between these (13.8 and 29.1 percent, respectively).

In the YITS, *Aboriginal* youth are identified by their parents’ response to the question, “Is this person [the student] Aboriginal, that is, North American Indian, Métis, or Inuit?” It should be noted that the YITS did not survey youth living on-reserve, so our analysis excludes that group. A relatively small proportion of our sample, just 2.8 per cent nation wide, consists of Aboriginal youth, ranging from a high of 4.3 percent in Western Canada to 1.6 percent in Québec.

Partly to gain sample size, but also to be inclusive, we adopt a fairly broad definition of *students with a disability*. This definition includes physical, sensory and cognitive disabilities based on information provided in the parental questionnaire, and captures those individuals whose parents report them having difficulties in those areas, as well as those whose parents report them having a condition that reduces the amount or kind of activities they perform at home, at school or elsewhere. These represent 12.9 percent of the sample, with some variation by region.

IV.3. The Explanatory Variables¹¹

In addition to membership in the identified under-represented or minority groups, we also include in our analysis measures of the experiences, behaviour, and performance in high school from the rich data available in the YITS-A.

For our measure of *high school grades*, the YITS asked students to specify their overall average grade using a series of percentage categories, from which we constructed

¹¹ See Finnie and Mueller (2008) for further details on the variables discussed in this sub-section.

a pseudo-continuous variable using the midpoints of these categories (tests indicated that it performed as well for our purposes as a set of detailed variables).¹²

Based on the answers to a battery of questions relating to high school engagement, self-image, social support and parental behaviour, Statistics Canada constructed various sets of scale variables pertaining to the individual's experiences, attitudes, and environment as of age 15 (cycle 1 of the YITS). One of these sets of variables relates to academic (high school) engagement. We use *Overall academic engagement*, which is the combination of academic identification (which refers to getting along with teachers, having an interest in the subject matter, and related behaviours and attitudes), and academic participation (which essentially reflects the student's work effort both inside and outside of school, including hours spent on homework, meeting assignment deadlines, not skipping classes, etc.) *Social engagement* is a gauge of social involvement at school such as having friends, a feeling of belonging to the social aspects of school, and so on.

The next set of variables represents the youth's personal qualities. *Self-esteem* is self-explanatory. *Self-efficacy* reflects the students' responses to questions related to their competence and confidence in performing school work. Finally, *self-mastery* represents an appraisal of the individual's sense of broader control over their life.

The third category of scale measure consists of a single variable, *social support*, which measures the availability of assistance from friends and family.

Finally, the parental behaviour scales consist of three separate measures. *Monitoring behaviour* reflects the parents' awareness of what their child is doing and with whom they are friends. Second, *nurturance behaviour* is measured by a set of variables aimed at measuring the degree to which parents are "supportive of their youth's education, are involved in their youth's school, and have a firm but responsive parenting style" (from the YITS codebook). The third measure, *inconsistent discipline*, captures how parents address their child's inappropriate behaviour.

¹² In previous work (Finnie and Mueller, 2008) we have found that the overall grade is a better predictor of access to PSE than other grades in specific subjects (math, science, main language).

These scale variables are constructed to have a mean of zero and a standard deviation of 1 across all the students surveyed in the PISA 2000 survey (which included Canada along with 42 other countries).

Finally, the *PISA reading score* is based on the standardised international reading test that was administered to all those included in the YITS, and is normalised to have a mean of 500 and a standard deviation of 100. We use the reading test because it was administered to all students.

IV.4. Sample Selection

Non-Canadian citizens and those with unknown immigration status were dropped from the sample. Additionally, we deleted those individuals for whom any of the URMG variables were missing as well as those who were continuing in high school as of the Cycle 4 survey at 21 years of age, since we do not observe any potential transition into PSE for this latter group. In large part due to the completeness of the YITS data, our selection procedures resulted in relatively few individuals being dropped. The final sample contains 7,901 females and 7,336 males for a total of 15,237 observations. This number is reduced slightly in certain parts of the analysis due to missing values of some of the variables included in the different models.

V. Results

V.1. PSE Access Rates by Group

As described in the previous section, we define access to a given type of PSE (college or university) as having been enrolled in that type of PSE program by the end of Cycle 4, when those in the YITS-A cohort are 21 years of age. These access rates are presented in Table 2, which also shows the rates by region, although discussion of these is left to the later section in which this is the focus.

The youth in our sample who come from low income households (parental income of less than \$50,000) have an overall rate of PSE attendance that is almost thirteen percentage points lower than those from higher income households, with their university participation rate being 15.5 percentage points lower (31.4 percent for low income versus 46.9 for others). Meanwhile, their college rates are a bit higher than those of high income students.

Students with no family (parental) background of PSE attendance have an overall PSE participation rate that is 19.8 percentage points lower than that of students with at least one parent who attended PSE. More dramatically, the university participation rate of first generation PSE students is less than half that of others, at 49.2 percent versus 24.3 percent, respectively. From another perspective, first generation PSE students are much less likely than others to go to any PSE at all, and much more likely to go to college rather than university when they do go, whereas the opposite holds for those whose parents have PSE.

Youth from rural Canada are also under-represented in PSE, with an overall PSE participation rate that is exactly ten percentage points lower than that of students from urban areas. Furthermore, and following the same pattern as for the other groups seen so far, their university access rate is much lower (44.7 versus 31.5 percent), while their higher college rates off-set this difference to some degree (35.5 versus 32.3 percent).

Linguistic minorities (French outside Québec and English in Québec) have somewhat higher overall PSE participation rates than others taken overall (i.e., Anglophones outside of Québec plus Francophones in Québec – i.e., the majority language groups), and the French minority group has higher university rates in particular, but the more direct within-province comparisons presented below are more meaningful, so further assessment is held off here on that account.

Students from single parent families access PSE at an overall rate that is 7.5 percentage points lower than that of students from two parent families. Once again, the college attendance rate is a bit higher for this group, while the university participation rate is lower, in this case by 10 percentage points.

First and second generation children of immigrants have higher PSE participation rates than non-immigrants, and so they are not actually an under-represented group as far as PSE is concerned. This is driven by their university participation rates, which are 20.0 percentage points higher for first generation children of immigrants and 16.0 percentage points higher for second generation children of immigrants as compared to non-immigrant youth; college rates are lower than those of non-immigrants.

Those of Aboriginal ancestry are dramatically under-represented in PSE, with an overall participation rate that is 24.3 percentage points lower than that of non-Aboriginal respondents. College participation rates are a bit lower for Aboriginal youth, but most of the difference in the overall rate of PSE access is due to the very large difference in their university participation rates (42.2 versus 23.1 percent).

Canadian youth whose parents identified them as having a cognitive or physical disability have an overall PSE participation rate 15.5 percentage points lower than those without a disability. The difference in university participation is even larger: 19.8 percentage points in favour of those without a disability, while once again the college gap goes a bit the other way.

Thus, for the truly under-represented groups, we observe substantially lower university participation rates than for other Canadians, but – interestingly – in every case but one (Aboriginals being the exception) their college participation rates are somewhat higher than those of the comparison groups, with the net effect being lower PSE participation rates overall (i.e., either college or university). Put differently, members of the identified groups have lower overall PSE participation rates than others, and of those who go, more attend college than university, while the opposite is true for the comparison groups.

We can thus say that, generally speaking, members of these under-represented groups are – at least statistically speaking – less likely to attend university, but also tend to substitute college for university, while others opt for no PSE at all. These groups are thus indeed “underrepresented” – both in terms of overall PSE participation, and especially at university (as opposed to college).

But these are just simple two-way statistics. We now turn to our regression analysis, which allows us to place these patterns in a tighter statistical framework, consider all groups individually and simultaneously, and to add other explanatory variables to the analysis.

V.2. National Level Regression Results: The Baseline Models

This section begins to extend the descriptive analysis presented above by placing those same two-way comparisons in a very simple regression framework and then seeing

what happens when interactions across the groups are taken into consideration. For example, many of those in one of the URMGs tend to be in one (or more) of the other groups as well: what are the differences in PSE participation rates between members of each of the groups and others before, and then after, membership in the other groups is taken into account? The results presented below represent a national level analysis, with males and females pooled together; results are presented broken down by sex and region later in the paper.

Table 3 thus shows the results obtained from a number of different models. The first set of columns, labelled “separately”, represents the findings from a set of regressions which treat each of the different groups of interest separately: that is, a different regression is run for each group, with each regression including only the relevant group indicator plus a (common) set of gender and regional indicator variables as controls.¹³ The table shows the estimated average marginal effects (or average differences in the probabilities of attending college or attending university – the two PSE outcomes, as compared to the no PSE outcome also allowed for in the models) associated with each variable included in the multinomial logit models, including the URMG indicators (along with the basic control variables mentioned above).

These results correspond very closely to the descriptive access rates presented in Table 2 (i.e., the estimated differences in access rates between each of the URMGs and others represented in the average marginal effects shown in the model results are very close to the differences seen in the descriptive table above). This is as expected, since we are simply estimating those overall differences in a very simple regression framework, here with the addition of some very standard control variables (gender and region).

The next set of columns, labelled “jointly”, represents the results (average marginal effects once again) obtained from one single model that includes *all* the indicator variables for the groups of interest (i.e., the identified URMGs) treated together (the basic gender and province controls are again included). Differences in the two set of results – i.e., “separately” versus “jointly” – reflect the correlations in membership in the

¹³ A single model is run including the two minority language indicators, and another for both the first and second generation immigrant indicators.

different groups and how taking account of these correlations changes the findings for each specific variable (group).

The third and fourth sets of columns summarize the differences between the two sets of models. The first of these represents the absolute change in the estimated average marginal effects between the separate and joint models. The final set of columns indicate what proportion of the effect found in the separate models remains when the other influences are considered: the higher the proportion, the more the effect is robust to adding in the additional effects (i.e., membership in the other URMGs).¹⁴

While a number of studies have shown that youth from low income households are less likely to attend PSE, recent research (e.g., Finnie and Mueller, 2008) has indicated that this effect is highly correlated with other factors, particularly parental education. We can see this in Table 3, where over 40 percent of the effect on university access associated with being in the low income group disappears when the other variables – including parents’ PSE backgrounds – are included. That said, students from low income families are almost nine percentage points less likely to attend PSE after controlling for other factors (this is seen in the -.088 average marginal effect in the “jointly” column). After controlling for the other variables (i.e., the “jointly” model) the positive effect on college attendance also becomes smaller, and statistically insignificant (the point estimate is 1.9 percent).

The results in Table 3 also show that first generation PSE students have very different access patterns than others. Taking this factor individually, the results indicate that a young person with no family (parental) history of post-secondary education is, on average, 24.2 percentage points less likely to attend university and 4.8 percentage points more likely to attend college. We are able to add the two average marginal effects and say that these students are, on average, 19.4 percentage points less likely to attend PSE of

¹⁴ When we discuss the average marginal effects derived from the estimation (often shortened to “effects”), we are referring to statistical correlations and are not making any claims about necessarily causal relationships.

any kind than someone whose parents themselves went to college or university.¹⁵ Furthermore, these effects remain quite strong, retaining over 80 percent of their force, when membership in the other groups is taken into account, the adjusted gaps being 20.0 percentage points (negative) for university attendance, 4.2 percentage points (positive) for college, and thus 15.8 percentage points (negative – i.e., lower PSE participation rates) overall.

This result emphasizes the important role that parental education plays in regard to PSE access; the effect of having parents with no history of PSE student is larger than the effects for any of the other URMGs, and this holds whether or not the other (URMG indicator) variables are included in the model. Being from a non-PSE family has a greater effect than being from a low income family (by far) or a rural area (again by far); the parental education effect is even greater than the effects of being Aboriginal or disabled.

Youth from rural areas are also under-represented in PSE as a whole, and in university in particular, the latter offset to some degree by a positive college effect. A student who attended a rural high school is 14.6 percentage points less likely to attend university, but 5.6 percentage points more likely to attend college, when this variable is considered in isolation. These effects are cut substantially, but remain at 9.2 and 4.5 percentage points, respectively, when the student's other characteristics are added to the model. This suggests that while some of the gap in rural student representation in PSE is explained by other observable demographic student characteristics (particularly membership in a lower-income household or not having a family history of PSE) there is also a significant unexplained portion, or “net effect”.

The similarity in magnitude – but opposite signs – of the college and university effects in the separate model suggest that students living out of Québec whose first language is French are, on average, approximately four percentage points more likely to

¹⁵ The college and university effects can be added together in this way because the multinomial set-up employed estimates the probabilities of college and university access together with the probability of not attending either form of PSE. The resulting estimated probability effects must add up to 1, by construction, across all three outcomes, meaning that the estimated changes in the college and university effects represent the total change in any PSE attendance, and must be exactly balanced by an offsetting change in the no PSE outcome. The no PSE outcome is not shown precisely because it represents this residual, and can thus be discerned from the other results.

attend college, and a similar four points less likely to attend university, and thus attend some form of PSE at a roughly comparable rate to others, but tend to favour college over university compared to non-Francophones. These differences are, however, not statistically significant, so not much can be read into them. The effects become even smaller in the joint models, suggesting that any differences that do exist may be largely explained by other basic (URMG) student characteristics.

The English minority in Québec is, in contrast, more likely to go to university than other Québécois, the difference being 14.7 percentage points in the separate model, some of this effect remaining (a 7.6 percentage point difference) when the other variables are taken into account (at that point the negative college effect becomes insignificant).

Youth from single parent families (and other non-two parent family types) – often thought to be a substantially disadvantaged group – are in fact 10.8 percentage points less likely (on average) to attend university than those from two parent families when treated in isolation. (The college effect is small and statistically insignificant.) Again, though, most if not all of these effects appear to be related to the other characteristics of the students (as captured by the other variables included in the “joint” model), and the remaining differences are small and not statistically significant. In short, family status on its own does not appear to be an important factor, but being in a single parent family also tends to be associated with low family income, with the parent not having a background in PSE, and other factors that are themselves associated with lower participation rates.

First and second generation children of immigrants, taken as a whole, are much more likely than others to attend PSE, particularly university (fewer go to college). Furthermore, a substantial proportion of the university effects – 87.2 percent for first generation children of immigrants and 74.0 percent for the second generation – is not explained by the other student characteristics included in the model. The differences thus remain at 17.0 percentage points for first generation children of immigrants, and 10.8 for the second generation group in terms of their higher university access rates, while they are approximately 5 and 3 percentage points less likely, respectively, to go to college.¹⁶

¹⁶ This matches the strong immigrant effects – and the limited ability of other variables to explain these differences – reported by Finnie and Mueller (2009b, 2010).

Aboriginal youth are, not surprisingly, found to be significantly under-represented in PSE. The average marginal effect on university attendance, taken separately, is 16.7 percentage points (there is little offsetting college effect), although this effect drops by about half, to 8.5 percentage points, when the students' other characteristics are taken into account. This gap thus appears to be partly related to their lower family incomes, being less likely to have a history of PSE in the family, living in rural communities, and so on, but also partly for reasons beyond this.

Finally, students with a physical or cognitive disability are 19.0 percentage points less likely to attend university than others, but 6.1 percentage points more likely to go to college, for an overall difference in PSE attendance rates of 12.9 percentage points. Interestingly, of all the groups addressed in this study, the effect of having a disability is the most robust to the inclusion of other characteristics in the model (the "joint" effects are 16.9 and 6.1 percentage points, respectively, for the university and (negative) college effects. This presumably reflects the fact that disability tends to be relatively uncorrelated with family income, parental education, rural residence, and so on.

In summary, these results illustrate some important "gross" and "net" gaps in PSE attendance between these under-represented and minority groups and others. The differences are greatest for university participation, while in most cases these are offset to some degree by differences in the opposite direction in college rates. But what happens to these gaps when the additional sets of explanatory variables representing high school and related experiences are added to the analysis? We now turn to those estimates.

V.3. Adding the Additional Explanatory Variables

The first set of results in Table 4 repeat the "jointly" estimated model shown in Table 3 for reference.¹⁷ The other models include the high school performance and related variables – grades, the scale variables and the PISA reading score – described in the data section above.

¹⁷ The estimates included in the first column of Table 4 are not exactly the same as those in the "jointly" column of Table 3 even though the same variables are included. The reason is that for the regressions in Table 4, respondents missing information on high school grades, scale variables or PISA reading scores have been dropped. The changes are, however, minimal.

The additional variables almost all behave as expected.¹⁸ The effect of high school grades can be interpreted as the change in the likelihood of attending the relevant level of PSE associated with a ten percentage point increase in the individual's overall high school grade average. The results where grades are added on their own thus indicate that a student with a ten percent higher grade would be 22.2 percentage points more likely to attend university, 8.9 percentage points less likely to attend college, and thus 13.3 percentage points more likely to attend any form of PSE. The effects are a bit weaker when the other additional variables are also included.

As described above, the various scale variables are constructed to have a mean of zero and a standard deviation of one. The estimated average marginal effects thus reflect the change in PSE participation rates associated with a difference of this magnitude. Overall academic engagement shows the greatest effect among the scale variables, probably because it includes both academic identification, which is highly correlated with PSE aspirations, and academic participation, which includes information on study habits and other behaviour that is correlated with academic success. The effect associated with the self-efficacy scale variable is also fairly strong. The negative effect of the social support measure may indicate that more strongly socially connected individuals are (holding the other variables constant) simply less likely to go on to university than others; perhaps they focus less on school, and more on the social side of their lives.

The effects of parents' behaviour are not large, but of the correct signs. Finally, the effects of the PISA reading score are in the expected direction and strong, as it captures both unobserved ability and academic skills (as shown by the reduction in the effect of high school grades when the PISA score is added). A one standard deviation difference in the score (100 points) is associated with a 19.3 percentage point increase in the probability of attending university, a 6.5 percentage point reduction in the college rate, and thus an overall increase in PSE participation of any type of 12.8 percentage points.

¹⁸ See Finnie and Mueller (2008, 2009a) for a more detailed analysis of these variables. The results reported here are generally consistent with those.

But what happens to the group variables when these measures are added? When high school grades are added (the second model), the (direct) effect of being from a low income household on university attendance is reduced from (negative) 8.8 percentage points to 5.9 percentage points, suggesting that one of the ways that income operates is through the student's high school grades. Including the scale variables and the PISA scores instead (the third model) reduces the effect to 4.2 percentage points, and including both these sets of variables reduces the effect further, to 3.7 percentage points.

That is, once high school factors are controlled for – along with membership in the other identified groups – there remains only a relatively small (low) income effect. This is very important from a policy perspective, because past policy has – as discussed above – been largely focused on money-related interventions (tuition subsidies, student financial aid, and so on), based in part on earlier findings that family income is highly correlated with participation in PSE. These findings suggest, first, that family income *per se* is only a moderate risk factor, and second (and related) that at least at the margin, income- and PSE financing-based policies are likely to have relatively little effect in increasing the university/PSE participation rates of youth from low income families, and that other interventions, which would probably be most effectively targeted in the early part of a student's life, would do a better job of helping level the playing field.

In contrast, when the grade, scale and PISA reading variables are added to the model, being a first generation PSE student still has a strong direct negative effect on not attending university, although it is substantially reduced, the effect going from 20.0 percentage points in the baseline (“jointly estimated”) model to 9.5 percentage points in the final model where all the high school and related variables are included. It therefore appears that parents' education has one strong set of influences related to what happens in high school, but also a significant (additional) direct impact on students' PSE outcomes, perhaps by influencing the schooling choices among those of a given set of (observable) characteristics. The (partially) compensating positive effect on college attendance disappears once the extra variables are added.

The negative effect of being from a rural area on PSE access, university in particular, also remains fairly strong when the additional regressors are added, although it

is reduced from 9.2 percentage points to 6.8 percentage points. This is consistent with the idea that part of the rural effect is related to other factors in the model, including not only parental education, family income and others seen above, but also (now) high school experiences and other related factors. But the results also show that part of the rural effect is net of these factors, perhaps because rural youth face higher costs in accessing PSE, university in particular, since institutions tend to be further away and require travel, because they have different preferences for higher education, because of other cultural effects not identified in the analysis, and other factors.

Adding high school grades to the model has little effect on the Francophone (outside of Québec) indicator, but it then jumps to a positive and statistically significant (positive) 8.9 percentage points when the scale and PISA reading score variables are included. This result may, however, be an artefact of the PISA reading test. That is, once PISA scores – where non-Québec Francophones perform relatively poorly – are added to the model, the Francophone effect jumps up, implying that the rate at which they go to university is high relative to what might be expected from those poor test scores. One explanation for the lower PISA scores of Francophones outside Québec is that they often take the test in English rather than French (their first language), precisely because they are a minority group and the French test is not available (e.g., for those attending English schools), thus driving their test scores downward. But here we are speculating beyond what these data can tell us.

Interestingly, the Anglophone effect in Québec changes only a little – in fact increasing marginally – when the high school variables are added. This group appears to go on to PSE, university in particular, more often for reasons that seem to have nothing to do with their high school experiences and outcomes.

Family status, when other factors are controlled for, continues to have no statistically significant effect on access to PSE. As discussed previously, the sizeable “raw” gap appears to be due to their also being in low income and lower parental education families, and so on, rather than their family status *per se*.

The positive effects on university attendance of being a first or second generation child of an immigrant remain strong, and are only slightly reduced when all the grade,

scale, and PISA score variables are added to the model. These results suggest that the effects of being the child of an immigrant on PSE attendance do not work through high school performance and behaviour. This is an interesting finding: the reason they go on to PSE (university) in much greater numbers is not because they do better in high school, but because they are more likely to go on for a *given* set of high school outcomes.¹⁹

In contrast, adding the high school variables to the model significantly reduces the Aboriginal effect – from 8.5 percentage points lower university attendance, for example, in the “jointly estimated” model, to an insignificant 3.4 percentage points when all the variables are included in the model (the college effects are not significant in either case). This suggests that the lower participation rates of Aboriginals are tightly wound up with what happens in (and during) high school: their grades are lower and they have worse scores on their scale and PISA reading test variables, and as a result they go to PSE at lower rates, with only a smallish (unexplained) residual effect remaining on top of this.

The effects of having a disability on access to PSE remain strong and significant, but are reduced in magnitude – from 16.9 percentage points to 9.1 percentage points in the case of the university variable, with a somewhat countervailing 4.8 percentage point positive effect on college attendance – after the grade, scale and PISA score variables are added to the model. These results suggest that there are both direct and indirect effects of having a disability on PSE attendance.

V.4. A Summary Graphical Presentation

Figure 1 summarises the results presented thus far. In each part, the graphs first show the results from the “separately” and “jointly” estimated models from Table 3; then those obtained after adding high school grades, the scale and PISA reading score variables, and finally, all of these. In each case, the graphs plot the average marginal effects reported in the tables. They are shown in sets, the results for each variable showing the general size of the effects (the overall height of the bars), and what happens as the additional regressors are added (how the bars change across model specifications). Only the university effects are shown because they represent the stronger effects, against

¹⁹ See Finnie and Mueller (2009b, 2010) for further details on immigrant children.

which the college effects are, in most cases, a kind of partial compensating outcome, typically going in the opposite direction, but not so strongly.

We start with the “Parental Attributes” panel. The strong effects of parental education (no PSE) stand out; especially in contrast to the much smaller low income (below \$50,000) effects shown beside them, which are also seen to largely fall off more strongly when the other variables are added to the model. The small magnitudes of the single parent family effect – once the other groups are taken into consideration (i.e., the “jointly” model) – are also clear.

The second set of graphs show the minority groups, who in fact turn out to be over-represented (rather than under-represented) in PSE – as seen in the negative bars (for expositional purposes, the graphs are constructed to show negative gaps as positive bars). First generation children of immigrants have the largest differences, the second generation group following them, but the English-Québec effect is also quite strong, and little affected by the additional (high school and related) regressors once the other identified group variables are added to the model. The flip from a small negative gap to a significant positive one for Francophones outside of Québec after the PISA reading score is added is also clearly presented.

The third set of graphs shows how coming from a rural setting, being an Aboriginal, or being disabled all have their own effects, the latter being the strongest of these, and falling off the least as additional variables are added to the models.

V.5. Male-Female Comparisons

So far we have presented results for males and females pooled together in one model. In this section, results are presented separately for females and males so that any gender differences in the relative PSE participation rates between those belonging to our identified under-represented and minority groups and others can be seen.

Appendix tables 1a and 1b present the baseline multinomial results (the equivalent of Table 3) for males and females. The results are striking: the differences are almost all greater for females than for males, whether estimated separately or jointly. That is, the negative effects of being in a low income family, of having parents with no PSE of their own, of coming from a single parent family, or of being disabled are all

greater for females than males, as are the positive effects of being an Anglophone Québec or a first generation immigrant.

The exceptions are being from a rural area or being an Aboriginal, where males are at a greater relative disadvantage than females. (The second generation children of immigrants are similar for males and females.) So, while females generally have higher rates of PSE attendance overall, driven principally by their higher university participation rates, females from under-represented groups are more disadvantaged relative to other females than is the case for their male counterparts. This finding has not, to our knowledge, been previously identified in the literature, and the policy implications are potentially important.

The effects of adding the grade, scale and PISA variables to the male and female models are shown in Appendix Tables 2a and 2b, which compare to the pooled results shown in Table 4. The same gender patterns generally hold, although the female differences are somewhat more related to the high school variables included in the second sets of models than is the case for men.

All of the aforementioned gender results are presented graphically in Figure 2.

V.6. Comparisons Across Regions

The various parts of Figure 3 show the results of the different models estimated separately by region in each case, starting with the jointly estimated baseline model (the “separately” estimated models are not shown in order to avoid clutter), and then adding the high school and related variables. These models use pooled samples of males and females, principally to increase sample size. Again we restrict the presentation to university results for the same reasons given above. The full set of regional results are found in Appendix Tables 3a and 3b.

Interestingly, coming from a low income household appears to be much less of an obstacle to university attendance for youth living in Ontario and Western Canada than for those from Québec and Atlantic Canada, the effects being greatest in the last province. In contrast, the effects of coming from a family with no parental history of PSE are more similar across regions, but greatest in Ontario, followed by Atlantic Canada, Québec, and Western Canada in that order. The disadvantages faced by rural students are also fairly

uniform across regions, the (regional) ordering of the effects depending on the particular model specification, except for Québec, where the effects are smallest.

Francophones living outside of Québec appear to be at a relatively similar advantage – not *disadvantage* – across the country, which also compares to the advantage of Anglophones in Québec. The effect of being from a single parent household is small everywhere.

The positive effects on university attendance of being the first generation child of an immigrant are a bit larger in Western Canada than in Ontario, while the relative magnitude of the Atlantic effects (where there are very few immigrants) depend on the specification. There is, however, no comparable effect for first generation children of immigrants in Québec. The second generation (positive) immigrant effects are more equal across the regions.

The Aboriginal penalty is, interestingly, by far the greatest in Ontario, being over twice as large as in the region with the next largest (and only other statistically significant) effect (Western Canada). In Québec and Atlantic Canada the differences are estimated to be small and not statistically significant. The disadvantage of having a disability on university access is also greater in Ontario than in the other regions.

In summary, the patterns are interesting. Coming from a low income household matters least in Ontario, but coming from a family with no history of PSE, being an Aboriginal, or being disabled represents more of a disadvantage in Ontario than elsewhere. The other regions tend to be more similar to each other for most groups. the language minority and immigrant effects tend to be relatively similar across regions, except for a few outliers.

VI. Conclusion

With the great importance attached to PSE as a driver of Canada's future competitiveness in the global economy, as well as the social imperative of equalising the opportunity of gaining the life-changing experiences that PSE typically provides, it becomes critical to identify groups who do not participate in PSE to the same extent as others and to try to understand the gaps that exist. With the goal of providing such an empirical foundation that should help policy makers and inform others, this paper has

explored the patterns of access to PSE for a set of under-represented and minority groups in Canada

The Youth in Transition Survey, “A” Cohort, allows for the identification of a number of such groups, and in sufficient numbers to provide for their analysis; for the tracking of these individuals from age fifteen through the end of high school and into the period when they would normally be making at least their initial PSE decisions (age 21); for an analysis that controls for a range of other factors that affect access to PSE that may be related to the observed patterns, including family background and high school experiences and performance; and for comparisons by sex and across regions. Such data are unique in Canada, and arguably at the global level.

While some of these groups have been treated in some fashion or other in other studies, including those which include measures of family income and (more recently) parental education, our analysis is unique in providing a uniform analysis of the entire range of identified groups, in its approach of seeing how the measured “access gaps” for each group change when (cross-cutting) membership in other groups is taken into account, and in taking advantage of the rich selection of variables available in the YITS-A to see how the gaps are further affected when various high school and related influences are considered.

Consistent with other recent findings, having a family history of PSE attendance is the single most important determinant of a youth’s own PSE participation, followed by being disabled, further followed by being an Aboriginal, living in a rural area, or coming from a low income family. Conversely, the children of immigrants are much more likely to go to PSE than others; Francophones outside of Québec have similar access patterns to others, while Anglophones in Québec have higher access rates than other Québécois; and coming from a single parent family appears to have virtually no effect once other individual characteristics (i.e., other group memberships) are taken into account.

In almost all cases, the main differences are in university access rates, with college differences usually providing a smaller countervailing effect (i.e., the identified groups have substantially lower university access rates, somewhat higher college rates, and lower PSE rates overall – or vice versa), thus pointing to a degree of substitutability

between college and university, along with PSE versus no PSE, that occurs as individuals make their schooling choices.

As important as their overall magnitudes is how these gaps change when the various explanatory variables used in our analysis are taken into account. The effects of being in a low income family, for example, drop off significantly as individuals' memberships in the other identified groups (i.e., no history of PSE in the family, rural residence, etc.) are considered, and decline further when the various high school and related measures are included. The implication here is consistent with the emerging story in the literature that family income itself has only a moderate relationship to participation in PSE once other family characteristics are taken into account, that another portion of the "gross" gap is due to developments during high school (grades, etc.), and that very little residual effect remains once these factors are considered.

The policy implication is that the income gap is to a large degree about things other than income *per se*, and that even some of the truly identified income effects are related to the preparation for PSE and other experiences that occur during high school, leaving only a small portion that is potentially due to matters related to the actual financing of PSE. Hence, policies such as enhanced loan programs are likely to have only negligible effects on the observed gaps.

As noted, parental education is the single most important determinant of access to PSE, and even though this effect declines as the high school and related variables are added (taking other group memberships into account has relatively little effect), these patterns presumably point to the paths through which parental education affects PSE participation – and to the kinds of early experiences and influences that need to be improved, or compensated for, if the PSE playing field is to be made more equal. As noted social thinker Gøsta Esping-Anderson has put it, "We cannot pass laws that force parents to read to their children, but we can compensate." (Esping-Anderson, 2002).

It is intriguing to see that being in a single parent family has no independent effect on PSE (university) participation once membership in the other groups is taken into account. The smallish raw (overall) gaps observed in the data thus appear to be not about family structure *per se*, but about the *other* family characteristics that tend to go along

with it: low income, no parental history of PSE, and so on. In treating those other problem factors, the lone parenthood gap would presumably be addressed as a matter of course.

As others have found, coming from a rural area is a significant risk factor for PSE, university attendance in particular, and while it is moderately related to the other family factors include in our analysis, a substantial pure “rural effect” remains, a portion of which appears to be related to what happens during high school (in school, and at home), another portion of which is not explained by these variables either. Whether this residual rural effect is related to costs, to attitudes to PSE, or to other factors, however, we cannot say. Further investigation of these issues is necessary before this gap can be fully identified, and addressed with policy.

The Aboriginal effect is also strong in the raw data, but also goes away to a significant degree first when the other group characteristics are taken into account, and then further when the high school and related variables are considered. Raising the PSE participation rates of Aboriginal youth will, therefore, likely require a range of initiatives, probably starting early in the youths’ lives, but again more information is required before policy can be effectively formulated.

Individuals with a disability are a particularly interesting group. Their raw gap is among the greatest, goes down the least when other group memberships are considered, and remains quite strong even when grades and other high school factors have been considered. It would thus appear that the disabled face a set of barriers that is particular to this group. Physical access and related issues may be one of these, although once again we need more research to go beyond speculation on this. It would appear, however, that we cannot ascribe the gaps to differences in ability or performance during high school, since our analysis takes such factors into account, at least to the degree they are measured by grades, PISA test scores, indices of effort and engagement, and so on. The extent of these controls makes the remaining gaps all the more intriguing, and perplexing.

The success story of the children of immigrants in terms of access to PSE is becoming increasingly well known, and our results are consistent with that developing literature, including the finding that this success is not particularly related to other family

background characteristics or high school experiences and related attributes – not even grades.²⁰ That said, other work has shown that this success is not uniform among different immigrant groups, and so we must be careful not to treat them as a homogeneous category. Still, almost all do better than non-immigrant Canadians, so they cannot be generally considered as an under-represented group, nor – on these grounds – as needing any special assistance in accessing PSE, at least to the degree such assistance was meant to bring them up to par with others, since they are already performing better than the non-immigrant population.

Anglophone Québécois appear to be a similarly advantaged group, while Francophones outside of Québec are another minority group that faces no identifiable disadvantages in terms of accessing PSE.

The patterns by gender are intriguing, revealing as they do that females who belong to the under-represented groups identified here tend to face greater relative disadvantages than do males. In addition, females in at least some of the *over*-represented groups tend to do *better* than males from the same group. We have no explanation for why this might be, but point to it as another important line of future research.

Finally, the patterns by region are also of interest. The low income effects vary substantially across regions, and are much smaller in Ontario and the West than Quebec and (especially) Atlantic Canada, where they are substantial. Conversely, the parental education effects are more uniform across the country, but slightly greater in Ontario. The rural differences are a bit greater in Ontario and Atlantic Canada and smallest in Québec. There is no (positive) first generation immigrant effect in Québec, whereas it is strong everywhere else, and the second generation effect is fairly uniform right across the country. The Aboriginal gap is by far the greatest in Ontario and smallest in Atlantic Canada and Québec, and disabled persons also appear to be somewhat more disadvantaged in Ontario compared to other regions. Again we cannot say why this is, but point to the potential value of further research, especially if it can begin to inform us

²⁰ In the words of Finnie and Mueller (2009b, 2010), “they just go” – as insufficient as that explanation may seem.

regarding the sources of these differences – their actual causes – and how the gaps might be reduced.

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Table 1: Underrepresented and Minority Group Distributions (%) by Region

	All Provinces	Atlantic Canada	Quebec	Ontario	Western Canada
Family Income					
Income below \$50,000	33.2	47.0	40.2	26.4	32.5
Income greater than \$50,000	66.8	53.0	59.8	73.6	67.5
Total	100	100	100	100	100
Parental Education					
No PSE	30.2	28.4	37.8	28.9	26.7
At Least Some PSE	69.8	71.6	62.2	71.1	73.3
Total	100	100	100	100	100
Rural/Urban					
Rural	23.0	46.5	21.0	16.2	26.4
Urban	77.0	53.5	79.0	83.8	73.6
Total	100	100	100	100	100
Linguistic Minority					
French Minority outside Quebec	2.8	10.2	n/a	4.2	1.1
English Minority in Quebec	1.9	n/a	8.4	n/a	n/a
Non-Linguistic Minority	95.3	89.8	91.6	95.8	98.9
Total	100	100	100	100	100
Family Type					
Single Parent	17.2	15.9	20.1	17.2	15.4
Two Parent Family	82.8	84.1	79.9	82.8	84.6
Total	100	100	100	100	100
Immigrant Status					
First Generation Immigrant	8.3	0.9	4.1	12.0	8.9
Second Generation Immigrant	18.8	5.8	9.7	26.1	20.2
Non-Immigrant	72.9	93.3	86.2	61.9	70.9
Total	100	100	100	100	100
Aboriginal Status					
Aboriginal	2.8	3.1	1.6	2.3	4.3
Non-Aboriginal	97.2	96.9	98.4	97.7	95.7
Total	100	100	100	100	100
Disability Status					
Disability	12.9	15	9.5	11.4	16.5
No Disability	87.1	85	90.5	88.6	83.5
Total	100	100	100	100	100

Note: n/a = Non-applicable.

Table 2: Rates of Access to College and University for Underrepresented and Minority Groups by Region

	All Provinces			Atlantic Canada			Quebec			Ontario			Western Canada		
	Coll.	Univ.	Any	Coll.	Univ.	Any	Coll.	Univ.	Any	Coll.	Univ.	Any	Coll.	Univ.	Any
All	33.0	41.7	74.7	24.6	51.1	75.7	40.0	30.3	70.3	36.4	45.5	81.9	26.1	42.8	68.9
Family Income															
Income below \$50,000	34.8	31.4	66.2	29.2	36.1	65.3	41.3	19.7	61.0	39.3	35.2	74.5	26.5	36.4	62.9
Income greater than \$50,000	32.1	46.9	79.0	20.5	64.4	84.9	39.2	37.3	76.5	35.2	49.5	84.7	26.0	45.8	71.8
Parental Education															
No PSE	36.6	24.3	60.9	30.1	30.1	60.2	38.5	16.7	55.2	43.5	25.7	69.2	27.5	28.6	56.1
At Least Some PSE	31.5	49.2	80.7	22.4	59.5	81.9	40.9	38.5	79.4	33.5	53.7	87.2	25.7	47.9	73.6
Rural/Urban															
Rural	35.5	31.5	67.0	30.4	42.5	72.9	40.0	23.2	63.2	44.6	28.6	73.2	28.7	33.1	61.8
Urban	32.3	44.7	77.0	19.6	58.5	78.1	40.0	32.1	72.1	34.9	48.8	83.7	25.2	46.3	71.5
Linguistic Minority															
French Min. outside Que.	35.2	43.6	78.8	26.3	48.4	74.7	n/a	n/a	n/a	43.0	39.5	82.5	21.0	50.0	71.0
English Min. in Que.	40.5	41.5	82.0	n/a	n/a	n/a	40.5	41.5	82.0	n/a	n/a	n/a	n/a	n/a	n/a
Non Minority	32.8	41.6	74.4	24.4	51.4	75.8	39.9	29.2	69.1	36.1	45.8	81.9	26.2	42.8	69.0
Family Type															
Single Parent	35.5	33.0	68.5	24.4	39.7	64.1	41.9	24.9	66.8	41.1	36.4	77.5	24.8	34.3	59.1
Two Parent Family	32.5	43.5	76.0	24.6	53.2	77.8	39.5	31.6	71.1	35.5	47.4	82.9	26.4	44.4	70.8
Immigrant Status															
First Gen. Immig.	29.6	57.0	86.6	12.6	82.6	95.2	44.5	29.1	73.6	30.1	58.4	88.5	24.1	63.4	87.5
Second Gen. Immig.	30.0	53.0	83.0	12.7	70.5	83.2	38.1	46.5	84.6	31.2	54.7	85.9	26.7	51.2	77.9
Non-Immigrant	34.2	37.0	71.2	25.5	49.6	75.1	40.0	28.5	68.5	39.9	39.2	79.1	26.2	37.9	64.1
Aboriginal Status															
Aboriginal	28.0	23.1	51.1	19.5	40.7	60.2	35.3	25.6	60.9	38.7	17.8	56.5	20.9	22.4	43.3
Non-Aboriginal	33.2	42.2	75.4	24.8	51.4	76.2	40.1	30.3	70.4	36.4	46.2	82.6	26.4	43.7	70.1
Disability Status															
Disability	36.4	24.8	61.2	26.4	37.9	64.3	41.6	16.5	58.1	46.2	22.1	68.3	28.5	27.4	55.9
No Disability	32.5	44.2	76.7	24.2	53.4	77.6	39.8	31.7	71.5	35.2	48.5	83.7	25.7	45.9	71.6

Notes: n/a = Non-applicable. The "Any" column represents the rate of accessing any form of PSE and is the sum of the College and University columns.

Table 3: Multinomial Estimates of Access to College and University - Baseline Model, All Students (All Provinces)

	Separately		Jointly		Absolute Change		Remaining Relative Effect (%)	
	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.
Region (Ontario)								
Atlantic Canada	‡	‡	-0.141*** [0.011]	0.135*** [0.015]				
Quebec	‡	‡	0.020 [0.017]	-0.105*** [0.015]				
Western Canda	‡	‡	-0.113*** [0.012]	-0.002 [0.014]				
Female	‡	‡	-0.039*** [0.011]	0.160*** [0.011]				
Income below \$50,000	0.029** [0.012]	-0.150*** [0.011]	0.019 [0.014]	-0.088*** [0.012]	0.010	-0.062	65.5	58.7
Parents with no PSE	0.048*** [0.013]	-0.242*** [0.011]	0.042*** [0.013]	-0.200*** [0.011]	0.006	-0.042	87.5	82.6
HS Location - Rural	0.056*** [0.013]	-0.146*** [0.012]	0.045*** [0.014]	-0.092*** [0.012]	0.011	-0.054	80.4	63.0
Linguistic Minority								
English Min. in Que.	-0.022 [0.026]	0.147*** [0.029]	0.015 [0.028]	0.076*** [0.028]	-0.037	0.071	-68.2	51.7
French Min. outside	0.041 [0.026]	-0.039 [0.025]	0.020 [0.024]	0.015 [0.024]	0.021	-0.054	48.8	-38.5
Single Parent Family	0.022 [0.016]	-0.108*** [0.015]	0.010 [0.017]	-0.025 [0.017]	0.012	-0.083	45.5	23.1
Immigration Status								
First Gen. Immig.	-0.065*** [0.022]	0.195*** [0.024]	-0.053** [0.023]	0.170*** [0.024]	-0.012	0.025	81.5	87.2
Second Gen. Immig.	-0.046*** [0.015]	0.146*** [0.016]	-0.032** [0.015]	0.108*** [0.015]	-0.014	0.038	69.6	74.0
Aboriginal	-0.019 [0.034]	-0.167*** [0.029]	-0.024 [0.034]	-0.085*** [0.032]	0.005	-0.082	126.3	50.9
Disabled	0.061*** [0.018]	-0.190*** [0.015]	0.061*** [0.018]	-0.169*** [0.015]	0.000	-0.021	100.0	88.9
Observations	15,237		15,237					

Notes: Average marginal effects are shown. Omitted region in parenthesis, the other omitted categories are respondents who are not members of the Underrepresented and Minority Groups. Standard errors in brackets. *** p<0.01 ** p<0.05 * p<0.1. The "separately" columns report the results of eight separate regressions, each run with a group variable included by itself. ‡ Regional dummy variables and a gender variable were included in each separate regression; their average marginal effects varied depending on which variable was also included. The "jointly" columns report the results when all variables are included together. The "absolute change" columns give the differences in average marginal effects between the separate regressions and the joint regression for each variable. The "remaining relative effect" represents the effect in the jointly regression as compared to the effect in the separately regressions.

Table 4: Multinomial Estimates of Access to College and University - Adding the Additional Explanatory Variables, All Students (All Provinces)

	Baseline		HS Grade		Scales and PISA		All	
	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.
Female	-0.039*** [0.011]	0.160*** [0.011]	-0.011 [0.011]	0.088*** [0.010]	-0.030*** [0.011]	0.110*** [0.011]	-0.014 [0.011]	0.075*** [0.010]
Income below \$50,000	0.019 [0.014]	-0.088*** [0.012]	0.008 [0.013]	-0.059*** [0.011]	0.004 [0.013]	-0.042*** [0.011]	0.002 [0.013]	-0.037*** [0.011]
Parents with no PSE	0.042*** [0.013]	-0.200*** [0.011]	0.020 [0.013]	-0.134*** [0.012]	0.015 [0.013]	-0.110*** [0.011]	0.009 [0.013]	-0.095*** [0.011]
HS Location - Rural	0.045*** [0.014]	-0.092*** [0.012]	0.038*** [0.013]	-0.084*** [0.011]	0.037*** [0.013]	-0.063*** [0.011]	0.036*** [0.013]	-0.068*** [0.011]
Linguistic Minority								
English Min. in Que.	0.015 [0.028]	0.076*** [0.028]	0.007 [0.026]	0.079*** [0.024]	0.011 [0.027]	0.082*** [0.024]	0.007 [0.026]	0.082*** [0.023]
French Min. outside	0.020 [0.024]	0.015 [0.024]	0.014 [0.023]	0.022 [0.020]	-0.014 [0.022]	0.089*** [0.020]	-0.005 [0.022]	0.072*** [0.019]
Single Parent Family	0.010 [0.017]	-0.025 [0.017]	0.004 [0.016]	-0.018 [0.015]	0.007 [0.016]	-0.022 [0.015]	0.002 [0.016]	-0.017 [0.014]
Immigration Status								
First Gen. Immig.	-0.053** [0.023]	0.170*** [0.024]	-0.031 [0.023]	0.126*** [0.021]	-0.056** [0.023]	0.188*** [0.022]	-0.041* [0.023]	0.156*** [0.021]
Second Gen. Immig.	-0.032** [0.015]	0.108*** [0.015]	-0.028* [0.015]	0.090*** [0.013]	-0.028* [0.015]	0.097*** [0.013]	-0.026* [0.015]	0.088*** [0.013]
Aboriginal	-0.024 [0.034]	-0.085*** [0.032]	-0.031 [0.032]	-0.057* [0.031]	-0.029 [0.032]	-0.044 [0.032]	-0.034 [0.032]	-0.034 [0.031]
Disabled	0.061*** [0.018]	-0.169*** [0.015]	0.047*** [0.017]	-0.123*** [0.015]	0.052*** [0.017]	-0.098*** [0.014]	0.048*** [0.017]	-0.091*** [0.014]
Overall Grade in Last			-0.089*** [0.005]	0.222*** [0.002]			-0.062*** [0.006]	0.145*** [0.005]
Overall Engagement					-0.013* [0.007]	0.059*** [0.006]	-0.007 [0.007]	0.045*** [0.006]
Self-Esteem					0.003 [0.008]	-0.001 [0.007]	0.004 [0.008]	-0.005 [0.006]
Self-Efficacy					-0.027*** [0.007]	0.055*** [0.006]	-0.014** [0.007]	0.028*** [0.006]
Self-Mastery					-0.003 [0.008]	0.004 [0.006]	-0.005 [0.007]	0.009 [0.006]
Social Support					0.013* [0.007]	-0.037*** [0.006]	0.008 [0.007]	-0.029*** [0.006]
Monitoring Behaviour					-0.004 [0.006]	0.012** [0.006]	-0.003 [0.006]	0.011* [0.005]
Nurturance Behaviour					0.001 [0.006]	0.001 [0.005]	0.001 [0.006]	-0.001 [0.005]
Inconsistent Discipline					0.004 [0.006]	-0.017*** [0.005]	-0.000 [0.006]	-0.008 [0.005]
Reading Ability					-0.065*** [0.006]	0.193*** [0.004]	-0.037*** [0.007]	0.133*** [0.006]
Observations	15,237		15,237		15,237		15,237	

Notes: Average marginal effects are shown. Omitted categories are respondents who are not members of the Underrepresented and Minority Groups. Standard errors in brackets. *** p<0.01 ** p<0.05 * p<0.1. Regional dummy variables were included in all equations. The grade variable represents the students' overall high school grades divided by 10. The reading ability variable used represents the students' PISA reading scores divided by 100.

Appendix Table 1a: Multinomial Estimates of Access to College and University - Baseline Model, Females (All Provinces)

	Separately		Jointly		Absolute Change		Remaining Relative Effect (%)	
	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.
Region								
Atlantic Canada	‡	‡	-0.140***	0.132***				
			[0.015]	[0.020]				
Quebec	‡	‡	0.027	-0.090***				
			[0.024]	[0.023]				
Western Canda	‡	‡	-0.087***	-0.027				
			[0.018]	[0.020]				
Income below \$50,000	0.060***	-0.186***	0.037**	-0.124***	0.023	-0.062	61.7	66.7
	[0.017]	[0.017]	[0.019]	[0.018]				
Parents with no PSE	0.084***	-0.267***	0.068***	-0.213***	0.016	-0.054	81.0	79.8
	[0.018]	[0.017]	[0.019]	[0.017]				
HS Location - Rural	0.087***	-0.142***	0.063***	-0.074***	0.024	-0.068	72.4	52.1
	[0.019]	[0.018]	[0.019]	[0.018]				
Linguistic Minority								
English Min. in Que.	-0.061*	0.174***	-0.007	0.080*	-0.054	0.094	11.5	46.0
	[0.034]	[0.038]	[0.039]	[0.041]				
French Min. outside	0.040	-0.026	0.010	0.028	0.030	-0.054	25.0	-107.7
	[0.036]	[0.036]	[0.033]	[0.031]				
Single Parent Family	0.057**	-0.127***	0.029	-0.028	0.028	-0.099	50.9	22.0
	[0.022]	[0.022]	[0.023]	[0.023]				
Immigration Status								
First Gen. Immig.	-0.110***	0.215***	-0.093***	0.193***	-0.017	0.022	84.5	89.8
	[0.030]	[0.033]	[0.032]	[0.033]				
Second Gen. Immig.	-0.067***	0.149***	-0.048**	0.115***	-0.019	0.034	71.6	77.2
	[0.020]	[0.022]	[0.021]	[0.021]				
Aboriginal	0.014	-0.150***	-0.010	-0.059	0.024	-0.091	-71.4	39.3
	[0.047]	[0.046]	[0.045]	[0.048]				
Disabled	0.101***	-0.224***	0.096***	-0.193***	0.005	-0.031	95.0	86.2
	[0.026]	[0.022]	[0.026]	[0.023]				
Observations	7,901		7,901					

See Table 3 for notes.

Appendix Table 1b: Multinomial Estimates of Access to College and University - Baseline Model, Males (All Provinces)

	Separately		Jointly		Absolute Change		Remaining Relative Effect (%)	
	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.
Region (Ontario)								
Atlantic Canada	‡	‡	-0.141*** [0.016]	0.139*** [0.022]				
Quebec	‡	‡	0.012 [0.024]	-0.118*** [0.020]				
Western Canda	‡	‡	-0.138*** [0.017]	0.021 [0.019]				
Income below \$50,000	-0.002 [0.018]	-0.114*** [0.015]	0.000 [0.019]	-0.051*** [0.017]	-0.002	-0.063	0.0	44.7
Parents with no PSE	0.011 [0.018]	-0.218*** [0.013]	0.018 [0.019]	-0.188*** [0.014]	-0.007	-0.030	163.6	86.2
HS Location - Rural	0.024 [0.019]	-0.151*** [0.014]	0.026 [0.019]	-0.110*** [0.015]	-0.002	-0.041	108.3	72.8
Linguistic Minority								
English Min. in Que.	0.016 [0.039]	0.122*** [0.043]	0.034 [0.040]	0.078** [0.040]	-0.018	0.044	212.5	63.9
French Min. outside	0.041 [0.037]	-0.053 [0.034]	0.032 [0.036]	0.001 [0.037]	0.009	-0.054	78.0	-1.9
Single Parent Family	-0.016 [0.023]	-0.088*** [0.021]	-0.013 [0.025]	-0.019 [0.024]	-0.003	-0.069	81.3	21.6
Immigration Status								
First Gen. Immig.	-0.020 [0.033]	0.174*** [0.035]	-0.010 [0.034]	0.142*** [0.033]	-0.010	0.032	50.0	81.6
Second Gen. Immig.	-0.023 [0.022]	0.141*** [0.023]	-0.017 [0.023]	0.100*** [0.022]	-0.006	0.041	73.9	70.9
Aboriginal	-0.052 [0.048]	-0.180*** [0.034]	-0.035 [0.049]	-0.114*** [0.042]	-0.017	-0.066	67.3	63.3
Disabled	0.022 [0.025]	-0.158*** [0.019]	0.026 [0.025]	-0.145*** [0.019]	-0.004	-0.013	118.2	91.8
Observations	7,336		7,336					

See Table 3 for notes.

Appendix Table 2a: Multinomial Estimates of Access to College and University - Adding the Additional Explanatory Variables, Females (All Provinces)

	Baseline		HS Grade		Scales and PISA		All	
	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.
Income below \$50,000	0.037** [0.019]	-0.124*** [0.018]	0.014 [0.019]	-0.088*** [0.017]	0.013 [0.018]	-0.067*** [0.016]	0.007 [0.018]	-0.059*** [0.015]
Parents with no PSE	0.068*** [0.019]	-0.213*** [0.017]	0.035* [0.019]	-0.144*** [0.017]	0.018 [0.018]	-0.108*** [0.016]	0.012 [0.018]	-0.096*** [0.015]
HS Location - Rural	0.063*** [0.019]	-0.074*** [0.018]	0.060*** [0.019]	-0.076*** [0.017]	0.055*** [0.018]	-0.058*** [0.016]	0.055*** [0.019]	-0.062*** [0.015]
Linguistic Minority								
English Min. in Que.	-0.007 [0.039]	0.080* [0.041]	-0.004 [0.039]	0.072** [0.037]	-0.018 [0.037]	0.102*** [0.033]	-0.012 [0.038]	0.091*** [0.033]
French Min. outside	0.010 [0.033]	0.028 [0.031]	0.010 [0.031]	0.027 [0.026]	-0.012 [0.028]	0.085*** [0.024]	-0.003 [0.028]	0.071*** [0.022]
Single Parent Family	0.029 [0.023]	-0.028 [0.023]	0.023 [0.023]	-0.021 [0.021]	0.030 [0.022]	-0.029 [0.020]	0.022 [0.022]	-0.022 [0.019]
Immigration Status								
First Gen. Immig.	-0.093*** [0.032]	0.193*** [0.033]	-0.070** [0.033]	0.162*** [0.032]	-0.092*** [0.030]	0.204*** [0.029]	-0.076** [0.032]	0.181*** [0.029]
Second Gen. Immig.	-0.048** [0.021]	0.115*** [0.021]	-0.045** [0.021]	0.102*** [0.019]	-0.034* [0.021]	0.095*** [0.019]	-0.037* [0.021]	0.093*** [0.018]
Aboriginal	-0.010 [0.045]	-0.059 [0.048]	-0.033 [0.047]	-0.017 [0.047]	-0.035 [0.045]	-0.001 [0.044]	-0.041 [0.045]	0.011 [0.044]
Disabled	0.096*** [0.026]	-0.193*** [0.023]	0.075*** [0.025]	-0.144*** [0.021]	0.072*** [0.024]	-0.112*** [0.020]	0.069*** [0.024]	-0.105*** [0.019]
Overall Grade in Last			-0.100*** [0.007]	0.218*** [0.003]			-0.059*** [0.009]	0.134*** [0.007]
Overall Engagement					-0.014 [0.010]	0.065*** [0.009]	-0.008 [0.010]	0.053*** [0.009]
Self-Esteem					0.004 [0.011]	-0.005 [0.010]	0.005 [0.011]	-0.009 [0.009]
Self-Efficacy					-0.036*** [0.009]	0.058*** [0.008]	-0.025*** [0.010]	0.034*** [0.008]
Self-Mastery					-0.009 [0.011]	0.009 [0.009]	-0.009 [0.011]	0.014 [0.009]
Social Support					0.021** [0.009]	-0.044*** [0.008]	0.015* [0.009]	-0.034*** [0.008]
Monitoring Behaviour					-0.016* [0.009]	0.023*** [0.008]	-0.015* [0.008]	0.020** [0.008]
Nurturance Behaviour					0.003 [0.008]	-0.011 [0.008]	0.001 [0.008]	-0.011 [0.007]
Inconsistent Discipline					0.006 [0.008]	-0.010 [0.007]	0.002 [0.008]	-0.003 [0.007]
Reading Ability					-0.076*** [0.009]	0.203*** [0.006]	-0.045*** [0.010]	0.145*** [0.008]
Observations	7,901		7,901		7,901		7,901	

See Table 4 for notes.

Appendix Table 2b: Multinomial Estimates of Access to College and University - Adding the Additional Explanatory Variables, Males (All Provinces)

	Baseline		HS Grade		Scales and PISA		All	
	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.
Income Below \$50,000	0.000	-0.051***	-0.000	-0.028*	-0.007	-0.017	-0.003	-0.015
	[0.019]	[0.017]	[0.018]	[0.016]	[0.019]	[0.016]	[0.018]	[0.015]
Parents With No PSE	0.018	-0.188***	0.006	-0.130***	0.013	-0.118***	0.007	-0.100***
	[0.019]	[0.014]	[0.018]	[0.016]	[0.019]	[0.016]	[0.018]	[0.015]
HS Location - Rural	0.026	-0.110***	0.018	-0.094***	0.020	-0.069***	0.019	-0.073***
	[0.019]	[0.015]	[0.019]	[0.016]	[0.019]	[0.015]	[0.018]	[0.015]
Linguistic Minority								
English Min in Que.	0.034	0.078**	0.013	0.093***	0.034	0.074**	0.017	0.089***
	[0.040]	[0.040]	[0.036]	[0.033]	[0.038]	[0.034]	[0.036]	[0.032]
French Min. outside	0.032	0.001	0.016	0.020	-0.015	0.096***	-0.009	0.079**
	[0.036]	[0.037]	[0.035]	[0.031]	[0.034]	[0.037]	[0.035]	[0.034]
Single Parent Family	-0.013	-0.019	-0.017	-0.007	-0.020	-0.011	-0.022	-0.005
	[0.025]	[0.024]	[0.023]	[0.022]	[0.024]	[0.021]	[0.023]	[0.020]
Immigration Status								
First Gen. Immig.	-0.010	0.142***	0.005	0.092***	-0.020	0.171***	-0.009	0.133***
	[0.034]	[0.033]	[0.033]	[0.029]	[0.034]	[0.032]	[0.033]	[0.029]
Second Gen. Immig.	-0.017	0.100***	-0.014	0.081***	-0.021	0.099***	-0.016	0.083***
	[0.023]	[0.022]	[0.021]	[0.019]	[0.022]	[0.019]	[0.021]	[0.018]
Aboriginal	-0.035	-0.114***	-0.025	-0.102**	-0.021	-0.090*	-0.021	-0.082*
	[0.049]	[0.042]	[0.047]	[0.042]	[0.048]	[0.046]	[0.047]	[0.043]
Disabled	0.026	-0.145***	0.019	-0.103***	0.029	-0.083***	0.026	-0.075***
	[0.025]	[0.019]	[0.024]	[0.020]	[0.024]	[0.019]	[0.024]	[0.019]
Overall Grade in Last			-0.083***	0.230***			-0.064***	0.159***
			[0.006]	[0.002]			[0.008]	[0.007]
Overall Engagement					-0.010	0.053***	-0.004	0.037***
					[0.010]	[0.009]	[0.010]	[0.008]
Self-Esteem					0.002	0.004	0.002	0.002
					[0.011]	[0.010]	[0.011]	[0.009]
Self-Efficacy					-0.019**	0.054***	-0.003	0.021***
					[0.009]	[0.008]	[0.009]	[0.008]
Self-Mastery					0.004	-0.001	0.000	0.004
					[0.011]	[0.009]	[0.010]	[0.009]
Social Support					0.002	-0.031***	-0.000	-0.024***
					[0.010]	[0.009]	[0.009]	[0.008]
Monitoring Behaviour					0.007	0.001	0.007	0.001
					[0.009]	[0.008]	[0.008]	[0.008]
Nurturance Behaviour					-0.003	0.012*	-0.001	0.009
					[0.009]	[0.008]	[0.008]	[0.007]
Inconsistent Discipline					0.002	-0.023***	-0.002	-0.012*
					[0.008]	[0.007]	[0.008]	[0.007]
Reading Ability					-0.054***	0.187***	-0.029***	0.125***
					[0.008]	[0.006]	[0.010]	[0.009]
Observations	7,336		7,336		7,336		7,336	

See Table 4 for notes.

**Appendix Table 3a: Multinomial Estimates of Access to
University and College - Baseline Model, by Region**

	All Provinces		Atlantic Provinces		Quebec		Ontario		Western Provinces	
	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.
Region (Ontario)										
Atlantic Canada	-0.141***	0.135***								
	[0.011]	[0.015]								
Quebec	0.020	-0.105***								
	[0.017]	[0.015]								
Western Canda	-0.113***	-0.002								
	[0.012]	[0.014]								
Female	-0.039***	0.160***	-0.042***	0.163***	-0.040*	0.187***	-0.062***	0.172***	-0.003	0.124***
	[0.011]	[0.011]	[0.011]	[0.014]	[0.022]	[0.023]	[0.023]	[0.023]	[0.014]	[0.016]
Income Below \$50,000	0.019	-0.088***	0.060***	-0.180***	0.027	-0.134***	0.013	-0.061**	0.004	-0.051***
	[0.014]	[0.012]	[0.015]	[0.017]	[0.026]	[0.021]	[0.032]	[0.028]	[0.017]	[0.018]
Parents with no PSE	0.042***	-0.200***	0.055***	-0.217***	-0.012	-0.183***	0.084***	-0.235***	0.026	-0.159***
	[0.013]	[0.011]	[0.015]	[0.019]	[0.025]	[0.019]	[0.030]	[0.023]	[0.018]	[0.017]
HS Location - Rural	0.045***	-0.092***	0.091***	-0.102***	0.002	-0.044*	0.055	-0.133***	0.040**	-0.081***
	[0.014]	[0.012]	[0.015]	[0.015]	[0.028]	[0.025]	[0.034]	[0.028]	[0.017]	[0.017]
Linguistic Minority										
French Min. outside Que.	0.015	0.076***	-0.014	0.046**			0.036	-0.002	-0.078*	0.084
	[0.028]	[0.028]	[0.016]	[0.020]			[0.037]	[0.038]	[0.040]	[0.061]
English Min. in Que.	0.020	0.015			0.018	0.066**				
	[0.024]	[0.024]			[0.032]	[0.029]				
Single Parent	0.010	-0.025	-0.015	-0.027	0.006	0.025	0.028	-0.040	-0.006	-0.045*
	[0.017]	[0.017]	[0.017]	[0.023]	[0.031]	[0.030]	[0.036]	[0.034]	[0.022]	[0.024]
Immigration Status										
First Gen. Immig.	-0.053**	0.170***	-0.110**	0.249***	0.035	-0.011	-0.096**	0.154***	-0.015	0.227***
	[0.023]	[0.024]	[0.053]	[0.063]	[0.059]	[0.051]	[0.041]	[0.041]	[0.028]	[0.030]
Second Gen. Immig.	-0.032**	0.108***	-0.103***	0.140***	-0.006	0.121***	-0.071**	0.106***	0.014	0.094***
	[0.015]	[0.015]	[0.022]	[0.032]	[0.035]	[0.033]	[0.028]	[0.027]	[0.019]	[0.021]
Aboriginal	-0.024	-0.085***	-0.058*	-0.044	-0.028	0.056	0.019	-0.184***	-0.038	-0.086**
	[0.034]	[0.032]	[0.031]	[0.046]	[0.098]	[0.093]	[0.082]	[0.071]	[0.034]	[0.037]
Disabled	0.061***	-0.169***	0.017	-0.101***	0.045	-0.145***	0.108***	-0.219***	0.034	-0.155***
	[0.018]	[0.015]	[0.017]	[0.022]	[0.039]	[0.029]	[0.041]	[0.032]	[0.021]	[0.020]
Observations	15,237		5,172		2,347		2,257		5,461	

See Table 3 for notes.

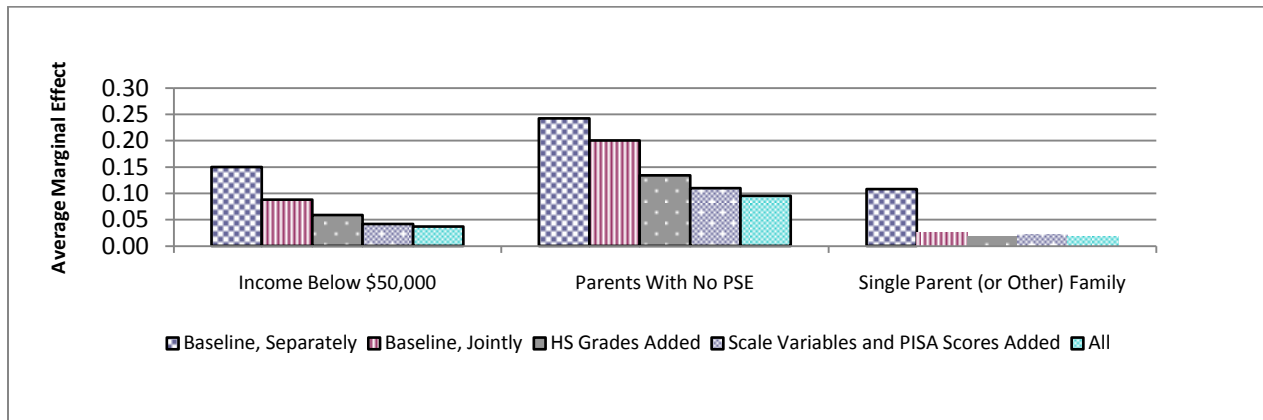
**Appendix Table 3b: Multinomial Estimates of Access to University and College
- Adding the Additional Explanatory Variables, by Region**

	All Provinces		Atlantic Provinces		Quebec		Ontario		Western Provinces	
	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.	Coll.	Univ.
Female	-0.014 [0.011]	0.075*** [0.010]	-0.017 [0.012]	0.061*** [0.014]	-0.030 [0.023]	0.117*** [0.020]	-0.015 [0.024]	0.068*** [0.020]	0.004 [0.015]	0.059*** [0.015]
Income below \$50,000	0.002 [0.013]	-0.037*** [0.011]	0.038*** [0.014]	-0.113*** [0.015]	0.013 [0.025]	-0.067*** [0.019]	-0.014 [0.029]	-0.005 [0.023]	-0.001 [0.016]	-0.020 [0.016]
Parents with no PSE	0.009 [0.013]	-0.095*** [0.011]	0.018 [0.014]	-0.109*** [0.015]	-0.004 [0.023]	-0.100*** [0.018]	0.024 [0.027]	-0.114*** [0.021]	0.000 [0.016]	-0.059*** [0.016]
HS Location - Rural	0.036*** [0.013]	-0.068*** [0.011]	0.089*** [0.014]	-0.097*** [0.014]	0.000 [0.026]	-0.031 [0.021]	0.023 [0.031]	-0.074*** [0.025]	0.039** [0.017]	-0.068*** [0.015]
Linguistic Minority										
English Min. in Que.	0.007 [0.026]	0.082*** [0.023]			0.012 [0.031]	0.068*** [0.023]				
French Min. outside Que	-0.005 [0.022]	0.072*** [0.019]	-0.013 [0.017]	-0.018 [0.021]			-0.029 [0.033]	0.088*** [0.030]	-0.083** [0.041]	0.084** [0.041]
Single Parent	0.002 [0.016]	-0.017 [0.014]	-0.013 [0.017]	-0.023 [0.022]	-0.004 [0.030]	0.012 [0.025]	0.017 [0.034]	-0.025 [0.027]	-0.010 [0.022]	-0.032 [0.022]
Immigration Status										
First Gen. Immig.	-0.041* [0.023]	0.156*** [0.021]	-0.051 [0.070]	0.141* [0.079]	0.043 [0.057]	0.035 [0.047]	-0.093** [0.040]	0.145*** [0.033]	0.001 [0.027]	0.196*** [0.028]
Second Gen. Immig.	-0.026* [0.015]	0.088*** [0.013]	-0.091*** [0.023]	0.093*** [0.029]	0.007 [0.034]	0.133*** [0.028]	-0.073*** [0.026]	0.089*** [0.021]	0.021 [0.019]	0.065*** [0.018]
Aboriginal	-0.034 [0.032]	-0.034 [0.031]	-0.079*** [0.028]	0.018 [0.043]	-0.028 [0.091]	0.039 [0.080]	0.017 [0.083]	-0.120 [0.073]	-0.047 [0.033]	-0.023 [0.039]
Disabled	0.048*** [0.017]	-0.091*** [0.014]	-0.002 [0.016]	-0.025 [0.019]	0.073** [0.036]	-0.122*** [0.025]	0.074** [0.037]	-0.120*** [0.029]	0.025 [0.021]	-0.072*** [0.019]
Observations	15,237		5,172		2,347		2,257		5,461	

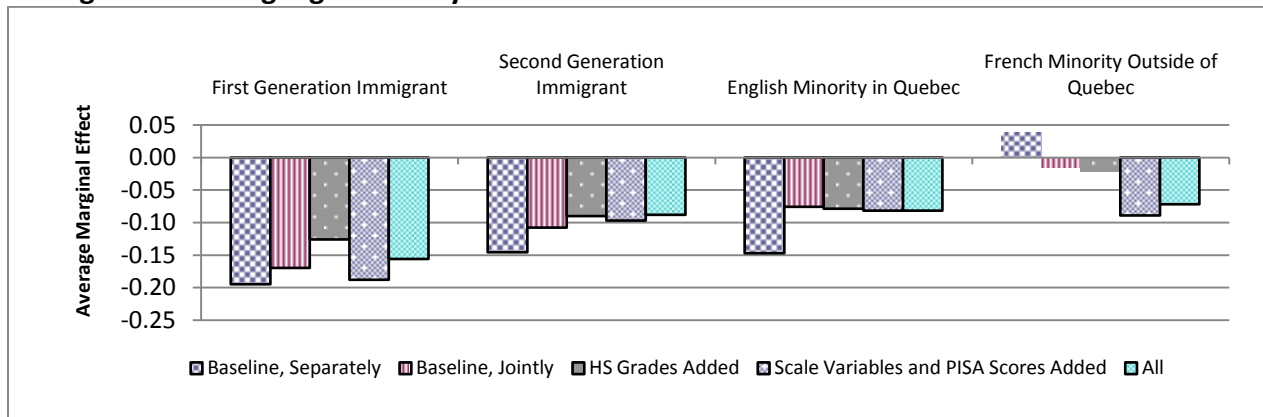
Notes: The additional explanatory variables from Table 4 are included in these models, but not reported here. Regional controls are also included. See Table 4 for additional notes.

Figure 1: Average Marginal Effects on Access to University

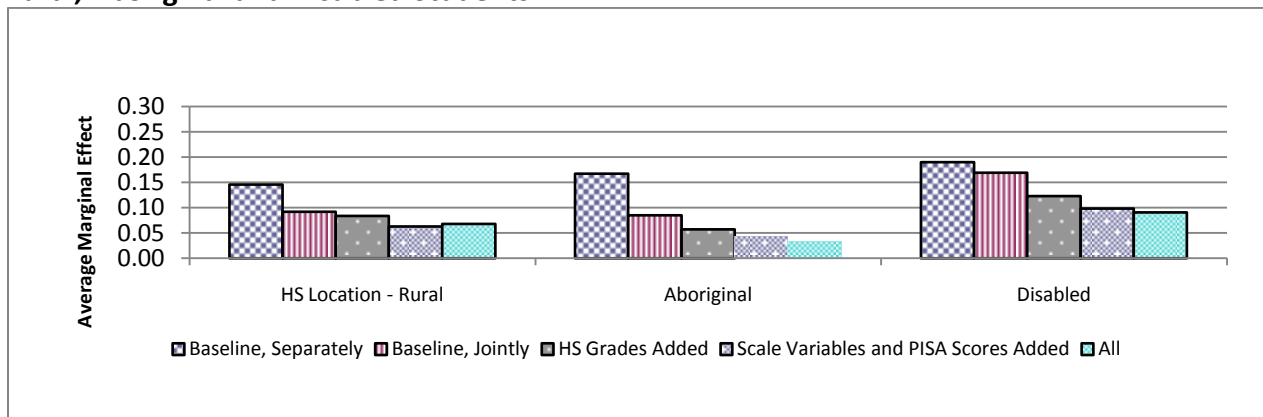
Parental Attributes



Immigrant and Language Minority Students



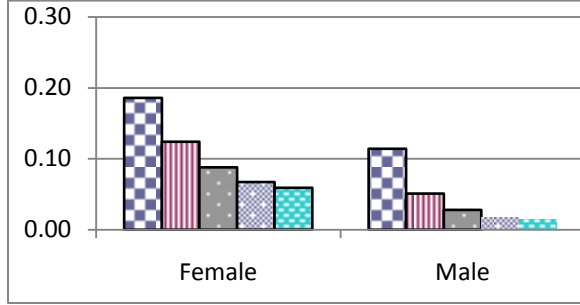
Rural, Aboriginal and Disabled Students



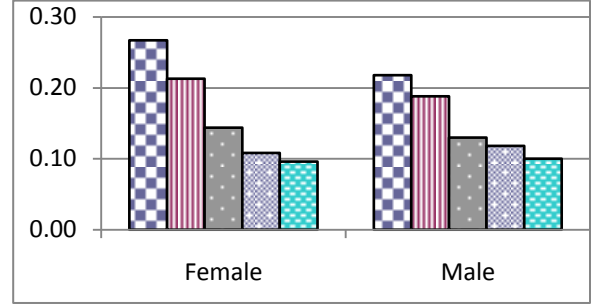
Source: Tables 2 and 3. Note: The values in the tables have been inverted so the heights of the bars represent the magnitudes of the effects. (Negative bars indicate access rates above those of the comparison group.) Black borders denote statistical significance at the 0.10 level or better.

Figure 2: Average Marginal Effects on Access to University, by Gender

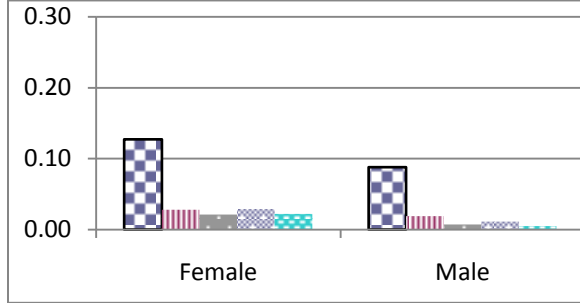
Income Below \$50,000



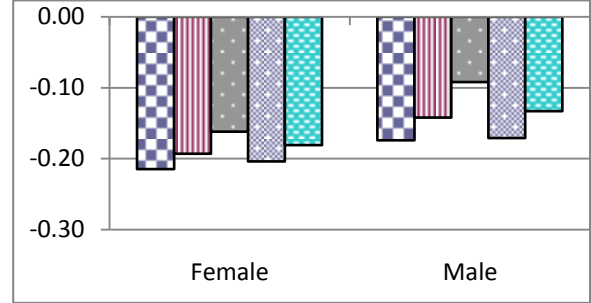
Parents With No PSE



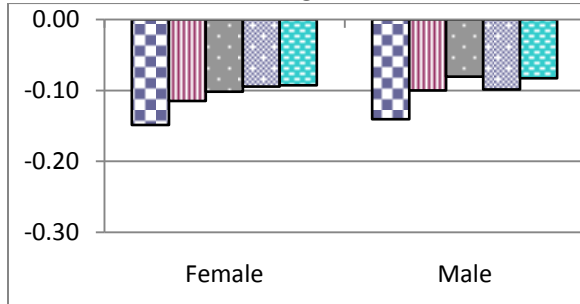
Single Parent (or other) Family



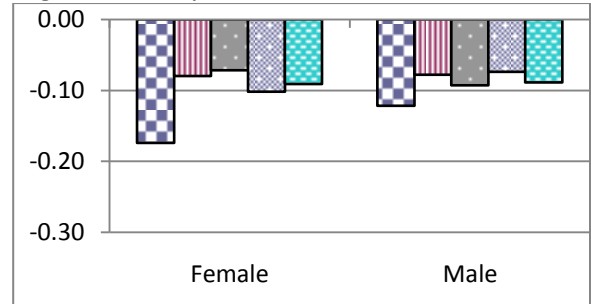
First Generation Immigrant



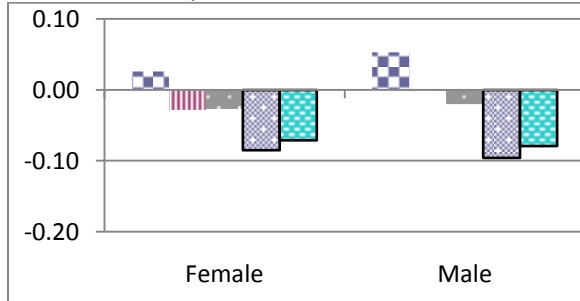
Second Generation Immigrant



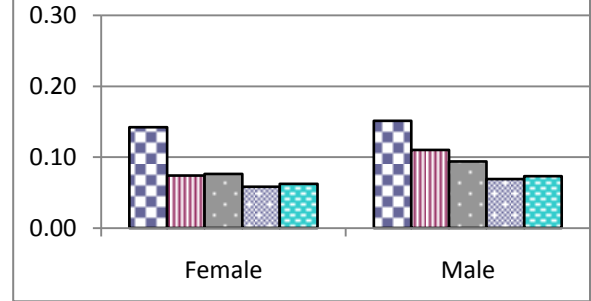
English Minority



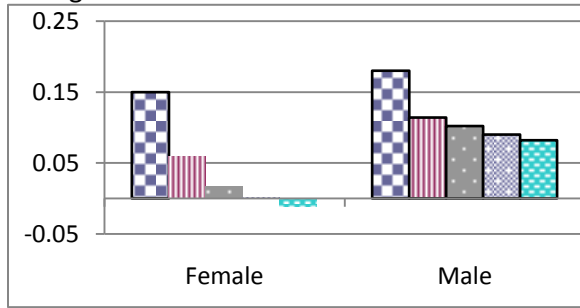
French Minority



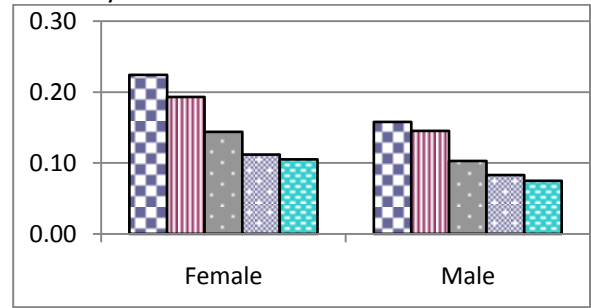
Rural



Aboriginal



Disability

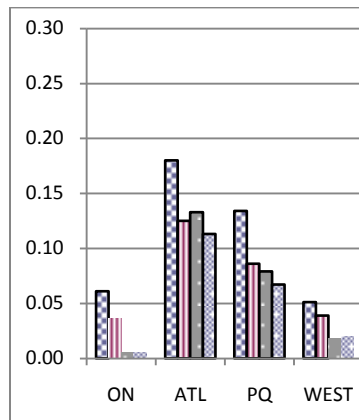


■ Separately ■ Jointly ■ HS Grade ■ Scales and PISA ■ All

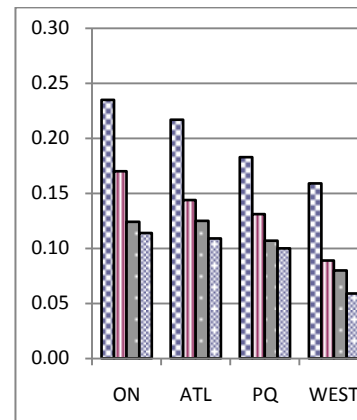
Source: The full set of gender results can be found in Finnie, Childs and Wismer (2010). Note: The values in the tables have been inverted so the heights of the bars represent the magnitudes of the effects. Black borders denote statistical significance at the 0.10 level or better.

Figure 3: Average Marginal Effects on Access to University, by Region

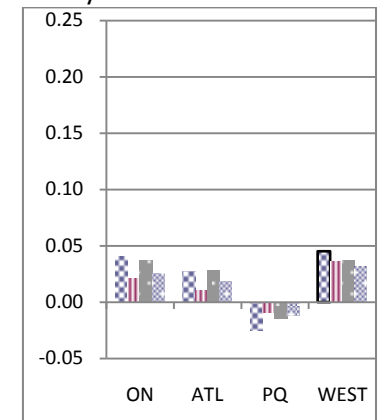
Income Below \$50,000



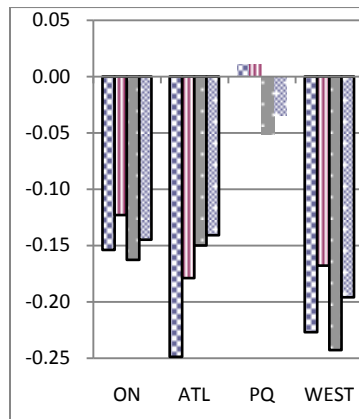
Parents With No PSE



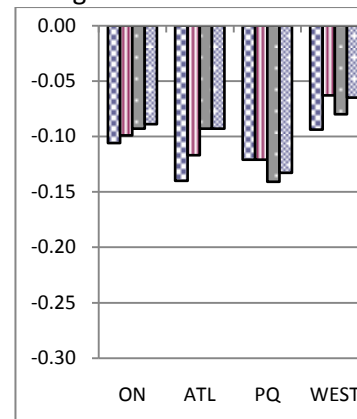
Single Parent (or other) Family



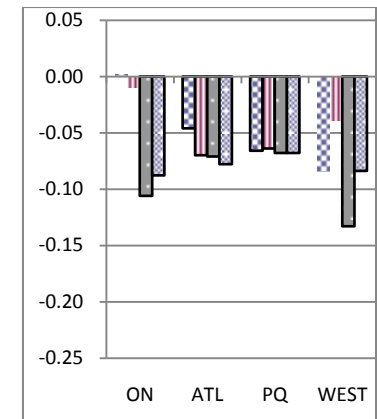
First Generation Immigrant



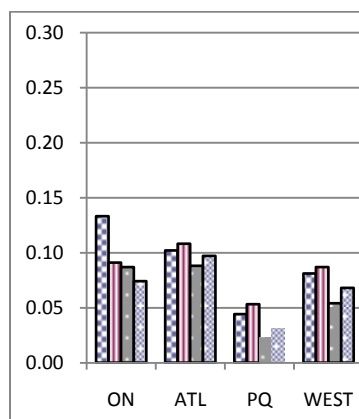
Second Generation Immigrant



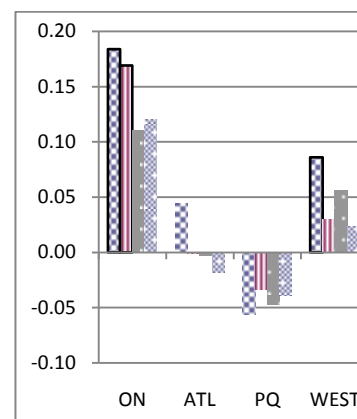
Language Minority



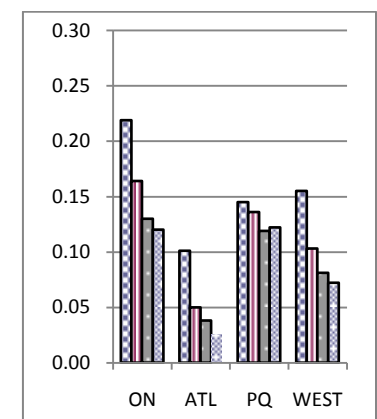
Rural



Aboriginal



Disability



Baseline, Jointly
HS Grades Added
Scale Variables and PISA Scores Added
All

Source: Appendix Tables 1 and 2. Note: The values in the tables have been inverted so the heights of the bars represent the magnitudes of the effects. Black borders denote statistical significance at the 0.10 level or better.