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An Overview of PSE Accessibility in Ontario

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Executive Summary

Access to postsecondary education (PSE) is a key policy priority for Ontario. The aggregate PSE attainment rate in the province is high by national and even international standards, but there are significant differences in these rates among demographic and socioeconomic groups.

Reducing and eventually eliminating these PSE attainment gaps means increasing participation and graduation rates for students from under-represented groups. These desired outcomes in turn require policies by both the government and individual institutions. Many such initiatives are in place, but monitoring and evaluation are hampered by two major issues; lack of appropriate data and issues of interpretation even when data are available.

HEQCO has sponsored external research and has undertaken work internally to address these challenges of lack of data and interpretation. We can report considerable progress in our efforts to provide a statistical profile of PSE accessibility in Ontario. The research undertaken to date provides a reasonably comprehensive and consistent snapshot of who participates and who does not participate in higher education. This picture can be summarized as follows.

First, aggregate PSE participation rates in Ontario are relatively high. Over 80% of secondary school students enroll in some type of PSE, a figure which puts the province among the leading jurisdictions world-wide. More than half of this group goes to university, with the remainder in colleges, apprenticeships, and private training programs. Not all these enrollees will graduate, so the eventual attainment rate will be somewhat lower. Still, it is clear that participation rates of Ontario youth will contribute to raising the province's PSE attainment rate for the population aged 25-64 from its current 62% figure to the target rate of 70%.

Second, some groups are clearly under-represented in higher education. Having any of the following characteristics lowers the chance that an Ontario youth will enroll in PSE: being from a low income family, having parents with no PSE, living in a rural area, identifying as an Aboriginal person, and having a disability. It is important to stress that this statement holds even when all student characteristics are considered together. That is, each characteristic brings its own challenges with respect to PSE participation, and thus its own challenges for policy making.

Third, some characteristics that appear to be correlated with under-representation in PSE cease to be significant when all factors are considered together. We refer here to mother tongue and family status. Youth from both groups are equally likely to enroll in PSE as their counterparts once factors such as geographic location and family income are taken into account. The finding with respect to language is now acknowledged in government policy as attention has turned from participation to availability of programs in French.

Fourth, some groups on the list of those needing special attention are in fact not under-represented in PSE. We refer here to first- and second-generation immigrants. Youth from these groups are significantly more likely than non-immigrants to enroll in PSE. As with some other characteristics noted above, this is purely a university effect. Immigrant youth are less likely than their counterparts to enroll in other types of PSE.

Fifth, there are clear gender differences in PSE participation, mainly reflecting preferences by females for university. This gap has been apparent for some time, and has gone a long way to overcoming historical trends where females were under-represented in PSE. This historical gap still persists in higher levels of university education although it is gradually disappearing. Traditional gender gaps in programs of registration remain in university, college and apprenticeship enrolments.

Unfortunately, we are further behind in our understanding of why participation rates vary among characteristics and what to do to overcome them.

Consider first the role of family income. Low income is a barrier to PSE participation, although the relationship is more complex than is traditionally expressed. Most notably, the effect of income is greatly reduced when it is considered jointly with other characteristics. The fact that the negative effect of family income is markedly less than is often believed reflects the important role that student financial assistance policies have played in encouraging and supporting PSE participation in Ontario and in Canada more generally. The fact that the income effect remains significant after controlling for other characteristics suggests there is a place for further improvements to these support policies.

The explanation for the urban-rural gap may be that rural students face additional costs in attending college or university. Institutions are generally located in urban centres so students must live away from home. The Ontario Student Assistance Program (OSAP) recognizes these costs, but the fact the variable is significantly negative suggests the offset is not complete.

The explanation for the under-representation of persons with a disability lies in part in the additional costs that these youth face in attending and completing PSE and in the greater uncertainties they may face in labour markets upon graduation. It also reflects the fact that PSE institutions in Ontario are in the early stages of taking the steps needed to accommodate students with disabilities.

The remaining two characteristics associated with under-representation – Aboriginal identity and parental education – represent the two largest negative effects on PSE participation. Their effects are only slightly reduced when all variables are considered together, meaning they have strong independent influences. While this statistical relationship is clear, the interpretation is obscure. The usual view is that parental education and Aboriginal identity are proxies for what have come to be known as cultural factors: attitudes to education, knowledge about expected costs and benefits of higher education, and so forth.

This interpretation, if true, has important policy implications. A different approach is required to increase participation rates. Put starkly, money alone will not work. Policy initiatives must somehow find ways to provide the advantages that other students receive by virtue of having parents with PSE experience or being a non-Aboriginal person. This certainly involves providing accurate and easy-to-understand information on the costs and benefits of pursuing PSE and the financial and other support available. It probably involves assistance in understanding the complex array of PSE choices available, and guidance on how to navigate the complex application and registration processes. It definitely means starting these initiatives in the beginning high school years or even earlier. It may mean involving extended families and even entire communities.

We end the paper on a note of concern. As matters stand, it will not be possible to track how PSE participation patterns evolve over time, and thus to evaluate the effects of policies aimed at reducing and eventually eliminating PSE participation rate disparities. There is one more cycle of YITS data to come, after which the survey ends and there are no plans to institute a follow-up project. In any case, YITS follows one cohort only so it is not possible to use a YITS-type survey to track changes over time. SLID is an ongoing survey and provides some useful information, but sample sizes at the provincial level are a problem.

Data linking may offer the best avenue for tracking and understanding changes in PSE outcomes over time. Students in grade 9 or grade 10 can relatively easily be surveyed each year. The implementation of the OEN will greatly ease the task of tracking students from high school into PSE and beyond. But formidable procedural and practical challenges remain, as noted above. Until these are overcome, Ontario will be constrained in its ability to track progress on a key policy priority and to evaluate the effects of the range of policy initiatives brought to bear on the problem.

Introduction

Access to postsecondary education (PSE) is a key policy priority for Ontario. The aggregate PSE attainment rate¹ in the province is high by national and even international standards, but there are significant differences in these rates among demographic and socioeconomic groups. Reaching Higher (Government of Ontario, 2005), building on the Rae Task Force (2004), identified a number of specific groups as warranting particular attention: low-income families, Aboriginal people, Francophones, new Canadians, persons with disabilities, and first generation students. Analysts frequently add gender and visible minority status to the list.

Narrowing and eventually eliminating PSE attainment gaps is a priority for at least three reasons. First, it is important for equity reasons. There are clear private economic and non-economic benefits to PSE (Norrie and Lennon, 2011) and it is only just that these be available to all Ontarians. Second, there are important social benefits to PSE in addition to these private returns, so the province as a whole benefits from a more widely-education populace. Finally, increasing PSE attainment of under-represented groups is a necessary condition for Ontario to achieve the 70% attainment target set out in the 2010 Throne Speech (Ministry of Finance, 2011).

Reducing and eventually eliminating these PSE attainment gaps means increasing participation and graduation rates for students from under-represented groups. These desired outcomes in turn require policies by both the government and individual institutions. Many such initiatives are in place², but monitoring and evaluation are hampered by two major issues.

The first issue is lack of appropriate data. The quinquennial Canadian census contains data on PSE attainment rates for some under-represented groups, and in these cases provides a useful overview of Ontario's situation in comparative and historical perspective (Norrie and Lin, 2009; HEQCO, 2010). But several groups of interest are not represented in the census data. Further, PSE attainment rates reflect participation and persistence decisions already made, and tell us nothing about what is happening currently. Any significant changes in behaviour, whether due to policy initiatives or other factors, will only show up with a considerable lag. To complicate matters further, Canadian census information is likely to be less reliable in future years given the switch in 2011 to voluntary returns.

The real need is for current PSE participation and graduation rate data. Estimates of who is going to PSE in Ontario and who is succeeding exist, but they are from a variety

¹ The attainment rate is the percentage of the population that has successfully completed at least one postsecondary education program. It is normally defined for specific age cohorts, for example ages 25-64 to represent the traditional working-age population, or 25-34 if the focus is on younger workers. Individuals with more than one PSE credential are classified according to the highest level obtained to avoid double counting.

² See Wiggers and Arnold (HEQCO, forthcoming) for a review of select institutional programs aimed at attracting and retaining students.

of sources and definitions and methodologies differ. Thus it is difficult if not impossible to track progress over time or to evaluate specific policy initiatives.

The second issue is a problem of interpretation, even when data are available. Under-represented groups are traditionally identified by specific demographic and socioeconomic characteristics – from low income families, neither parent having higher education, and so forth – and presented as if these were distinct sets. Yet there is considerable overlap among these characteristics. Individuals grouped together because they come from families where neither parent has PSE are also likely to be grouped together when family income levels are considered. This overlap means that it is impossible on the surface to know which characteristics are paramount in explaining under-representation in PSE. It obviously matters, for policy purposes, to disentangle these factors.

HEQCO has sponsored external research and has undertaken work internally to address these challenges. We proceeded on three fronts. One, we asked whether national data sources could be usefully mined for Ontario-specific data. Two, we supported efforts to track student's educational choices by linking secondary school data, PSE application data, institutional administrative data, and census data. Three, we pursued the possibility of developing and implementing a made-in-Ontario longitudinal student survey.

The purpose of this @Issue paper is to provide a first report on this work. Specifically, the paper presents an overview of PSE accessibility in Ontario derived from national data sources and from data-linking initiatives³. A companion paper (McCloy, HEQCO, forthcoming) will do the same for retention/graduation rates. A series of forthcoming @Issue papers, noted below, will go into further detail on each of the under-represented groups.

Evidence from the Youth in Transition Survey (YITS)

The main source of information on PSE participation in Canada is the Youth in Transition Survey (YITS). This unique longitudinal data source has been used extensively in PSE research at the national level (Finnie, Muller, Sweetman and Usher [2008]; Finnie, Frenette, Muller and Sweetman [2010c]). HEQCO engaged Professor Ross Finnie and his colleagues to work with these data to extract Ontario results and to compare them to the rest of Canada. Unless otherwise noted, the results in this section are drawn from their papers (Finnie, Childs and Wismer [2010a, 2010b])

³We continue to work to develop and implement an Ontario Longitudinal Student Survey (OLSS), but this project will not be on discussed further in this paper.

The Data

YITS is actually two surveys⁴. YITS-A follows a representative sample of Canadians who were 15 years old in December, 1999. Respondents were first surveyed in early 2000. They completed a written survey, and staff interviewed their parents and school officials. The survey gathered information on an array of demographic and attitudinal variables. Importantly for this paper, it attempted to identify characteristics associated with under-representation in PSE. The parental survey asked for family income, which is important as students' estimates of this variable are known to be highly unreliable, and for parental education levels, which are normally unavailable.

The students (but not parents or school officials) were surveyed again every two years. The cycle 4 survey took place in 2006 when respondents were 21 years of age⁵. They were asked if they had ever enrolled in college, university, or other types of PSE regardless of whether they continued in their studies. The responses to this question allow researchers to calculate PSE participation rates; the participation rate for any population sub-group is the percentage of respondents in that cohort who answered yes to the question. The overall rate for each group can be further sub-divided into rates for university and for other types of higher education.

YITS-A was designed and administered as a national data set, with sample sizes chosen accordingly. It is possible to identify Ontario respondents in the data and thereby provide an accessibility profile for the province. The sample sizes for most population sub-groups are acceptable, but for three cohorts – Francophones, Aboriginal people, and persons with a disability – the small number of respondents complicates analysis of the data.

YITS-B collects information on a sample of young Canadians who were ages 18-20 in December 1999. These individuals were interviewed again in 2002, 2004, 2006 and 2008. Many of the same demographic variables were collected, but there is no information on the all-important family income or parental education variables so it has not been used as extensively to study PSE participation decisions. It has proven most useful in analyzing persistence rates (Finnie and Qui, 2008).

Overview

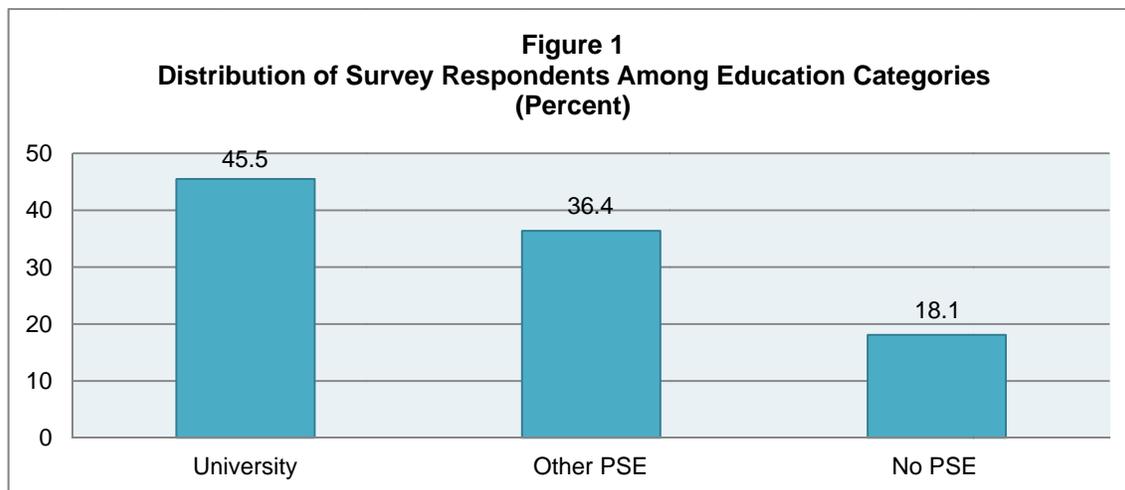
Finnie and colleagues grouped respondents into three outcomes: enrolled at university, enrolled in other PSE, and did not attempt PSE. The no-PSE group includes those who had not finished high school and those who had completed high school but had not (at

⁴ See Motte et al (2009) for more detail.

⁵The cycle 5 survey took place in 2008 when respondents were 23 years of age and cycle 6 in 2010 when they were 25. Cycle 5 results are available now and those for cycle 6 will be in Spring, 2011. Finnie et al used the cycle 4 data for the HEQCO work to take advantage of the larger sample sizes. The number of respondents, not surprisingly, falls over time.

least yet) attempted PSE⁶. The category “other PSE” is mainly college registrations but also includes apprenticeship and private training. Students who report both “other PSE” and university are included in the latter category to avoid double counting.

Figure 1 shows the distribution of respondents among these three outcomes. Nearly 82% of Ontarians surveyed had enrolled in some form of PSE by age 21. The majority of those continuing (56%) had enrolled in university while 44% had enrolled in other types of PSE. Only 18% had not attempted higher education.



These aggregate numbers correspond closely to those available from the YITS-B survey. Eighty-three percent of this older group of Ontarians had attended PSE by ages 24 to 26 (Shaienks and Gluszynski, 2007, Table 1). Just over half of this group (51%) chose university while 49% chose other forms of PSE.

It is instructive to examine these figures more closely in light of the government’s target of a 70% PSE attainment rate for the Ontario population aged 25-64. The current attainment rate is just over 62% (HEQCO, 2010), so the increase to 70% will have to come from three groups: Ontario high school graduates completing PSE, new immigrants bringing higher education credentials with them, and educational upgrading by the current adult population⁷.

Nearly 82% of Ontarians in the YITS survey had enrolled in PSE by age 21. For this group to achieve a PSE attainment rate of 70%, their graduation rate has to be 85.4% ($0.819 \times 0.854 = 0.7$). The required graduation rate is lower if some portion of the 18% of respondents in the no-PSE category eventually enrolls in PSE.

⁶HEQCO and HRSDC (2011) reports that 94.5% of respondents who participated in the original survey had completed high school within 5 years.

⁷ See Kerr (HEQCO, forthcoming) for an overview of adult learning in Ontario.

This required graduation rate figure might seem high based on traditional ways of measuring graduation rates; i.e. the percentage of students enrolling in an institution who do not complete within a specified time period. But this approach assumes that all students who do not return to the institution in which they initially enrolled are drop-outs from PSE. Finnie and Qui (2008) use YITS-B data to track students who switch institutions, those who stop out for a period but return, and those still in PSE. Ignoring these groups, five-year university graduation rates in Canada are 52% and five-year college graduation rates are 56.5%. Allowing for switchers and those stopping out and returning bumps the rate to 69.4% for universities and to 73.1% for colleges. Taking into account those still in PSE pushes these rates further to 89.8% and 82%.

These final rates are close to the required graduation rate of 85.4% to achieve a PSE attainment rate of 70% for current students. This group represents only a portion of the population, however. Reaching the 70% target for the total population aged 25-64 will require net additions to the stock of PSE credentials by immigrants and those already in the labour force.

PSE participation rates are not evenly distributed over the youth population, however. Table 1 presents these rates for respondents grouped by demographic and socioeconomic characteristics. There are 22 student characteristics in total, representing 9 categories: gender, family income, parental education, Aboriginal identity, disability status, immigration status, language group, geography and family status.

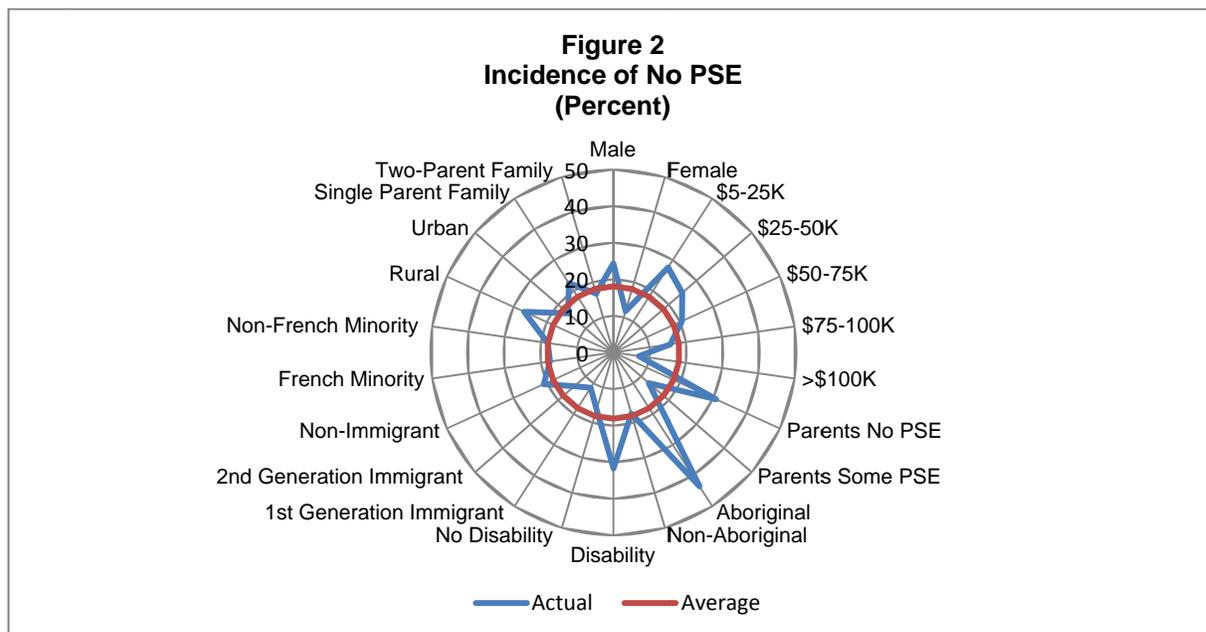
Table 1: Distribution of Respondents by Characteristic Among PSE Outcomes

	Total PSE	University	Other PSE	No PSE
All	81.9	45.5	36.4	18.1
Male	75.7	36.3	39.4	24.3
Female	88.2	54.7	33.5	11.8
\$5-25K	72.4	38.7	33.7	27.6
\$25-50K	75.1	34.2	40.9	24.9
\$50-75K	79.4	42.7	36.7	20.6
\$75-100K	84.3	47.8	36.5	15.7
>\$100K	92.9	61.9	31	7.1
Parents No PSE	69.2	25.7	43.5	30.8
Parents Some PSE	87.2	53.7	33.5	12.8
Aboriginal	56.5	17.8	38.7	43.5
Non-Aboriginal	82.6	46.2	36.4	17.4
Disability	68.3	22.1	46.2	31.7
No Disability	83.7	48.5	35.2	16.3
1st Generation Immigrant	88.5	58.4	30.1	11.5
2nd Generation Immigrant	85.9	54.7	31.2	14.1

	Total PSE	University	Other PSE	No PSE
Non-Immigrant	79.1	39.2	39.9	20.9
French Minority	82.5	39.5	43	17.5
Non-French Minority	81.9	45.8	36.1	18.1
Rural	73.2	28.6	44.6	26.8
Urban	83.7	48.8	34.9	16.3
Single Parent Family	77.5	36.4	41.1	22.5
Two-Parent Family	83.2	47.7	35.5	16.8
Family Income <\$50K	74.5	35.2	39.3	25.5
Family Income >\$50K	84.7	49.5	35.2	15.3

As an example of how to interpret the data in Table 1, consider the row entries for males. The table tells us that 75.7% of male Ontarians first surveyed in the spring of 2000 had enrolled in some form of PSE by the time they were 21 years of age. Of this cohort, 36.3% had enrolled in university, 39.4% had enrolled in other types of PSE, and 24.3% had not attempted higher education.

Figure 2 displays graphically a subset of the information in Table 1. The smooth circle is the provincial average of respondents not attempting PSE (18.1%) and is included for ease of interpretation. The jagged line is the actual percentage, for each characteristic, of respondents in that group that had not attempted higher education. Along any ray, a point outside the smooth circle indicates a group that is under-represented in PSE while a point inside indicates one where the participation rate is above the provincial average.

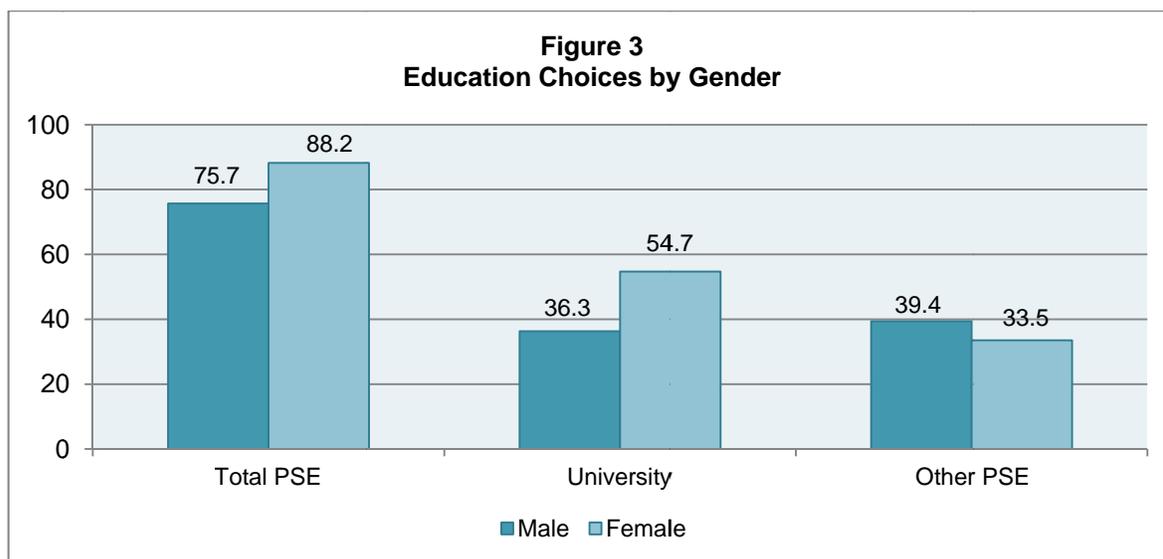


The diagram illustrates clearly that access to postsecondary education in Ontario varies systematically with population characteristics. Specifically, PSE participation rates are relatively low for the following groups: males, those from families with incomes less than \$75,000, those having parents with no PSE, those identifying as Aboriginal people, those identifying as having a disability, those from a rural area, and those from single-parent families. New Canadians are sometimes assumed to be an under-represented group, but Table 1 and Figure 2 show that immigrants, particularly first generation ones, are markedly more likely to attend PSE than are non-immigrants.

These are important differences in participation rates among population characteristics so it is worth examining them in more detail. It is also the case, as we shall see, that there is also substantial variation in the type of PSE chosen.

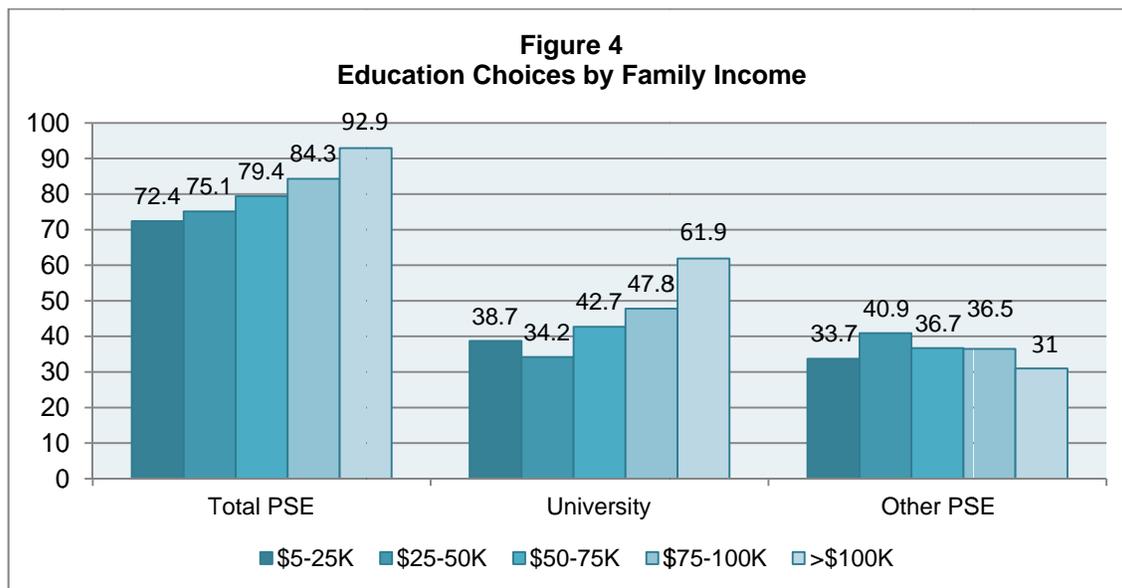
Further Detail

Figure 3 demonstrates that gender is an important factor in understanding PSE choices. Three quarters of male survey respondents had attempted PSE by age 21 compared to 88% of females. Put differently, the percentage of males not having enrolled in PSE by age 21 (24.3%) is more than double the figure for females (11.8%). Gender also matters for the type of PSE program chosen. Females were notably more likely than males to enroll in university (54.7% compared to 36.3%), whereas males were slightly more likely than females to opt for other forms of PSE (39.4% compared to 33.5%). This gender gap in PSE participation is not unique to Ontario. Understandably, it has drawn considerable research attention in recent years. Some of the topics include: when the gender gap emerged, why it emerged, and what it has meant for labour market outcomes⁸.



⁸ See Kerr (2010) for a literature survey and references, and Card et al (2011) for a novel analysis using linked data sets.

Figure 4 shows education choices by family income cohorts. The share participating in PSE increases consistently with family income, from a low of 72.4% for the lowest income group (\$5,000 to \$25,000) to a high of 92.9% for those from families with incomes over \$100,000. Viewed from the opposite perspective, the percentage of respondents in the lowest income category that had not enrolled in PSE by age 21 (27.6%) is nearly four times greater than that in the highest income category (7.1%)⁹.



Family income is also a factor in determining the type of PSE chosen. With one interesting exception¹⁰, the percentage of the population going to university rises with family income, with the jump from the fourth to the fifth (and final) category being particularly large. In contrast, family income is much less of a factor for decisions to participate in other types of PSE. The percentage of respondents choosing these latter programs rises from the first to the second family income cohort, declines to the third and fourth, and falls notably for the highest-income group.

Figure 4a shows education choices for just two categories of family income: less than \$50,000 and greater than \$50,000. This information is included here for use later in the paper. PSE participation rates differ between the two groups as expected, with 74.5% of those in families with income less than \$50,000 having enrolled in PSE compared to nearly 85% for those with incomes in excess of \$50,000. The link between family income and university participation is obvious from the diagram, with 35.2% of respondents in the lower-income cohort enrolling in university compared to nearly 50%

⁹ See Deller and Oldford (HEQCO, forthcoming) for a review of PSE participation by low-income Ontarians.

¹⁰ The exception is the cohort with family income \$25-\$50K where the university participation rates is slightly lower than that for the cohort \$5-\$25K. This result warrants further examination.

of the upper-income group. There is much less of a gap between income groups for other forms of PSE.

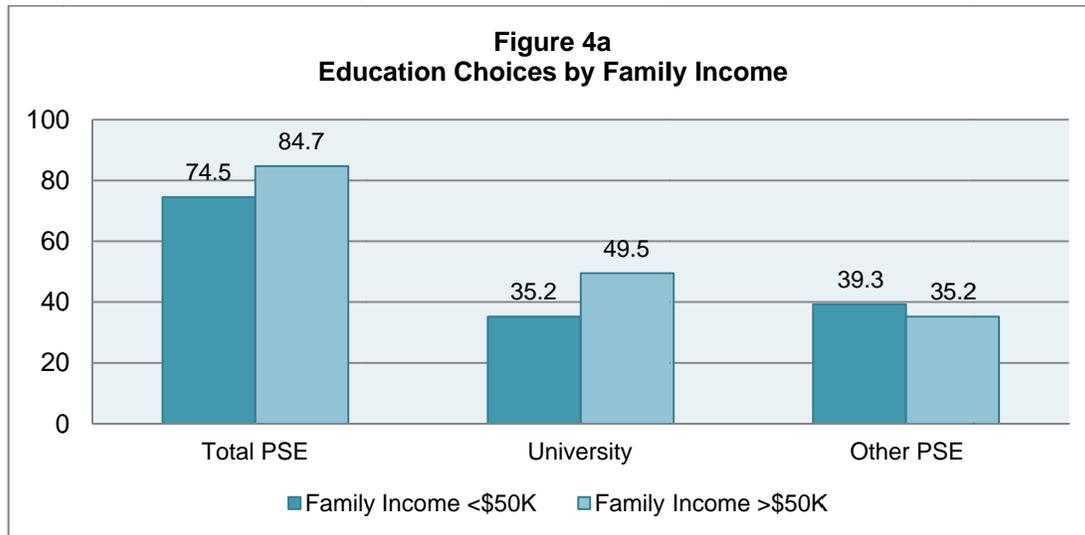
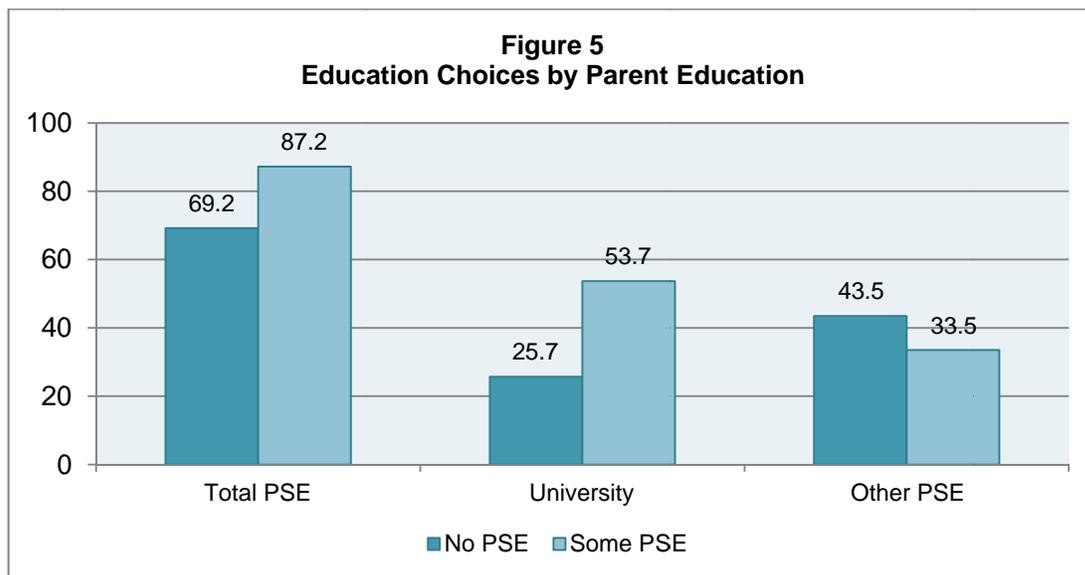


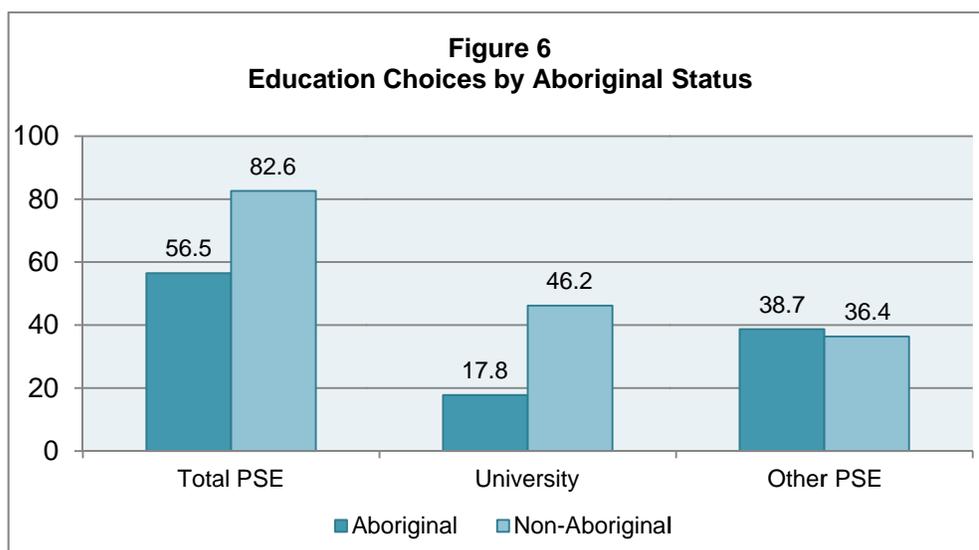
Figure 5 illustrates that parents' education is a significant factor in explaining PSE choices. A first-generation student is defined as one whose parents did not attend any form of PSE. Just under 70% of first-generation respondents proceeded to higher education, compared to 87.2% for those whose parents had at least some PSE. Seen from the opposite perspective, the percentage of first generation respondents not attempting any form of PSE was nearly 2.5 times greater than their reference group¹¹.



¹¹ See Deller and Oldford (HEQCO, forthcoming) for a review of PSE participation by first-generation Ontarians.

There is a notable contrast in the type of PSE chosen as well. Only one-quarter of first generation respondents chose university, compared to nearly 54% for the reference group. The figures are reversed for other types of PSE, where 43.5% of first generation respondents opted for other forms of PSE compared to one-third of their counterparts.

The picture for Aboriginal people is stark (Figure 6). Aboriginal identity was determined from the initial YITS parent survey, and includes individuals identifying as North American Indian, Métis, and Inuit. Only 56.5% of Aboriginal respondents had attempted PSE by age 21 compared to 82.6% of non-Aboriginal people. This is the largest participation rate gap between an under-represented group and its reference group for all categories¹². Aboriginal people who did go on to PSE were much less likely to opt for university; just 17.8% of respondents did, compared to 46.2% for non-Aboriginal people. Participation rates in other types of PSE were very similar, however: 38.7% for Aboriginal people compared to 36.4% for non-Aboriginal people.



The data for participation by disability status display a similar pattern to that for Aboriginal people. Disability in the YITS survey includes physical, sensory and cognitive disabilities, with the information gleaned from the parent responses. Figure 7 shows that 68.3% of respondents with a reported disability participated in PSE, compared to 83.7% of persons with no disability. Put differently, the percentage of respondents reporting a disability that had not attempted any type of PSE by age 21 (31.7%) was nearly double that for their reference group (16.3%). Those with a

¹² It is important to note that the YITS data reflect PSE participation rates for 21-year olds. If a higher proportion of Aboriginal persons start postsecondary education later, as is almost certainly the case, these figures overstate the PSE participation rate gap.

disability who did go on to higher education were less than half as likely to choose university that their counterparts, but more likely to choose other types of PSE¹³.

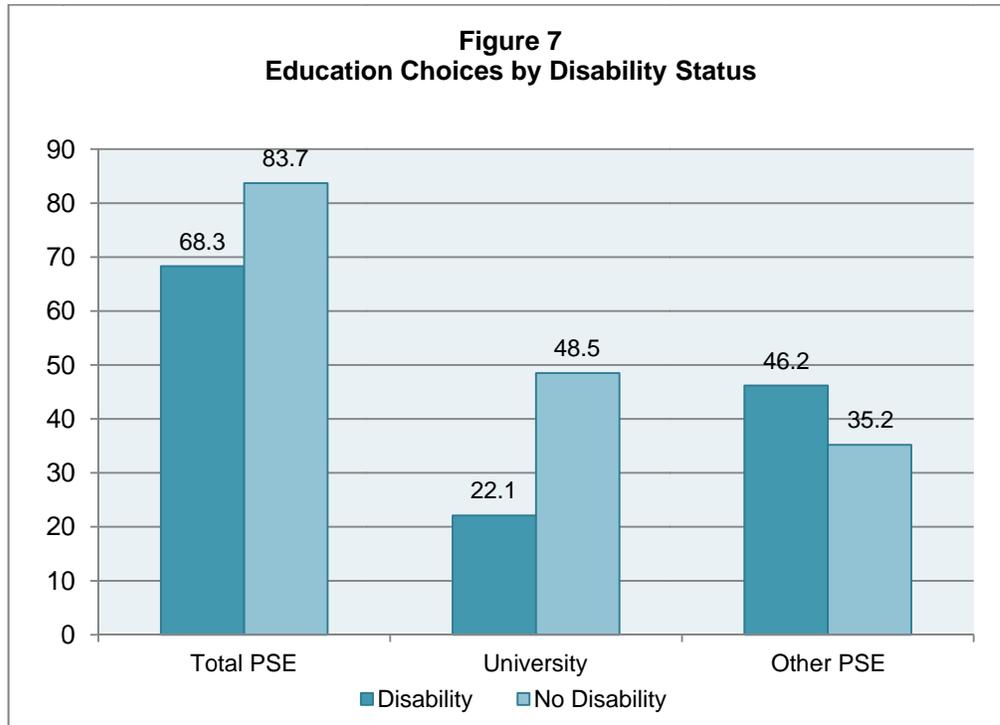
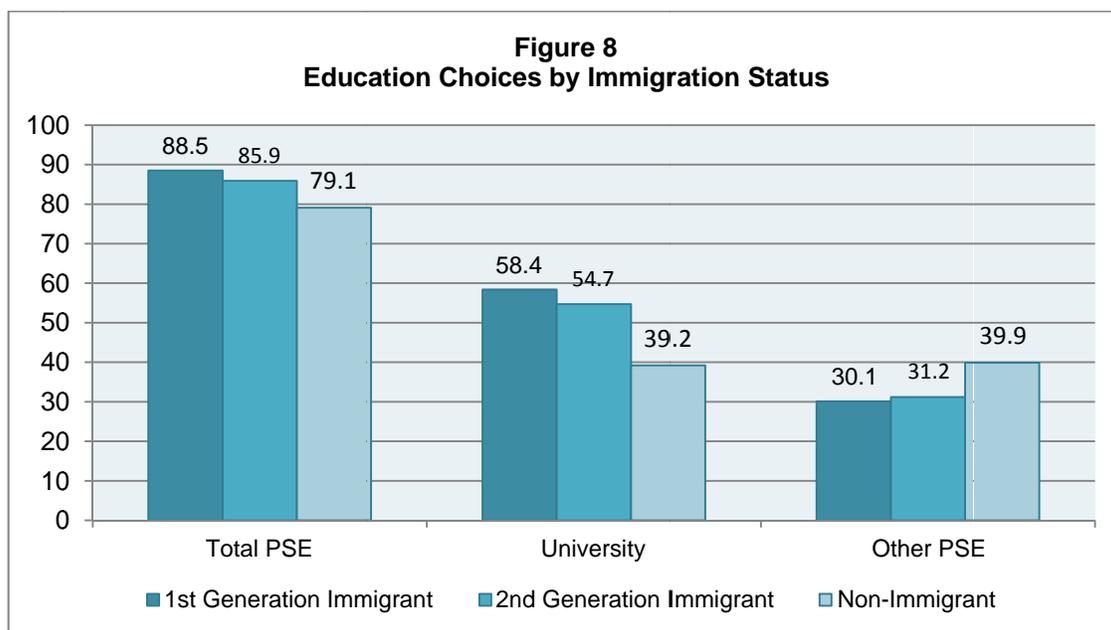


Figure 8 shows that PSE choices vary by immigration status, but not in the way that is sometimes imagined. A first-generation immigrant is someone born outside Canada, and a second-generation immigrant is someone born in Canada but with at least one parent born outside the country. Nearly 89% of first-generation immigrants and 86% of second-generation immigrants went on to PSE compared to 79% of non-immigrants. Immigrants were also more likely to choose university than their native-born counterparts, and less likely to choose other types of PSE¹⁴.

¹³ See McCloy and Holms (HEQCO, forthcoming) for a review of PSE participation by Ontarians with disabilities.

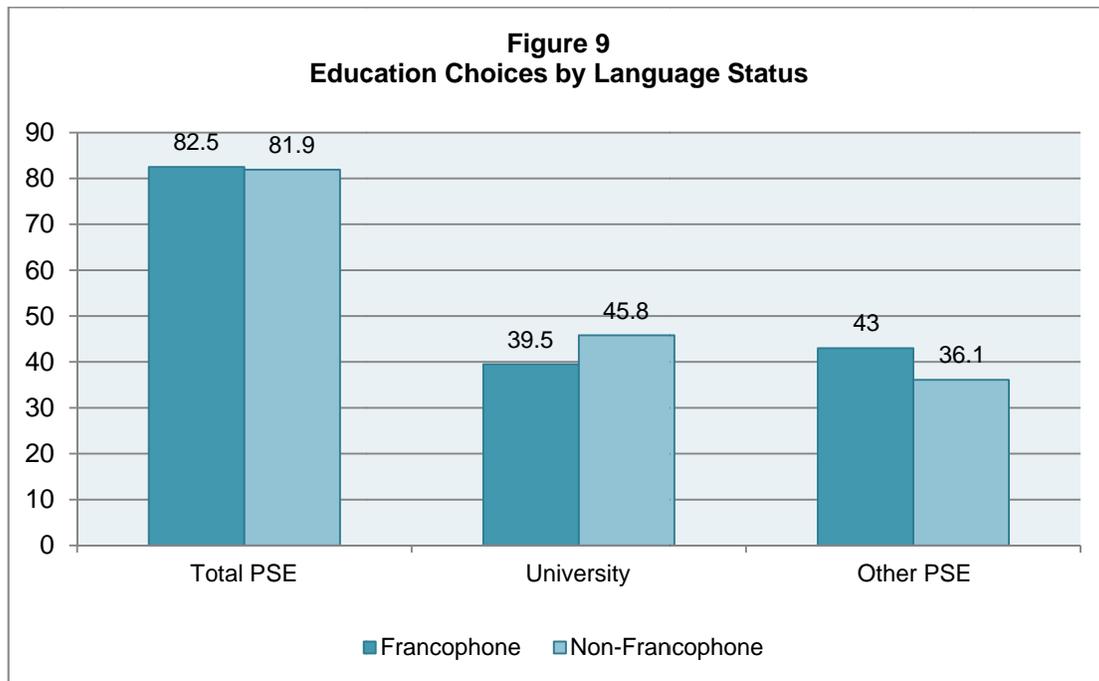
¹⁴ Sweet et al (2010) examine the education choices of immigrant youth by linking Toronto District School Board administrative records to college and university application data. Abada and Lin (, HEQCO, forthcoming) link census data for 1996 and 2006 to examine educational attainment and labour market outcomes of immigrant youth in Ontario.



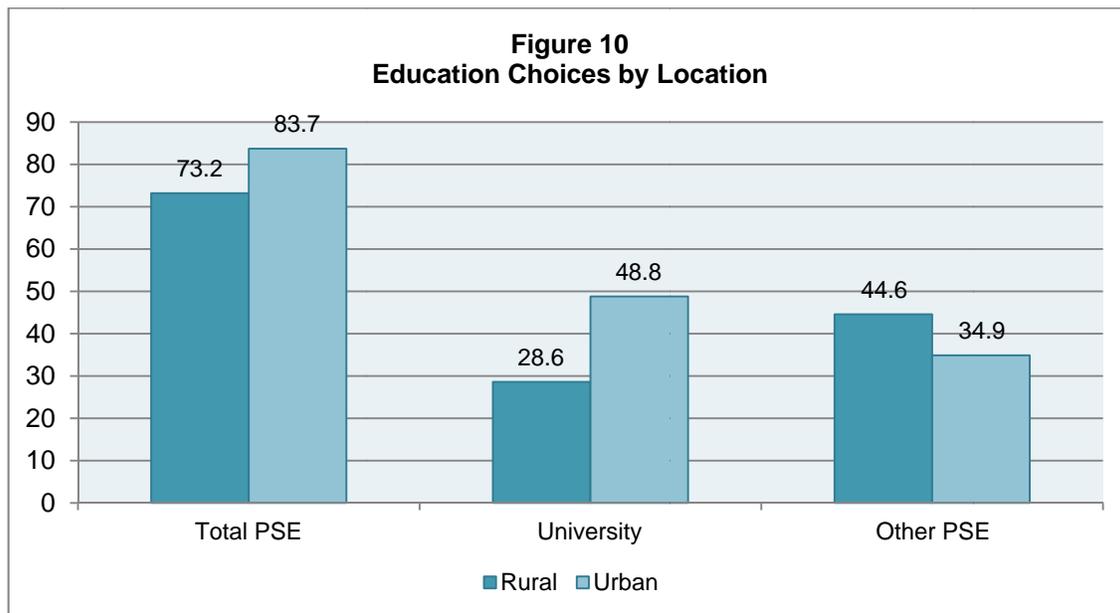
Note from Figure 8 that the non-immigrant population going on to PSE is almost exactly evenly divided between university and other PSE (39.2% and 39.9% respectively). We know from Table 1 or Figure 1 that 45.5% of all respondents chose university while 36.4% chose other forms of PSE. The implication is that the observed preference for university over non-university education among Ontario youth is explained almost entirely by the education choices of first and second generation immigrants.

Interestingly, education choices by Francophones correspond closely to those by other Ontarians (Figure 9). A Francophone is someone who learned French as a first language, with the information from the parent survey. Non-francophone includes English and all other languages. The percentages of respondents going on to higher education were nearly equal at 82.5% for Francophones and 81.9% for the non-Francophones. There was some difference where they went, however. Francophone respondents were slightly less likely than other language groups to choose university (39.5% compared to 45.8%) and slightly more likely to choose other types of PSE (43% compared to 36.1%)¹⁵.

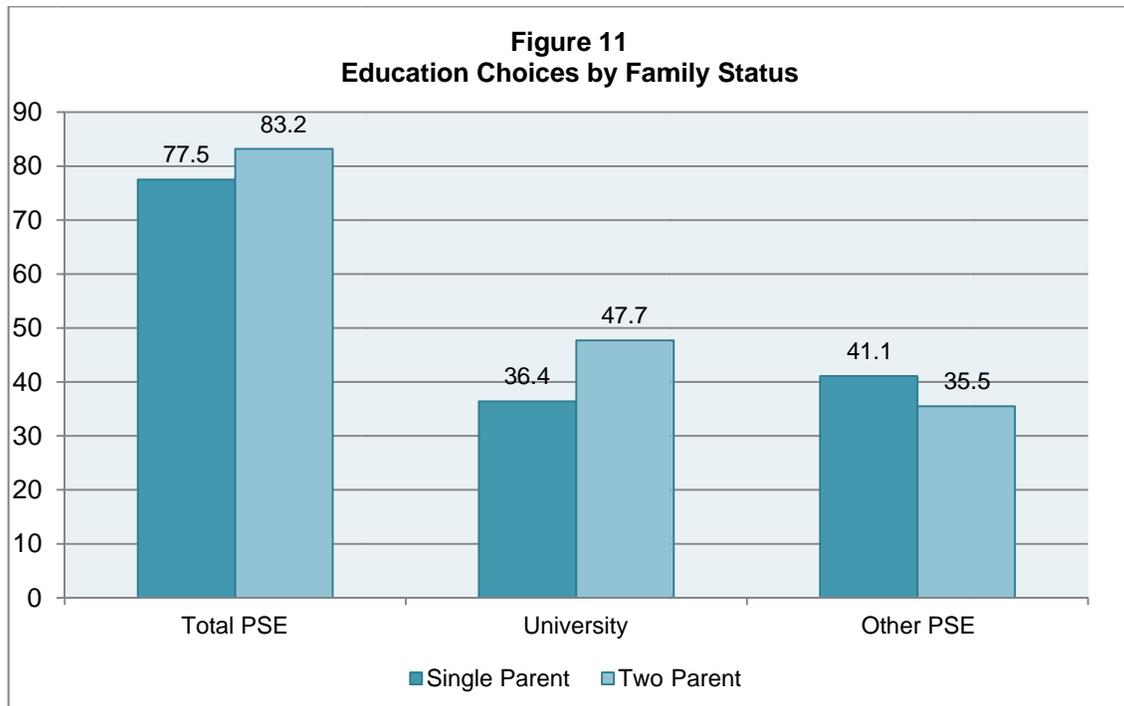
¹⁵ Deller and Motte (HEQCO, forthcoming) focus on the educational circumstances of Ontario Francophones.



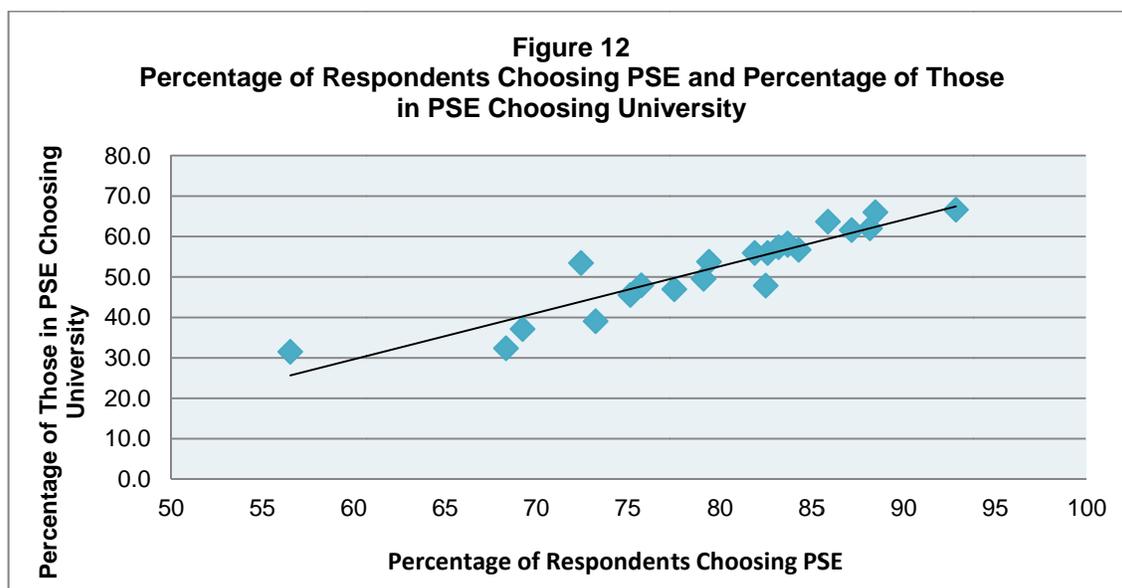
Geography clearly matters. Figure 10 reveals that 73.2% of the respondents from rural areas went on to PSE compared to 83.7% for those from urban areas. Those from rural areas who did go on to higher education were notably less likely to opt for university (28.6% compared to 48.8%) and more likely to choose other forms of PSE (44.6% compared to 34.9%).



Finally, PSE participation varies by family status (Figure 11). Single-parent family is a general category that includes all respondents from anything other than a two-parent family. Nearly 78% of respondents from single-parent families chose to proceed to PSE compared to 83.2% of those from two-parent households. For those who did go on, those from single-parent families were less likely to choose university (36.4% compared to 47.7%) and somewhat more likely to choose other forms of PSE (41.1% compared to 35.5%).



There is an interesting pattern in these data. Population characteristics associated with high rates of PSE participation also have relatively high rates of university enrolment. Figure 12 shows that this correlation is very tight. The horizontal axis is the percentage of each population group pursuing PSE. The vertical axis is the percentage of the group pursuing PSE that chooses university programs. The scatter diagram shows a very clear correlation between the two variables.



There are only two population groups where the PSE participation rate is below the provincial average but where the percentage of students enrolled in university is greater than 50%: those with family incomes between \$5,000 and \$25,000 and those with family incomes between \$50,000 and \$75,000. There is only one group – Francophones – where the PSE participation rate is above the provincial average but where the percentage going to university is less than 50%.

Which Characteristics Really Matter?

Table 1 or Figures 2-11 provide an initial overview of PSE accessibility in Ontario. With the possible exception of immigrants, the picture largely confirms the one set out in the Rae Task Force or in *Reaching Higher*. The data must be analyzed in two ways before any meaningful observations can be made, however.

Characteristics Considered Individually

The first question to ask is whether the differences in participation rates between each characteristic and its reference group are statistically significant. Recall that the data are drawn from a random sample of Ontarians who were 15 years old in December, 1999. The obvious question to ask is how representative this sample is of all Ontarians who met this condition. Put differently, how confident can we be that the same variations in participation rates among groups would have been observed if a different group of 15-year olds had been selected for the sample¹⁶?

¹⁶ As a general guide, a larger difference between a group and its reference category is more likely to be statistically significant than a small difference, all else being equal. Further, any given difference is more likely to be statistically significant the larger is the sample size.

Finnie et al (2010, Table 3, p. 23) provide this information in the first stage of their more formal statistical analysis. The answers fall into three groups.

First, there are three instances where the observed differences in participation rates are not statistically significant at conventional confidence levels. All instances are for enrolment in non-university PSE: those associated with family income (Figure 4a), those associated with Aboriginal identity (Figure 6), and those associated with family status (Figure 11). Put less formally, the apparent differences in participation rates in these three instances are sufficiently small that, given the sample sizes involved, we cannot be confident they are real and meaningful.

Second, there are three instances where the differences are statistically significant but at lower levels of confidence: mother tongue for university enrolment, mother tongue for other types of PSE enrolment (10% confidence level), and disability status for other types of PSE enrolment (5% confidence level).

All other participation rate differences between or among groups are highly statistically significant (at the 1% confidence level).

Characteristics Considered Jointly

The second adjustment is to account for overlaps among the characteristics. The analysis to this point has looked at the participation rate data for each characteristic separately. But many respondents will have several of the characteristics associated with being under-represented in PSE. For greater understanding of participation rate differences, as well as for policy purposes, we want to remove the overlap and get the “true” effect that each characteristic has on higher education decisions.

This result can be achieved with multiple regression analysis. While the actual analysis is complex, the interpretation is relatively straightforward. Each YITS survey respondent has three possible choices: enroll in university, enroll in another type of PSE, or not pursue higher education. The probability that any given individual will enroll in university or in other types of PSE is postulated to depend on his or her family income, gender, parental education, and so forth¹⁷. By considering these characteristics jointly, any overlap among them is removed. That is, regression analysis allows the analyst to examine the effect of variations in one independent variable (e.g. family income) on education choice (e.g. the probability of enrolling in university), holding the values of all other independent variables (e.g. parental education) constant.

Consistent with the data presented to this point, the probabilities are expressed as differences between those for each characteristic of interest and its reference group.

¹⁷Finnie et al (2010a, 2010b) also present models with additional explanatory variables such as academic preparation and attitudes to education. We do not report these here as we are mainly interested in differences due to population characteristics.

We are interested in knowing if the differences observed above remain statistically significant when all variables are considered jointly.

Table 2 summarizes the results of the regression analyses in Finnie et al (2010a, 2010b). The first column lists the independent variables of interest. Note that the simpler version of family income is used. The second column shows the results for university when the independent variables are considered individually; i.e., ignoring any overlap among them. Column 3 shows the results for university when the independent variables are considered jointly. Columns 4 and 5 present similar results for other types of PSE, while columns 6 and 7 combine the results for the two sectors. An entry of zero means the variable is not statistically significant, meaning that that we cannot reject the view that there is no difference in the PSE participation rate of this group and its reference group.

Table 2: Summary of Regression Results

	University Individually	University Jointly	Other PSE Individually	Other PSE Jointly	PSE Individually	PSE Jointly
Income <\$50K	-14.9	-7.2	0	0	-14.9	-7.2
Parents no PSE	-28	-23.6	9.9	8.0	-18.1	-15.6
Rural	-20.1	-13.1	9.6	6.3	-10.5	-6.8
French	-7.1	0	7.5	0	0.4	0
Single Parent	-11.5	0	0	0	-11.5	0
1 st Generation Immigrant	18.9	14.5	-10.7	-7.7	8.2	6.8
2 nd Generation Immigrant	14.5	10.1	-8.5	-6.5	6.0	3.6
Aboriginal	-27.7	-22.2	0	0	-27.7	-22.2
Disabled	-23.9	-20.7	9.1	8.2	-14.8	-12.5
Female	18.4	17.1	-5.9	-5.0	12.5	12.1

As an aid to understanding the table, consider the effects of family income on education decisions. The entry in column 2 tells us that, ignoring overlap among characteristics, family income matters. Youth from families with income less than \$50,000 are 14.9% less likely to have enrolled in university by age 21 than their counterparts with family incomes greater than \$50,000. The entry in the third column tells us that when all characteristics are considered together, family income still matters but the effect is cut by half. In other words, about 50% of what appeared at first glance

to be an income effect on university enrolment is actually due to other factors that are correlated with family income.

Column 4 repeats the finding from above that family income is not a significant determinant of participation in other types of PSE, and column 6 confirms that this conclusion carries over when all variables are considered together. The overall effect of family income on PSE participation is thus restricted to the negative impact on university enrolment¹⁸.

We learn from column 3 that when all characteristics are considered together the probability of an Ontario youth in the YITS survey enrolling in university is *negatively related* to the following characteristics: family income, having parents without PSE, living in a rural area, being an Aboriginal person, and having a disability. It is *positively related* to being female and being a first or second generation immigrant. It is *not related* to having French as a first language or being from a single-parent family.

Column 5 reveals that when all characteristics are considered together the probability of an Ontario youth in the YITS survey enrolling in other types of PSE is *negatively related* to being female and being a first or second generation immigrant. It is *positively related* to having parents with no PSE, living in a rural area, and being disabled. It is *not related* to family income, having French as a first language, being from a single parent family, or being an Aboriginal person.

Column 7 shows the effects of the characteristics on overall PSE participation rates. The largest participation gap when all variables are considered together is that between Aboriginal people and non-Aboriginal people. Aboriginal youth in the YITS survey are 22.2% less likely to have enrolled in PSE than their non-Aboriginal counterparts, even after all other disadvantages (low family income, no parental PSE, rural location) are taken into account. The effect is purely a university phenomenon as Aboriginal youth in the YITS survey were as likely as their peers to enroll in other types of PSE.

Parental education level is the next largest negative effect on overall PSE participation. Respondents whose parents had no PSE were 15.6% less likely to enroll in PSE than their reference group (parent with some PSE). The effect of parental education on university participation is even larger (-23.6%), but this is offset somewhat by the fact that these youth are more likely than their counterparts to enroll in other types of PSE.

Having a disability is the third largest deterrent to PSE participation. Youths reporting a disability were 12.5% less likely to have enrolled in PSE than their reference group. As with parental education, the university effect is even larger (-20.7%) but is offset somewhat by the fact that persons with a disability are more likely than their peers to have enrolled in other types of PSE.

¹⁸Bear in mind that these results pertain to a period when student financial assistance policies were in place. The conclusion would no doubt be different in the absence of this support.

Family income is the fourth largest effect on overall PSE participation. Respondents from families with income less than \$50,000 were 7.2% less likely than their counterparts from higher-income families to have enrolled in PSE. Note that this is purely a university effect; family income is not significantly related to participating in other types of PSE. Note also that the income effect is less than half that for parental education and only one-third that for Aboriginal identity.

Rural location is the smallest of the negative influences considered. Youth from rural locations are 6.8% less likely to have enrolled in PSE than their urban peers, a figure about equal to that for family income. The effect again is purely a university phenomenon; youths from rural areas are more likely to have enrolled in other types of PSE. These results are found in the literature more generally (Frenette, 2004; PEDAL, 2009).

Two characteristics cease to be significant when all variables are considered together: French as a mother tongue and family status. In both cases, this conclusion holds equally for university and other PSE participation. Whatever influences these characteristics might seem to have had on PSE decisions actually reflected other attributes.

Finally, immigrant status is positively related PSE participation rates. First generation immigrants are 6.8% more likely than non-immigrants to have enrolled in PSE and second generation immigrants only slightly less so at 3.6%. Both effects reflect a preference for university over other PSE. Both categories of immigrants are less likely than non-immigrants to have enrolled in other types of PSE.

Summary

The research based on the YITS data suggests some revision to the accessibility picture set out in the Rae Task Force or in *Reaching Higher*. Family income remains a barrier to higher education, but its significance is much reduced once overlap with other factors is considered. The links of participation rates to language and family status disappear in the full model. Immigrants are more likely rather than less likely to enroll in higher education, in universities in particular.

Some patterns are confirmed, however. Having parents with no PSE is clearly an important determinant of whether an Ontario youth enrolls in higher education; its impact is only marginally reduced when all factors are considered together. The same is true for Aboriginal identity and having a disability.

YITS is but one data source. Before drawing policy implications from these results, it is important to check if other data sources support the conclusions.

Evidence from the Survey of Labour and Income Dynamics (SLID)

We turn our attention in this section to another longitudinal data source – the Survey of Labour and Income Dynamics (SLID). While not designed specifically to follow youth transition decisions, it provides an opportunity to see how closely SLID tracks the YITS pattern. For more detail, see Zhao (HEQCO, forthcoming).

The Data

SLID has been conducted annually since 1993. It is a longitudinal survey that collects information on all members of a household and follows those individuals for six consecutive years. Each SLID panel consists of roughly 17,000 households and about 34,000 adults. A new panel is introduced every three years, so there are always two overlapping panels.

The SLID data have some features that make them useful for studying Ontario youth's accessibility to PSE. They contain information on the youth's family background including family structure, the parents' social economic status, and other demographic characteristics. They provide information on PSE participation including time of registration, institution type, and level and program of study. Finally, they are longitudinal, providing the ability to track PSE participation over time. The main drawback is the small sample size at the provincial level, making it difficult to confidently identify patterns for some population sub-groups.

Zhao (HEQCO, forthcoming) uses SLID data from 2002 to 2007 to estimate PSE participation rates. The first step in the calculation is to identify all individuals in the sample who were 18 to 21 years of age in 2007 and no longer attending high school. This age group was chosen because the sample size for a single-year age cohort is too small for reliable analysis¹⁹. The second step is to match these individuals to their reported demographic and socioeconomic characteristics when they were 16 years of age. For 18-year olds, this means going back two years in the SLID data, for 19-year olds going back 3 years, and so forth. A respondent's status at age 16 was selected because this is when PSE decisions are likely being made.

The third and final step is to note which individuals aged 18-21 reported attending PSE in any period since 16 years of age. Similar to the YITS study, Zhao groups SLID respondents into three outcomes: enrolled at university, enrolled in other PSE, and did not attempt PSE. The PSE participation rate is defined as the number of individuals enrolled in a university or in other types of PSE (including a community college, business school, trade or vocational school) by ages 18-21 expressed as a percentage of the total pool of respondents. In cases where an individual had enrolled in both a

¹⁹Over 90% of first-year entrants to Ontario universities are under 21 years old (Application statistics, COU); the figure for Ontario colleges is over 60% (OCAS).

university and a non-university PSE institution, he or she is included in the calculation of university participation rate to avoid double counting.

Overview

Figure 13 shows the distribution of SLID respondents among the three PSE participation outcomes. Overall, 69% of Ontarians who were 18-21 years old in 2007 had enrolled in some form of PSE. As in the YITS data, the larger portion of this group (60%) had enrolled in university while 40% had enrolled in other PSE. The aggregate participation rate figure is slightly lower than that found in the YITS study, likely because the average age of the SLID respondents is younger²⁰. The share enrolled in university is slightly higher than in the YITS data, likely for the same reason as the average age of first entry to college or other types of PSE is higher than for university.

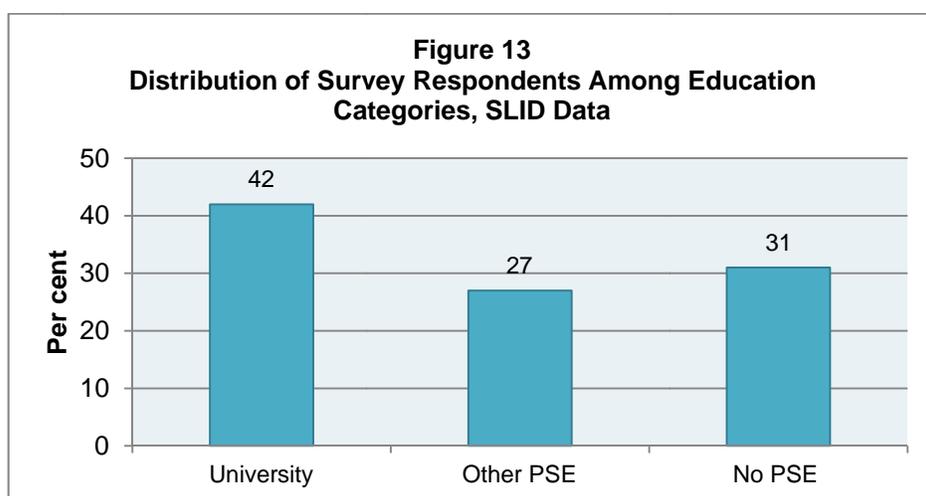
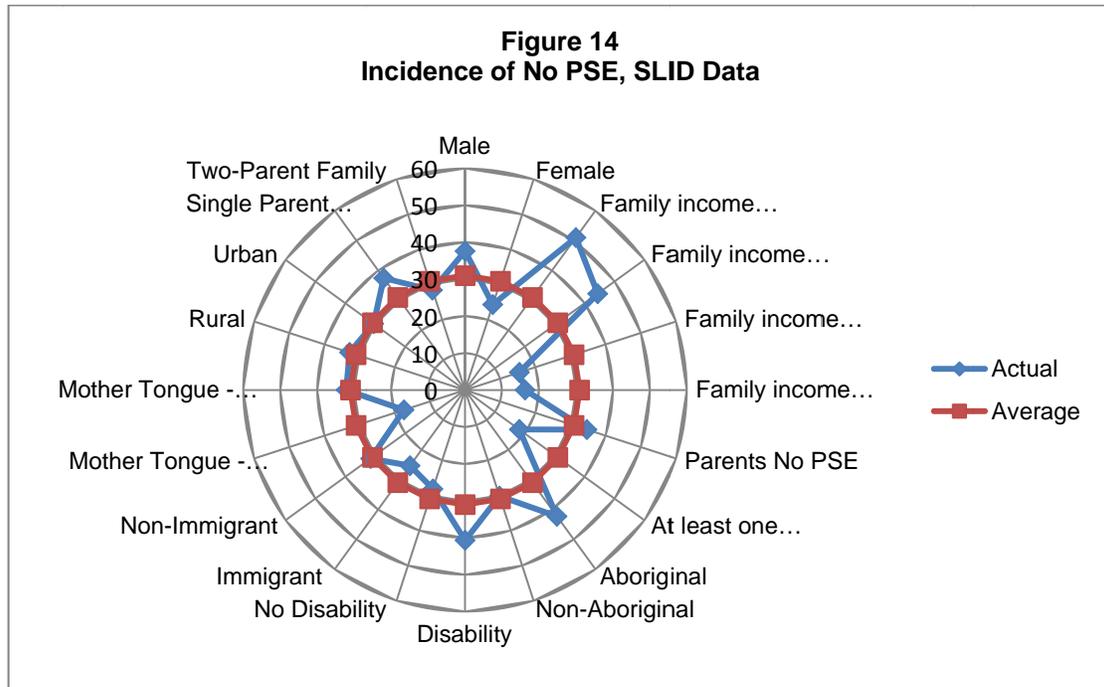


Table 3 presents PSE participation rates for a number of demographic and socioeconomic characteristics. The nine categories are the same as in the YITS data -- gender, family income, parental education, Aboriginal identity, disability status, immigration status, language group, geography, and family status – although the definitions of the characteristics differ in some cases. Figure 14 displays the information in Table 3 graphically. As with Figure 2, any point outside the smooth circle (the average PSE participation rate) indicates a PSE participation rate below the overall average while a point inside the circle indicates a rate above average.

²⁰Recall that all YITS respondents were all 21 years of age.

Table 3: Rates of Access to Postsecondary Education in Ontario -- SLID Estimates

	Total PSE	University	Other PSE	No PSE
All	69.0	42.0	27.0	31.0
Male	62.4	31.3	31.1	37.6
Female	75.7	52.4	23.2	24.3
Family income 1st quartile	49.0	30.4	18.5	51.0
Family income 2nd quartile	55.6	26.4	29.2	44.4
Family income 3rd quartile	84.5	50.8	33.8	15.5
Family income 4th quartile	83.7	58.9	24.8	16.3
Parents No PSE	65.3	34.4	30.9	34.7
At least one parent completed PSE	81.8	58.8	23.0	18.2
Aboriginal	57.7	36.3	21.4	42.3
Non-Aboriginal	69.8	42.5	27.3	30.2
Disability	59.3	30.2	29.1	40.7
No Disability	71.8	45.3	26.5	28.2
Immigrant	74.7	58.9	15.7	25.3
Non-Immigrant	68.4	39.7	28.7	31.6
Mother Tongue - Non-English	82.6	53.4	29.2	17.4
Mother Tongue - English	67.8	40.1	27.7	32.2
Rural	67.2	25.0	42.1	32.8
Urban	69.5	44.2	25.3	30.5
Single Parent Family	62.6	46.1	16.4	37.4
Two-Parent Family	71.5	41.7	29.8	28.5



By comparing SLID results (Table 3 or Figure 14) with YITS results (Table 1 or Figure 2), it is clear that although the variable definitions and groupings differ somewhat in the two surveys, the overall differences in participation rates among population characteristics are similar. The groups in the SLID data with relatively low participation rates are: males, those from families with income in the 1st and 2nd quartiles, those whose parents have no PSE, Aboriginal people, those with a disability, and those from single-parent families.

Comparison of SLID and YITS results for each population sub-group

In this section, we compare the SLID results to the YITS results for each population sub-group and examine the similarities and differences in detail. We are only able to present results on a characteristic-by-characteristic basis as sample sizes are too small to support statistical analysis aimed at allowing for overlap among categories²¹.

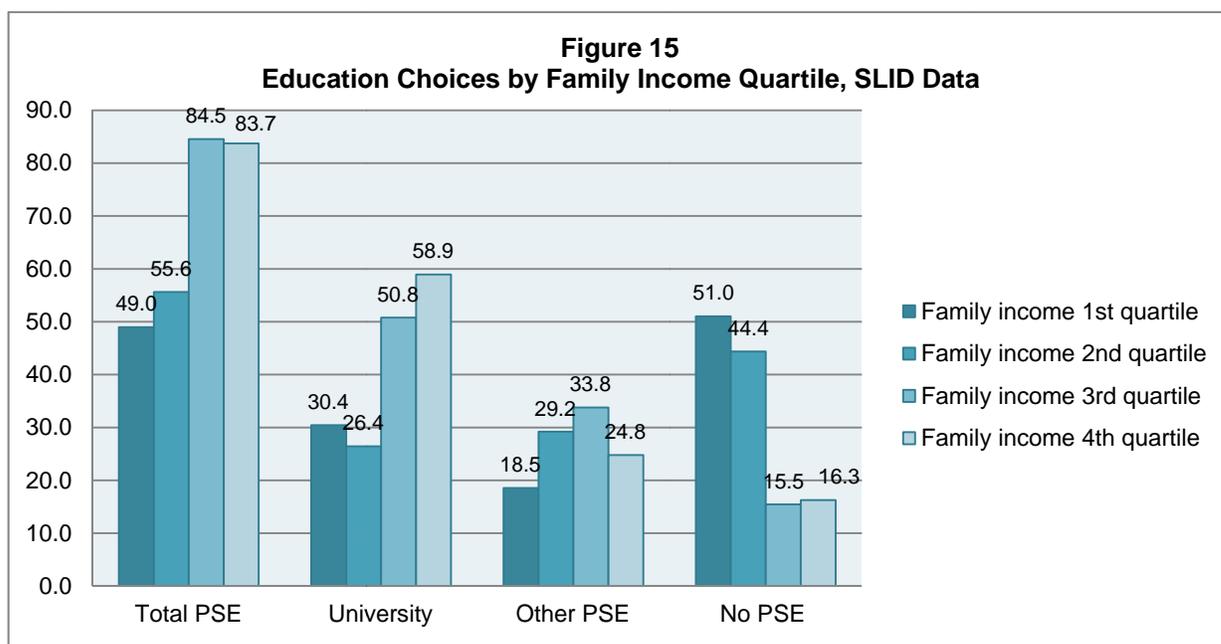
As with the YITS results, SLID data also show that gender is an important factor in explaining PSE choices. Sixty-two percent of males in the SLID sample had enrolled in PSE compared to 76% of females. Females were notably more likely than males to enroll in university (52.4% compared to 31.3%), while males were slightly more likely than females to attempt other types of PSE (31.1% compared to 23.2%).

The gender gap in the SLID data is slightly larger than that found in the YITS data. The ratio of females to males ever having enrolled in PSE is 1.23 in the SLID data and 1.17

²¹ Research underway by Zhao (forthcoming) will use the cross-sectional SLID data to examine the effect of each factor in regression models.

in the YITS data. This difference is probably explained by the younger average age in the SLID sample as males tend to start PSE later than females (Kerr, 2010).

Family Income in the YITS study is grouped into five categories in increments of \$25,000, while the SLID study disaggregates family income into family income quartiles. Although the groups are different, both data sets show that family income is a significant factor for overall PSE participation and for university participation. Figure 15 shows that more than half of youths in the SLID sample from the lowest family-income quartile had not attempted PSE compared to just 16% of youths from the highest quartile. This is the largest gap for any of the groups in the SLID sample. In addition, the university participation rate of youths in the highest income quartile families is nearly twice that for youths in the lowest quartile.



One notable pattern in Figure 15 is the jump between the first two income quartiles and the second two. This jump is not shown in the YITS data where PSE participation rate increases gradually over the five income groups. The SLID data show that youth from the second income quartile are slightly more likely to attend PSE than those from first income quartile families, while the PSE participation rate is almost identical for those from the third and fourth income quartiles. The participation rate difference between the highest income group (>\$100K) and the lowest income group (\$5-25K) in the YITS study is 21%. In comparison, the variations among SLID income groups are much more dramatic with the difference between the fourth family income quartile and first quartile being 35%.

SLID results closely mirror YITS on the link between family income and university participation. Both datasets show that with one exception (the second lowest income group), participating in university increases with family income. Both also show that university participation of the second lowest income group is lower than that for the

lowest income group, a result consistent with that found in the YITS data. SLID data also show that family income is much less of a factor for participating in other types of PSE. The percentage of SLID respondents choosing other PSE rises from the first to the third family income quartile, but falls notably for the highest income quartile.

Similar to the findings in the YITS data, SLID data show that parental education matters for educational choices. Sixty-five percent of youths whose parents had not completed any PSE opted for higher education compared to 82% for youths with at least one parent with some PSE. The university participation for the latter group is also much higher than the former – 59% compared to 34%.

The PSE participation rate difference between Aboriginal people and non-Aboriginal people in the SLID data is not as marked as that seen in YITS. Fifty-eight percent of Aboriginal people reported participating in PSE compared to 70% of Non-Aboriginal people. Also, the gap between the two groups in terms of university participation rate is much smaller than the gap seen in the YITS study. However, given the small sample of Aboriginal respondents included in the SLID sample used for this study, the results for Aboriginal people may not be robust.

In the SLID data, a respondent is assigned disability status if there is a physical or mental condition or a health problem that reduced the amount or kind of activity he or she was able to carry out. SLID results show that disability status matters for university participation, but does not matter much for other PSE participation. Participation rate in other types of PSE for youths without disability and with disability are almost identical (27% compared to 29%). However, similar to the YITS finding, university participation rate of those without disability were higher than those with disability (45% compared to 30%).

In the SLID data, PSE participation gap between youths with and without disability status is not as wide as the one shown in the YITS data. One possible explanation for the narrow gap is that the disability status definition is broader in the SLID data.

The PSE choices by immigrant status in SLID data closely mirror the results found in YITS. Immigrants are much more likely to participate in universities than non-immigrants (59% compared to 40%), while non-immigrants are more likely to choose other types of PSE than immigrants (29% compared to 16%). Overall, immigrants have a slightly higher PSE participation rate than non-immigrants.

The results for participation by English and Non-English mother tongue display a similar pattern to that for Immigrant status. Youths with non-English as a mother tongue have higher university participation rate than youths with English as their mother tongue. The population with non-English mother tongue likely overlaps the immigrant population.²²

²² Due to the small sample size of the SLID data, we were not able to create a separate group for Francophones based on the mother tongue variable.

Education choices by geographic location in SLID data show a similar pattern to that seen in YITS. Urban youths are more likely than rural youths to participate in university (44.2% compared to 25%) while rural youths are more likely to choose other PSE institutions than urban youths (42.1% compared to 25.3%).

Finally, SLID results on participation by family status are slightly different from the results seen in YITS. In both datasets, youths from two-parent families have higher total PSE participation rates than youths from single parent families. However, different from the YITS results, SLID respondents from single-parent families were slightly more likely to choose university over other types of PSE (46.1% chose university, 16.4% chose other PSE). In comparison, YITS data shows that those from single parent families were more likely to opt for other PSE. There is no obvious explanation for these differences in the results.

In sum, the SLID data confirm the accessibility picture derived from the YITS data. There are some small variations to be sure, but these can generally be explained by differences in age groups and in how population characteristics are defined.

Data Linking

An alternative approach to filling data gaps is tracking students' educational choices by linking information from a number of education data bases. HEQCO has supported two initiatives exploring this approach.

The main HEQCO data-linking effort is the work carried out by the Public Economics Data Analysis Laboratory (PEDAL) based at McMaster University. PEDAL's initial focus was identifying the effects of income on university participation. To this end, they were able to link information from three data sets²³.

The starting point is annual student-level application and registration data from the Ontario Universities' Application Centre (OUAC) for the period 1995 to 2005. These data provide the numerator for calculating university participation rates. The next step was to link these data to high school variables. They were able to use publicly-available school level data to calculate the number of students enrolled in grade 10 each year, which is a measure of the population potentially available for PSE in 2-3 years and serves as the denominator for calculating the PSE participation rate.

They then matched the postal code for high schools to the census sub-division in which they are located, and extracted the relevant demographic and socioeconomic information from the 1991, 1996, 2001 and 2006 census returns. By assuming that every student from a high school lived in the neighbourhood in which the school was

²³ They also linked registration data to administrative records for 4 universities to track progress of students once registered. The results on persistence rates are discussed in another *@Issue* paper (McCloy, HEQCO, forthcoming).

located, they were able to attach a demographic and socioeconomic profile to each university applicant.

Their results (Dooley et al, 2009) are consistent with those reported for YITS and SLID. They find a strong rank ordering of university application rates by family income. The application rate for the highest income quartile in 1995 was nearly 50%, compared to 30% for the bottom quartile. This gap appears to have widened over time; the rate for top quartile in 2005 was 55% compared to just over 30% for the lowest quartile. Interestingly, there were no significant differences among income cohorts for registration rates. The implication is that the challenge lies in getting low-income students to apply to university; having applied, they are equally likely as their higher-income counterparts to attend.

Dooley et al note the overlap among characteristics and conduct multiple regression analysis to uncover the independent effects. The income effect remains when other variables are included, but the impact is diminished. The gap of 21.4 percentage points when income is considered in isolation is reduced to 13.6 points when control variables are included. They find that single parent status is not significant (unlike the YITS data) and that rural location has a significantly negative impact on university participation rates (as with YITS data).

Alan King et al (2009) conducted a study for Colleges Ontario on who does not proceed to higher education, with HEQCO as one of several partners. These researchers linked secondary school data at the student level to college and university application centre data, and looked at rates of transition to PSE. They found that after 5 years (or less) of secondary school 34% of the students had enrolled in university, 20% had enrolled in college, and 6% had enrolled in apprenticeship programs.

Their estimate of the total PSE rate of 60% is lower than that found with the YITS data (81.9%) or SLID data (69%). There are two factors that likely explain this difference. One, they look at transition rates after 5 years so are not considering students who do not enter PSE directly. Two, they only look at university, college or apprenticeship, where the other data sources include transition to other forms of PSE as well (e.g. private career colleges).

The authors examined characteristics associated with a transition to PSE. They looked at these characteristics individually and did not control for overlap among them. They had no data on family income or parental education so were unable to report on these variables. Their other results are generally consistent with those from YITS and SLID. Thus they report that rural and northern students are less likely to apply to and register in PSE than urban and southern students. Further, students from large urban areas are much more likely to register in university than college.

They find that students from French-language school boards are more likely to attend college and slightly more likely to attend university than those from English-language boards. This result differs somewhat from results from YITS where, considered in isolation, Francophone respondents in YITS are less likely to enroll in university than non-Francophones and more likely to enroll in college. When all characteristics are

considered together in the YITS analysis, however, these differences cease to be statistically significant.

King et al find that females are more likely than males to register in university while males and females are equally likely to register in college. The first conclusion is consistent with the YITS results even when overlap is considered. The second is not. In the YITS analysis, females are significantly less likely to enroll in college than males.

They also find that Aboriginal students are far less likely than non-Aboriginal students to enroll in university or college. Their former conclusion is consistent with the YITS data but the second is not. The YITS data show no statistically significant difference for non-university enrollment. This discrepancy may reflect age differences in the two samples. King et al looked at direct entry students while YITS respondents are 21 years of age.

These investigations demonstrate that linking education data sets holds significant promise for further our understanding of accessibility in Ontario. One important advantage is that it can be repeated every year and thus used to track changes in participation and graduation rates over time. But there are a number of issues to resolve before the potential can be fully exploited. Most obviously, there are important privacy considerations to be resolved when student-record-level data are involved. There are also significant practical challenges dealing with large and complex data sets.

Summary and Observations

We can report considerable progress in our efforts to provide a statistical profile of PSE accessibility in Ontario. The data analyses reviewed above provide a reasonably comprehensive and consistent snapshot of who participates and who does not participate in higher education. This picture can be summarized as follows.

First, aggregate PSE participation rates in Ontario are relatively high. Over 80% of secondary school students enroll in some type of PSE, a figure which puts the province among the leading jurisdictions world-wide. More than half of this group goes to university, with the remainder in colleges, apprenticeships, and private training programs. Not all these enrollees will graduate, so the eventual attainment rate will be somewhat lower. Still, it is clear that participation rates of Ontario youth will contribute to raising the province's PSE attainment rate for the population aged 25-64 from its current 62% figure to the target rate of 70%²⁴.

Second, some groups are clearly under-represented in higher education. Having any of the following characteristics lowers the chance that an Ontario youth will enroll in PSE: being from a low income family, having parents with no PSE, living in a rural area, identifying as Aboriginal, and having a disability. It is important to stress that this

²⁴ To repeat a point made in the text, for the target to be reached anytime soon Ontario will require additions of immigrants with PSE credentials obtained abroad and educational upgrading by adults.

statement holds even when all student characteristics are considered together. That is, each characteristic brings its own challenges with respect to PSE participation, and thus its own challenges for policy making.

Third, some characteristics that appear to be correlated with under-representation in PSE cease to be significant when all factors are considered together. We refer here to mother tongue and family status. Youth from both groups are equally likely to enroll in PSE as their counterparts once factors such as geographic location and family income are taken into account. The finding with respect to language is now acknowledged in government policy as attention has turned from participation to availability of programs in French.

Fourth, some groups on the list of those needing special attention are in fact not under-represented in PSE. We refer here to first- and second-generation immigrants. Youth from these groups are significantly more likely than non-immigrants to enroll in PSE. As with some other characteristics noted above, this is purely a university effect. Immigrant youth are less likely than their counterparts to enroll in other types of PSE.

Fifth, there are clear gender differences in PSE participation, mainly reflecting preferences by females for university. This gap has been apparent for some time, and has gone a long way to overcoming historical trends where females were under-represented in PSE. This historical gap still persists in higher levels of university education although it is gradually disappearing. Traditional gender gaps in programs of registration remain in university, college and apprenticeship enrolments.

Unfortunately, we are further behind in our understanding of why participation rates vary among characteristics and what to do to overcome them.

Consider first the role of family income. Low income is a barrier to PSE participation, although the relationship is more complex than is traditionally expressed. Most notably, the effect of income is greatly reduced when it is considered jointly with other characteristics. The fact that the negative effect of family income is markedly less than is often believed reflects the important role that student financial assistance policies have played in encouraging and supporting PSE participation in Ontario and in Canada more generally. The fact that the income effect remains significant after controlling for other characteristics suggests there is a place for further improvements to these support policies.

The explanation for the urban-rural gap may be that rural students face additional costs in attending college or university. Institutions are generally located in urban centres so students must live away from home. The Ontario Student Assistance Program (OSAP) recognizes these costs, but the fact the variable is significantly negative suggests the offset is not complete.

The explanation for the under-representation of persons with a disability lies in part in the additional costs that these youth face in attending and completing PSE (Chambers, Bolton and Sukai, 2011) and in the greater uncertainties they may face in labour markets upon graduation (Holmes and Silvestri, 2011). It also reflects the fact that PSE

institutions in Ontario are in the early stages of taking the steps needed to accommodate students with disabilities.

The remaining two characteristics associated with under-representation – Aboriginal identity and parental education – represent the two largest negative effects on PSE participation. Their effects are only slightly reduced when all variables are considered together, meaning they have strong independent influences. While this statistical relationship is clear, the interpretation is obscure. The usual view is that parental education and Aboriginal identity are proxies for what have come to be known as cultural factors: attitudes to education, knowledge about expected costs and benefits of higher education, real or perceived institutional and labour market discrimination, and so forth.

This interpretation, if true, has important policy implications. A different approach is required to increase participation rates. Put starkly, money alone will not work. Policy initiatives must somehow find ways to provide the advantages that other students receive by virtue of having parents with PSE experience or being a non-Aboriginal person. This certainly involves providing accurate and easy-to-understand information on the costs and benefits of pursuing PSE and the financial and other support available. It probably involves assistance in understanding the complex array of PSE choices available, and guidance on how to navigate the complex application and registration processes. It definitely means starting these initiatives in the beginning high school years or even earlier. It may mean involving extended families and even entire communities.

We end the paper on a note of concern. As matters stand, it will not be possible to track how PSE participation patterns evolve over time, and thus to evaluate the effects of policies aimed at reducing and eventually eliminating PSE participation rate disparities. There is one more cycle of YITS data to come, after which the survey ends and there are no plans to institute a follow-up project. In any case, YITS follows one cohort only so it is not possible to use a YITS-type survey to track changes over time. SLID is an ongoing survey and provides some useful information, but sample sizes at the provincial level are a problem.

Data linking may offer the best avenue for tracking and understanding changes in PSE outcomes over time. Students in grade 9 or grade 10 can relatively easily be surveyed each year. The implementation of the OEN will greatly ease the task of tracking students from high school into PSE and beyond. But formidable procedural and practical challenges remain, as noted above. Until these are overcome, Ontario will be constrained in its ability to track progress on a key policy priority and to evaluate the effects of the range of policy initiatives brought to bear on the problem.

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