

Regional Differences in Canadian Rural- Urban Participation Rates in Post- Secondary Education

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MESA MEASURING THE EFFECTIVENESS OF STUDENT AID

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The MESA Project

The Measuring the Effectiveness of Student Aid Project, or the MESA Project, is a four year research effort being conducted by the Canadian Education Project and the School for Policy Studies at Queen's University on behalf of the Canada Millennium Scholarship Foundation. It has been designed to answer the following four questions:

- After graduating from high school, teenagers coming from low-income backgrounds face a choice as to attend college or university, or not. For those who did attend, how do they compare to those who did not?
- Does providing more funding in a student's first few years of further education attract more low-income students to post-secondary education?
- Does providing more funding in a student's first few years of further education make it more likely for low-income students to stay in and graduate?
- Are low-income students different across Canada?

This paper is part of a series of research papers solicited from some of the leading Canadian researchers in the field of post-secondary education; the researchers were asked to write about issues of access and persistence in post-secondary education in Canada. The requirements for the papers were that the researchers use one of several currently-existing Statistics Canada databases or another source of Canadian data. Each of the papers commissioned during this project is available for downloading from the MESA Project website at www.mesa-project.org.

The findings and conclusions expressed in this paper are those of the authors and do not necessarily represent those of the MESA Project or its partners.

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The **Canada Millennium Scholarship Foundation** is a private, independent organization created by an act of Parliament in 1998. It encourages Canadian students to strive for excellence and pursue their post-secondary studies. The Foundation distributes \$325 million in the form of bursaries and scholarships each year throughout Canada. Its objectives are to improve access to post-secondary education for all Canadians, especially those facing economic or social barriers; to encourage a high level of student achievement and engagement in Canadian

society; and to build a national alliance of organizations and individuals around a shared post-secondary agenda. The Foundation is funding the MESA Project overall, and has negotiated access to its student administrative lists with each of the provinces on the project's behalf.

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Abstract

This paper uses data from the four cycles of the Youth In Transitions Survey (YITS), Cohort A (who were 15 years old at the first data collection) to examine how the different post-secondary education (PSE) options facing youth across Canada affect the PSE participation rates of rural as compared to urban youth. The specific issues examined are: rural-urban differences in (a) PSE participation and (b) participation particularly in university, among those who attend some PSE. Findings show that, apart from some important differences between Quebec (which has a very different PSE system) and other regions, much of the rural-urban difference in both PSE and university participation can be explained by characteristics of the students and their families in the different regions. There is little or no rural-urban difference in persistence to date, but, given their youth, as the respondents age, this pattern may change.

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Introduction

This paper¹ looks at rural-urban differences in post-secondary education (PSE), and attendance at university among those who attend PSE, in different regions of Canada using data from the younger cohort (Cohort A) of the Youth in Transitions Survey (YITS). Specifically, it examines rural-urban differences in participation in any form of PSE, as well as whether the youth had registered at a university by age 22, when cycle four of the YITS was conducted. It also considers levels of “persistence,” or continued enrolment in post-secondary education, keeping in mind that some respondents may return to PSE beyond the age of 22.

An ongoing issue in the Canadian educational scene is that one of the many factors influencing youth’s participation in PSE is their rural versus urban location (Andres and Looker 2001; Butlin 1999; Corbett 2000, 2007; Christofides et al., 2001; Looker 2007, 2003, 2001, 1997a, 1997b, 1994, 1993; Rojewski, 1999; Tomkowicz and Bushnik 2003; Witko et al., 2006). Much of this difference appears to reflect physical distance from universities and colleges insofar as most urban areas have some type of post-secondary institution (often several) while few such institutions are located in rural areas (Andres and Looker 2001; Frenette 2003, 2006). This differential distribution of institutions (which itself varies by type of institution) means that rural youth often have to leave their home community to attend any post-secondary institution, particularly if they want to attend university (see Corbett 2000, 2007 for in-

sightful discussions of the related tensions created in schools in rural areas).

There is also considerable variation in post-secondary education participation rates across the different regions of Canada, with corresponding differences in these rates based on rural versus urban location within the different regions. This variation no doubt reflects, in part, the differences among the provinces and regions in the availability of post-secondary education options. It is important to examine the effect of these different systems and structures on the participation rates and persistence of rural youth in post-secondary education.

In much of the literature, the primary focus is on individual and family level factors that have an impact on rural youths’ decisions about pursuing post-secondary education (but see Cartwright and Allen 2002). Parents in rural areas tend to have lower levels of education (Looker 1994). Rural youth often have lower educational aspirations (Andres and Looker 2001; Looker 1997b, 1993). Previous literature focuses less on the impact of different educational structures in the different regions of Canada (but see Lambert et al. 2004), despite the fact that these structures reflect and can be modified by public policy, while individual and family characteristics are more difficult to alter with such policies.

Tuition costs and program lengths vary by type of PSE (with many but not all non-university programs being shorter than university ones). Tuition fees reflect provincial

¹ This research was financed by the Canada Millennium Scholarship Foundation through the MESA project.

policy in addition to varying by institution (Coelli 2004). Unfortunately, details regarding tuition costs and program lengths are not easily accessible in the YITS data.

The current analysis carries potential policy implications since it examines the effect of PSE educational structures on the PSE participation and persistence rates of rural as compared with urban youth. These structures vary across different parts of the country because different policies have been put in place in these regions. As Frenette (2003, 2006) has shown, distance to a PSE institution affects not only whether a rural young person attends PSE but also the type of PSE attended. Increasing options within rural areas means that rural youth can base their educational decisions on factors other than distance from their home community. One of the reasons Alberta and British Columbia have invested so heavily in an articulated system (which allows university credit courses to be offered in the widely dispersed community college system) is to increase access to university programs for rural youth. University administrators across Canada are considering similar options. The CEGEP system in Quebec involves students in PSE in a way that is very different from the systems in other areas of Canada. Discussions about whether similar systems would be advantageous in other regions need to be based on empirical evidence of the effects of this system on rural as well as urban youth.

Why study rural-urban differences? Rural-urban differences are important for a number of reasons. Not only are rural students underrepresented at universities, the dynamic of their decision-making about PSE

is very different than that of most urban youth. While some rural youth may share background characteristics with many disadvantaged urban youth (e.g., low parental socio-economic status, no history of further education in their family or sub-culture, assumptions that further education is not for “people like me”), their geographical location puts them in a unique situation. With the exception of those who live in the few rural communities in Canada that contain a university, most would have to leave their community to pursue a university education. This usually means leaving not only their parental home, but also their friendship network of support. If there is a non-university program nearby, they may opt for that instead (Frenette 2006). However, this reality means that their decisions reflect not only their preferences but also their location, something that tends to be less of a factor for most urban youth.

Beyond the impact on individual youth, requiring rural youth to leave their home communities to pursue PSE also has a major impact on these rural communities. Corbett (2000, 2007) presents a detailed and insightful analysis of how rural youth are “learning to leave” by following dictates that urge them to continue their education beyond high school. Moreover, as Bollman and Berishi (2000) note, “education is important to migration not only because there is a positive relationship between educational attainment and migration rates. The rate of out-migration from RST (rural and small towns) areas is higher for each level of educational attainment.” In other words, rural youth not only leave to pursue PSE, but once they leave they are unlikely to return, despite their oft

noted close ties to their home communities (Looker 1993).

This out-migration of rural youth is an ongoing issue for many rural communities in Canada. “There has been for some time substantial concern regarding the loss of young people in rural communities. There is a sense that most rural communities offer few opportunities for their younger people, requiring them to leave for urban communities, most likely not to return” (Dupuy, Mayer and Morissette 2000: 1). “Migration is a concern for Rural and Small Town (RST) areas of Canada as rural development is essentially a demographic phenomenon” (Rothwell et al. 2002: 1). This concern is not only limited to Canada (Rye 2006), but rather is a concern shared by other countries as well.

Hence, youth out-migration is an issue not only for those interested in educational policy, but also those involved in policies related to rural economic development. That is, the “solution” to the problem of rural youth underrepresentation in certain PSE programs, particularly university, cannot simply be to put supports in place to encourage more youth to pursue this level of education and to continue on to graduation. Rather, any policy initiatives need to take into account more macro level issues of the health of rural communities, and how to keep or attract youth, including highly educated youth, to these areas.

Data and Measures

As indicated above, the data used in this analysis come from participants in the YITS,

Cohort A, who were 15 years of age at the time of the first data collection. In 2000, surveys were given to a sample of students born in 1984 in Canada’s ten provinces. A two-stage sampling procedure was used, with the first stage involving the selection of 1,200 schools. Within each school a sample of the appropriately aged students were selected. Completed surveys were received from 34,275 students in cycle one.² These respondents were resurveyed every two years, with cycle four data being collected in 2006. Only those who responded in cycle three were contacted in cycle four. The number responding in cycle four was 22,626. The cycle four weights were used in the analysis.

Measures

The measures used in the analysis are listed here, with the detailed descriptions and source variables from the YITS given in Appendix A.

Dependent variables

The three dependent variables in this analysis are:

1. Ever attend PSE (1=attended, 0=didn’t attend);
2. Ever attend university (1=attended, 0=didn’t attend); and
3. Persistence (1=graduate or continuer, 0=leaver).

Note that the focus of the first two is on PSE and university *attendance*, not the attainment of a degree, diploma or certificate. The third considers whether, *at the time of the cycle four data collection*, the young person has left PSE without completing or not.

² See www.statcan.ca for details regarding sampling and data collection.

“Persisters” include those who have graduated with a certificate or diploma as well as those still registered in PSE. Only leavers are considered “non-persisters.” Since Cohort A respondents are just 22 years of age at cycle four, this examination of persistence may be premature.

Also note that *type* of PSE and persistence were only asked of those who attended PSE, so the case base on which percentages are calculated varies for the first versus the second and third measures. That is, they are conditional percentages. This fact needs to be kept in mind when considering the results.

Independent variables

The main independent variable in this analysis is *rural-urban location*. The codes for this variable in the YITS data are based on the location of the high school the respondent attended in cycle one (where 0=urban, 1=rural). A quarter (25 percent) of the respondents were classified as rural.

As indicated in Appendix A³, the designation of “rural” in this survey includes all areas other than “census metropolitan areas” and “census agglomerations”. Therefore, rural includes what Statistics Canada refers to as “strong metropolitan influence zones”. The effect of this definition is that more communities are coded rural than might otherwise be the case. This coding (which cannot be changed for different analyses) is likely to

have the effect of minimizing rural-urban differences, since some communities that are near metropolitan areas, and therefore are more “urban” in their characteristics, are counted as rural. This fact should be kept in mind, especially in those instances when control variables reduce the rural-urban difference to non-significance.

The other key independent variable is the *region of the country*. In order to maintain a sufficient case base, it was necessary to group some provinces together⁴. Based on the province of last high school attended, the five identified regions include: (a) Atlantic (Newfoundland and Labrador, Nova Scotia, New Brunswick, Prince Edward Island), (b) Quebec, (c) Ontario, (d) the Prairies (Manitoba and Saskatchewan), and (e) the West (Alberta and British Columbia). Alberta and British Columbia both have formal systems of articulation. Quebec has a very unique post-secondary system with its CEGEP program, which is coded in the YITS as “college” even if the student is registered in a university program. While grouping all four Atlantic Provinces together might be problematic, it was seen as warranted in order to maintain sufficient cases in the various analyses. Of course, there are some important differences, with Prince Edward Island and Newfoundland and Labrador having only one university each (albeit with more than one campus, in the latter case) and New Brunswick and Nova Scotia

³ See Appendix A for more details regarding the definitions of urban and rural used in the YITS.

⁴ As is true in many Statistics Canada surveys, the northern territories were not included in the sampling frame.

having several, including several campuses in rural areas.⁵

So, what can the YITS data tell us about the systems in the different regions? If one system were better than another at providing access to PSE for rural youth, two patterns should emerge: (a) the rates of PSE participation among rural youth should be higher in that region than for rural youth from other regions and (b) the rural-urban *difference* in participation should be lower in that region. Similarly, if one system were better than others at encouraging rural youth to participate in university and at providing access to universities, then (a) higher rates of participation in university by rural youth and (b) lower rural-urban differences in university participation in that region could be expected.

The types of "systems" used for comparison in the regions identified in this analysis were:

1. a proliferation of PSE institutions in general and of universities in rural areas (as is found in the Atlantic region and Quebec);
2. formal articulation agreements between colleges and universities (as is found in Alberta and British Columbia);
3. the system in Quebec whereby the first years of PSE take place in the CE-

GEP system, which is part of both university and non-university programs. That is, Quebec essentially has an "articulated" system as well. As noted above, Quebec also has a proliferation of institutions (especially CEGEPs) in rural areas.

If the distribution of institutions were key to participation, one would expect participation rates by rural youth to be highest in the Atlantic and Quebec. If an articulated system were to attract more rural youth, more PSE participation (although lower university participation) would be expected in the West and Quebec. Given that the proliferation in the Atlantic region tends to be of universities, more university participation of rural youth in the Atlantic region, but not necessarily Quebec, would be expected.

Control variables

A number of variables were also controlled in the multivariate analyses, given that they are known to be related to rural-urban residence, PSE participation, or both.⁶ These variables include (see Appendix A for details):

- Gender (0=male, 1=female);
- Language used to complete survey (0=non-English, 1=English);
- Visible minority (0=no, 1=yes);

⁵ There is also a large francophone population in New Brunswick. Preliminary analyses (see Appendix B) showed no French-English differences in rural or urban New Brunswick. Indeed, the only significant English-French difference was seen in urban, not rural, Quebec. Given that language was so conflated with province of residence, particularly with residence in Quebec, which has a different structure and pattern of PSE attendance, a more detailed analysis of the role of language would require an in-depth examination of PSE in Quebec, a task beyond the scope of this paper.

⁶ There are, of course, a wide range of other variables that could also have been included as controls. Aboriginal status is an obvious one. However, the YITS, like many Statistics Canada data sets, excluded on-reserve First Nations youth, as well as any living in the northern territories. One might include their educational aspirations, but this would create endogeneity problems. The control variables included in the analysis did capture some key factors that could help explain any regional rural-urban differences in PSE and university participation, within the constraints of the information provided by the YITS.

- Immigrant status (0=non-immigrant/3rd generation or higher, 1=1st or 2nd generation immigrant);
- Repeated a grade (0=no, 1=yes);
- Marks in high school, from a high of 6=90%-100% or more, to a low of 1=less than 50;
- Parental education (1=no PSE, 2=non-university PSE, 3=university); and
- Parental income, fifteen categories in \$10,000 increments from 0=no income to 15=\$15,000 or higher.

Results

Rural-urban differences

Table 1. Urban-rural differences in PSE participation and persistence

	Attend any PSE	Attend university	Persist (grad or continuer)
Urban	76%***	58%***	87%
Rural	67%	46%	85%
Total	74%	56%	86%
Weighted N	16996	12500	12520

*= sig at .05, **= sig at .01, ***=sig at .001.

The first stage of the analysis involved documenting the overall rural-urban differences. As seen in Table 1 (above), there were differences in both participation measures based on urban-rural location. More urban youth attend some form of PSE. Among those who attended PSE, more urban youth also reported attending university at some point. As one might expect, the rates of ever attending university were lower than those

for attending some PSE, with these rates remaining fairly consistently lower (by 9 percent to 12 percent) for rural youth. It is this difference that is the main point of interest in this paper. Notably, as shown in the right hand column of Table 1, there was no urban-rural difference in persistence rates.

The main focus of this analysis is on how these urban-rural differences in participation vary by region of the country. Table 2 (below) shows the relevant results.

Looking first at the measure of whether the young person attended *any* PSE, some consistent urban-rural differences were observed in almost all regions. In all areas, more urban than rural youth attended a post-secondary institution at some time prior to the cycle four data collection in 2006 (although the difference in the Prairies is too small to reach statistical significance). The participation of rural youth in PSE was also higher in the Atlantic region (73 percent) and Ontario (74 percent) than the remaining three regions (67 percent, 61 percent and 61 percent in the Prairies, Quebec and the West, respectively). The urban-rural *difference* was largest in Quebec, Ontario and the West. These preliminary results suggest that neither Quebec's CEGEP system nor the articulated systems in the West in and of themselves increase access for rural youth as much as the proliferation of PSE institutions in rural areas that characterizes much of the Atlantic region. Note that *urban* levels of PSE attendance were highest in Ontario and the Atlantic region,⁷ suggesting that the situation

⁷ The authors of a 2008 Canadian Policy Research Network report note that, based on the 2001 census, more Quebecers obtain a PSE diploma, certificate or degree than elsewhere in Canada. It remains to be seen if the educational attainments of the YITS youth will reflect this same pattern.

Table 2. Urban-rural differences in PSE participation and persistence by region

	Attend PSE	Urb-rural difference	Attend university	Urb-rural difference	Persist	Urb-rural difference
Atlantic		4%*		15%***		-1%
Urban	77%		73%		85%	
Rural	73%		58%		86%	
Quebec		11%***		7%*		0%
Urban	72%		44%		82%	
Rural	61%		37%		82%	
Ontario		9%***		22%***		-2%
Urban	83%		59%		89%	
Rural	74%		37%		91%	
Prairies		1%		14%***		3%
Urban	68%		72%		85%	
Rural	67%		58%		82%	
West		11%***		12%***		5%*
Urban	72%		62%		87%	
Rural	61%		50%		83%	
Total N	16886		12500		12520	

*= sig at .05, **= sig at .01, ***=sig at .001.

warrants more detailed analyses beyond these percent differences.

The middle section of the table shows that, among those who attended some PSE, there was an additional urban-rural difference in university participation. The percentages were lower for Quebec than elsewhere, suggesting that starting PSE in a CE-GEP does not seem to improve the likelihood of university attendance. However, language and other factors are conflated with province here, so it is difficult to decipher the underlying dynamic.

The urban-rural *difference* in university participation was largest in Ontario (22 percent difference), the Atlantic region (15 per-

cent) and the Prairies (14 percent) and smallest in Quebec (7 percent). This pattern may be surprising given that rural participation in universities was highest in the Atlantic region and the Prairies and lowest in Quebec and Ontario. However, there were also regional variations in the participation of urban youth in universities.

Finally, the right hand column clearly shows that there were essentially no urban-rural differences in PSE persistence in any of the regions except the West. (More detailed analyses document that this difference exists only in British Columbia, where urban youth had an 87 percent persistence rate, compared to 79 percent for rural youth).⁸ Given this lack of difference, further analyses of the

⁸ This difference in persistence rates (the urban-rural difference in persistence being two percent in Alberta and eight percent in British Columbia) is the only statistically significant difference in the dependent variables between the two provinces that comprise the “West”. In all other comparisons, the rural-urban differences (in PSE and in university attendance) in Alberta and British Columbia are within two percentage points and the absolute levels in rural and urban areas are within 5 percentage points.

rural-urban gap in persistence seem unwarranted. The remainder of the paper therefore focuses on differences in participation in PSE and in university.

It is clear from these preliminary results that (a) there are clear and consistent urban-rural differences in PSE and university participation and (b) there is some important regional variation in these differences. However, since it is known that a range of other factors affect participation in PSE, it is important to control for the effects of these variables to see if they account for the regional differences in rural versus urban rates of participation.

Table 3 (right) confirms that the control variables included here were related to the outcome measures being considered, the only exception being that language (measured by language used to complete the first survey) was not related to whether or not respondents attended some PSE.

The overall patterns, as seen in Table 1, show that rural youth were less likely than urban youth to attend PSE and to ever attend university. Females were more likely than males to do both. Those completing the survey in English were somewhat more likely than those who completed it in French to attend university. Youth who self-identified as a member of a visible minority group were more likely than others to attend PSE and to attend university. Immigrants attended more than non-immigrants. Not unexpectedly, those who did less well in school were less likely to attend PSE and less likely to attend a university. This pattern holds whether one looks at whether they ever repeated a grade

or at their marks as of age 15. Finally, those whose parents have higher education or higher income were more likely to pursue some PSE and more likely to ever attend university. None of these findings are unexpected. The key question is to what extent these differences can and do account for the rural-urban differences seen in Table 2; since the outcome measures of interest are dichotomies, logistic regression was used to address this question.

Table 3. Bivariate Pearson correlations of independent and control with the dependent variables

	Attend any PSE	Attend university
Rural (0=urban, 1=rural)	-.09***	-.11***
Female (0=no, 1=yes)	.15***	.12***
English (0=no, 1=yes)	0.07	.14***
Visible Minority (0=no, 1=yes)	.12***	.10***
Immigrant Status (0=non-immigrant, 1=immigrant)	.12***	.11***
Repeated a Grade (0=no, 1=yes)	-.26***	-.11***
Marks (1=<50%, 6=90% or more)	.39***	.42***
Parental Education (1=no PSE, 2=Non-university, 3=university)	.26***	.27***
Parental Income (0=no Income to 15=\$150,000+)	.18**	.16***
Total N (varies by question)	16996	12500

*=sig at .05, **=sig at .01, ***=sig at .001.

Multivariate analysis

The first step in the multivariate analysis was to run the regression with all control

variables and with rural-urban location as the independent variable for each of the dependent variables for all respondents.⁹ Then, in order to take into account regional variation in the control variables, two composite regressions were run, including main effects for rural-urban location and region and interaction effects for the five regions with this geographic location. Clearly it is beyond the scope of any one paper to discuss all the findings in detail. However, the key points relevant to this discussion of regional differences in rural versus urban location in PSE and university attendance are identified.

Table 4. Logistic regression of all respondents for ever attended PSE and ever attend university

Odds ratios	Attend PSE	Attend University
Rural	0.91	0.73***
Female	1.61***	1.43***
English	1.08	2.13***
Visible Minority	2.29***	1.50***
Immigrant	1.31***	1.23***
Repeated	0.26***	0.45***
Marks	2.58***	3.32***
Parental Education	1.68***	1.76***
Parental Income	1.08***	1.05***
Constant	0.01***	0.00***
Nagelkerke's R ²	0.32	0.35
N	14754	11492

*=sig at .05, **=sig at .01, ***=sig at .001.

As the top row in Table 4 (above) indicates, the urban-rural difference in attending some PSE in Canada was not statistically significant once the control variables were taken into account. Although an overall difference is evident in Table 1, Table 4 suggests that the rural-urban differences in PSE attendance could be accounted for by differences in students' background characteristics.¹⁰

Being female increased the odds of PSE participation, as did higher academic performance (measured by marks and whether one ever repeated a grade), parental education and parental income.¹¹ These results are not surprising. Being English-speaking (measured in terms of completing the survey in English rather than French) had no effect Canada wide¹². Being a member of a visible minority increased the likelihood of attending PSE, as did being an immigrant.

The patterns for whether or not students had ever attended a university by the time of the fourth data collection were examined, keeping in mind that this question was only asked of those who attended some PSE. The right hand column of Table 4 shows that the pattern of rural "disadvantage" (odds ratio of less than 1.0) existed, even after taking into account these control variables. So, while the control measures seem to account for the

⁹ This analysis was rerun separately for each region – see details in Appendix B.

¹⁰ In data not shown here, rural youth in the YITS are less likely to fill out the survey in English (as opposed to French). They are also less likely to report being a member of a visible minority or a first or second generation immigrant. In addition, they tend to have lower grades, more of them have repeated a grade, and their parents tend to have lower education and income. The only control variable unrelated to rural versus urban location is gender.

¹¹ It is important to note that most of the control variables are 0/1 dichotomies. However, parental socio-education has three categories and income fifteen. Marks are measured with a six point scale, with 1 being low and 6 being high. The odds ratios indicate the effect of *one unit* change in the independent variable on going from 0 to 1 in the dependent variable.

¹² There is a relationship between language and PSE participation in Quebec.

rural-urban difference in PSE participation, they do not account for this location difference in participation rates at university.

The analyses in Table 4 are for Canada as a whole. In order to examine regional differences in the rural-urban patterns of participation in PSE and university, two composite regressions were used, with region and the interactions of region with rural-urban location being explicitly examined. The relevant results are presented in Table 5. Note that the comparisons are relative to Quebec (the omitted category).¹³

The middle column shows the results for “ever attend PSE.” The coefficients of note are the interaction effects, highlighted in Table 5. Here, the only observed rural-urban difference (as measured by the regional interaction effect) was in the Prairies (relative to the omitted category, Quebec). The odds of a rural young person in the Prairies compared to an urban youth in the Prairies participating in some PSE were higher than the comparable odds in Quebec when other factors, including the overall impact of region, were controlled. Put another way, the rural-urban gap was less pronounced in the Prairies than in Quebec, once other variables were controlled. Other analyses (not shown)¹⁴ document that the only other significant rural-urban difference (the only significant interaction effect) in terms of participation in some form of PSE, when region and background/performance factors were controlled, was between the Prairies and the West, with the rural-urban odds ratio and

therefore the rural-urban gap being lower in the West.

Table 4 shows that control variables seem to account for the urban-rural differences in PSE participation Canada-wide, so it is perhaps unsurprising that there were few remaining differences by region.

Table 5. Composite logistic regression of *ever attend PSE* and *ever attend university* with interaction effects (compared to Quebec)

Odds ratios	Ever attend	
	Ever attend PSE	university
Rural	0.82	1.05
Atlantic	1.31	5.27***
Ontario	1.24	2.05***
Prairies	0.62**	4.52***
West	0.70**	2.43***
Atlantic* rural	1.12	0.49***
Ontario * rural	1.24	0.46***
Prairies * rural	1.45*	0.49***
West * rural	1.02	0.69
Female	1.64***	1.43***
English	1.13	1.10
Visible Minority	2.40***	1.52***
Immigrant	1.26***	1.38***
Repeated	0.27***	0.45***
Marks	2.58***	3.36***
Parental Education	1.71***	1.76***
Parental Income	1.08***	1.06***
Constant	0.01***	0.01***
Nagelkerke's R ²	0.33	0.37
N	17373	11492

*=sig at .05, **=sig at .01, ***=sig at .001.

Omitted categories are “Quebec” and “Quebec rural” interaction.

¹³ The decision to use Quebec as the reference category was made on the basis that it showed the most difference from the other regions; omitting it allows those differences to be clearly documented in the results presented.

¹⁴ The significance of the other interaction terms (measuring the rural-urban gap) was tested using the Wald test (in Stata).

What about university attendance among those who attend PSE? A slightly different picture emerges here. The pattern in Table 5 suggests that the odds ratio for the Quebec interaction (the reference category indicating the rural-urban gap) was significantly different, not only from the Prairies, but also from the interaction terms for *all* other regions except the West. Moreover, the odds ratios suggest that, after controls, the rural-urban gap in Quebec was *smaller* than in these other regions. This pattern is consistent with the low rural-urban difference in university attendance in Quebec reported in Table 2.

It is clear that YITS respondents from rural Quebec stood out from all others. As is seen in the interaction effects, the rural-urban gap in university attendance in Quebec was larger than elsewhere, even with controls for (a) the individual background factors included in the analysis, (b) the overall levels in the region, and (c) the overall rural-urban effect. However, given the low rates of university participation in Quebec, it may be that relatively small numbers were involved in creating this pattern, so it is important to keep in mind the extent to which these patterns are conflated with language differences (see Table 6 in Appendix B).

Discussion and Conclusions

To draw conclusions from these results involves going back to the identification of systems that might facilitate access to PSE and to university for rural youth in Canada (see earlier discussion in Introduction section above).

With regard to access to PSE, there were clearly both regional and rural-urban differences in participation rates. However, these differences seem to reflect regional and rural-urban differences in individual characteristics. If the demographic profile and academic performance of rural youth were to parallel those of urban youth, the current results suggest that rural youth would attend PSE in numbers comparable to the attendance rates of urban youth in Canada. After controls, the only remaining rural-urban differences were those (a) between Quebec and the Prairies and (b) between the Prairies and the West. Given the very different PSE system in Quebec, the meaning of the observed difference is very difficult to interpret. However, these findings beg the question of what can be done to improve PSE access, given that the background and school performance of rural youth do *not* match those of their urban counterparts. If rural youth come from households with lower levels of parental education and family income, and they fare less well in school than their urban counterparts, to what extent is the urban-rural gap in PSE attendance “warranted” and to what extent does it call for policy intervention? This is a question of policy priorities, not data analysis.

In terms of access specifically to university, the picture is somewhat different, with a rural-urban gap that persists almost everywhere when a range of control variables are taken into account (see Table 4). It is not just a matter of rural youth having different backgrounds or personal characteristics or performance in school. However, the rural-urban gap (as indicated by the region by ru-

reality interaction effects) again highlights the unique system in Quebec.

The relative absence of a rural-urban difference in persistence (documented in Table 1 and Table 2) could indicate that once rural youth get into PSE, they are as likely as their urban counterparts to continue. However, the YITS data examined is limited in terms of examining this issue in depth, as the available data only reflect the participants' attainments up to age 22. Ongoing follow-ups on these youth would be needed to more effectively analyze rural-urban differences in persistence rates.¹⁵

This analysis was just a first step in identifying how educational policy and structures affect the likelihood that rural youth pursue PSE. If there is an advantage to one type of arrangement over another, the proliferation of options in rural areas seems to be attractive to rural youth. While the articulation systems in Alberta and British Columbia provide this option to some extent, as Andres and Looker (2001) find, this system may encourage rural youth to attend PSE but does not necessarily meet the goal of getting them to continue their university educations beyond the first years at the PSE level. In the current data, based on a more recent national data set, there was little evidence that the articulated system in the West encouraged PSE participation any better than the systems in place in other regions. In the "articulated" CEGEP system in Quebec, the key issue may be the low overall participation levels.

Another matter that needs to be raised here is the tension identified by Corbett (2000, 2007) and by Looker (1993) between the educational aspirations of rural youth (and their parents) and the desire for them to maintain ties to their rural communities. Beyond these desires at the individual level, retaining youth in rural communities is one of the biggest challenges facing these communities (Dupuy et al., 2000). As Looker and Naylor (2008) indicate, the "solution" to lower educational aspirations and attainments among rural youth is not simply to put in place policies to get individuals to leave these communities to pursue further education. One also has to take into account the need of rural communities to support and retain their young people, and the desire of many rural youth to live in rural communities once they have completed their formal education. In other words, it is not enough to get the youth to the PSE institutions, but rather it is important to get the PSE institutions (and the accompanying jobs that make use of higher levels of education) to the rural areas and rural youth.

Moreover, the proliferation of institutions provides other economic advantages to rural communities. "Rural based colleges are often the only post-secondary institution in the region and play a key role in facilitating a strong rural revitalization strategy through local and regional economic and social development" (Association of Canadian Community Colleges 2007). In other words, the presence of a post-secondary institution may, in turn, provide employment possibilities in a num-

¹⁵ Note that the older YITS cohort, Cohort B, can be used to examine persistence. However, there is no clean measure of rural-urban location at the initial data collection, since the respondents at 18-20 years of age would not necessarily be living where they attended high school.

ber of occupations, including those that require post-secondary level education, given the range of enterprises in the adjacent area that are required to support such an institution. While creating new PSE options in rural areas would not be the only way of dealing with the underrepresentation of rural youth in PSE, and particularly in university, it does appear to be one option.

More work needs to be done to identify factors that may affect rural youth participation in PSE in general and at the university level in particular. This preliminary analysis is an important step in that direction.

Next steps for related research could include examining regional and provincial dif-

ferences, taking into account more details regarding PSE structures in the different provinces and regions, including tuition costs, should such information be available. Further down the road, once more of the respondents are old enough to have completed a university degree, it will be interesting to see the effect of attending a school in a rural versus an urban area on the attainment of a diploma, certificate or degree in the longer term. For now, it has been established that the options facing rural as compared to urban students do vary in important ways across the different regions of Canada, as reflected in their levels of PSE participation and university attendance.

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Appendix A - Measurement of Variables

Dependent variables

Ever attend PSE? Coded 0=no, 1=yes. This measure was based on level of education in cycle four; if there was no answer in cycle four, cycle three data were used; if there was no answer in cycle three, cycle two data were used. No respondents were in PSE in cycle one, given the sampling frame. Uses information from *hedld2*, *hedld3*, *hedld4*.

Ever attend university, coded 0=non-university, 1=university. As with the "ever attend PSE" measure, the "ever attend university" measure involved working backwards from cycle four responses. So, the highest level listed in cycle four was used, unless there was no answer (or no PSE) in which case cycle three responses were used. If both cycle three and cycle four data were missing (or involved no PSE), highest PSE was based on cycle two responses. Uses *hlpsd2*, *hlpsd3*, *hdpsd4*.

Persistence, coded 0= leaver, 1=graduate or continuer. Since the students would not have started PSE until cycle two, the first time they could persist or leave would be cycle three. So, this measure was taken from cycles three and four, using *lpsat3* and *lpsat4*.

Independent variables

The main independent variable in this analysis is *rural-urban location*, coded as 0=urban, 1=rural. The codes were pre-assigned in the YITS data set, based on the location of the high school the respondent attended in cycle one (*urbrurmz*). Since schools, especially in rural areas, can have large catchment areas, the characteristics of the locales where the students themselves lived would be slightly different.

Since this is the key independent variable, some additional details on how it is measured in the YITS are warranted. The coding was based on

the sampling information about the location of the high school, not the respondents' categorization of the location of their school. Rather, it was based on the census classification of the school locale.

According to the census definitions (for details see:

<http://www12.statcan.ca/english/census01/products/reference/dict/geo010.htm>):

The "MIZ" coding is a classification of "census subdivisions", the term "assigned to a municipality not included in either a census metropolitan area (CMA) or a census agglomeration (CA). (A CMA or CA is an area consisting of one or more adjacent municipalities situated around a major urban core. To form a CMA, the urban core must have a population of at least 100,000. To form a CA, the urban core must have a population of at least 10,000). A municipality is assigned to one of four categories depending on the percentage of its residents who commute to work in the urban core of any census metropolitan area or census agglomeration."

In the YITS, CMAs and CAs are coded as urban. The four categories for census sub-divisions (those not classified as a CMA or CA), from strong "metropolitan influence zone" (MIZ) to no MIZ, are all coded as rural in the YITS. Including the strong MIZ zones as rural is likely to minimize the urban-rural differences reported in this paper.

The other key independent variable is the *region of the country*. In order to maintain a sufficient case base, some grouping of provinces¹⁶ was necessary. Based on the province of last high school attended, using codes from the variable *province*, five regions were identified:

- Atlantic (Newfoundland and Labrador, Nova Scotia, New Brunswick, and Prince Edward Island);
- Quebec;

16 As is true in many Statistics Canada surveys, the northern territories are not included in the sampling frame.

- Ontario;
- the Prairies (Manitoba and Saskatchewan); and
- the West (Alberta and British Columbia).

Control variables

- Gender (0=male, 1=female); taken from cycle one responses (*st03q01*).
- Language (0=non-English, 1=English); taken from cycle one, based on the language used to respond to the survey (*yslangue*).
- Visible minority (0=no, 1=yes); based on the parental responses in cycle one (*visminp1*).
- Immigration status (0= non-immigrant, i.e. 3rd generation or more, 1=first or second generation immigrant); based on information from the youth and the parent (*st16q01*, *st16q02*, *st16q03*; *pd2p1*, *pd2p2*, *pd2p3*).
- Marks in high school, from a high of 6=90% or more to a low of 1=less than 50%; measured at cycle one, when the youth were 15 years of age (*ysdv_l2*, reverse coded).
- Ever repeat a grade, coded (0=no, 1=yes); measured in cycles two and four. If the respondent said "yes" in any cycle, they were coded as having repeated a grade (*b2q59*, *b3q59*, *b4q59*).
- Parental education (1=no PSE, 2=non-university PSE, 3=university); uses information from the parental reports *pe1c* and *pe2c*.
- Parental income; fifteen categories in \$10,000 increments from 0=no income to 15=\$15,000 or higher, from a recode of the variable *ctid*.

Appendix B – Supplementary Tables

Table 6. Participation in PSE and university in Quebec and New Brunswick by language and rural-urban location

		English	French	Significance
PSE				
Quebec	Urban	86%	70%	***
	Rural	67%	60%	ns
New Brunswick	Urban	74%	75%	ns
	Rural	71%	73%	ns
University				
Quebec	Urban	51%	43%	*
	Rural	48%	36%	ns
New Brunswick	Urban	70%	74%	ns
	Rural	63%	55%	ns

*=sig at .05, **=sig at .01, ***=sig at .001.

Table 7. Separate logistic regressions of PSE participation by region, with controls

	Atlantic	Quebec	Ontario	Prairies	West
Rural	0.94 ns	0.85 ns	0.97 ns	1.11 ns	0.87 ns
Female	1.52*	2.17***	1.76***	1.61**	1.37***
English	0.72 ns	2.17***	0.84 ns	0.72 ns	0.92 ns
Visible Minority	1.06 ns	2.05**	2.04***	1.43 ns	3.38***
Immigrant	1.04 ns	1.45 ns	1.16 ns	1.36 ns	1.27*
Repeat	0.36***	0.21***	0.32***	0.38***	0.33***
Parental Education	1.93***	1.87***	1.79***	1.56***	1.53***
Parental Income	1.13***	1.10***	1.09***	1.07*	1.05**
Marks	2.66***	3.69***	2.27***	2.67***	2.42***
Constant	0.01***	0.01***	0.03***	0.01***	0.02***
R²	0.34	0.45	0.26	0.31	0.30

*=sig at .05, **=sig at .01, ***=sig at .001.

Based on five separately run logistic regressions.

Table 8. Separate logistic regressions of university participation by region, with controls

	Atlantic	Quebec	Ontario	Prairies	West
Rural	0.52***	1.04 ns	0.51***	0.49***	0.70**
Female	1.44*	2.00***	1.31***	0.95 ns	1.31**
English	0.86 ns	1.51*	0.91 ns	0.50 ns	0.62 ns
Visible Minority	1.02 ns	1.36 ns	1.53***	0.78 ns	1.82 ***
Immigrant	1.99 ns	1.33 ns	1.56***	1.20 ns	1.09 ns
Repeat	0.25**	0.42***	0.15***	0.85 ns	0.85 ns
Parental Education	1.69***	1.68***	2.05***	1.58***	1.45***
Parental Income	1.11**	1.08***	1.05***	1.06 ns	1.04**
Marks	3.73***	3.45***	3.70***	2.69***	3.11***
Constant	0.01***	0.01***	0.01***	0.02***	0.01***
R²	0.42	0.32	0.41	0.27	0.31

*=sig at .05, **=sig at .01, ***=sig at .001.

Based on five separately run logistic regressions.