OECDpublishing

OECD Education Working Papers No. 77

Immigrant Status and Secondary School Performance as Determinants of Post-Secondary Participation

A COMPARISON OF CANADA AND SWITZERLAND

Garnett Picot

OECD

Unclassified EDU/WKP(2012)14

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development

11-May-2012

_____

English - Or. English

DIRECTORATE FOR EDUCATION

Cancels & replaces the same document of 11 May 2012

IMMIGRANT STATUS AND SECONDARY SCHOOL PERFORMANCE AS DETERMINANTS OF POST-SECONDARY PARTICIPATION: A COMPARISON OF CANADA AND SWITZERLAND

OECD Education Working Paper number 77

This paper was prepared by Garnett Picot of Queens University and Feng Hou of Statistics Canada

JT03321446

OECD EDUCATION WORKING PAPERS SERIES

ABSTRACT

This working paper seeks to explore the reasons why educational attainment in the immigrant population varies between North America and Europe. Specifically, the examples of Canada and Switzerland are used as Canada has an immigrant population with a typically higher rate of post-secondary education than that of the domestic population, while in Switzerland the opposite is true. Analysis shows that while differences in immigration policy play a significant role, there are many other variables which affect educational attainment in immigrants, such as the education level of the parents, source region and home language.

RÉSUMÉ

Le présent document de travail tente d'explorer les raisons pour lesquelles le niveau de formation de la population immigrée varie entre l'Amérique du Nord et l'Europe. Il s'attache plus particulièrement aux exemples du Canada et de la Suisse, les diplômés de l'enseignement post-secondaire étant typiquement plus nombreux dans la population immigrée que dans la population autochtone au Canada, tandis qu'en Suisse, c'est l'inverse qui s'observe. L'analyse montre que si les différences en termes de politiques d'immigration jouent un rôle important, il existe également de nombreuses autres variables qui influent sur le niveau de formation de la population immigrée, telles que le niveau de formation des parents, la région d'origine et la langue parlée à la maison.

TABLE OF CONTENTS

INTRODUCTION

1.   This paper is about a student"s immigration status, secondary school performance, and the association with their educational attainment. There is considerable research on the relationship between immigration status and educational attainment in particular. The focus on immigrant status is driven by the observation that in North America, students with immigrant backgrounds on average achieve higher levels of education than their counterparts with domestic backgrounds (Picot and Hou, 2010), while in Europe the opposite is typically observed (Heath *et al*, 2008). But few studies have addressed the role of the student"s secondary school performance in explaining the difference in educational attainment between students with and without immigrant backgrounds. We add that dimension.

2.   In addition, two unique features of this paper allow us to hopefully make a contribution. First, we compare and contrast the determinants of students" educational attainment outcomes in Canada and Switzerland. Why these two countries? We selected them in part because they are two of the few countries that possess the longitudinal data necessary for such a study. But also, they have very different immigration and education systems. As we will see, this fact has a significant effect on the results. Furthermore, they are in some ways reflective of the difference between Europe and North America in terms of both immigration systems and immigrant educational attainment outcomes.

3.   The second unique feature of the paper is the focus on low secondary school performers. In addition to conducting the analysis for all students, we concentrate on the educational attainment of students who do relatively poorly on PISA tests in secondary school. Are these students necessary relegated to poor educational attainment outcomes? Or do significant numbers of these students continue to the post-secondary level, and if so, what distinguishes those who continue from those who do not? The paper addresses those questions.

4.   Consistent with earlier research, we find that in Canada students with immigrant backgrounds, both first and second generation, are more likely to continue to the post-secondary level than their counterparts with domestically born parents. In Switzerland they are less likely to continue. In Switzerland, this negative post-secondary attendance gap is due almost entirely to lower secondary school performance among immigrant background students, as measured by the PISA reading literacy scores. After controlling for PISA scores, differences in family background and other variables become less important. When secondary school stream is included, it explains a significant part of the gap as well. However, academic performance works in part through this variable, since school stream is determined by academic performance, as well as other variables such as social background.

5.   The story is very different Canada. Differences in PISA scores play little role in the positive post-secondary attendance gap between students with and without immigrant backgrounds. Our analysis can account for about one-half of the gap, and parents" and students" aspirations regarding the student"s post-secondary attendance play a major role. In both countries, the significant variation in these results by source region is presented.

6.   Being a *low-performing* secondary school student, those with PISA reading scores at level 1 or 2 at age 15, results in a greater reduction in the likelihood of post-secondary participation in Switzerland than Canada, particularly among immigrant-background students. There are a number of reasons for this, many related to the differences in the structure of the educational systems between the two countries. In Canada, a surprisingly high share of low-performers with immigrant backgrounds continue to the post-secondary level, around 50%, compared to one-third of those with strictly Canadian backgrounds. This figure reaches 66% among students with Asian backgrounds. Again there is significant variation by source region

background. Even with a rich set of PISA, family background and aspirational variables, we can account for only about one-third to one-half of the post-secondary participation gap between low-performing students with and without immigrant backgrounds. Differences in the student"s and parent"s aspirations regarding post-secondary attendance again play an important role. But other unmeasured factors are also at play. In Switzerland, first generation low-performing students are less likely to continue than their counterparts with Swiss backgrounds. We can account for little of this gap with the family background, PISA and other variables at our disposal.

7. But many other variables besides immigrant status distinguish low-performers who continue to the post-secondary level from those who do not. The Canadian data suggest that besides immigration status, variables related to motivation, such as parent"s and student"s aspirations regarding post-secondary attendance, and degree of financial preparedness, are important. Other important variables include family type, PISA reading score, and parental educational attainment. In Switzerland, variables related to the family aspirations were not available. Important variables that distinguish those low secondary school performers who continue from those who do not included parental education, family type, PISA score, and when it is included, the secondary school stream of the student. The conclusion contains a more complete summary of results and their implications.

LITERATURE REVIEW

8. It is well known that students" academic and cognitive performance in secondary school is positively correlated with their ultimate educational attainment. PISA[1] reading and literacy tests, administered at age 15, provide one means of assessing the association between secondary school performance and ultimate educational attainment. A recent OECD study found that in Canada, students who obtained the highest PISA scores (level 5) were 20 times[2] more likely to attend a university degree than those registering level 1 PISA scores (the lowest), and twice as likely to attend college[3] (Pathways to Success, OECD, 2010). In Switzerland, researchers found that almost one-half of students age 15 who scored the highest (levels 4 and 5) of the PISA reading literacy test continued to the tertiary level six years later, as compared to only 8% of those scoring at reading level 2 (Meyer and Bertschy, 2011).

9. The PISA reading, math and science scores themselves have been used as an outcome measure of educational achievement. In Canada, second generation students (those born in Canada with foreign born parents) performed as well in the PISA reading literacy test as students with Canadian born parents. However, immigrant students (first generation) performed less well, in part because the language of the test was different than the home language of the student. In Switzerland, both first and second generation students received significantly lower PISA scores, on average, than their counterparts with Swiss born parents (OECD 2001). A Swiss study found that social origin was one of the most important factors accounting for the difference in PISA score outcomes between children with and without immigrant backgrounds (Vellacott and Wolter, 2002). Meunier (2010) found that for Switzerland, differences in individual characteristics, family background and school characteristics could account for the majority of the PISA reading literacy gap between both first and second generation students on one hand, and students with Swiss born parents on the other. A study based on the 2003 PISA reading test scores concluded that controlling only for differences in parental educational and occupational background reduced the PISA

---

1 . Programme for International Student Assessment

2 . This is an adjusted result, after controlling for other variables such as parent"s education, high school marks, gender, etc.

3 . The PISA reading scores were much better at discriminating between those who attend university and those who do not than other variables, such as self-reported secondary school marks, or parents" education (OECD, 2010).

performance gap but did not by eliminate it (OECD, 2006). The association between PISA reading scores and family background is important in the discussion section.

10.   However, we are concerned with educational attainment, conditional on PISA reading literacy scores, and other background variables. Few studies focus specifically on the tertiary educational outcomes of low cognitive achievers in secondary schools. Thompson and Hillman (2010), using Australian longitudinal data, concluded that motivation was a key determinant of student‟s later educational and labour market outcomes among low achievers at age 15. The socio-economic background of the student was also important, as was having some form of educational goal or plan. Stalder, Meyer and Hupka-Brunner (2011a) conclude that in Switzerland, a surprisingly large number of low secondary school achievers (those with PISA reading literacy level 2 or below) complete upper secondary with a VET (vocational) diploma. However, they do not examine the tertiary participation of low secondary school achievers.

11.   Using the Canadian YITS (Youth in Transition) longitudinal data, Foley, Gallipoli and Green (2010) conclude that parental aspirations are major determinants of the tendency to drop-out of school after age 15, above and beyond any effect of the PISA score at age 15, family background and other variables. This was particularly true for low achievers at age 15 (*i.e.* those with low PISA reading scores). In fact, they conclude that after accounting for PISA reading scores and parental valuation of education, parental educational attainment has no direct effect on the student‟s probability of dropping out after age 15. Falter (2009) obtains similar results for Switzerland, except that the outcome variable is the likelihood of making the transition to a particular upper secondary school stream, typically a vocational or academic stream (see the next section). After controlling for PISA score, he finds that parental background has little effect on the outcomes of low and high ability students.

12.   The early Canadian research suggested that the most important determinant of the gap was parents‟ education, as well as age and residential location (Boyd 2002; Hum and Simpson, 2007; Bonikowska, 2008). However, parental education may be a proxy for other effects, such as the aspirations of the parents regarding educational outcomes, educational resources made available to the child, and the valuation of education by the parents or the student. But even after accounting for many determinants, earlier research found that perhaps one half of the positive gap in educational attainment between the children of immigrant and domestically-born parents persisted. After accounting for such variables, ethnic group differences also matter in the likelihood of attending the tertiary level (Abada, Hou, and Ram, 2009).

13.   More recent research uses the YITS to address issues related to attendance at the tertiary level among students with immigrant backgrounds and those without (Childs *et al*, 2010). They find that parental aspirations regarding university attendance is higher among children with immigrant backgrounds, and in particular among the immigrant families from the source regions such as China, India, other Asian countries and Africa.

14.   Regarding low-achievers, they observe that in general students from immigrant families who have low PISA scores are more likely to attend the tertiary level than their low scoring counterparts from domestic families.

15.   Recent European research has also shown that there are significant gaps between the children of immigrants and those from non-immigrant families in educational attainment. Heath *et al* (2008) find significant variation in educational attainment depending upon the home country of the immigrant parents. Second generation students whose parents came from less economically developed origins tend to have much lower educational attainment (before controlling for social background) than the students from non-immigrant groups. This is particularly true of Turkish immigrant families in Switzerland and other countries. Second-generation minorities of European ancestry (*e.g.* Italians in Switzerland and other

countries, the Portuguese, etc.) have a negative educational attainment gap (unconditionally) with children of non-immigrant families, but less of a gap than those with non European backgrounds. Finally, just as in Canada and the United States, second generation minorities of Indian and Chinese background often outperform children of non-immigrant families educationally (unconditionally).

16.   Heath *et al* (2008) conclude that among second generation groups of European ancestry, most of the negative gap in educational attainment between children with immigrant backgrounds and those without can be accounted for by socio-economic background.

17.   Heath *et al* (2008) also point out that educational aspirations are often much higher among immigrant than domestic born families. In many countries intergenerational educational mobility is higher among immigrant than non-immigrant families, and that appears to be true in both Switzerland (Bauer and Riphahn, 2007) and Canada (Aydemir *et al*, 2008)[4]. Of direct interest for this paper, Heath *et al* find that although PISA test scores tend to be lower among 2nd generation minorities in Europe, in some countries minorities tend to have higher educational continuation rates than do their 3rd-and-higher generation counterparts with similar test scores.

18.   In Switzerland in particular, Meyer and Bertschy (2011) conclude that after controlling for socio-economic background variables, PISA literacy scores at age 15 and the student‴s secondary school stream, immigration background has no effect on the likelihood of attending tertiary level education. However, as they point out, this does not mean that immigration background is not important. Its effect may work through other variables, notably the type of secondary school stream in which students with immigrant backgrounds find themselves, as compared to those with Swiss backgrounds. More is said of this later in the paper.

19.   With that as background, this paper concentrates on two issues: (1) the role of immigrant status in educational attainment, and the factors that explain the differences in outcomes between students with and without immigrant backgrounds, including secondary school performance, and (2) the extent to which immigration status and other variables can distinguish between low-performing secondary students who continue to the tertiary level, and those who do not.

INTER-COUNTRY DIFFERENCES IN THE IMMIGRATION AND EDUCATIONAL SYSTEMS

20.   To understand the inter-country differences in the role of student immigrant background on participation at the tertiary educational level, and the outcomes of low-performers, it is necessary to review the basics of the educational and immigration systems in the two countries. We first outline on the immigration systems.

21.   Canada, like Australia and New Zealand, has a highly managed immigration system that focuses on highly educated/skilled immigrants, particularly since the 1980s. Immigrants have, on average, educational attainment levels above that of the Canadian-born. This process has a positive influence on both the social and economic integration of immigrants, as well as the quite successful educational outcomes of the children of immigrants (see Picot and Hou, 2010 for a review). Switzerland, like many European nations, has had a much less managed system. It experienced immigration of largely lower skilled workers. This approach affects the educational outcomes of the immigrants and their children. However, because of changes in the Swiss system during the early 1990s, and more recently with the

---

4 .   For the population as a whole, however, intergenerational mobility of education is relatively low in Switzerland (i.e. a relatively high correlation between the education of the parent and the child) by international standards, while in Canada it is high (relatively low correlation of education across intergenerations).

2002/03 treaty on the free movement of labour in the EU, migration patterns are shifting. Many more highly skilled immigrants are entering Switzerland from nations such as Germany and France, and a smaller share of immigrants are lower-skilled from countries such as the Balkans, Turkey or Portugal. This polarization in the educational level of immigrants will be seen in the data that follows.

22.   For the purposes of our study, these inter-country differences mean that the socio-economic characteristics of immigrant-background students are very different in Canada and Switzerland. This obviously affects the gap in educational attainment between students with and without immigrant backgrounds, upon which we focus. We account for these background differences in the statistical models used in the analysis, and assess to what extent socio-economic background, driven to a considerable extent by the type of immigration system in place, accounts for the gap in educational attainment between students with and without an immigrant background.

23.   The Canadian and Swiss education systems are also structurally very different. The Swiss system is highly selective. Students are streamed at a very early age, starting at the sixth or seventh grade, into roughly three streams: an upper school track with more intellectually demanding courses (pro or Untergynasium), an intermediate track, and a third offering very basic courses (*e.g.* Realschule). See Bertschy *et al*. (2009) and Meyer (2009) for a description of the school system. Only 3% of students from the "basic" track (Realschule/Oberschule) ultimately enter tertiary level education by age 23, compared to 30% of those in the upper level track (Sekundarschule/Progymnasium) (Meyer and Bertschy, 2010). Students with a migrant background are over-represented in the lower level tracks, thus influencing their tertiary educational opportunities (Meyer, 2009). Following compulsory school, students move into upper-secondary, which is also heavily segmented. General education is provided in the Gymnasium stream. In many regions this level is open only to those students from the upper school tracks in compulsory school. This track typically leads to university.

24.   There is a difference in participation in these streams between students with and without immigrant backgrounds. Meunier (2010) found that 24% of students with Swiss parents were in streams that prepared for university entrance, compared to 19% of 2nd generation students, and 12% of the 1st generation (immigrant students). However, most students (between 40% and 70% depending upon the region) enter 3 to 4 year vocational training (VET) program, usually through a dual apprenticeship where training is done both in school and with a firm. Labour market outcomes for VET graduates are typically quite favourable, and relatively few continue to the tertiary level. However, some students in the vocational training stream also have the possibility of continuing to the tertiary level in a higher vocational school or university of applied science. Such schooling has been increased recently to allow more tertiary level opportunity for students in the vocational (VET) streams (Falter, 2009).

25.   The over-representation of students with immigrant backgrounds in the lower academic streams appears to be related to more than marks and school performance. Sacchi *et al*. (2010) found that the transition from compulsory to upper secondary school in Switzerland is strongly shaped by the students" social origins and cultural backgrounds, irrespective of their school achievements as measured by PISA reading scores and academic record. Haeberlin*et al*. (2004) found similar results. Students with immigrant backgrounds, but with equal school performance, were much less likely to be recommended for a "higher level" school streams than were students with strictly Swiss backgrounds. Coradi Vellacott and Wolter (2004) discuss the degree of equity in the Swiss school system across immigrant and other groups.

26.   At the tertiary level, the level beyond upper secondary, there are two major streams, "Tertiary A", and "Tertiary B". The former includes longer university programs leading to a bachelor"s, master"s or above degree. Tertiary B includes mostly vocational education programs in specialized areas. More specifically, Tertiary A includes universities of applied sciences, institutes of technologies, other universities, and institutes of post-graduate studies. Tertiary B includes post-secondary specialized schools,

and advanced schools of vocational education and training (Professional Education and Training or PET). At age 23, roughly 25% of the 15 year old cohort of seven years earlier are in tertiary A, 5% in tertiary B. However, many students enter the tertiary B level at an older age, so that perhaps half of the students who graduate from tertiary B have not entered the system by age 23. Thus, by focusing on the educational outcomes of 23 year olds we are under-representing the ultimate participation in tertiary B level in particular (OPET, 2011)

27.   Regarding the effect of streaming on the gap in tertiary level participation of students with and without immigrant backgrounds, we run two statistical models, with one controlling for secondary school type, and the other not. The implications of the controls and the effect on the outcomes are discussed later in the paper.

28.   The Canadian educational system has much less streaming, and in many ways a simpler structure. There is little or no streaming during elementary and secondary schooling in most provinces, although there is significant freedom regarding course selection in secondary schools. As a result of this course selection by students, some are eligible to apply to more types of post-secondary options, such as university or college, than others. A very small percentage of students enter secondary vocational schools. In the province of Quebec, secondary school consists of 3 years rather than 4 years, followed by 2 or 3 years in CEGEPS (colleges), which is considered to be post-secondary (or tertiary).

29.   At the post-secondary (tertiary) level, most provinces have both community colleges and universities (Quebec has the CEGEP system plus universities). Universities are degree granting institutions at the bachelors, master and PhD level. Community colleges include both advanced vocational programs designed for labour market entry, as well as, in some provinces, an academic stream that can lead to university attendance.

DATA AND METHODS

What does PISA measure?

30.   Reading literacy in PISA is used to identify low and high secondary school performers. PISA defines reading literacy quite broadly, as the ability to understand, use and reflect upon written texts (OECD 2001). PISA attempts to measure all of these aspects of reading literacy. It goes well beyond the ability of individuals to simply read a text. It is a combination of the student's level of reading ability, as well as cognitive skills at age 15.

31.   PISA 2000, used here, assesses the extent to which 15 year old students have mastered reading skills, and have the cognitive literacy abilities to succeed in the future (OECD, 2001). To do so, it measured ability in three major domains: (1) the ability to read various types of text, including different types of prose such as narrative, exposition and argumentation, as well as forms, charts and diagrams, (2) the ability to retrieve, understand, interpret and reflect upon text, and (3) to be able to relate the text to its intended use, such as private use, public documents, work-related use or for educational purposes. PISA literacy scores should provide a reasonable basis for the categorization of 15 years olds into low and high performers. That is, those who have mastered and demonstrated the literacy skills, broadly defined, that are required for future academic advancement, and those that have not.

The data sets

32.   TREE (Transition from Education to Employment) is a longitudinal survey at the national level in Switzerland that focuses on the transition from school to work (Stalder, Meyer and Hupka-Brunner, 2011a). The original TREE sample consisted of 6300 students selected for the PISA 2000 survey (Program for International Student Assessment). These students were age 15 in December of 1999, and were

assessed in PISA at the end of compulsory school in 2000. However, in the case of Switzerland, the sample was augmented to include all grade 9 students, so some respondents may have an age other than 15. Hence, the PISA sample frame in Switzerland included all 15 year olds in the school system plus others in grade 9.

33.   The first wave of the survey was conducted in 2001, when the students were age 17, and the 7th wave at the time of this study was in 2007, at age 23. Approximately 5532 of the original sample had a valid return in the first wave, for a response rate of 87%. Response rates in each subsequent wave remained at between 85% and 89% of the previous year‟s sample. Hence, by 2007 (with 7 waves completed), approximately 3900 of the original sample remain in the survey, for a response rate of 62%. The data are reweighted with each wave to reduce the sample bias introduced by non-response, and hence to compensate as much as possible for sample attrition.

34.   It is ultimately necessary to take into account the complex sampling structure and estimate correct sampling variances. The TREE data provide variables on stratification and primary sampling unit identifier. These variables are used in STATA‟s survey data analysis tools to correct the variance estimation for the effect of a complex survey design.

35.   The Canadian Youth in Transition Survey (YITS-reading cohort) is also a longitudinal survey that was designed to examine the major transitions in young people‟s lives including formal education, training and work. At cycle 1, collected in 2000 for the 15 year-olds, the survey consists of two parallel programs: PISA 2000 and YITS. PISA 2000 assesses reading, mathematical and scientific literacy, with a primary focus on reading (the other two components were administered to only two thirds of the respondents).   PISA 2000 also collects additional information on social, cultural, economic and educational factors that are likely associated with student performance. YITS collects information not covered by PISA 2000 from both students and parents, including school engagement, educational and career aspiration, labour force participation, family relationships, living and learning conditions, and parents‟ socio-economic status.

36.   At cycle 1, the YITS has a response rate of 87% among students and 91% among parents. The response rate in the follow-up surveys ranges between 91% at cycle 2 and 78% at cycle 5. The cycle 1 sample includes 29687 respondents. At cycle 5, collected in 2008, 14751 respondents remain. The survey micro data file contains a longitudinal weight to account for non-random attrition as defined by a series of variables including province, some schooling related information such as social participation, overall scores, etc, along with family structure and social network variables (Statistics Canada 2009). This longitudinal weight is used in the present study. Because of the complexity of the YITS sample design (stratified and clustered) and the resulting effect on standard error estimates, a bootstrap re-sampling method with 1000 replicate weights is used for variance and standard error estimates.[5] The final sample size for the current study is 13705 as 1045 students could not be matched with the parent data and thus are excluded.

37.   Regarding the PISA reading literacy score, there is not a single score for each respondent (*i.e.* student). Rather, each student obtains five "plausible values" of their score. This approach is necessary because no student receives all of the questions in the literacy test. Hence, some estimation is required to obtain a PISA score. In line with the approach recommended in the PISA Data Analysis Manual (OECD, 2009), the estimates of the PISA scores are based on the average of the five PISA scores. When the PISA reading score is used in a regression, the regression is run five times, each time with one of the five plausible values, and the values of the coefficients averaged.

---

5 .   This is done with a SAS Macro, BOOTVAR, written by Statistics Canada for Bootstrap estimation.

Low Performers in Secondary School

38.   PISA reading scores are grouped by the OECD into five main categories, with Category 5 being the highest. Students with level 1 or below fail to display the most basic reading skills, and have serious reading deficiencies. In the OECD in general, most students fall within category 3. We are concerned with low secondary school performers which include students in level 2 or lower. These are students who received a score of 480 or less on the PISA test. High performers for our purposes are students who attained levels 4 or 5, that is, a score of 553 or higher.[6]

39.   Given the distribution of student by level in PISA 2000, this means that for Canada 26% of students are classified as low performers (in level 2 or lower), and 47% as high performers (levels 4 or 5, table 1). Switzerland has a higher percentage of low performers (44%) and a smaller percentage of high performers (27%). But the real inter-country difference is among students with immigrant backgrounds. Fully 78% of 1st generation (immigrant) students and 61% of 2nd generation students are low-performers in Switzerland, compared to 38% and 23% in Canada. Among students with strictly domestic backgrounds (*i.e.* 3rd and higher generations), the inter-country difference is not that great (26% in Canada and 31% in Switzerland).

---

6 .   Our approach uses an absolute measure of reading ability to determine low and high performers, i.e., the proportion of students below or above a fixed PISA score cut-off. Relative measures of low and high performers could also be used, i.e., the performance of the student relative to that of other students in the same country. Students who fall in the bottom or top, say, quintile of the PISA scores in each country could be used to define low and high performers. Most papers use the former, but some papers have used the latter relative measure (e.g. Foley, Gallipoli, Green, 2010). We use the absolute rather than the relative approach because we want to compare the outcomes of students who have roughly the same absolute level of reading ability in both Canada and Switzerland. When we speak of "low performers", we want it to refer to students in both Switzerland and Canada who have roughly the same level of reading ability. Because on average the Canadian sample has a much higher PISA reading score than the Swiss sample, if we were to use the relative approach to defining low performers (i.e. relative to other students in the same country), low performers in Canada would have significantly higher reading scores than those in Switzerland. We would not be comparing students with similar reading scores.

Table 1. Distribution of students by PISA reading level					
	All students	First generation	Second generation	2.5 generation	Third-and-higher generation
<u>Canada</u>	%				
Low (level 2 or lower)	25.9	37.6	23.3	18.6	25.8
Medium (level 3)	27.2	21.9	29.8	27.8	27.4
High (level 4 and 5)	46.9	40.5	46.9	53.6	46.8
<u>Switzerland</u>					
Low (level 2 or lower)	43.7	78.2	61.2	36.8	31.4
Medium (level 3)	29.5	14.1	23.2	36.9	33.9
High (level 4 and 5)	26.8	7.6	15.7	26.3	34.7
Sources: Canadian Youth in Transition Survey and Swiss Transition from Education to Employment Survey					
Note: First generation refers to foreign born students; second generation refers to domestic-born students with two foreign born parents; 2.5 generation refers to domestic-born students with one foreign born parent; and third-and-higher generation refers to students with two domestic-born parents					

The variables

40.   The analysis concentrates on low-performers in secondary school. However, as a point of comparison, we also include some analysis for the entire sample of students. For both Switzerland and Canada, the dependent variable is the probability of being enrolled in or having completed the tertiary (post-secondary) level in 2007 at age 23; that is, participation in tertiary A or B in Switzerland, and in college or university in Canada. Among the "all" student sample, we replicate the results using participation in university only as the outcome variable.

The independent variables that are common between the two surveys include:

Generational status:

1.   Immigrant (foreign born) student who immigrated prior to the age of 15. Also referred to as a 1st generation student.
2.   Student born domestically with two immigrant (foreign born) parents, also referred to as a 2nd generation student.
3.   Student born domestically with one immigrant (foreign born) parents, also referred to as the 2.5 generation.
4.   Student with parents who are domestically born, also referred to as the 3rd plus generations.

Gender: male or female

Highest level of parents" education:

1. Both parents graduated from the tertiary (post-secondary) level
2. Only one parent graduated from the tertiary level
3. Both parents graduated from secondary school
4. Only one parent graduated from secondary school
5. At least one parent with some secondary school but did not graduate
6. Elementary school the highest for both parents

   Family structure:

1. Nuclear family (student living with two biological parents)
2. Single parent family
3. Blended families, including students living with a mother and male guardian, father and female guardian, or two guardians
4. Other families

   Number of siblings

   Home language

1. Language spoken at home most of the time is the language of the PISA assessment, another official language, or a national dialect
2. Language spoken at home most of the time is not the language of assessment, another official language, or a national dialect

   Geographical location of residence:

   In Canada– (1) three largest metropolitan areas each with a population over 2 millions, (2) the next 5 largest metropolitan areas each with a population over 500,000, (3) other metropolitan areas each with a population over 100,000, and (4) small urban areas, (5) towns, and (6) villages or rural areas. In Switzerland – (1) cities, (2) towns, (3) villages or rural areas, and (4) location not specified.

41.   The following two variables are derived by combining the responses to two or more related questions in the survey. The indexes are standardized so that they have a mean of zero and standard deviation of 1 across all students in all participating OECD countries. Hence, a negative value for the index does not necessarily imply a negative response, simply that the response is less positive than the average response across all OECD countries. The variables are:

1. Educational resources at home
2. Time spent on homework

Variables used only in the Swiss TREE data analysis:

   Type of Secondary School Program enrolled in:

1. pre-gymnasium (typically leading to university)
2. extended academic requirements
3. basic academic requirements
4. no formal streaming

42.   Language of the Canton of residence: German, Italian or French. The streaming process in the school system and the participation at the tertiary level are quite different among the three major language cantons.

Variables available only in Canadian YITS data analysis

1. Parent hopes/aspirations: X=1 if the parents hope the child will get at least one university degree, 0 otherwise

2. Financial preparation : X=1 if parents have done something specific to ensure that the child will have money for further education after high school

3. Students" educational aspirations: X=1 if the student would like to get at least one university degree

4. Job expectation: X=1 if the student would be interest in having a job by age 30 that requires at least one university degree

The models

43.   We focus on two gaps: one between immigrant students and those with domestically born parents (*i.e.* between the 1st and 3rd-plus generations), and one between domestically born students with two immigrant parents and the 3rd plus generations (*i.e.* between the 2nd and 3rd plus generations). We also ask what additional variables, besides immigrant status, distinguishes low secondary school performers who continue to the university level from those who do not? To address these questions we use a linear probability (least squares) approach to model the participation at the university level. The regression coefficients are easily interpreted when a linear probability model is used, unlike a probit or logit model, where the coefficients cannot be directly interpreted.

44.   The dependent variable is in most cases participation at the tertiary (post-secondary) level (Y=1) or not (Y=0). For the sample of "all" secondary school students the results are replicated with participation at university as the dependent variable. University in Switzerland means the tertiary A level, and post-secondary tertiary A plus tertiary B levels. In Canada, post-secondary includes colleges plus universities. We focus on the participation of students aged 15 as of December, 1999 at the university or post-secondary level by 2007, at age 23. Participation means the student is either enrolled in university (or college) in 2007, or had previously graduated with a degree or certificate from a university (or college). We use participation in the tertiary system as the outcome variable in most cases because among low performers in particular focusing only on the university system would exclude the majority of the secondary to post-secondary transitions. However, the university systems are more comparable between the two countries than is the rest of the tertiary level, so the results for "all" students are likely the most comparable between countries.

45.   Three statistical models are used. They are:

$$Model\ 1: \ Y_i = \beta_1 G_i + \beta_2 H_i + \beta_3 I_i + \varepsilon_i$$

$$Model\ 2: \ Y_i = \beta'_1 G_i + \beta'_2 H_i + \beta'_3 I_i + \beta_x X_i + \beta_p P_i + \varepsilon_i$$

$$Model\ 3: \ Y_i = \beta^\dagger_1 G_i + \beta^\dagger_2 H_i + \beta^\dagger_3 I_i + \beta_x X_i + \beta_p P_i + \beta_z Z_i + \varepsilon_i$$

46.   In model 1, G_i is one if student i is an immigrant (1st generation), H is one if the student i has two immigrant parents, and I is one if the student i has one immigrant parent and one domestic-born parent. If the student has domestically born parents, then the variables G, H, and I take on the value 0. The coefficient, β_1 and β_2 are the coefficients of interest. Their values represent the percentage point gap in

post-secondary participation between (1) immigrants and (2) the children of immigrants, respectively, and the children with domestic-born parents. We report the values of β_3, but do not focus on it for reasons that will become obvious later. In model 1, with no other independent variables, the coefficients β_1 to β_3 simply indicate the difference in post-secondary participation observed in the raw data.

47.   Model 2 includes both student background characteristics for each student i, the vector of X_is, as well as the PISA reading score, P_i, for student i. The characteristics included in the vector of Xs were detailed in the variables section above, and include parents" education, family structure, home language, educational resources available in the family at age 15, time spent on homework at age 15, and residential location. P_i is the PISA reading literacy score at age 15.

48.   The difference between β_1 in model 1 and β'_1 in model 2 indicates the magnitude of the gap (in percentage points) between first generation immigrant students and those with domestically born parents (*i.e.* 3rd plus generation) that is accounted for by the differences in the independent variables, the X_is and P_i. Put differently, $\beta_1 - \beta'_1$ is the portion of β_1 that is "explained" by the differences in X_is and P_i between the 1st and the 3rd plus generations. The difference between β_2 and β'_2 can be interpreted in the same way, only with reference to the gap between 2nd generation students (those born domestically but with two foreign born parents) and those with domestically born parents (the 3rd plus generation). The difference between β_3 and β'_3 represents to the gap between students with one foreign born parent and the 3rd plus generation after controls. However, the focus in this paper is on B1 and B2.

49.   We also decompose the "explained" gap (*e.g.* $\beta_1 - \beta'_1$) to determine each variable"s contribution. Taking $\beta_1 - \beta'_1$ as the example, it can be shown that $\beta_1 - \beta'_1 = \Sigma \beta_x * (\overline{X}_{i.G1} - \overline{X}_{i.G0}) + \beta_p * (\overline{P}_{i.G1} - \overline{P}_{i.G0})$,

where $\overline{X}_{i.G1} - \overline{X}_{i.G0}$ is the difference between the 1st generation and 3rd-and-higher generation in the means of variables X_is and $\overline{P}_{i.G1} - \overline{P}_{i.G0}$ is the difference between the 1st generation and 3rd-and-higher generation in the means of PISA reading scores (Abada, Hou and Ram 2009).[7] From this equation, the total "explained" component, $\beta_1 - \beta'_1$, can be further decomposed into the contribution of each characteristic as $\beta_{xi} * (\overline{X}_{i.G1} - \overline{X}_{i.G0})/(\beta_1 - \beta'_1)$ for group difference in variable X_i, or $\beta_p * (\overline{P}_{i.G1} - \overline{P}_{i.G0})/(\beta_1 - \beta'_1)$ for group difference in PISA reading scores. A similar decomposition of the gap $\beta_2 - \beta'_2$ is carried out.

50.   Model 3 adds additional explanatory variables (Z_i) unique to each country. For Canada, earlier research by Foley *et al* (2010) and Childs *et al* (2011) suggest that parent"s hopes/aspirations regarding the students" educational attainment significantly affect educational outcomes. We also include the student"s, as well as the parent"s aspirations regarding university attendance. The other variables that are added include whether the student expects to get a job that requires a university degree, and parents" financial preparedness.

51.   For Switzerland, we add the secondary school stream in which the student was enrolled, and the language of the canton (region). Students in "strong" academic streams are much more likely to continue to university in particular, and immigrant students are underrepresented in these streams (see the earlier section "Inter-Country Differences in the Immigration and Education Systems"). However, academic performance is the basis of selection into the streams, so the PISA score and the secondary school stream are highly correlated, making it difficult to separate the effect of one variable from another. For that

---

7 .   This is done following one variation of the Oaxaca decomposition method (Oaxaca and Ransom 1994). In this approach, the „explained" component is calculated as the sum of the differences between group means and the means of the pooled sample of all groups, with the differences weighted by the model coefficients of the pooled sample.

reason, it is best to consider the effect of the two variables together. Put another way, one could think of the PISA score as having an indirect effect through the secondary school stream. However, research has shown that for children with immigrant backgrounds, factors other than academic performance are involved in the streaming process. Hence, the school stream could also be reflecting factors other than academics, such as cultural background, family background and discrimination.

52.   The change from β_1 in model 1 to $\beta^\dagger_1$ in model 3 indicates the share of the gap in university attendance between the 1st and the 3rd-and-higher generations, in percentage points, that is accounted for by the difference in the independent variables between the two generations. Following the decomposition approach outlined above, the contribution of each of variables X_is, P_i, and Z_is to $\beta_1 - \beta^\dagger_1$ can be calculated. Note that the contribution of X_is and P_i to $\beta_1 - \beta'_1$ may not be the same as their contribution to $\beta_1 - \beta^\dagger_1$ because their effects may be at least partially captured by the added variables Z_is.

53.   A similar decomposition approach is applied to the gap $\beta_2 - \beta^\dagger_2$.

Interaction terms

54.   Earlier research suggests that the effect of parental education on university attendance may differ between the 2nd and 3rd-and-higher generations. Some research finds that in Canada the correlation between parents" education and the students" educational attainment is weaker among immigrant than domestic families (Bonikowska, 2008; Childs, Finnie, Mueller 2010). Similar results are found in Switzerland (Bauer and Riphahn (2007). This would suggest interacting immigrant (generational) status and parental education in the model. It may also be that PISA scores have a different effect on attendance for immigrant as compared to other students, also suggesting an interaction term. In a robustness check, including these interaction terms had virtually no effect on the "explained" gap in attendance between students with and without immigrant backgrounds, the coefficients of interest. Furthermore, in many cases the interaction terms themselves were statistically insignificant. Hence, we excluded them from the final models.

CHARACTERISTICS OF STUDENTS WITH AND WITHOUT IMMIGRANT BACKGROUNDS

55.   The mean values of the variables used in the regressions are in tables 2 and 3. The difference in characteristics between students with immigrant backgrounds (1st and 2nd generations) and those without (3rd and higher generations) are, in Switzerland, almost the mirror-image of those for Canada. In Canada, first and 2nd generation students exhibit background characteristics that tend to be correlated with higher levels of post-secondary participation. In Switzerland, the opposite is often the case.

Canada

- In Canada, the parents of 1st and 2nd generation students are more highly educated than those of the 3rd-and-higher generation: 49% of 1nd generation and 38% of 2nd generation students have two parents who are post-secondary graduates (college or university) compared to 33% among the 3rd-and-higher generation.

- A smaller share of 1st and 2nd generation students are in families without two biological parents (*e.g.* single parent or blended families) than are 3rd-and-higher generation students (21.1% and 24.9% vs. 26.2%). Students from single parent or blended families are less likely to participate in university than those from two-parent families, all else equal.

- Both 1st and 2nd generation students, and their parents, have greater aspirations/hopes of attaining a post-secondary education than their 3rd-and-higher generation counterparts (*e.g.* 97% of

students with immigrant backgrounds hope the student will obtain post-secondary education, compared to 87% of the 3rd-and-higher parents)

- A larger share of 1st and 2nd generation students live in the three largest metropolitan areas (63% and 55% vs. 21% for the 3rd plus generation), where university attendance is higher

Table 2. Variable means by generational status, Canada								
	All students				Low PISA students			
	First generation	Second generation	2.5 generation	Third-and-higher generation	First generation	Second generation	2.5 generation	Third-and-higher generation
Plausible PISA reading (mean)	518	540	557	537	414	420	425	419
Girl (%)	51.9	53.8	48.5	48.3	43.9	34.9	38.3	34.5
Both parents with post-secondary education	49.1	37.5	45.9	33.1	33.2	28.2	31.3	24.0
One parent with post-secondary education	23.0	27.7	32.0	31.6	24.4	26.1	32.5	30.1
Both parents upper secondary	10.7	15.2	13.2	16.7	8.6	20.2	17.9	18.1
One parent upper secondary	7.4	7.0	6.6	10.6	11.4	5.5	13.9	13.1
No parent with higher than lower secondary	4.3	7.0	1.6	6.3	9.5	9.2	2.4	11.1
Both parents lower than lower secondary	5.4	5.6	0.8	1.7	12.9	10.9	2.1	3.6
Nuclear families	76.5	73.8	85.7	71.1	70.7	68.8	80.8	66.8
Single parents	15.7	22.5	1.2	15.7	23.2	25.7	1.5	16.2
Blended families	5.4	2.4	10.3	10.5	2.2	2.5	13.7	13.1
Other families	2.3	1.3	2.8	2.7	3.8	2.9	4.0	3.8
Number of siblings (mean)	1.8	1.8	1.8	1.8	2.2	1.9	1.9	1.9
Home language is official	39.2	74.0	95.4	98.0	26.3	65.6	88.1	96.6
Educational resources at home (mean)	0.2	0.0	0.0	-0.2	-0.1	-0.2	-0.4	-0.4
Time spent on homework (mean)	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Three largest metropolitan areas (%)	63.2	55.1	37.1	20.5	60.8	50.6	30.3	15.8
The five next largest metropolitan areas	14.0	16.7	19.7	14.8	17.3	15.2	12.6	12.1
Other metropolitan areas	13.2	16.4	16.8	17.6	11.4	15.5	25.3	16.6
Small urban areas	4.5	7.2	11.0	18.4	4.1	10.9	10.5	21.1
Town	4.3	3.8	11.1	18.3	6.3	7.6	15.2	21.7
Village or rural area	0.9	0.8	4.3	10.3	0.1	0.2	6.1	12.8
Parents hope child get PSE	98.0	96.6	94.0	87.6	96.6	90.2	82.4	73.6
Parents made financial preparation	63.3	75.4	75.4	65.4	49.6	70.0	74.1	59.0
student hopes to finish PSE	86.9	83.6	84.6	74.2	79.3	64.2	67.7	50.7
Expect a job requiring PSE	60.8	56.2	56.6	54.8	44.3	40.5	40.4	36.8
Source: Canadian Youth in Transition Survey								

Switzerland

- In Switzerland, the educational attainment of the parents of 1st and 2nd-generation is lower than among the 3rd and higher generation students, and more polarized. Among 1st generation (immigrant) students, a somewhat smaller but significant proportion of students have at least one parent who has graduated from the tertiary level as compared to students with strictly Swiss backgrounds (33% vs. 39%). However, a much greater share of the immigrant students have parents who have not graduated from secondary school (50% vs. 21%). The educational attainment of the 2nd generation students tends to be lower (table 3).

- The educational resources at home are greater among the 3rd-and-higher than the 2nd generation, on average.

- Differences in residential location (city size) tend to favour higher participation by 1st and 2nd generation students, as in Canada. They are more likely to live in cities, when the probability of attending university or the tertiary level is greater, and less likely to live in villages and smaller communities.

- By design, students in the pre-gymnasial stream in secondary school are much more likely to attend university or the tertiary level in general, than those in the other streams (extended or basic academic requirements). Immigrant (1st generation) students are much less likely to be in the pre-gymnasium stream than the 3rd and higher generation students (14% compared with 31%). This is as a result of many factors, including academic performance, as well as cultural and social backgrounds differences (see literature review). However, 2nd generation students are, if anything, more likely to be in the pre-gymnasial stream (34%). This tends to increase their likelihood of attending the tertiary level.

Table 3. Variable means by generational status, Switzerland								
	All students				Low PISA students			
	First generation	Second generation	2.5 generation	Third-and-higher generation	First generation	Second generation	2.5 generation	Third-and-higher generation
Plausible PISA reading (mean)	404	452	498	517	366	392	412	423
Girl (%)	46.2	44.2	51.6	50.5	47.4	35.5	44.6	42.2
Both parents with tertiary education	16.5	4.7	17.0	8.2	14.0	2.9	19.3	5.5
One parent with tertiary education	16.5	19.1	32.0	30.5	16.2	10.4	18.5	27.7
Both parents upper secondary	4.9	8.6	15.7	26.0	1.7	5.5	9.6	25.2
One parent upper secondary	11.8	15.7	14.4	10.6	10.3	16.1	24.2	9.8
No parent with higher than lower secondary	29.0	36.7	15.5	20.4	34.6	46.4	18.4	25.2
Both parents lower than lower secondary	21.3	15.1	5.4	4.3	23.2	18.8	9.9	6.6
Nuclear families	68.1	66.1	81.5	76.5	67.8	72.5	74.3	72.5
Single parents	20.5	25.0	0.0	12.5	22.7	17.7	0.0	13.2
Blended families	9.7	5.8	11.2	6.7	8.1	5.6	14.1	8.8
Other families	1.8	3.1	7.3	4.4	1.3	4.2	11.6	5.6
Number of siblings (mean)	2.8	2.3	2.6	1.8	2.9	2.5	2.8	2.0
Home language is official	23.6	60.2	91.0	97.2	17.8	55.7	88.6	94.8
Educational resources at home	-0.1	0.2	0.2	0.4	-0.2	0.1	0.1	0.2
Time spent on homework	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03
Village	7.0	6.3	6.6	15.2	8.5	7.4	9.4	16.9
Town	73.2	66.5	75.8	74.8	74.1	62.8	67.5	73.0
City	16.8	26.3	13.8	7.8	14.5	29.0	17.1	8.0
Location missing	3.0	0.9	3.8	2.1	2.9	0.8	6.1	2.1
pre-gymnasial	14.2	33.7	29.3	30.9	5.7	20.7	5.3	5.2
Extended academic requirements	26.1	25.4	46.9	44.0	22.8	20.4	51.6	38.6
Basic academic requirements	55.7	36.3	20.6	23.7	67.6	52.2	41.1	53.9
No formal tracking	4.0	4.6	3.3	1.4	3.7	6.7	2.0	2.3
German language region	57.9	61.1	53.1	81.3	58.0	60.3	45.4	77.0
French language region	34.3	32.9	40.2	16.7	33.0	33.5	48.7	20.4
Italian language region	7.8	6.0	6.6	2.0	9.0	6.2	5.9	2.6
Source: Swiss Transition from Education to Employment Survey								

RESULTS

PISA scores for Canada and Switzerland

56.   PISA literacy scores are, in general, higher in Canada than in Switzerland. This was true in PISA 2000 and PISA 2009, both of which concentrated on reading, rather than math or science (OECD 2001; 2010). In PISA 2000, used in this research, the mean literacy performance score in Canada was 534 and 494 in Switzerland. The average for all OECD countries was 500. In PISA 2009, the scores were 524 for Canada and 501 for Switzerland, with an OECD average of 494.

57.   In Switzerland, the reading ability as measured by PISA scores was much lower among children with an immigrant background. Students with Swiss-born parents (the 3rd-and-higher generation) registered a score of 514, those born in Switzerland with immigrant parents 460, and immigrant students, 412 (OECD, 2001). For many of these foreign born students the language of assessment would have been a second language, and some may not have had many years experience in the school system of their host country. Even among students born in Switzerland but with immigrant parents, the language spoken at home may be different from the language of assessment.

58.   In Canada, students with Canadian born parents and those with immigrant parents have approximately the same average raw PISA score, at 538. Students who are immigrants themselves have slightly lower scores, at 511(OECD, 2001). All of these groups have scores above the OECD average score of 500, however.

59.   Given their higher educational hopes/aspirations and higher parental educational attainment, one might have expected the 2nd generation in Canada to register higher PISA scores than their 3rd-and-higher generation counterparts with similar backgrounds. This was not the case.

The Results for "All" Students

The likelihood of attending university

60.   Before focusing on secondary school low-performers, the results for *all* secondary students are presented in order to provide some context for later findings. To review, the sample consists of students who were 15 as of December, 1999, and participated in the PISA 2000 survey. If the students were attending or had graduated from a university[8] in 2007 (at roughly age 23), they are considered to have participated at university.[9]

61.   Participation by the PISA 2000 cohort at the university level by 2007 was higher in Canada than Switzerland (35.7% vs. 22.6%, table 4). Keller, Hupta-Brunner and Meyer (2010) found that about one-quarter of the 15 year old cohort were in tertiary A level (university) in Switzerland by 2007, and another 5% in tertiary level B. They note that while this is an increase over previous periods, that Switzerland has one of the lowest rates of tertiary education among developed economies (OECD, 2008,

---

8 .   In Switzerland this includes tertiary "A" schools (universities, universities of applied science, institutes of technology, and institutes of post-graduate studies). Tertiary "B" schools (post-secondary specialized schools, and advanced schools of vocational education and training) are excluded. Over 80% of the sample attending the tertiary level were in a tertiary A school. In Canada, all universities are included. Community colleges (and CEGEPS in QUEBEC) are excluded.

9 .   We are missing a small set of students who attended the tertiary level before 2007 and dropped out before graduating in Switzerland. This group cannot be identified in the TREE data.

Education at a Glance). This is in part because of the successful VET (vocational education and training) programs in upper secondary school.

62.   Among students *without* immigrant backgrounds, the inter-country difference was much less (31.6% vs. 25.0%, table 4). It is among students with immigrant backgrounds that the largest difference is observed. One-half of the 1st and 2nd generation PISA 2000 students in Canada attended a university by 2007, compared to only 11% and 20% respectively in Switzerland[10]. However, our main focus is not the Swiss-Canadian differences, but rather the participation rate gap between students with and without immigrant backgrounds within each country. We focus on those participation rate gaps, and their explanations, using the linear probability regression models outlined in the Data and Methods section. In this section, the dependent variable is the probability of attending university[11].

63.   The coefficients in the models are as one would expect (Appendix tables 1 and 2)

- In both countries, students with more highly educated parents are more likely to attend, even after controlling for performance in high school as measured by the PISA reading score. However, the effect of parent" education is considerably reduced when parental and students aspirations are included in model 3 in the Canadian case.

- Students from single parent (in Canada) and blended families are less likely to attend than those from two-parent families, all other things equal.

- Interestingly, in both countries if the home language is an official language, the student is significantly *less* likely to attend university than if it is not. This is, of course, after controlling for parents education, PISA score and other variables. It may be that the "home language" variable is picking up other "immigrant" effects correlated with home language[12].

- The effect of the PISA score on the probability of attending university is large in both countries. After controlling for background characteristics in model 2, a 10 percentage point increase in the PISA score is associated with a roughly 1.8 percentage point increase in the likelihood of attending university in both countries.

---

10 .   As noted earlier, this is in part because of the significant differences in the school systems. Many Swiss students, including many strong academic performers, choose upper secondary VET programs rather than university. That option does not exist in Canada. However, the Canadian-Swiss differences are accentuated among students with immigrant backgrounds.

11 .   The independent variable of interest is generational (immigrant) status, the only variable in model 1. The coefficients on this variable indicate the gap in university attendance between generations. In addition, Model 2 includes identical independent variables for both Canada and Switzerland, including gender, parents education, number of siblings, family type, educational resources in the home, time spent on homework, size of residential location, and PISA reading score at age 15. Model 3 includes additional independent variables for each country. For Switzerland, secondary school stream and language canton are added, and for Canada, parent"s aspirations regarding student"s university attendance, the students own aspirations, whether the parents made some financial preparations for university attendance, and whether the student expects to get a job requiring a university degree.

12 .   Students with "other" home language (other than an official language) are for the most part students with immigrant backgrounds. In the Canadian data when we add variables such as parents" and students" expectations regarding university attendance, the coefficient on the "home language" variable becomes much smaller, and no longer statistically significant. This suggests that home language is a proxy for other "immigrant effects" that are not captured in the Swiss data in particular.

- The variables added in model 3 are quite important in both countries. In the Canadian case, both the parents aspirations/hopes and the student"s own aspirations for university attendance demonstrate strong effects on the likelihood of attending, even after controlling for parental education and other variables. In Switzerland, not surprisingly the student"s secondary school stream has a strong effect on the probability of attendance, since this is by design. Since the stream in which a student is located is in part a function of their academic performance and social and cultural background, both the immigrant status and the PISA variables act in part through the secondary school stream variable in model 3 (see appendix tables 1 and 2).

Table 4. Percent attending university and any post-secondary educational institutions by age 23, by PISA reading level at age 15

			All students	First generation	Second generation	2.5 generation	Third-and-higher generation
Canada					%		
	Attending university						
	All students		35.8	49.3	48.9	45.4	31.6
	By PISA level						
		Low (level 2 or lower)	11.0	25.7	16.5	17.5	7.6
		Medium (level 3)	26.8	50.3	38.7	30.7	22.6
		High (level 4 and 5)	54.7	70.6	71.5	62.8	50.0
	Attending any post-secondary						
	All students		55.7	64.5	70.3	62.6	52.2
	By PISA level						
		Low (level 2 or lower)	35.6	48.5	50.3	38.7	31.7
		Medium (level 3)	49.5	67.1	67.5	53.5	45.0
		High (level 4 and 5)	70.5	77.9	82.1	75.7	67.7
Switzerland							
	Attending university						
	All students		22.6	11.1	19.9	30.4	25.0
	By PISA level						
		Low (level 2 or lower)	5.7	2.7	8.0	6.9	6.6
		Medium (level 3)	21.2	29.3	25.6	30.0	18.0
		High (level 4 and 5)	51.6	62.9	58.3	63.6	48.6
	Attending any post-secondary						
	All students		30.7	16.7	25.8	35.6	34.8
	By PISA level						
		Low (level 2 or lower)	11.2	6.1	10.9	10.3	15.0
		Medium (level 3)	33.9	46.3	38.2	40.6	30.5
		High (level 4 and 5)	59.0	70.7	65.4	64.0	56.9

Sources: Canadian Youth in Transition Survey and Swiss Transition from Education to Employment Survey

64.   *For Canada*, for both the 1st and 2nd generation students the likelihood of attending university is about 18 percentage points higher than for students with a strictly Canadian background (3rd and higher generation). Controlling for background characteristics and PISA scores (model 2) accounts for from one-third to one-half of this gap (table 5). Adding the additional variables in model 3 increases the "explained" gap to about 60% of the original unadjusted gap in the raw data. Around 10 percentage points of the 18 point gap is accounted for. Even after controlling for all of the independent variables, immigrant status remains important.

65.   In model 3, the decomposition indicates that the higher parental and students" own aspirations regarding university education among 1st and 2nd generation families account for most, almost two-thirds, of the explained gap among the 1st generation, and almost half among the 2nd (table 5). The higher parental educational attainment among the 1nd generation remains significant, but its effect is greatly reduced, accounting together for only 15% of the explained gap. Parental educational differences play no role in explaining the gap among the 2nd generation students. Geographical location and the lower PISA scores registered by 1st generation students (but not 2nd) play lesser roles.

66.   These results fit with earlier research by Foley *et al* (2010) and Childs *et al* (2010) for Canada. Both papers find that when parental aspirations are included, the effects of parental education and ethnic background on educational outcomes are reduced, and in the case of Foley *et al*, the effect of parental education is completely eliminated.

67.   *For Switzerland,* the story is somewhat different for immigrant (1st generation) students, and those who are the children of immigrants (2nd generation). The large 14 percentage points deficit in the probability of university attendance among *1st generation students* as compared to the 3rd-and-higher generation is entirely accounted for in both models 2 and 3 (table 6). In model 2, the lower PISA scores among the 1st generation, as compared to the 3rd-and-higher, more than account for the entire gap. In model 3, secondary school stream is added, and the effect of the PISA score is reduced, but remains important, along with the secondary school stream. Together these two variables account for more than the entire gap. The model 3 results are not surprising. The effect of the PISA scores act, in part, through the secondary school streaming variable, since the stream allocation is determined in part by academic performance. Hence, in the end, differences in reading literacy appear to be the principle explanation of the difference in university attendance between the 1st and 3rd-and-higher generations. It is also possible that some of the streaming of 1st generation students into the "basic" program, from which university attendance is extremely unlikely, is related to social and cultural background, including immigration status (see Haeberlinet *et al*, 2004, and Sacchi *et al*, 2010). Hence, social and cultural background may play a role through the "streaming" variable.

Table 5. Decomposition of the gap in educational outcomes between students with immigrant backgrounds and 3rd-and-higher generations, Canada

		All students				Low-performing students	
		University		Post-secondary		Post-secondary	
		Model 2	Model 3	Model 2	Model 3	Model 2	Model 3
First generation		Percentage points					
Observed gap		17.7	17.7	12.3	12.3	16.9	16.9
"Explained" Gap		6.0	10.5	5.2	6.8	5.6	8.1
Gap "explained" by differences in:							
Gender		0.2	0.1	0.3	0.2	0.5	0.4
Parents' education		2.0	1.5	1.8	1.6	0.7	0.7
Family structure		0.6	0.5	0.6	0.6	0.2	0.2
Number of siblings		0.0	0.0	0.0	0.0	-0.6	-0.4
Home language		2.2	0.7	0.9	0.3	-0.8	-1.3
Home education resources		0.3	0.1	0.4	0.2	0.1	-0.1
Homework time		1.8	1.0	1.8	1.3	2.3	1.7
PISA reading score		-3.3	-2.3	-2.5	-1.9	-0.5	-0.4
Geographic location		2.2	1.6	2.0	1.4	3.6	2.7
Parental expectation			2.7		1.5		2.3
Parents made financial preparation			-0.1		-0.1		-0.7
student hopes finishing university			3.9		1.6		2.9
Expect a job requiring university degree			0.8		0.2		0.1
Second generation							
Observed gap		17.3	17.3	18.2	18.2	18.6	18.6
"Explained" Gap		7.3	10.1	6.0	7.6	4.4	7.0
Gap "explained" by differences in:							
Gender		0.3	0.2	0.4	0.4	0.0	0.0
Parents' education		0.4	0.4	0.3	0.3	0.5	0.6
Family structure		0.5	0.5	0.4	0.4	-0.1	0.0
Number of siblings		0.0	0.0	0.0	0.0	-0.1	-0.1
Home language		0.9	0.3	0.4	0.1	-0.4	-0.6
Home education resources		0.2	0.0	0.2	0.1	0.0	-0.1
Homework time		1.6	0.9	1.6	1.1	1.4	1.1
PISA reading score		1.3	0.9	0.9	0.7	0.1	0.1
Geographic location		2.0	1.4	1.8	1.2	2.9	2.1
Parental expectation			2.0		1.3		1.7
Parents made financial preparation			0.4		0.6		0.9
student hopes finishing university			2.7		1.2		1.4
Expect a job requiring university degree			0.4		0.0		0.0
Source: Youth in Transition Survey, Canada							

Note: First generation refers to foreign born students; second generation refers to domestic-born students with two foreign born parents; 2.5 generation refers to domestic-born students with one foreign born parent; and third-and-higher generation refers to students with two domestic-born parents

Table 6. Decomposition of the gap in educational outcomes between students with immigrant backgrounds and 3rd-and-higher generations, Switzerland

	All students				Low-performing students	
	University attendance		Post-secondary attendance		Post-secondary attendance	
	Model 2	Model 3	Model 2	Model 3	Model 2	Model 3
First generation	Percentage points					
Observed gap	-14.0	-14.0	-18.1	-18.1	-8.9	-8.9
"Explained" Gap	-16.2	-15.1	-19.2	-19.2	-1.2	0.7
Gap "explained" by differences in:						
Gender	0.1	0.1	0.0	0.0	0.0	0.1
Parents' education	-0.5	0.0	-0.9	-0.6	0.5	0.6
Family structure	-0.5	-0.3	-0.7	-0.4	0.0	0.1
Number of siblings	0.1	-0.3	0.2	0.1	0.0	-0.4
Home language	4.3	2.2	2.8	0.8	1.8	1.5
Home education resources	0.4	-0.1	0.6	0.3	0.6	0.3
Homework time	0.0	0.0	0.0	0.0	0.1	0.1
PISA reading score	-21.3	-11.8	-22.3	-13.4	-4.6	-2.8
Geographic location	1.2	0.9	1.0	0.9	0.4	0.2
School streaming		-6.3		-6.0		0.1
Language regions		0.3		-0.8		1.0
Second generation						
Observed gap	-5.1	-5.1	-9.1	-9.1	-4.1	-4.1
"Explained" Gap	-10.9	-5.6	-12.9	-9.1	-0.3	4.7
Gap "explained" by differences in:						
Gender	0.1	0.1	0.1	0.1	0.0	-0.1
Parents' education	-2.8	-1.9	-2.6	-1.9	-0.5	-0.1
Family structure	0.0	0.1	-0.8	-0.6	0.3	0.4
Number of siblings	0.1	-0.1	0.1	0.0	0.0	-0.2
Home language	2.1	1.1	1.4	0.4	0.9	0.8
Home education resources	0.2	0.0	0.3	0.1	0.2	0.1
Homework time	0.1	0.1	0.1	0.1	0.3	0.4
PISA reading score	-12.3	-6.8	-12.9	-7.8	-2.5	-1.5
Geographic location	1.6	1.1	1.4	1.1	0.9	0.9
School streaming		0.5		0.3		3.4
Language regions		0.1		-0.9		0.8

Sources: Swiss Transition from Education to Employment Survey

Note: First generation refers to foreign born students; second generation refers to domestic-born students with two foreign born parents; 2.5 generation refers to domestic-born students with one foreign born parent; and third-and-higher generation refers to students with two domestic-born parents

68.   Among the *2nd generation* in Switzerland, the students" lower PISA scores, as compared to the 3rd plus generation, also represent the major explanation of the gap. In model 2, conditional on having similar PISA scores and other background variables, the children of immigrants are about 6 percentage points *more* likely to attend university than their counterparts with Swiss parents (appendix table 2). But PISA scores in particular are not similar, and they more than account for the "explained" gap in university attendance between the 2nd and 3rd and higher generations. In model 3, conditional on having the same PISA score, background and secondary school stream[13], the 2nd and 3rd plus generations are seen to have about the same likelihood of attending university; the original observed gap disappears. Again, the decomposition shows that differences in the PISA scores between generations more than accounted for the original observed gap in university attendance (table 5).[14]

69.   To summarize, in the raw data, the 1st and 2nd generation students in Canada are much more likely to attend university than their 3rd-and-higher generation counterparts, while in Switzerland the opposite is true. In the Swiss case, the fact that immigrant-background students have, on average, lower reading ability in high school accounts for the entire negative gap in university attendance. Once these academic/cognitive differences are accounted for, background variables like parents" education account for little of the difference between students with and without immigrant backgrounds. Some of the effect of parental education likely works through the PISA variable.

70.   In the Canadian case, we find that the greater aspirations regarding university education among immigrant families, both 1st and 2nd generation, play the greatest role in accounting for their higher university attendance as compared to the children with Canadian-born parents. Higher parental education played a much lesser role after aspirations were included. Differences in academic/cognitive ability as measured by the PISA scores do not contribute to the gap for the 2nd generation, although they do negatively affect university attendance among the 1st generation students. With similar cognitive/academic abilities at age 15 and similar family backgrounds, the 1st and 2nd generation students are more likely to attend university, in part because of the higher expectations/aspirations regarding university education.

All students: the likelihood of attending the tertiary level

71.   We repeat the above analysis, now using the likelihood of attending the tertiary (post-secondary) level in general as the dependent variable. The regression results are reported in appendix tables 1 and 2, and the decomposition results reported in tables 5 and 6.

72.   The results are similar to those reported above for university attendance.

---

13 .   Adding the secondary school stream variable in model 3 results in the disappearance of the positive university attendance gap between the 2nd and 3rd and higher generations observed in model 2. That is because the 2nd generation is marginally *more* likely to be in the pre-gymnasial stream, which leads to university, than the 3rd and higher generation. Hence, after controlling for (adjusting for) these differences in the streams, the university participation rate advantage of the 2nd generation over the 3rd is seen to disappear.

14 .   Earlier research found that in Switzerland, the PISA score gap between either the 1st and 3rd, or 2nd and 3rd generations could be, in part, explained by family background and individual characteristics (see Meunir, 2010, Vellacott and Wolter, 2002, OECD, 2006). The authors of this paper, using the PISA score as the dependent variable, found that one could account for about half of the PISA gap between generations using the background variables available in the TREE data set. In the regressions with the probability of university participation as the outcome variable, some of the effects of parental educational attainment and other background variables on participation are likely working through the PISA variable. We found that when the PISA variable is not included in the regression, the β on parental education increased considerably. One can think about βs on the parental education variable in model 2 or 3 as reflecting the effect that remains after accounting for the effect of parental education on the PISA score.

73.   *For Canada*, the advantage in post-secondary attendance that the *1st generation* demonstrate over the 3rd plus generation is somewhat smaller, at around 12 percentage points rather than the 18 points observed in university attendance. Students with immigrant backgrounds are more likely to choose university over college than their counterparts with strictly Canadian backgrounds. About 40% to 50% of this gap is accounted for in models 2 and 3. A number of variables account for this "explained" portion of the gap, including differences in the students" and parents" aspirations (accounting for almost one-half of the explained gap), as well as differences in parents" education, geographical location, and homework time, each accounting for about one-fifth of the explained gap. Differences in PISA scores tended to reduce the likelihood of the 1st generation attending post-secondary, but this effect was more than offset by the other positive effects.

74.   For the 2nd generation, in the raw data the advantage over the 3rd plus generation remained at around 18 percentage points. In model 3 about one-half of this gap can be accounted for by the independent variables related to background, PISA score and aspirations (table 5). Of this "explained" gap, parents" and students" aspirations accounted for about one-third, geographical location and homework time each about 15%. There were no differences in PISA scores between the 2nd and 3rd plus generations, so this variable is not important in this case. Differences in parental education also were not seen to be important in the explanation.

75.   *For Switzerland,* the disadvantage in participation rates for students with immigrant backgrounds were seen to be greater at the tertiary level than for university attendance alone. In the raw data, 1st generation students were 18 percentage points less likely to attend the tertiary level by age 23 than their 3rd plus generation counterparts, and the 2nd generation, 9 percentage points less likely. In both cases, the entire gap could be accounted for by the independent variables included in both models 2 and 3. Once again the differences in the PISA score between the students with immigrant backgrounds and the 3rd-and-higher generations accounted for the entire gap. As before, in model 3 when secondary school stream is introduced, it robs some of the explanatory power from the PISA variable. However, since a students" stream is in part a reflection of academic performance, both the PISA and the "stream" variables are reflecting academic performance to some extent. Parents" education and geographical location account for some of the gap, the former in a negative and the latter in a positive sense, but their effects are very small compared to the PISA variable.

Results for Low-Performers

The Likelihood of participation at the tertiary level

76.   Students with lower reading literacy scores may be more likely to attend college, or tertiary B schools in Switzerland, than university. Hence, for students with PISA level one or two reading literacy scores, we focus on the probability of attending the post-secondary level in general. This includes university or college in Canada, or tertiary A or tertiary B schools in Switzerland.

77.   More than one-third of low-performers participated at the post-secondary level in Canada, compared to 11% in Switzerland (table 4). However, as noted earlier, we are likely underestimating tertiary participation in Switzerland. Enrolment in tertiary B schools in Switzerland often occurs at a later age. Perhaps as few as one-half of the students who will ultimately attend tertiary B schools are enrolled by the age 23. Furthermore, the capacity of the tertiary B system in Switzerland is relatively small compared to the college system in Canada. Finally, many low-performing students may opt for vocational training (VET) in upper secondary, rather than continuing to the tertiary level. This route can result in positive labour market outcomes, and is a choice not readily available in Canada.

78.   Being a low secondary school performer in Switzerland results in a much greater reduction in the likelihood of tertiary attendance than in Canada, particularly among students with immigrant backgrounds. Overall, high secondary school performers (in PISA reading level 4 or 5) are twice as likely to attend the post-secondary level as their low-performing counterparts in Canada (in the raw data, no controls), but in Switzerland they are over five times as likely to attend. This difference is exacerbated among the immigrant population. In Canada, among the 1st and 2nd generation, high performers are 1.6 times as likely to attend as low-performers. In Switzerland, high performers are 12 (among the 1st generation) and 6 times (2nd generation) as likely to attend. Immigrant students who are low-performers have very low probabilities of tertiary attendance, and over three quarters of these students are in fact low secondary school performers as measured by the PISA literacy test[15] (table 1).

79.   What of the gap in attendance patterns between students with immigrant backgrounds and those without, and the explanations for the gap?

80.   In *Canada*, about one-half of low secondary school performers in the 1st and 2nd generation continue to the post-secondary level, compared to only one-third of low-performing students with strictly Canadian backgrounds. Students with immigrant backgrounds seem to find some way of attending the post-secondary level in spite of their low PISA reading scores. Of this 17 or 18 percentage point gap, 40% to 50% of it can be "explained" by the explanatory variables included in model 3 (table 5). Hence, even after controlling for numerous variables related to background, PISA reading literacy scores and aspirations, low-performing students with immigrant backgrounds remain 9 to 12 percentage points more likely to continue to the post-secondary level than their 3rd plus generation counterparts (appendix table 3). Of the "explained" gap, once again differences in parents" and students" aspirations regarding post-secondary attendance accounted for the majority, or roughly 40% (among the 2nd generation) to 60% (among the 1st generation) of the explained gap. Other variables of significance included differences in geographical location, accounting for about one-third of the "explained" gap, and differences in homework time (one-fifth). But more than half of the difference in post-secondary attendance between the generations remains unexplained by the variables we have at our disposal. Differences between generations in PISA reading scores and parental education accounted for little of the post-secondary attendance gaps.

81.   *For Switzerland*, the educational attainment of low-performing students is an important issue, since three quarters of 1st generation students and 60% of 2nd generation students find themselves in this group. The tertiary attendance rate of 1st generation low-performers is less than one-half that of their 3rd plus generation counterparts, and among the 2nd generation is it two-thirds of the rate (table 4). Hence, the very large numbers of students with immigrant backgrounds who find themselves in the low-performing category have relatively low tertiary attendance rates compared to their counterparts with strictly Swiss backgrounds. What can we say about these gaps?

82.   Unfortunately our models explain little of the gap. For the *1st generation*, both models 2 and 3 account for virtually none of the 9 percentage point gap in tertiary attendance between immigrant students and those with Swiss backgrounds. Or more specifically, there are a number of off-setting factors. Differences in PISA scores (even among low performers) tend to favour higher participation rates among

---

15 .   As noted earlier, the language of the test is often not the immigrant student"s home language, affecting test scores. This may be true among some 2nd generation students as well, where the share who are low-performers is also high (61%). However, these PISA reading literacy scores are strongly correlated with post-secondary attendance, and no doubt play a significant role in tertiary attendance patterns.

the 3rd plus generation, but home language[16] and language canton of residence tend to favour higher rates among the 1st generation. The effects offset each other (table 5).

83.   Among the *2nd generation students,* the gap in the likelihood of tertiary attendance with the 3rd plus generation is much smaller, at - 4.1 percentage points, and not statistically significant. However, in model 3, when the secondary school streaming variable is added, the gap becomes marginally significant at – 8.8 percentage points (appendix table 4). The gap increases in model 3 because 2nd generation students were more likely[17] to be in the pre-gymnasial stream that leads to tertiary schooling than 3rd plus generation students. Hence, after one accounts for this difference through the control variable, the likelihood gap increases.

84.   Hence, conditional on their family background, PISA scores and secondary school stream, low-performing students with immigrant background, both 1st and 2nd generation, are about 9 percentage points less likely to attend the tertiary level than students with Swiss-born parents. This is the opposite of the situation in Canada, where after controlling for similar variables, low-performing students are from 9 to 11 points more likely to attend, although the differences are statistically insignificant, given the small sample of low-performers in Canada. We can account for relatively little of this gap in Switzerland based on the variables in the models. Other unmeasured variables are playing a role.

Differences in outcomes by source country background

Ethnic composition of the second generation in Canada and Switzerland

85.   Earlier research clearly shows that the educational attainment of immigrants and the 2nd generation varies by ethnic group/source country of the parents. These ethnic group effects hold both unconditionally (prior to accounting for differences in backgrounds) and after adjusting for background characteristics (See Picot and Hou, 2010 for a North American review, and Heath *et al.,* 2008 for a European review). In North America, the higher levels of educational attainment are observed among the 2nd generation whose parents originate in China, India, Africa, and other Asian countries. Poorer outcomes are observed among students whose parents came from Mexico and other Latin American countries. Students whose parents originated in Western Europe or North America tend to have educational outcomes that fall between the two extremes. In Europe, in general, students whose parents come from other European nations, particularly Western Europe, tend to have superior educational outcomes to those whose parents originated in less developed nations outside of Europe. There is some evidence, however, that 2nd generation students of Chinese or India origin have very high levels of educational attainment in Europe as well as North America.

86.   Source country, likely serving as a proxy for a host of variables that it may be difficult to disentangle, is one of the important determinants of the educational attainment of the children of immigrants. Source country may reflect differences in the value placed on education by the parents, the expectations of the parents regarding educational attainment, the support available from the ethnic group as a whole ("ethnic capital"), the educational attainment and occupational status of the parents, which varies

---

16 .   As noted earlier, students whose home language is not an official language have a higher probability of continuing to the tertiary level. Since this is largely the foreign born population, it seems likely that this variable is picking up some other trait associated with the foreign born, such as aspirations to attend the tertiary level. It seems unlikely that it is a true reflection of the effect of home language alone.

17 .   This phenomenon is not observed in all parts of Switzerland. A higher share of the 2nd generation than 3rd plus students were in the pre-gymnasial stream in the French speaking, but not the German speaking cantons.

by ethnic groups, the quality of the school systems to which students are exposed, home language effects, and other cultural differences influencing life-style choices.

87.   With the data at hand, we can control for some of these differences, but not others. Our work differs from the earlier research in two ways. First, we are able to control for secondary school performance and cognitive abilities by using the PISA scores. Most of earlier research did not have access to such data. Secondly, the earlier work focused on the "average" student, whereas we produce results for the low-performers in secondary school, as well as the mean results for all students. However, given the relatively small samples in the surveys with which we are working, it is necessary to combine the 1st and 2nd generations into one group. In this section, the term "students with immigrant backgrounds" refers to the pooled data on both immigrant students (1st generation) and those with two foreign born parents (2nd generation).

88.   The birth place variable is not comparable between the YITS (Canada) and the TREE (Switzerland) data. In Switzerland, a little over one-quarter of the immigrant-background students were from, or had parents who were from, developed European economies (Table 7). About 40% were born in, or had parents who were born in, the less developed economies of the former Yugoslavia, Albania, Kosovo or Turkey. The remaining roughly one-third had Spanish or Portuguese backgrounds, or were from other countries.

Table 7. Source region of students with immigrant backgrounds (the first and second generation combined)

In Canada	%		In Switzerland	%
China	14.3		Germany, Austria	3.1
India	9.8		France, Belgium	5.1
Other East, South East Asian	19.7		Italy	17.5
U.S.	4.4		Spain	3.8
Central/South America	13.0		Portugal	9.0
U.K.	8.9		Former Yugoslavia	15.6
Northern/Western Europe	3.9		Albania or Kosovo	13.5
Other Europe	18.4		Turkey	9.8
Africa and others	7.6		Others	22.6

Source: Swiss Transition from Education to Employment Survey and Canadian Youth in Transition Survey

89.   The background of immigrant-background students was very different in Canada (Table 7). About 44% were of Asian origin, notably China and India. About 18% had backgrounds associated with the developed economies of the U.S., the U.K or Northern and Western Europe. The remaining one-third were born in, or had parents who were born in, Central or South America, elsewhere in Europe, or Africa.

Group differences in educational outcome

90.   To assess differences in outcomes by source region of the parents (or students if they are immigrants), we use the three regression models outlined in the methods section. The same population of students with PISA scores at age 15, and who remain in the sample in 2007 at age 23, is employed. The dependent variable is the probability of attending a tertiary level institution (or university) by age 23. With

the exception of the "generational" variables, the independent variables are the same as those used in the earlier described regression models 1, 2 and 3 (appendix tables 1 and 2). Given the small sample sizes, it is necessary to combine the 1st and 2nd generation populations into one category, referred to as students with immigrant backgrounds. Rather than employing a binary variable that denotes generational status (1st, 2nd, 2.5 or 3rd-and-higher) as in the earlier regressions, we use a "source region" variable that denotes the country of birth of the student if a 1st or 3rd-plus generation student, and of the parent if a 2nd generation student. The source country variable has seven levels for Switzerland, and eleven for Canada.[18] The host country (Switzerland or Canada) is always the reference group. In the Swiss data, for example, the 3rd plus generation students would always register Switzerland as the source country. Since this category is always used as the reference group, the coefficients in the regression model estimate the differences in the likelihood of attending the tertiary level between the immigrant-background students whose source region is, say, Turkey, and students whose parents were born in Switzerland (the 3rd-and-higher generation). The same approach is used with the Canadian sample; 3rd plus generation students, whose parents are always born in Canada, form the reference group.

Results

For Switzerland

91.   The sample that includes *all students*, not just low-performers, displays the expected results (table 8). In *Switzerland*, unconditionally (in the raw data, model 1), immigrant-background students with German/Austrian/French/Belgium backgrounds are more likely than those with Swiss born parents (the 3rd and higher generation) to attend university, or the tertiary sector as whole, while those with all other backgrounds are less likely to attend (Table 8). The differences are substantial, ranging from 21 percentage points more likely to attend (German etc. backgrounds) to 21 percentage points less likely to attend. Students with families from Yugoslavia/Albania/Kosovo, Spain/Portugal and Turkey are in particular much less likely to attend either university or the tertiary level than their counterparts with Swiss-born parents (unconditionally).

92.   For most regions, the differences in the explanatory variables included in models 2 and 3 can account for most of this gap in both university and tertiary attendance between immigrant-background students from a particular region, and students with strictly Swiss backgrounds. After controlling for family background, and in particular PISA scores, as well as secondary school stream in model 3, most or all of the gap is accounted for in most cases (table 8). In models 2 and 3 most of the gaps become statistically insignificant, and small. The German/Austrian/France/Belgium case is an exception. Relatively little of the advantage that students with backgrounds from these countries have relative to Swiss-background students in both university and tertiary attendance is accounted for either by family background, PISA scores or school stream. Other unmeasured variables are playing a significant role.

---

18 .   For Switzerland, the categories for this variable include Switzerland (i.e. 3rd-and-higher generation), Germany/France/Austria/Belgium, Italy, Spain/Portugal, Yugoslavia/Albania/Kosovo, Turkey, and Other. For Canada, the categories are Canada (i.e., the 3rd-and-higher generation), China, India, Other East or South East Asia, Other Asia, U.S., Central/South America, U.K., Northern/Western Europe, Other Europe, Africa and others. Some aggregation of categories was necessary due to sample size issues.

Table 8. Differences in the likelihood of attending university or post-secondary education between students with immigrant backgrounds and 3rd-and-hihger generation students, by source region

Coefficients from regression models showing difference in the proportion attending university or post-secondary education, for *all students*

	Attending university as the outcome				Attending post-secondary as the outcome			
	Model 1	Model 2	Model 3	% of gap accounted for	Model 1	Model 2	Model 3	% of gap accounted for
<u>Canada</u>								
China	0.40 *	0.29 *	0.24 *	40%	0.28 *	0.20 *	0.16 *	45%
India	0.28 *	0.16 *	0.09	66%	0.19 *	0.09	0.04	80%
Other East, Southeast Asia	0.14 *	0.12 *	0.06	56%	0.20 *	0.19 *	0.15 *	25%
Other Asia	0.28 *	0.27 *	0.21 *	26%	0.25 *	0.25 *	0.20 *	20%
U.K.	0.04	-0.01	-0.01	129%	0.09	0.05	0.05	46%
U.S.	0.01	-0.02	-0.02		-0.05	-0.06	-0.05	
Caribbean, Central and South Ameri	-0.03	0.01	-0.03		-0.01	0.03	0.01	
Northern, Western Europe	0.11	0.04	0.06	51%	0.07	0.01	0.02	70%
Other Europe	0.16 *	0.12 *	0.10 *	39%	0.17 *	0.14 *	0.12 *	27%
Africa and others	0.23 *	0.17 *	0.12 *	49%	0.19 *	0.14 *	0.10 *	50%
<u>Switzerland</u>								
Germany, Austria, France, Belgium	0.16 *	0.12 *	0.10 *	36%	0.21 *	0.19 *	0.18 *	13%
Italy	-0.12 *	0.03	-0.02	80%	-0.14 *	0.03	-0.02	88%
Spain and Portugal	-0.12 *	0.01	-0.06	52%	-0.21 *	-0.07	-0.11 *	48%
Former Yugoslavia, Kosovo, Albania	-0.19 *	0.05	0.02	109%	-0.20 *	0.05	0.02	111%
Turkey	-0.13 *	0.09 *	0.04	132%	-0.20 *	0.04	-0.01	94%
Other countries	-0.05	0.03	0.02	136%	-0.13 *	-0.02	-0.03	79%

Source: Swiss Transition from Education to Employment Survey and Canadian Youth in Transition Survey

Note: * significant at p<=0.05. Students with immigrant backgrounds include both first and second generation students

93.   Among secondary school *low-performers,* the unconditional differences (in the raw data) between immigrant-background students and Swiss-background students are much smaller. Only among students with an Italian background is there a statistically significant difference in the likelihood of attending the tertiary level (table 9) In this case, virtually none of this -12 percentage point gap is accounted for by the explanatory variables in model 3. The gaps with the Swiss-background students are much smaller for immigrant-background students from other regions. Hence, there is less to explain in the case of secondary school low-performers in Switzerland.

For Canada

94.   For *Canada,* the now familiar pattern is observed for *all* students (Table 8). Unconditionally, students with Chinese backgrounds are 40 percentage points more likely

Table 9. Differences in the likelihood of attending post-secondary education between students with immigrant backgrounds and 3rd-and-higher generation students, by source region

Coefficients from regression models showing difference in the proportion attending post-secondary education for *Low Performing Students*

	Attending post-secondary as the outcome			
	Model 1	Model 2	Model 3	% of gap accounted for
<u>Canada</u>				
China	0.34 *	0.30 *	0.24 *	28%
India	0.08	-0.01	-0.04	
Other East, Southeast Asia	0.33 *	0.29 *	0.26 *	22%
Other Asia	0.34 *	0.36 *	0.33 *	3%
U.K.	0.26 *	0.20	0.20	21%
U.S.	-0.17	-0.06	-0.10	45%
Caribbean, Central and South Ameri	-0.03	-0.04	-0.07	
Northern, Western Europe	0.21	0.28	0.22	
Other Europe	0.15	0.13	0.12	22%
Africa and others	0.07	0.02	0.00	101%
<u>Switzerland</u>				
Germany, Austria, France, Belgium	0.00	-0.02	-0.05	
Italy	-0.12 *	-0.09 *	-0.14 *	
Spain and Portugal	-0.06	-0.03	-0.11	
Former Yugoslavia, Kosovo, Albania	-0.06	0.00	-0.02	57%
Turkey	-0.05	0.01	-0.01	72%
Other countries	-0.09 *	-0.05	-0.09	3%

Source: Swiss Transition from Education to Employment Survey and Canadian Youth in Transition Survey

Note: * significant at p<=0.05.

to attend university and 28 percentage points more likely to attend the post-secondary level than those with parents born in Canada. That means that almost three quarters of students with a Chinese immigrant background attend university, more than twice the rate among Canadian-background students. And 80% of Chinese background students attend some form of post-secondary institution. Accounting for background characteristics and aspirations regarding attendance, as well as residential location (model 3), accounts for 40% to 45% of this positive gap in the Chinese case. But there remains an unexplained component even with this relatively rich set of control variables.

95.   Students with many other source region backgrounds also display a significant advantage over the Canadian-background students regarding university and post-secondary participation. This is particularly true for students with backgrounds from all other Asian regions, Africa, and "other European" nations. Students with backgrounds from other developed economies such as the U.S, U.K., and Northern

and Western Europe do not look much different from Canadian-background students regarding post-secondary participation. However, students with immigrant backgrounds from all source-regions used in this typology have participation rates equal to or higher than students with strictly Canadian backgrounds. No source region group is seen to lag behind in the raw data.

96.   Among the source regions with large positive advantages in post-secondary attendance, the proportion of the gap with Canadian-background students that can be accounted for by differences in family background, PISA scores, aspirations and other variable sin model 3 varies tremendously, from one-quarter to over three-quarters (table 8). However, in many cases the post-secondary attendance advantage cannot be entirely explained, even by the rich set of variables available in model 3.

97.   Among *low-performers* in Canada, students with Chinese background are 34 points more likely to attend the post-secondary level than their counterparts with Canadian born parents (Table 9). Among low performers with Chinese backgrounds, two-thirds (66%) attend a college or university (about one-half attend a university). Being low-secondary school performers appears to do little to discourage students with such a background from continuing. Only about one-quarter of this large advantage in post-secondary attendance by students with Chinese backgrounds can be accounted for by differences with the Canadian-background students in family background, PISA score, aspirations and the other variables included in model 3. Conditional on having similar backgrounds, having a Chinese background continues to result in a 24 percentage point advantage in post-secondary attendance compared to the 3rd-and-higher generation low performers (Table 9).

98.   Virtually identical results are evident for students with other Asian backgrounds (other than Indian), and like the Chinese background students, these significant advantages are not explained by the background variables included in the models. Other unmeasured factors are at play. Low-performing students with European backgrounds also display a substantial advantage over their counterparts with strictly Canadian backgrounds regarding post-secondary attendance. Little of this advantage can be explained by these models as well.

99.   In summary, there are important differences by source country background in the likelihood of attending university or college in both Switzerland and Canada. In Switzerland, this means a lower probability of attendance among students with immigrant backgrounds, except for students with French/German/Austrian/Belgium backgrounds. In most cases, controlling for family background and PISA score accounts for most or all of this negative gap (except for Germany/France). It is likely that PISA score differences play an important role.

100.   In Canada, unconditionally, students in virtually all source region groups are more likely to attend a post-secondary institution than those with strictly Canadian backgrounds. The Chinese and other Asians stand out, as they have very much higher university and post-secondary participation rates, even if they are low-performers in secondary school.[19] Among the low-performers, students with Asian (except Indians) backgrounds in particular have very high post-secondary participation rates. Low-performing

---

19 .   It is possible that students with immigrant backgrounds have lower PISA reading scores because the language of the test is not their "home" language, and that they may be much better in other subjects, such as science and math. However, these results apply equally to 2nd generation students, whose schooling would have been in the language of the test. Also, the PISA results show that immigrant-background students with low PISA reading scores also had, on average, low PISA math and science scores. In Canada, among immigrant background students, those with low PISA reading scores (in level 1 or 2) had reading scores that were 68% of those of their counterparts with high PISA reading scores (level 4 and 5). These same students with low reading skills had *science* PISA scores that were only 70% of those of students with high PISA reading scores, and *math* scores that were 75%. Very similar results were observed for Switzerland.

students with European backgrounds are also more likely to attend post-secondary than the 3rd-and-higher generation. Controlling for family background, PISA score differences and aspirations accounts for little of the positive gap. This is in part because, unlike Switzerland, the PISA scores are very similar between students with and without immigrant backgrounds.

What differentiates low-performers who attend from those who do not?

101.   The paper so far has concentrated on the role of immigrant status as a determinant of post-secondary participation, among both students in general, and low-performing secondary school students in particular. But many other variables may also differentiate low-performers who attend the post-secondary level from those who do not. To address this issue, we compare the magnitude of the effect of various explanatory variables on the likelihood of attending a post-secondary institution (reported in appendix tables 3 and 4).

102.   For *Canada*, among the low-performing secondary school students, the variables that play a significant role in differentiating those who attend from those who do not include parents" and students" aspirations regarding post-secondary attendance, whether the family made financial preparations for post-secondary attendance (likely a motivational effect), family status, PISA reading literacy level even among low-performers, and parental educational attainment.

103.   If both the parents and student held aspirations to attend the post-secondary level, they were about 20 percentage points more likely to attend than those who did not, after controlling for parental education and PISA score (Appendix table 3). This is an important difference. Students in single parent or blended families were about 10 percentage points less likely to attend than their counterparts in two parent families. A 10 percentage point difference in Pisa reading scores resulted in about a 0.8 percentage point difference in the likelihood of attending. Students whose parents had high school or less education were from 10 to 15 percentage points less likely to continue as compared to families where both parents had a post-secondary education.

104.   In *Switzerland*, in model 2 the results are similar (appendix table 4). There is no variable related to the aspirations of parents or students, but parental education, family status, and PISA score are all seen to play a role in differentiating those low-performers who continue from those who do not. In model 3, when secondary school stream and language canton variable are added, not surprisingly secondary school stream in particular is seen to play a significant role, since this is by design. Low-performing students living in the Italian language cantons are also more likely to continue to the tertiary level than their counterparts in other cantons, all else being equal.

105.   The results from the two countries suggest that the traditional variables such as parental education and family type play a role in the likelihood of low-performers continuing, even after controls for PISA reading scores and other background variables. But the Canadian results also suggest that variables related to motivation, such as parental and student aspirations, and the degree of financial preparedness, play even a greater role in distinguishing those who continue from those who do not.

SUMMARY AND DISCUSSION

106.   We begin by summarizing the main findings.

> *Explaining the gap in post-secondary participation between students with and without an immigrant background: ALL STUDENTS*

107.   In line with earlier research, compared with students with strictly domestic backgrounds, the raw data indicate that students with immigrant backgrounds are more likely to continue to the post-secondary

(tertiary) level in Canada, and less likely in Switzerland. First and 2nd generation students in Canada are both 18 percentage points more likely to go on, and in Switzerland, 14 and 5 percentage points, respectively, less likely to continue than their counterparts with strictly Swiss backgrounds.

108.   The lower participation rates among immigrant-background students in *Switzerland* are almost entirely the result of their poorer secondary school performance as measured by the PISA reading literacy scores, even when controlling for family background and numerous other variables. When the student"s secondary school stream is added to the model, the fact that fewer 1st generation students in particular are in the pre-gymnasial stream also contributes to the participation rate gap. However, since the student"s stream is in part a function of academic performance, this effect is likely school performance related as well. Parental educational attainment, although lower among students with immigrant backgrounds, accounts for little of the negative Swiss attendance gap, after controlling for PISA score. There is some variation in these results by source country background. Students with German/French/Austrian/Belgium backgrounds were considerably more likely to attend the post-secondary level than those with strictly Swiss backgrounds. All other major groups were less likely to attend, and the analysis could account for virtually all of their negative participation rate gaps with Swiss-background students. Why the lower PISA scores among students with immigrant backgrounds? While not addressed directly here, earlier research and the authors" calculations suggest that from one-half to all of the difference in PISA scores between students with immigrant backgrounds and those without can be accounted for by individual characteristics, family background, and school characteristics.

109.   The story is for *Canada* is more complex. The analysis can typically account for about one-half of the very significant participation rate advantage that immigrant background students hold over those with Canadian-born parents, referred to as the "explained" gap. Unlike the Swiss case, differences in secondary school performance (PISA scores) between groups play virtually no role (there is a small negative effect among immigrant students). Rather, the parent"s and student"s aspirations regarding post-secondary attendance for the student play the most significant role, accounting for from one-third to one-half of the "explained" gap (perhaps 20% to 35% of the total participation rate gap). Differences in parents" education played a smaller role. There was significant variation by source region. Among secondary school students with Chinese backgrounds, fully 80% continue to the post-secondary level, compared to 52% of those with strictly Canadian backgrounds. Large advantages are observed among students with other Asian and African backgrounds as well. The analysis can account for from 20% to 80% of this post-secondary advantage, depending upon the source region. Thus, even after accounting for differences in family background, secondary school performance, aspirations regarding post-secondary attendance, and so on, immigrant-background students are more likely to continue to the post-secondary level.

Explaining the gap in post-secondary attendance: LOW PERFORMING SECONDARY SCHOOL STUDENTS

110.   Differences in school systems of the two countries make comparisons of the educational attainment outcomes of low secondary school performers difficult. Switzerland has the upper secondary vocational/apprenticeship programs (VET) which many students choose rather than continuing to the tertiary level. VET graduates have a reasonable chance of obtaining qualified jobs in the labour market without having to attend a tertiary institution. A similar choice is not readily available in Canada where students must continue to the post-secondary level (colleges) for significant vocational training. Stalder *et al* (2010) found that a surprisingly large proportion of Swiss students with low PISA reading scores chose and graduated from the basic VET route, in spite of their low PISA scores. However, Meyers (2010) found that immigrant background students are underrepresented in the VET stream. Furthermore, many students enter the tertiary B level after the age of 23, and hence we are underestimating the proportion of 15 year olds who will ultimately enter the tertiary level in Switzerland.

111.   That said, having poorer reading literacy skills in Switzerland results in a much greater reduction in the likelihood of tertiary attendance than in Canada, relative to students with higher level skills. In Canada, low-performing students (level 1 or 2 PISA scores) are about one-half as likely to continue to the tertiary level by age 23 as high-performing students (PISA levels 4 or 5); in Switzerland they are one-fifth as likely to continue. This difference is exacerbated among immigrant students. In Switzerland, by age 23 low-performing 1st generation (foreign born) students are one-tenth as likely to reach the tertiary level as first generation high performers. This difference between the two countries may be related to the streaming process, which makes tertiary attendance difficult once in a stream other than the pre-gymnasial stream. This may in particular affect students with lower literacy skills, since academic performance is a basis of stream selection. Research has shown that social and cultural background can also affect stream selection (Sacchi *et al*, 2010; Haeberlinet *et al*, 2004), and this too may play a role, particularly for low performers. The structure of the Canadian education system can also affect these results. In many provinces, Canadian low-performers must continue to the community college (post-secondary level) to obtain significant vocational training, something done at the upper secondary level in Switzerland. This too could affect the relative post-secondary attendance patterns of low and high performers.

112.   But what of the gap in tertiary level participation between students with and without immigrant backgrounds, and its explanations? In Canada, many low-performers with immigrant-backgrounds find some way of getting to the post-secondary level, usually university, in spite of their low PISA scores at age 15. About one-half of immigrant-background low-performers continue, compared to one-third with strictly Canadian backgrounds. Controlling for PISA score, family background and aspirations accounts for about one-half of this difference, with students and parents aspirations being the most important explanatory variable along with geographical location (living in large cities increases the likelihood of attendance). Even with similar PISA scores, family background and aspirations, low-performing students with immigrant backgrounds are more likely to continue.

113.   There is significant variation by source region. An extremely high proportion of Asian background students who registered low PISA reading scores continue to the post-secondary level, usually university[20]. Among low-performers with Chinese backgrounds (both 1st and 2nd generation), fully two-thirds attend a college or university (one-half a university), compared to 32% of the Canadian-background low-performers. Differences in PISA scores, family background and aspirations can account for only one-quarter of this large difference. Other unmeasured factors are at play that contribute to this significant advantage. An identical advantage is seen among other Asian-background students (other than Indian). European backgrounds are also associated with higher post-secondary attendance among low-performers, and our models explain little of this advantage.

114.   In Switzerland, low-performing immigrant students are 9 percentage points less likely to continue to the tertiary level than those with strictly Swiss backgrounds. Accounting for differences in family background, PISA scores, geographical location and streaming accounted for little of this gap. Here again, unmeasured factors are at play. Second generation students were 4.1 percentage points less likely to continue, but the difference was not statistically significant.

---

20.   It is possible that students with immigrant backgrounds have lower PISA reading scores because the language of the test is not their "home" language, and that they may be much better in other subjects, such as science and math. However, these results apply equally to 2nd generation students, whose schooling would have been in the language of the test. Also, the PISA results show that immigrant-background students with low PISA reading scores also had, on average, low PISA math and science scores. In Canada, among immigrant background students, those with low PISA reading scores (in level 1 or 2) had reading scores that were 68% of those of their counterparts with high PISA reading scores (level 4 and 5). These same students with low reading skills had *science* PISA scores that were only 70% of those of students with high PISA reading scores, and *math* scores that were 75%. Very similar results were observed for Switzerland.

What differentiates low-performers who attend the tertiary level from those who do not?

115.   Many other variables besides immigrant status may differentiate low-performers who continue to the post-secondary level from those who do not. For *Canada*, the variables that play a significant role in this process include parents" and students" aspirations regarding post-secondary attendance, whether the family made financial preparations for post-secondary attendance (likely a motivational effect), family structure, PISA reading literacy level even among low-performers, and parents" educational attainment.

116.   If both the parents and student held aspirations to attend the post-secondary level, they were about 20 percentage points more likely to attend than those who did not, after controlling for parents" education and PISA score. This is an important difference. Students in single parent or blended families were about 10 percentage points less likely to attend than their counterparts in two biological parent families. A 10 percentage point difference in PISA reading scores resulted in about a 0.8 percentage point difference in the likelihood of attending. And students whose parents had high school or less education were from 10 to 15 percentage points less likely to continue as compared to families where both parents had a post-secondary education.

117.   In *Switzerland*, a variable related to the aspirations of parents or students is unavailable, but parents" education, family structure, and PISA score are all seen to play a role in differentiating those low-performers who continue from those who do not. When secondary school stream and language region variables are added to the models, not surprisingly secondary school stream in particular is seen to play a significant role, since this is by design.

118.   The results from the two countries suggest that the traditional variables such as parents" education and family type play a role in the likelihood of low-performers" continuing, even after controls for PISA reading scores and other background variables. But the Canadian results also suggest that variables related to motivation, such as parents" and student aspirations, and the degree of financial preparedness, play even a greater role in distinguishing those who continue from those who do not.

Discussion

119.   Why do students with immigrant backgrounds have better relative educational attainment outcomes in Canada than Switzerland? There are a host of possible reasons that extend far beyond the topic of this paper. However, differences in the immigration systems probably play a significant role. Through its more managed system, since the 1960s Canada has had the tools to encourage more highly skilled immigration. The educational attainment of immigrants exceeds that of the domestically born population by quite a wide margin. Furthermore, much of Canada"s immigration over the past thirty years has been from Asian countries. These cultures place a very high value on educational attainment and labour market success. Having said that, there are clearly many other factors at work. By including variables influenced by the immigrant selection system, including parental education, source region and home language, we were able to account for only about one-half of the post-secondary attendance advantage of immigrant-background students over others.

120.   Until recently, Switzerland has had a much less managed immigration system, and through humanitarian and guest worker programs, generally attracted lower skilled immigrant from less developed nations. Other research has shown that differences in individual and family background between immigrant-background students and others could account for one-half to all of the differences in secondary school PISA reading literacy scores between these groups. And we find that this difference in PISA scores accounts for virtually all of the difference in tertiary participation between students with and without immigrant backgrounds. The inter-country difference in immigration systems, resulting in immigrants with very different backgrounds, plays a role in explaining the differences between countries. However, because

of changes in the Swiss system during the early 1990s, and more recently with the 2002/03 treaty on the free movement of labour in the EU, migration patterns are shifting. Many more highly skilled immigrants are entering Switzerland from nations such as Germany and France, and a smaller share of immigrants are lower-skilled from countries such as the Balkans, Turkey or Portugal. This shift could significantly influence the educational attainment of immigrant-background students in the future.

121.   Differences in the educational systems, and the interaction of immigrant background students with it, may also play a role. The more structured Swiss system allows for less adjustment on the students part, and research has shown that social background is a factor in the streaming that takes place in secondary school, above and beyond academic performance. This could negatively affect the educational attainment of immigrant background students in particular. The culture in most immigrant communities in Canada is such as to accent skills required for labour market success. And the structure of the Canadian system is such that continuation to the post-secondary level is pretty well essential to acquire skills of value in the job market. This is not the case in Switzerland, with the vocational (VET) programs in upper secondary school.

122.   The results also point to possible policy interventions. In Switzerland, with controls for secondary school performance, parental background variables play little *direct* role in explaining the negative attendance gap between students with and without immigrant backgrounds.. Given the earlier research referred to, it seems likely that parental education, for example, acts indirectly through high school performance. This distinction is important. It is virtually impossible to change the parental background of current students in immigrant families, but there may be ways of improving their high school performance. And immigration patterns have recently shown an increase in the educational attainment of entering immigrants, and could increasingly do so in the future. Without adequate data, it is difficult to know what role family hopes/aspirations play in the Swiss case. However, assuming that the Canadian results may apply to Switzerland, policies designed to influence the value that immigrant families place on higher education, and hence their aspirations regarding tertiary level attendance for their children, could also positively influence the currently negative post-secondary attendance gap.

123.   In the Canadian case, parental background is also not directly a major explanation of the positive post-secondary attendance advantage immigrant-background students hold over the 3rd-and-higher generation among low-performers (and in general). Higher parental education among immigrant families may act indirectly through the hopes and aspirations of parents and students. But since this latter variable appears to have a more direct effect on educational attainment, focusing on the value placed on higher education, and hopefully thereby influencing aspirations, may be helpful. More research on this particular question would assist policy development.

References:

Abada, T., F. Hou, and B. Ram. 2009. Ethnic differences in educational attainment among the second generation of immigrants. *Canadian Journal of Sociology* 34(1): 1-28.

Aydemir, A., W. H. Chen and M. Corak. 2008. Intergenerational education mobility among the children of Canadian immigrants. Statistics Canada Catalogue no. 11F0019M. Ottawa. Analytical Studies Branch Research Paper Series. No. 316.

Bauer, P. and R.T. Ridahn, 2007, Heterogeneity in the Inter-generational Transmission of Educational Attainment: Evidence for Switzerland on Natives and Second Generation Immigrants, Journal of Popualtion Economics

Belley, P., M. Frenette and L. Lochner. 2010. Post-secondary attendance by parental income: Comparing the U.S. and Canada. Working Paper #2010-3. Department of Economics, the University of Western Ontario

Bertschy K., M.A. Cattaneo, S.C. Wolter. 2009.PISA and the transition into the labour market. *Labour* 23: 111-139.

Bonikowska, A. 2008. Explaining the education gap between children of immigrants and the native born: Allocation of human capital investments in immigrant families. *Canadian Economics Association 42nd Annual Meeting.* University of British Columbia, Vancouver (B.C.)

Boyd, M. 2002. "Educational attainments of immigrant offspring: Success or segmented assimilation?" *International Migration Review* 36 (4): 1037–1060.

Childs S., R. Finnie, R. Mueller. 2010. Why do so many immigrants and their children attend university? Some (more) evidence for Canada. Working paper, Graduate School of Public and International Affairs, University of Ottawa

Coradi Vellacott, M., S.C Wolter, 2002 "Origine sociale et égalite des chances", in OFS/CDIP, Prepare pour la vie? Les compétences de base des jeunes – Rapport national de l'enquête PISA 2000 (pp. 88-109). Neuchâtel : Office fédéral de la statistique

Coradi Vellacott, M., & Wolter, S. C. (2004). *Equity in the Swiss education system: dimensions, causes and policy responses. National report from Switzerland contributing to the OECD's review of «Equity in Education» 2004*. Aarau: Schweiz. Koordinationsstelle für Bildungsforschung.

Falter, J.M. 2009, Transitions to Upper Secondary Education: Parental Background and Skills, Dept of Economics, Geneva, Switzerland

Frenette, M. 2004. Access to college and university: Does distance matter? *Canadian Public Policy* 30(4): 427-43.

Frenette, M. 2007. "Why are youth from lower-income families less likely to attend university? Evidence from academic abilities, parental influences, and financial constraints", Statistics Canada, Analytical Studies Branch Research Paper No. 295.

Finnie, R., and R.E. Mueller. 2010. They came, they saw, they enrolled: Access to post-secondary education by the children of Canadian immigrants." *Pursuing Higher Education in Canada: Economic, Social and Policy Dimensions*. R. Finnie, M. Frenette, R.E. Mueller and A. Sweetman (eds.). Kingston: School of Policy Studies, Queen"s University. p. 191-216.

Foley, K., V. Gallipoli, D. Green. 2010. Ability, parental valuation of education and the high school dropout decision, Canadian Labour Market and Skills Researcher Network Working Paper No. 60.

Gang I., C. Zimmerman 2000. Is child like parent? Educational attainment and ethnic origin. *Journal of Human Resources* 35:550–69.

Haeberlin, U.; Imdorf, Ch. & Kronig, W. (2004). Von der Schule in die Berufslehre. Untersuchungen zur Benachteiligung von ausländischen und von weiblichen Jugendlichen bei der Lehrstellensuche. Bern: Haupt

Heath A., C. Rothon, E. Kilpi.l 2008. The second generation in Western Europe: Education, unemployment, and occupational attainment. *Annual Review of Sociology* 34: 211-35.

Hum, D., W. Simpson, 2007. The legacy of immigration: labour market performance and education in the second generation. *Applied Economics* 39: 1985-2009.

Jonsson, J.O. and F. Rudolphi, 2011, Weak Performance – Strong Determination: School Achievement and Educational Choice Among Children of Immigrants in Sweden, European Sociological Review

Keller, A., S. Hupka-Brunner, T. Meyer. 2010. Post-compulsory education pathways in Switzerland: The first seven years. Transitions from Education to Employment, Basel

Kristen C., N.Granato. 2007. The educational attainment of the second generation in Germany. *Ethnicities* 7:343–66

Levels M., J. Dronkers. 2008 Immigrant children"s educational achievement in western countries: Origin, destination, and community effects on mathematical performance. *American Sociological Review* 73: 835-853.

Marks, G. N. 2005. Accounting for immigrant non-immigrant differences in reading and mathematics in twenty countries. *Ethnic and Racial Studies* 28:925–46.

Meyer, T. (2009). Can "vocationalisation" of education go too far? The case of Switzerland. *European Journal of Vocational Education, 46*(1), 28-40.

Meyer, T., & Bertschy, K. (2011). The Long and Winding Road from Education to Labour Market: The TREE Cohort Six Years After Leaving Compulsory School. In M. M. Bergman, S. Hupka-Brunner, A. Keller, T. Meyer & B. E. Stalder (Eds.), *Youth Transitions in Switzerland: Results from the TREE Panel Study* (pp. 92-119). Zurich.

Meunier, M., 2010, Immigration and Student Achievement: Evidence from Switzerland, Cahier de recherece No HES- SO/HEG-GE/C-10/3/1-CH, University of Applied Sciences, Switzerland

Oaxaca, R. L., M. R. Ransom. 1994. On discrimination and the decomposition of wage differentials. *Journal of Econometrics* 61:5-21.

OECD, 2001, Knowledge and Skills for Life, Organization for Economic Co-operation and Development, Paris

OECD, 2003, Literacy Skills for the World of Tomorrow, Organization for Economic Co-operation and Development, Paris

OECD. 2001. Manual for the PISA 2000 Database, Paris.

OECD, 2006, "Where immigrant students succeed – A comparative review of performance and engagement in 2003, Organization for Economic Co-operation and Development, Paris

OECD, 2009. PISA Data Analysis Manual: SAS Second Edition, Paris

OECD. 2010. PISA 2009 Results: Overcoming Social Background – Equity in Learning Opportunities and Outcomes, Paris

OECD, 2010. Pathways to Success: How Knowledge and Skills at Age 15 Shape Future Lives in Canada, Paris

OPET (2011). *Vocational Education and Training in Switzerland 2011. Facts and Figures*. Bern: Federal Office for Professional Education and Technology (OPET).

Picot, G., F. Hou. 2011. The Educational outcomes of the children of immigrants in Canada and the U.S., Statistics Canada Catalogue no. 11F0019M. Ottawa. Analytical Studies Branch Research Paper Series. No 332.

Picot, G. And F. Hou, 2010, Seeking Success in Canada and the United States, Labour Market Outcomes Among the Children of Immigrants, *in* Equal Opportunities, The Labour Market Integration of the Children of Immigrants, OECD

Sacchi, S., Hupka-Brunner, S., Stalder, B. E., & Gangl, M. (2011). Die Bedeutung von sozialer Herkunft und Migrationshintergrund für den Übertritt in anerkannte nachobligatorische Ausbildungen in der Schweiz. In M. M. Bergman, S. Hupka-Brunner, A. Keller, T. Meyer & B. E. Stalder (Eds.), *Youth Transitions in Switzerland: Results from the TREE Panel Study* (pp. 120-156). Zurich: Seismo Verlag.

Stalder, B. E., Meyer, T., & Hupka-Brunner, S. (2011a). Leistungsschwach - bildungsarm? Ergebnisse der TREE-Studie zu den PISA-Kompetenzen als Prädiktoren für Bildungschancen in der Sekundarstufe II. In M. M. Bergman, S. Hupka-Brunner, A. Keller, T. Meyer & B. E. Stalder (Eds.), *Youth Transitions in Switzerland: Results from the TREE Panel Study* (pp. 201-216). Zurich.

Stalder, B. E., Meyer, T., & Hupka-Brunner, S. (2011b). TREE Project Documentation. In M. M. Bergman, S. Hupka-Brunner, A. Keller, T. Meyer & B. E. Stalder (Eds.), Youth Transitions in Switzerland: Results from the TREE Panel Study (pp. 66-85). Zurich.

Statistics Canada, 2009. Youth in Transition Survey (YITS) Cohort A - 23-year-olds Cycle 5 User Guide. Ottawa

Thompson, S., K. Hillman. 2010. Against the odds: Influences on the post-school success of „low performers". National Center for Vocational Education Research (NCVER), Adelaide, SA, Australia.

Appendix Table 1. Coefficients of linear probability models with the dependent variable as the probability of attending university or post-secondary institutions, all students, Canada

	Model 1			Model 2			Model 3		
	β		Standard error	β		Standard error	β		Standard error
Attending university									
Intercept	0.316	***	0.008	0.491	***	0.028	0.211	***	0.028
First generation	0.177	***	0.035	0.118	***	0.031	0.073	*	0.029
Second generation	0.173	***	0.022	0.101	***	0.021	0.072	***	0.020
2.5 generation	0.139	***	0.025	0.051	*	0.021	0.022		0.020
Girl				0.052	***	0.011	0.041	***	0.010
One parent with tertiary education				-0.107	***	0.015	-0.078	***	0.014
Both parents upper secondary				-0.151	***	0.016	-0.105	***	0.015
One parent upper secondary				-0.160	***	0.018	-0.118	***	0.017
No parent with higher than lower secondary				-0.179	***	0.021	-0.121	***	0.020
Both parents lower than lower secondary				-0.182	***	0.031	-0.106	*	0.030
Single parents				-0.050	***	0.014	-0.046	***	0.014
Blended families				-0.111	***	0.018	-0.108	***	0.017
Other families				0.012		0.032	0.010		0.028
Number of siblings				-0.011	*	0.004	-0.007		0.004
Home language is official				-0.037		0.023	-0.011		0.022
Educational resources at home				0.010	*	0.004	0.002		0.004
Time spent on homework				0.041	***	0.005	0.022	***	0.006
PISA reading level				0.175	***	0.005	0.122	***	0.006
Village or rural area				-0.071	***	0.019	-0.049	**	0.016
Town				-0.063	**	0.020	-0.046	*	0.019
Small urban areas				-0.046	*	0.019	-0.034		0.018
Other metropolitan areas				0.004		0.022	0.006		0.020
The five next largest metropolitan areas				-0.031		0.019	-0.030		0.017
Parents hope child get university degree							0.121	***	0.012
Parents made financial preparation							0.039	***	0.009
student hopes finishing university							0.169	***	0.012
Expect a job requiring university degree							0.060	***	0.012
N	13705			13705			13705		
Adjusted R-squared	0.022			0.255			0.311		
Attending post-secondary education									
Intercept	0.522	***	0.008	0.671	***	0.032	0.361	***	0.037
First generation	0.123	***	0.032	0.071	***	0.032	0.056		0.031
Second generation	0.182	***	0.024	0.122	***	0.025	0.106	***	0.025
2.5 generation	0.105	***	0.026	0.023		0.024	0.011		0.023
Girl				0.077	***	0.012	0.069	***	0.012
One parent with tertiary education				-0.090	***	0.016	-0.081	***	0.015
Both parents upper secondary				-0.133	***	0.019	-0.111	***	0.019
One parent upper secondary				-0.157	***	0.020	-0.137	***	0.020
No parent with higher than lower secondary				-0.188	***	0.028	-0.146	***	0.026
Both parents lower than lower secondary				-0.187	***	0.044	-0.138	**	0.043
Single parents				-0.091	***	0.016	-0.088	***	0.016
Blended families				-0.116	***	0.023	-0.116	***	0.023
Other families				-0.073		0.039	-0.055		0.036
Number of siblings				-0.016	***	0.005	-0.011	*	0.005
Home language is official				-0.015		0.026	-0.006		0.026
Educational resources at home				0.011	*	0.005	0.005		0.005
Time spent on homework				0.041	***	0.006	0.028	***	0.006
PISA reading level				0.129	***	0.007	0.101	***	0.007
Village or rural area				-0.047	*	0.023	-0.022		0.022
Town				-0.055	*	0.024	-0.043		0.023
Small urban areas				-0.053	*	0.022	-0.040		0.021
Other metropolitan areas				0.010		0.023	0.009		0.023
The five next largest metropolitan areas				-0.041		0.023	-0.036		0.022
Parents hope child get PSE							0.145	***	0.018
Parents made financial preparation							0.064	***	0.012
student hopes finishing PSE							0.123	***	0.017
Expect a job requiring PSE							0.025	*	0.013
N	13705			13705			13705		
Adjusted R-squared	0.016			0.176			0.200		
Source: Canadian Youth in Transition Survey									

Appendix Table 2. Coefficients of linear probability models with the dependent variable as the probability of attending university or post-secondary institutions, all students, Switzerland								
	Model 1			Model 2			Model 3		
	β		Standard error	β		Standard error	β		Standard error
Attending university									
Intercept	0.251	***	0.018	0.496	***	0.052	0.669	***	0.048
First generation	-0.140	***	0.023	0.022		0.026	0.011		0.024
Second generation	-0.051	*	0.026	0.058	*	0.027	0.005		0.028
2.5 generation	0.053		0.032	0.058	*	0.029	0.057	*	0.026
Girl				-0.021		0.017	-0.023		0.016
One parent with tertiary education				-0.118	**	0.038	-0.091	**	0.033
Both parents upper secondary				-0.202	***	0.036	-0.175	***	0.031
One parent upper secondary				-0.219	***	0.037	-0.183	***	0.031
No parent with higher than lower secondary				-0.245	***	0.037	-0.184	***	0.032
Both parents lower than lower secondary				-0.234	***	0.039	-0.183	***	0.033
Single parents				-0.011		0.027	0.004		0.029
Blended families				-0.145	***	0.029	-0.111	***	0.028
Other families				-0.009		0.041	-0.006		0.039
Number of siblings				0.001		0.003	-0.003		0.004
Home language is official				-0.058	*	0.025	-0.030		0.023
Educational resources at home				-0.009		0.011	0.002		0.010
Time spent on homework				0.013		0.009	0.008		0.008
PISA reading level				0.188	***	0.011	0.104	***	0.012
Village				-0.139	***	0.040	-0.105	**	0.042
Town				-0.033		0.034	-0.025		0.032
Location missing				-0.038		0.055	0.006		0.048
Extended academic requirements							-0.304	***	0.034
Basic academic requirements							-0.348	***	0.040
No formal tracking							-0.241	***	0.038
French language region							-0.041		0.028
Italian language region							0.182	***	0.022
N	3979			3979			3979		
Adjusted R-squared	0.019			0.240			0.322		
Attending post-secondary									
Intercept	0.348	***	0.020	0.534	***	0.053	0.702	***	0.050
First generation	-0.181	***	0.031	0.011		0.033	0.011		0.034
Second generation	-0.091	**	0.037	0.038		0.034	0.000		0.034
2.5 generation	0.008		0.037	0.006		0.031	0.015		0.029
Girl				-0.009		0.021	-0.011		0.020
One parent with tertiary education				-0.076		0.041	-0.056		0.038
Both parents upper secondary				-0.193	***	0.038	-0.167	***	0.036
One parent upper secondary				-0.148	**	0.049	-0.119	**	0.045
No parent with higher than lower secondary				-0.214	***	0.040	-0.167	***	0.038
Both parents lower than lower secondary				-0.237	***	0.042	-0.195	***	0.037
Single parents				-0.077	**	0.029	-0.060		0.031
Blended families				-0.087		0.050	-0.046		0.050
Other families				-0.075		0.047	-0.069		0.044
Number of siblings				0.002		0.004	0.001		0.004
Home language is official				-0.039		0.028	-0.011		0.028
Educational resources at home				-0.013		0.013	-0.005		0.013
Time spent on homework				0.017		0.011	0.013		0.011
PISA reading level				0.197	***	0.013	0.119	***	0.014
Village				-0.126	**	0.042	-0.106	*	0.046
Town				-0.019		0.033	-0.018		0.033
Location missing				-0.094		0.053	-0.019		0.050
Extended academic requirements							-0.270	***	0.033
Basic academic requirements							-0.324	***	0.041
No formal tracking							-0.194	***	0.038
French language region							-0.096	***	0.028
Italian language region							0.156	***	0.024
N	3979			3979			3979		
Adjusted R-squared	0.023			0.222			0.277		
Sources: Swiss Transition from Education to Employment Survey									

Appendix Table 3. Coefficients of linear probability models with the dependent variable as the probability of attending post-secondary institutions, low PISA students, Canada								
	Model 1			Model 2			Model 3	
	β		Standard error	β		Standard error	β		Standard error
Intercept	0.317	***	0.015	0.662	***	0.075	0.400	***	0.081
First generation	0.169	**	0.057	0.113		0.067	0.088		0.067
Second generation	0.186	**	0.057	0.142	*	0.060	0.116		0.060
2.5 generation	0.070		0.060	0.010		0.059	-0.013		0.056
Girl				0.050		0.027	0.043		0.027
One parent with tertiary education				-0.097	**	0.034	-0.084	*	0.032
Both parents upper secondary				-0.131	**	0.043	-0.102	*	0.042
One parent upper secondary				-0.173	***	0.042	-0.151	***	0.041
No parent with higher than lower secondary				-0.145	**	0.048	-0.111	**	0.046
Both parents lower than lower secondary				-0.170	**	0.063	-0.124	*	0.062
Single parents				-0.115	***	0.031	-0.104	**	0.032
Blended families				-0.089	*	0.041	-0.088	*	0.041
Other families				-0.046		0.071	-0.023		0.069
Number of siblings				-0.020	*	0.009	-0.015		0.009
Home language is official				0.011		0.053	0.018		0.053
Educational resources at home				0.003		0.010	-0.005		0.009
Time spent on homework				0.045	***	0.012	0.034	**	0.012
PISA reading level				0.107	***	0.025	0.082	***	0.024
Village or rural area				-0.085		0.046	-0.051		0.043
Town				-0.085		0.044	-0.061		0.042
Small urban areas				-0.082		0.045	-0.068		0.041
Other metropolitan areas				-0.043		0.049	-0.049		0.047
The five next largest metropolitan areas				-0.069		0.048	-0.059		0.046
Parents hope child get PSE							0.101	***	0.028
Parents made financial preparation							0.080	**	0.026
student hopes finishing PSE							0.102	***	0.031
Expect a job requiring PSE							0.010		0.028
N	3241			3241			3241		
Adjusted R-squared	0.009			0.102			0.128		
Source: Canadian Youth in Transition Survey									

Appendix Table 4. Coefficients of linear probability models with the dependent variable as the probability of attending post-secondary institutions, low PISA students, Switzerland								
	Model 1			Model 2			Model 3	
	β		Standard error	β		Standard error	β		Standard error
Intercept	0.150	***	0.031	0.326	***	0.056	0.482	***	0.076
First generation	-0.089	**	0.036	-0.077		0.041	-0.096	*	0.043
Second generation	-0.041		0.040	-0.038		0.044	-0.088	*	0.045
2.5 generation	-0.047		0.045	-0.050		0.046	-0.058		0.044
Girl				0.004		0.030	0.014		0.030
One parent with tertiary education				0.019		0.050	0.034		0.048
Both parents upper secondary				-0.117	**	0.045	-0.107	*	0.043
One parent upper secondary				-0.036		0.059	-0.019		0.058
No parent with higher than lower secondary				-0.053		0.039	-0.026		0.035
Both parents lower than lower secondary				-0.095	**	0.034	-0.078	*	0.031
Single parents				-0.029		0.035	-0.021		0.038
Blended families				-0.117	***	0.029	-0.124	***	0.031
Other families				-0.048		0.039	-0.055		0.039
Number of siblings				0.000		0.004	-0.005		0.005
Home language is official				-0.024		0.026	-0.020		0.027
Educational resources at home				-0.013		0.015	-0.006		0.015
Time spent on homework				0.019		0.011	0.020	*	0.010
PISA reading level				0.080	***	0.021	0.049	*	0.022
Village				-0.058		0.056	-0.046		0.057
Town				-0.022		0.030	-0.031		0.028
Location missing				-0.130	***	0.035	-0.140	***	0.039
Extended academic requirements							-0.202	***	0.055
Basic academic requirements							-0.212	***	0.062
No formal tracking							-0.152	*	0.065
French language region							0.032		0.034
Italian language region							0.093	***	0.031
N	1014			1014			1014		
Adjusted R-squared	0.014			0.068			0.103		
Sources: Swiss Transition from Education to Employment Survey								

Appendix Table 5. Sample size be generation status		
	All students	Low-performing students
Canada		
First generation	569	175
Second generation	841	149
2.5 generation	871	157
Third-and-higher generation	11424	2760
Switzerland		
First generation	463	256
Second generation	472	192
2.5 generation	485	97
Third-and-higher generation	2559	469
Sources: Canadian Youth in Transition Survey and Swiss Transition from Education to Employment Survey		

THE OECD EDUCATION WORKING PAPERS SERIES ON LINE

The OECD Education Working Papers Series may be found at:

- The OECD Directorate for Education website: www.oecd.org/edu/workingpapers

- The OECD's online library, SourceOECD: www.sourceoecd.org

- The Research Papers in Economics (RePEc) website: www.repec.org

If you wish to be informed about the release of new OECD Education working papers, please:

- Go to www.oecd.org

- Click on "My OECD"

- Sign up and create an account with "My OECD"

- Select "Education" as one of your favourite themes

- Choose "OECD Education Working Papers" as one of the newsletters you would like to receive

For further information on the OECD Education Working Papers Series, please write to: edu.contact@oecd.org.