The Patterns of Persistence in Post-Secondary Education in Canada: Evidence from the YITS-B Dataset

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MESAMEASURING THE EFFECTIVENESS OF STUDENT AID

Canadian Education Project | Queen's University School of Policy Studies | Canada Millennium Scholarship Foundation
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The MESA Project

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

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

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

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

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The **Canada Millennium Scholarship Foundation** is a private, independent organization created by an act of Parliament in 1998. It encourages Canadian students to strive for excellence and pursue their post-secondary studies. The Foundation distributes $325 million in the form of bursaries and scholarships each year throughout Canada. Its objectives are to improve access to post-secondary education for all Canadians, especially those facing economic or social barriers; to encourage a high level of student achievement and engagement in Canadian society; and to build a national alliance of organizations and individuals around a shared post-secondary agenda. The Foundation is funding the MESA Project overall, and has negotiated access to its student administrative lists with each of the provinces on the project's behalf.

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Abstract

This paper uses the extremely rich YITS-B database to provide a unique national-level analysis of persistence in post-secondary education (PSE) in Canada from individuals' entry into their first PSE program. We first calculate hazard rates (and cumulative transition rates) with respect to those who i) graduate, ii) switch programs, and iii) leave PSE (perhaps to return later). Switchers are further divided into those who change programs within a given institution, those who change to a different institution at the same level (i.e., college or university), and those who change level. We also look at the reasons for switching and leaving, subsequent re-entry rates among leavers, and graduation and persistence rates once switchers and re-entrants are taken into account. These patterns are then probed in more detail using hazard (regression) models where switching, leaving, and re-entering are related to individual characteristics, family background, high school outcomes, and early PSE experiences. We find that by five years after entering PSE, graduation rates from the first program are 56.5 percent for college students and 52.1 percent for university students, but these rates rise to 73.1 and 69.4 percent, respectively, when switchers and leavers who subsequently return to school and graduate are included. Total persistence rates which also take into account those who are still in PSE push the rates to 82 (college) and 89.8 (university) percent.

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Table of Contents

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Introduction

Entering a (first) post-secondary education (PSE) program is just a beginning, and can be followed by many possible outcomes. Some students continue in their programs until graduation – some at faster or slower rates than others. Other students switch to another program, possibly at the same institution, at another institution of the same kind (college, university), or at a different level of study. Still other students abandon their studies – some to return at a later date.

The general objective of this paper is to provide new and unique empirical evidence on these different pathways of persistence in PSE in Canada. We present evidence on not only the frequency of various different trajectories, but also use modelling techniques to show how they vary by students' individual characteristics, family background, and educational outcomes at the high school level, PSE program characteristics, and early PSE experiences.

The study employs Statistics Canada's Youth in Transition, Cohort B ("YITS-B") dataset, which possesses a number of unique strengths for this analysis. The YITS-B is a national level sample of Canadian Youth first interviewed at age 18-20 in 2000 and then followed with additional interviews in 2002, 2004, and 2006. It thus captures young people when they tend to be entering the PSE system and tracks them through their PSE dynamics of interest: i) graduation; ii) continuing on in the initial program; iii) switching programs within a given institution, moving to a new institution but staying at the same level of study (i.e., college versus university), or changing levels of study; and iv) leaving PSE, possibly to return to school at the original institution or another one at a later date. We are aware of no other Canadian dataset that allows this kind of analysis.

Furthermore, the YITS-B also includes a range of variables that permit a detailed analysis of the transitions in question. These include basic individual demographic characteristics such as sex, age, and immigrant and visible minority status; family background measures, including parental education and family type (two parent or otherwise); high school experiences as represented by the person's overall grade average and academic and social engagement; PSE program characteristics, such as province of study, level of study (trade school, college, and university), and current year of the program; and early PSE experiences, including grades, the receipt of student financial aid, and the student's perception of the quality of teaching, work load, relevance of the program to the job skills being sought, and the presence of a social support network.

In contrast, previous studies of persistence in PSE (and graduation rates) have – in Canada as also in most cases elsewhere – been almost entirely restricted to following students at a given institution, which implies a number of important limitations. First, mobility across institutions is not captured, and this not only precludes the analysis of various dynamics that are interesting on their own, but also leads to a general underestimation of persistence (and graduation) rates at the more general level. Second, although the results of institution-specific analyses can be important for campus planning and management and otherwise have specific rele-

vance for the particular institution in question, they do not reflect student experiences at the broader (national) level. Finally, such studies tend not to have the richness of variables available in the YITS-B which allow us to probe these transitions in detail.

This paper thus fills an important void in the existing literature which allows the following sorts of questions to be answered:

- How many students continue in their programs after entering PSE, how many change programs, and how many leave PSE on a year by year basis from their time of entry?
- How many students who leave their initial programs subsequently return to their studies?
- Where do switchers and those who return after leaving continue their studies – at the first institution, at another institution at the same level, or at a different level of study?
- What are graduation rates from the initial program, and how do these rates change once program switchers and leavers who subsequently return are taken into account? How do persistence rates change further when those still in PSE are factored in?
- What are the reasons students cite for switching or leaving?
- How are these different transition rates related to individual, family, high school, and early PSE factors?

These and other issues related to this analysis are not only of academic interest, but also of significant policy relevance. If, for example, leaving rates are high, this essentially raises the "access to PSE" and "PSE attainment" issues at another stage, especially if the reasons for leaving are significantly related to financial reasons or family background or other relatively well defined indicators of "barriers" to program completion. If, on the other hand, leaving rates are significantly related to a student's educational experiences, an entirely different set of policy issues would be raised. Finally, if persistence rates are found to be significantly lower once the full set of PSE pathways is taken into account, the concern currently attached to the issue might be at least partly attenuated.

The paper is organised as follows. In the literature section, we discuss the previous research on persistence. The two following sections describe the model specification and data, and the empirical results. Finally, the concluding section summarises the main empirical findings, places them in context, and discusses possible directions for further research.

The Literature

The persistence literature can be classified into two parts, that which focuses on overall rates of graduation, switching, and leaving, and that which analyses these patterns by various characteristics of the student, his or her situation, and other relevant factors. We discuss each of these literatures in turn.

Overall Persistence Rates

Much of the interest in participation in PSE is grounded in empirical estimates which suggest that the returns to higher education are substantial. Ferrer and Riddell (2001), to

take but one recent example, use 1996 Canadian census data to find that a college diploma or trade certificate increases earnings by 3.5 percent for males and by 5.1 percent for females, and individuals with a bachelor's degree increase their earnings by more than 20 percent. Other studies show that the completion of a PSE program is associated not only with positive economic outcomes at the individual level, but also broader social benefits, including non-economic outcomes relating to health, crime reduction, citizenship, and more.

Turner (2004) has, however, pointed out that it is to not enough to look at "access" (typically defined as entering the PSE system at some level at some point in time) when the critical element is schooling *attainment* as defined by the successful *completion* of a PSE diploma or degree. In her words (p. 14): "…many education analysts (including economists) focus on *enrolment* measures, which is an indicator of *potential* investment, rather than on degree or credits, which measures *[actual]* additions to human capital stock".

This critique is, furthermore, offered in a context where persistence in PSE is much less studied than access. The main reason for this is that persistence is essentially a dynamic process, and studying it is much more demanding in terms of the data requirements, which essentially include the longitudinal tracking of sufficient numbers of students and their (detailed) PSE outcomes (Long, 2005), along with the measures of family background, high school and PSE experiences, and other factors to which it would be interesting to link persistence. General longitudinal databases (including the SLID in Canada) tend to lack the required sample sizes of students and detailed PSE information, while more specific student-focused longitudinal databases are rare, precisely because of their narrow relevance, which makes their high costs (longitudinal data are inherently expensive) more difficult to justify.

But if we believe the evidence that suggests that access to – and persistence in – PSE is a fundamental determinant of an individual's future well-being, with important ramifications at the larger, social level, such investments in the data required to study persistence might well be worthwhile. This is especially true if persistence rates are perceived to be not as high as might be desired, which seems to be the prevailing concern. If, for example, such data can permit studies that yield useful, policy relevant information regarding persistence rates which lead to policy initiatives that improve matters to even a moderate degree, the data investments could well be worthwhile. Hence the potential value of the YITS-B database (along with its sibling, the YITS-A, which tracks a cohort of individuals aged 15 in 2000 over the same period of time as the YITS-B).

In any event, principally due to the lack of better data of a more general nature, a significant proportion of the existing studies have focused on persistence at a single institution, and have thus ignored switching across institutions and other related dynamics, and are in any event not representative of any population more than the particular institutions studied. The importance of these limitations is indicated by a number of studies for the United States which suggest that

many students have relatively complicated PSE pathways, and that persistence rates do indeed vary by institution.

Using the Beginning Postsecondary Student Longitudinal Study, Choy (2002) reports on the 1994 status of students who started at four-year institutions in 1989-90. Five years after their initial enrolment, 47 percent had earned a degree at their first institution, 9 percent were still enrolled at that institution, a full 28 percent had transferred to other institutions, and 16 percent had left PSE completely. Adelman (2006) uses the National Education Longitudinal Study of 1988 to find that nearly 60 percent of all undergraduates attended more than one institution within 8.5 years of starting (1992-2000).

In Canada, the even more limited persistence literature includes an early piece by Gilbert (1991), who collected answers from 47 Canadian universities to the question: "Of full-time university students enrolled for the first time in the fall of 1985 how many graduated at their institution by the summer of 1990?", and thereby estimated an average five-year non-completion rate of 42 percent.[1] This figure is close to the six-year dropout rate of 46 percent for the 1994 cohort reported by the Consortium of Student Retention Data Exchange (CSRDE) for (principally) U.S. colleges and universities (CSRDE, 2001b) as reported in Grayson and Grayson (2003, p.7), which also represents an average dropout rate based on information collected from each individual institution and does not take into account switching across institutions.[2] This 46 percent number in turn corresponds to the sum of the switching rates and leaving rates (28 percent plus 16 percent) reported in Choy, leaving the two different sets of results very close in magnitude, although different in nature due to the varying treatment of switchers.

Wong (1994) finds an average first-year dropout rate of 24 percent for 13 Canadian universities, which is moderately higher than the 20 percent first-year dropout rate reported by CSRDE (2001a) for its 1999 cohort (again as reported in Grayson and Grayson, 2003). Combining this with the five-year non-completing rate of 46 percent from Gilbert, it appears that students in Canada are most likely to leave PSE between the first and the second year, after which the probability of leaving decreases substantially.

In a broader study of all students entering Ontario universities to pursue bachelor or first professional degrees from 1980 to 1984, Chen and Oderkirk (1997) find that 68 percent had graduated from their initial programs by 1993. (This represents different numbers of years after starting for the different cohorts included in the sample, but most students could reasonably be expected to have finished their studies by this time.) Another 30 percent had not completed their programs in Ontario by 1991 and were not enrolled in any university in Ontario. A very

1 The non-completion rate is defined as 100 percent minus the average completion rates from these Canadian PSE institutions.

2 The Consortium for Student Retention Data Exchange (CSRDE) is a cooperative group of colleges and universities that collect and analyze retention and graduation data for institutional benchmarking purposes. These data are analyzed for first-time full-time degree seeking freshmen by the Center for Institutional Data Exchange and Analysis (C-IDEA) at the University of Oklahoma. Data is then made available to the 421 consortium members (including some Canadian universities along with the great majority of American universities) to use for benchmarking with their peers for their internal academic planning purposes.

small proportion of the group, two percent, had not completed their programs but were still enrolled in an Ontario university. Note that not only is this study restricted to Ontario students (as opposed to generating nation-wide numbers), it does not follow students who move outside of Ontario.

None of the Canadian studies discussed above explicitly identifies rates of switching across institutions, and Gilbert himself noted that he was unable to distinguish pure leavers from institutional switchers and temporary stop-outs, and putting all these students into one category make it difficult for him to find significant predictors of the observed profiles. Gilbert concluded that "Canadian universities need to conduct longitudinal research on student learning and eventual destinations, which involves tracking students across institutions in the post-secondary system" (Gibert, 1991, p.18).

Who Leaves and Why: Factors that Influence Persistence Decisions

There exist two well known and broadly used theoretical models in the persistence literature. The first is Tinto's (1975; 1993) model of "student integration", according to which students enter PSE with various pre-entry characteristics, such as age, race, gender, family structure, parental education attainment, high school preparation, and their own skills and abilities. These factors contribute to the formation of their initial goals and their level of commitment to their studies. Once enrolled, students then begin to have their specific institution-related PSE experiences, which include their level of academic and social engagement and academic performance. Students' initial goals and commitments are then influenced and modified by these post-entry experiences. These various factors are then taken to determine persistence.

The second well known model in the literature is Bean and Metzer's (1985) "student attrition model". Its main difference from the Tinto model is that it introduces factors external to institutions, such as finances and peer effects. The student integration model also regards academic performance as an indicator (or determinant) of academic integration, while the student attrition model treats PSE experiences as an outcome (Cabrera, Castaneda, Nora, and Hengstler, 1992) on the grounds that, for example, lower grades can be a symptom of an individual's detachment from school as they begin the process which leads to their leaving.

In summary, these two models both posit that persistence decisions are affected by both pre-entry characteristics and post-entry experiences, but differ in what they include in the latter and their interpretation of some of the related effects.

In the empirical literature, however, there is no consensus on who drops out and why. In their review, Grayson and Grayson (2003) say that "…it is difficult to tell if different results of various studies reflect real differences in explanations for attrition or are simply artefacts of different methodologies…it [therefore] makes more sense to examine findings of individual studies in their own right rather than attempting to fabricate generalizations about attrition." This statement of course points to the need for more empirical work, especially if it employs a da-

taset that is well suited to the relevant estimation issues, is broadly representative, and uses an appropriate methodology.

Again first turning to the richer U.S. literature, Horn (1998) uses the Beginning Post-Secondary Student Longitudinal Study data to find that the education attainment of a student's parents are related to persistence, with students whose parents received no education beyond high school being about twice as likely to drop out at the end of the first year as those with parents with a college degree, and this gap is not narrowed in the following years. The U.S. literature also suggests that students who drop out of their PSE studies appear to have been less academically prepared for their studies than those who persist. For example, using survival analysis techniques on a sample of 8,867 undergraduate students at Oregon State University between 1991 and 1996, Murtaugh, Burns, and Schuster (1999) find that dropout rates decrease with high school GPA.

Post-secondary experiences generally found to be important in the (American) literature include students' GPA and academic and social engagement, and other related measures. For example, using administrative records from Virginia Commonwealth University, Wetzel, O'Toole, and Peterson (1999) find that academic and social integration are the most significant factors determining persistence for all freshmen and sophomore students enrolled at this particular urban public university over the years 1989-1992. This said, and as alluded to above, although the relationship between such PSE indicators and PSE persistence is strong, it is difficult to identify the extent to which these relationships are causal: perhaps being less engaged and obtaining lower grades is simply a step on the path to a student's leaving PSE rather than an exogenous determinant of that outcome.

A national level Canadian study based on the Post-Secondary Education Participation Survey (PEPS) found that among students who left PSE prior to completion, half of them cited "lack of interest in their programs or PSE in general" as the reason for dropping out, whereas 29 percent cited "financial considerations" (Barr-Telford, Cartwright, Prasil and Shimmons, 2003), implying that motivation plays a more important role than financial factors with respect to PSE persistence. This is, however, only a descriptive study, and does not control for other factors or probe into the determinants of these different reasons for leaving, including the various factors (e.g., family background) associated with the two models that have driven the American empirical literature.

Taking one step in this direction, Gilbert and Auger (1988) check the first-year persistence rates for students who entered the University of Guelph in the fall of 1986 to find that financial factors appear to play an important role among students with lower socio-economic status (SES), but not others. They also find that students from relatively higher SES backgrounds tend to switch to other institutions, while low SES students are more likely to stop-out.

Grayson and Grayson (2003), in their review of the literature, conclude that the few studies that consider financial constraints as a reason for leaving a PSE program show only

a weak relationship between leaving PSE and finances.

Summary of the Literature

The literature includes a number of interesting pieces of research, but none of them represents a full analysis of PSE pathways, or "persistence", using any sort of representative national level sample. The principal problem has been the data: what is needed has not been available. This sets the stage for the present analysis based on the YITS-B.

The Model and Data

In the first part of this section the methodological approach used in the analysis is developed, including a description of the econometric model employed in the multivariate analysis. The YITS-B data and the derivation of the samples employed are then discussed, including discussion of some important issues relating to the treatment of "ineligible" programs. Finally, some sample statistics are presented.

The Model

This paper essentially uses a survival analysis set-up. The two spell types in question, and their starting points, are defined as follows. The first (and most important) is the individual's persistence in their first PSE program, which begins with their entry into that program. The possible transitions are graduation, a switch to another program, or leaving PSE (at least temporarily) before graduation. The second spell/process which is analysed is the return to PSE among those who leave their first PSE program before graduation (as just defined). The rest of this section is framed principally in terms of the first dynamic (i.e., what happens in the first program) but the methods discussed extend directly to the re-entry problem (as is noted in several places).

One reason to adopt the survival approach for both the descriptive analysis and the multivariate regression analysis is that switching programs, leaving PSE, or graduating (as well as the secondary process of returning to PSE on the part of those who leave), are essentially dynamic processes which can be defined in terms of the relevant transition rates, with these transition rates changing with the duration of the relevant spell. In short, the inherently dynamic properties of the survival approach fit the dynamic nature of the processes being investigated.

The second (and related) reason for adopting the survival (or hazard) approach is that the data are in many cases censored. This can occur for three reasons. The first source of censoring is that some of the relevant spells are still in process at the end of the data, which corresponds to the (final) March-April 2006 Cycle IV interview date. The second source of censoring is the attrition that occurs from the YITS-B across cycles (interviews). The third reason is that in some cases the transition information in the data becomes uncertain at a certain point in time, a matter which is discussed further below. As is standard in survival analysis, spells are censored at any point they can no longer be tracked for any of these reasons, but enter the analysis up to the point of censoring, meaning that all the information available in the data is used in the most efficient manner.

The time frame is spell time, not calendar time. Individuals enter PSE (and leave) in different calendar years, but we define the beginning time for anybody starting a spell (for each of the two processes considered) as t_0.[3] We then observe individuals after one year, after two years, etc. (t_1 through a maximum of t_5). The analysis is organized around these event-based one-year intervals.

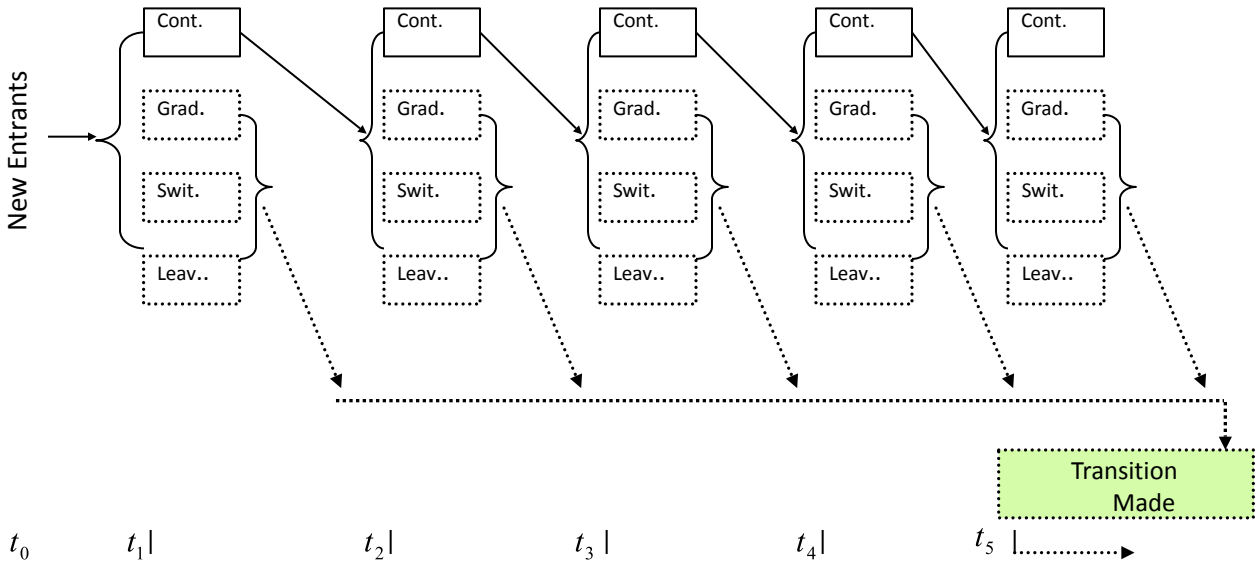
Figure 1 presents the framework graphically. Individuals start their PSE program at time t_0. After one year, at time t_1, they can be classified according to the four possible outcomes: "continuer", "graduate", "switcher", and "leaver". For continuers, a solid arrow depicts their progression to the next time period t_2, since they did not make any of the relevant transitions during the first year. For those who graduate, switch programs, or leave PSE in the first year, a dashed arrow indicates that these individuals are excluded from further analysis of this process since they have made one of the relevant transitions during the first year, thus terminating the spell. The other "pure" censored observations discussed above (i.e., those due to the spell still being on-going as of the last interview at the relevant point in spell time, those due to the individual

attriting from the sample from one interview to the next, or those due to incomplete information regarding what exactly was happening in terms of the relevant transitions) are also excluded from the point this censoring occurs. This process is repeated in subsequent years.

A similar set-up characterises the re-entry process among leavers, except the outcomes are simpler: individuals either re-enter or they don't – or the spell is censored. This set-up applies to the descriptive analysis as well as the regression analysis.

For the regression analysis, a multinomial logit model is used to capture the different

Fig 1. Conceptual Framework



3 t_0 is thus mapped to different calendar year for different cohorts. For example, t_0 is mapped to the year 1997 for cohort-1997, to the year 1998 for cohort-1998, and so on.

possible transitions. It can be expressed as follows:

$$\Pr(Y_t = j / x) = \frac{\exp(x\beta_j)}{1 + \sum_{j=0}^{j=2} \exp(x\beta_j)}, \quad j = 0,1,2$$

where *x* represents a vector of explanatory variables. The dependent variables y_t, are the different possible outcomes with respect to the person's persistence, again defined on a year-by-year basis and measured at the end of each school year, where t = 1, 2, 3, 4, or 5 (the elapsed time since the beginning of the person's studies). j = 0 indicates a continuer, 1 indicates a switcher, and 2 indicates a leaver.[4] Students who earn a degree (i.e., graduate) are no longer at risk of switching or leaving and are therefore censored at the time of graduation.[5] In the re-entry model there are just the two principal outcomes: return, stay out.[6]

The multinomial model generates a set of coefficients which capture the (average) marginal effect of each of the explanatory variables on the relative risk of each outcome relative to the baseline event (i.e., continuing). These coefficients are then transformed into average marginal effects which have a relatively straight-forward and intuitive interpretation. A formal statement of these effects is included in Appendix C. In the case of the re-entry models, the same sort of set-up is used.

The YITS-B, the Samples Employed, and Some Data Issues

The Youth in Transition Survey, Cohort B (YITS-B) dataset used in this analysis is a Canadian longitudinal survey designed to facilitate the study of the patterns and determinants of major transitions in young people's lives, particularly with respect to education. So far, the YITS-B has gone through 4 cycles. The first interview was conducted in April 2000 when information was collected for the year 1999 and retrospectively for earlier years. A second interview was conducted in April 2002 and captured activity during 2000 and 2001, the third interview was held in 2004 and picked up activity during 2002 and 2003, and the last interview in 2006 collected information on students' activities during 2004 and 2005.

The YITS-B includes 22,378 respondents who were 18 to 20 years old on December 31, 1999, who were then followed through the subsequent interview cycles. The sample frame is thus clearly well suited to tracking

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4 To simplify the analysis, only individuals who enter school in August or September of a given year are considered. We then assess their status one year later, and classify them into one of the indicated categories: graduate, switcher, leaver. Note that someone who leaves early, spends some time out of school, but returns to school by the next September is classified as a switcher, while someone who goes most of the year but then fails to return to school by the second September will be classified as a leaver, even if he or she returns to school soon thereafter. A continuous time hazard modeling approach which will be able to incorporate such information better is currently under development, and preliminary estimation indicates that the results are qualitatively very similar across the two methods.

5 Graduation could be modelled as another competing risk, and this was initially attempted. But the process has a very particular set of duration effects, since graduation rates are very low in the initial years, spike, then tail off. Similarly, many explanatory factors have mixed effects depending on the year of this process. In any event, it is persistence with which we are most occupied in this paper, and simply censoring graduates and focusing on the switching and leaving transitions best served the purposes of the analysis.

6 The likelihood function for the logit model described above is equivalent to that discussed by Keifer, 1990, who demonstrates that this set-up can be seen as a classic hazard model. This technique has been used by (among others) Finnie and Sweetman, 2003 to analyse poverty spells, and by Finnie and Gray, 2002 to look at earnings transitions.

young people as they move through their first PSE experiences, and its focus on PSE-related information (among other early transitions) allows the construction of the detailed PSE profiles required for this analysis with relatively little recall bias. Finally, the dataset includes a selection of interesting variables to include as explanatory factors in the analysis.

For the work reported in this paper, individuals who did not have any Canadian PSE experience over the observed period (prior to December 31, 2005) were excluded. Individuals who started PSE before 1996 were also screened out, since there were few such persons and they tended to be sufficiently young to be considered as outliers (with recall bias also being an issue). The final sample includes 11,951 individuals, consisting of nine cohorts as defined with respect to the year of entering PSE: cohort-1996 through to cohort-2004.[7]

When we link the four cycles of the YITS together to track students' PSE trajectories over time, information could be lost for two reasons. First, there is attrition from the YITS-B over the period studied. Among the 22,378 respondents who were interviewed the first time, 18,743 were included again in the second interview, 14,753 respondents participated in the third interview, and 12,360 remained in the last interview. Rather than restrict the analysis to individuals who were present all four cycles and risk introducing the associated sample bias, we kept individuals until they attrited from the sample, at which point they were treated as right-hand censored.[8] We use the "weight in current school year" generated by Statistics Canada for each cycle for each person-year observation. (Individuals' spells are in many cases tracked across different interview cycles – with different weights thus applying for the different person-year observations of a given spell as it continues through time).

The second issue with respect to information being lost over time relates to what the YITS-B refers to as "ineligible programs", which basically has to do with inconsistencies in an individual's record in terms of the reporting on PSE programs across YITS interview cycles. It occurs in the following circumstance. In one of the cycle II or III or IV interviews, undertaken in April of 2002, 2004 or 2006 and using the preceding December as an anchor point for many of the questions asked, a student states that he or she was in a PSE program ("program p_1") in the relevant interview period and was still in that program as of the end of the December preceding the interview in question. Program p_1 is therefore carried forward to the subsequent interview

7 Cohorts are defined with respect to the year of entry into PSE. For example, "cohort-1997" represents respondents who started PSE in 1997. Since entry into PSE is highly concentrated in August and September, and because restricting the analysis to those who entered at this time made for a much cleaner and more tractable identification of the dynamics in question, individuals' spells were included only if they started PSE in these months.

8 Left-hand censoring is not an issue with this sample since we capture all individuals from the beginning of their PSE programs if this occurred at any point over the period covered by the sample.

and used as an "open program" in the next cycle's questionnaire.

In that next interview, however, the student denies being in program p_1 during the current reference period starting in the January immediately following the preceding interview's December reference date when the person had said the program was still ongoing, which would seem to be inconsistent with the information given in the previous interview.[9] The YITS therefore declares such programs to be "ineligible" as of the second interview. (All variables related to this program are coded as 6, 96, 9996). 18.8 percent of all p_1 programs became ineligible in this way from cycle 1 to cycle 2, 19.6 percent became ineligible from cycle 2 to cycle 3, and 19.9 percent became ineligible from cycle 3 to cycle 4. These are substantial numbers, and how they are treated significantly affects the persistence rates calculated with these data.

But all is not lost – and in any event, a decision has to be taken as to how to treat such observations. According to the extra information available in a Statistics Canada YITS internal variable (*ineligd2_p, ineligd3_p, and ineligd4_p*), students with an ineligible program p_1 can be categorized into three groups. Students in the first group said they were indeed enrolled in program p_1 at the end of cycle 1, were no longer in the program during cycle 2, but had in fact graduated from the program (*ineligd2_p=5 or ineligd3_p=5 or ineligd4_p=5)* – presumably at (or around) the year's end. The second group also said they were indeed enrolled in program p_1 at the end of cycle 1, were also no longer in program p_1 during cycle 2, but in their case had left the program p_1 without completion (*ineligd2_p=6 or ineligd3_p=6 or ineligd4_p=6)* – again presumably at or around the year's end. The third group gave no information regarding their final status in program p_1 (*ineligd2_p=1,2,3,4,7,8,9,10,99 or ineligd3_p=1,2,3,4,7,8,9,10,99 or ineligd4_p=1,2,3,4,7,8,9,10,99)*, but deny its existence in the later interview.

Three possible treatments of these ineligible programs were thus possible:

1. Right-hand censor all students when their programs became ineligible, thus excluding them from the relevant calculations the year in question and from there forward.

2. Use the additional information available to assign the first group as graduates and the second group as either switchers or leavers, depending on whether the individual was observed in a subsequent program in the following year ("switcher") or was not ("leaver"), which is the same treatment as applies to programs that were actually declared to have ended. Continue to right-hand censor the third group (for whom no extra information is available) at the point the program becomes ineligible.

9 The inconsistency may be characterised as follows: Interviewer: "In the previous interview you said you were still enrolled in p_1 (without having left that program or graduated) in December of year *x* (the previous interview's December end reference date). Now let's talk about your programs in the current reference period, starting with that one." Respondent: "I wasn't in that program in the current reference period."

3. Do the same as option 2 except assume students in the third group had in fact left the programs they had previously declared as on-going at the earlier cycle's December end date but then said they had never been in the following cycle. These individuals were similarly called either switchers or leavers depending on whether they entered a different program before August-September of the later year.

We reject the first treatment because it does not exploit the information available in the extra YITS variables available at Statistics Canada. It simply drops students when ineligibility (of any form) occurs, and since such spells would likely include relatively high numbers of switchers and leavers, such censoring would likely understate switching/leaving and overstate persistence rates.

The second treatment retrieves students in groups 1 and 2 with the help of the additional information available and would seem to represent a reasonably sure re-categorisation of these observations, thus presumably leading to better estimates of the persistence dynamics in question (continuing, leaving, switching).

The third treatment comes down on the side of re-categorising records in the absence of any certain information in this regard. It effectively assumes the information given in the first interview was partially correct (the program did exist in that cycle) but also partially incorrect (the program had in fact ended in that period) *and* that the second interview information was fully correct (the person had in fact not been in the program in question during the second cycle). This is a riskier re-categorisation, yet not doing so when the programs had indeed existed and ended at the point of ineligibility would risk introducing a bias to the analysis in the same sort of manner just mentioned.

In the face of this uncertainty, we performed a test of these alternative treatments. As mentioned above, our final sample includes nine cohorts. These nine cohorts could be categorized into two groups. The first group includes cohort 1996, cohort 1997, 1998, 2000, 2002, and 2004. The second group includes three cohorts: cohort 1999, cohort 2001, and cohort 2003. These latter three cohorts are different from the first group in that they include a "seam" across cycles following the start of the program – and hence a situation where "ineligibility" could be an issue. We calculated first-year transition rates for these two groups under the three different treatments.[10] The first-year transition rates for the first group are used as a comparison group since they are not subject to the ineligibility problem because there is no cross-cycle seam (and hence no ineligibility issues). It turns out that the second treatment generates transition rates for the second group of observations (i.e., those that have the cross-cycle seam and hence the ineligibility problem) that are the most similar to the comparison group.

Since the second treatment of ineligible programs suggested above uses only the more certain information available in the sample and simply censors observations at

10 Results can be found in Appendix A.

the point the uncertainty associated with the ineligible programs occurs (and thus corresponds to the uncertainty in the data), and because adopting this approach seems to generate the better (truer) results, we adopt this treatment as our preferred approach for the analysis. We also, however, present simple transition rates under all three treatments, and many other results using the third treatment, which are found in Appendix B. Readers can therefore make their own comparisons in this regard.

The Explanatory Variables Used in the Analysis

The explanatory variables used in the analysis are as follows:

Gender: Student's gender.

Age at enrolment: Series of categorical variables representing the student's age at the beginning of their program.

Immigrant: Indicator that the student was not born in Canada but became a citizen after coming to the country.

Visible minority: Indicator that the student is identified as being non-Caucasian in race or non-white in colour according to the Employment Equity Act.

Parental education: Series of categorical variables representing the highest level of education obtained by the student's natural or adoptive parents. The categories are "less than high school", "high school completed", "college completed", "university completed", and "don't know/no parent".

Family type: Series of categorical variables representing the family structure in which the student was living most of the time during high school. The categories are "single parent", "two parents", "other", and "don't know/no parent".

Program year: Series of categorical variables indicating the current year of the student's program as it is tracked over time: first year, second year, etc.

Average grade in high school: Series of categorical variables representing the student's overall grade average in the last year of high school. The categories are 80% or above, 70-79%, 60-69%, and below 60%.

High school academic engagement: Series of categorical variables representing the student's academic engagement in high school, defined as their identification with, and involvement (participation) in, the academic aspects of school.[11]

High school social engagement: Series of categorical variables representing the student's social engagement at high school, defined as their identification with, and involvement in, the social aspects of school.

PSE region: Series of categorical variables representing the geographic location of the PSE institution of the student's program.

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11 The high school academic engagement and social engagement measures are "scale variables" generated by YITS. These scales are scores obtained by combining answers to a group of questions, based on established methodologies. For detailed information, see *YITS, Cohort B, Cycle 1, User Guide, section 4.3*.

Unemployment rate: Provincial unemployment rate for individuals with no PSE (CANSIM Table 282-0004).

Trade School: Categorical variable indicating the student was in a trade school program (within the college system).

Scholarship: Indicator that the student received a scholarship when the program was started. A scholarship is defined as a financial award based on outstanding academic achievement rather than financial need.

Grant: Indicator that the student received a grant or bursary when the program was started. A grant is defined as a financial award provided by a government, corporation, or educational or charitable foundation on the condition that certain terms are accepted or certain engagements fulfilled, or based on financial need and satisfactory achievement.

Student Loan: Indicator that the student received a student loan when the program was started. A student loan is defined as money received from a government to assist a student in the pursuit of his or her studies, that has to be paid back.

Average grade in PSE: Series of categorical variables representing the student's overall grade average in the first year of PSE. The categories include above 80% or above 70-79%, 60- 69%, and below 60%.

PSE engagement: Student's self-reported answers to the following questions:[12]

How many instructors had strong teaching ability?

During first year, I had trouble keeping up with the workload.

There were people at school that I could talk to about personal things.

My first year gave me skills that would help me in the job market.

Sample Characteristics

Table 1 shows the characteristics of the individuals selected into the samples of first PSE programs used in our analysis. These are shown for college and bachelor's students, respectively[13].

We focus our analysis on the college and bachelor's groups, and exclude those in master's, ph.d., or first professional programs (medicine, law, etc.), because these are the largest and therefore most important groups of PSE students, their larger sample sizes facilitate a much more detailed analysis, and

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12 Although YITS generates scale variables for high school engagement (see above), it does not do so for PSE engagement. We therefore use students' answers to the questions indicated to measure their PSE experiences directly.

13 College and university students are categorized by the relevant YITS variable that includes the following categories: 02 Attestation of Vocational Specializations (AVS or ASP); 03 Private Business School or Training Institute Diploma or Certificate; 04 Registered Apprenticeship Program; 05 College or CEGEP program; 06 University transfer program at a college or CEGEP; 07 College post-diploma or graduate level program; 08 University diploma or certificate BELOW Bachelor's; 09 Bachelor's degree; 10 First Professional degree; 11 Graduate-level diploma or certificate above Bachelor's, below Master's; 12 Master's degree; 13 Ph.D. degree; 20 Diploma, certificate or license from a professional association as in accounting, banking, or insurance. Our college sample includes 02, 03, 04, 05, 06, and 07, our university sample includes 08 and 09.

the associated dynamics are more varied and more interesting. Henceforth we use "university" to refer to bachelor's level university students. Our entire analysis is broken down at this level (i.e., college versus university) because persistence patterns are substantially different for the two groups. All results shown here and below represent weighted numbers, which should approximately reflect the distributions in the underlying population.

Our samples include CEGEP students in Quebec. These include both a traditional "community college" group (comparable to college students in the rest of the country) and those planning to go on to university. Our college samples also include those in university-transfer programs in other provinces, which are especially popular in Alberta and British Columbia (although their numbers are relatively small even in those provinces). This was done partly because while such students – and their related experiences and behaviour – might be different from other college students/experiences, they are also fundamentally different from those of individuals who are actually at a university in a university program. Also, it did not seem possible to identify such individuals with sufficient precision, and dealing with the college-university dynamic of this group would pose various analytical problems.[14]

We thus acknowledge that although our treatment of CEGEP and university-transfer students might not be perfect, it is not clear if any perfect treatment is possible, and we did not want to simply drop them from our analysis. Separating out university-bound college students – in Quebec as in other provinces – would be an interesting study of its own, but we leave this to a future undertaking. We did, though, check most of our results using samples that excluded Quebec, and got similar findings.

The samples have more men than women, this imbalance being much greater at the university level (56.0 percent female) than the college level (52.4 percent female).

The age distribution shows that 78.8 percent of all college students and 86.5 percent of all university students began their PSE education at age 19 or younger, indicating that most individuals follow a relatively traditional educational path – that is, going to PSE soon after finishing high school rather than waiting until later to start. The data also reveal, however, different age spreads for the college and university students, there being proportionately more college students in both the youngest age group (below 17) and older group (20 and above 21).

The distributions of the samples by region are consistent with the relevant provincial population sizes allowing for differences in access to PSE by province. Students in Quebec comprise 44 percent of the college sample and just 2.4 percent of the university sample because of the treatment of CEGEP students described above. The university sample thus essentially captures the record outside of Quebec, while the college samples include (possibly) university-bound college students in Quebec (as elsewhere).

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14 For example, it is not clear what the appropriate classification/treatment would be for those supposedly university-bound college students who did not actually go on to university after completing their college programs.

Immigrants make up 7.6 percent of the college sample and 12.9 percent of the university sample. Ten point six percent of the college students and 19.6 percent of the university students are identified as visible minorities. Comparing college and university students by family background, high school grade, and first year experience in PSE shows that college students tend to have lower grades in high school, to be more likely to come from single parent families, and to have parents with lower education attainment. However, college students seem to have a more positive view of their first year in PSE than university students in terms of the proportion that think that the first year helped them to obtain useful skills (72.1 versus 58.0 percent), that most of their instructors had strong teaching ability (63.1 versus 54.4 percent), and that they did not have trouble keeping up with the workload (51.0 versus 35.1 percent).

University students received more scholarships and grants when they began their programs than college students, but had similar rates of having a student loan.

Empirical Findings

We turn now to the results of our empirical analysis of persistence based on the YITS data. We first present a descriptive analysis of the various transitions and other rates which describe the different pathways students take after entering PSE. In the latter part of the section we then break the key transition patterns down by various characteristics, first using simple descriptive tables, then using the hazard model approach described above.

Descriptive Analysis

Hazard and Cumulative Transition Rates: Persistence in PSE

Tables 2a and 2b show the hazard (transition) rates for college and university students, respectively. The calculations show the proportion of students who, during each year of the program (one through five), made each of the relevant transitions, namely that they graduated from the program, they switched to a new program, or they left PSE. Those who did not make one of these transitions were, by definition, still continuing in the program at the end of the year in question, and these rates are also shown. For each year, these rates are calculated for those students who had not yet made a transition by the relevant year and who were not censored in the current year or in a previous one, thus corresponding to the standard hazard analysis methodology.

Switchers are further differentiated by where they switched to: the same level or (very rarely) a different level in the same institution, or to a different institution, either at the same level or a different one.

Three sets of results are presented, corresponding to the different treatments of ineligible programs previously discussed. Switching and leaving rates rise from the first panel to the third panel, pointing to the different results that are obtained under the different treatments. The reader is reminded that we prefer the second treatment over the raw, unadjusted data as represented by the

first treatment, as well as treatment three where we make more extreme assumptions about people leaving their programs based on the information available, although we also report results for the third treatment in Appendix B.

One general finding is that switching and leaving rates are considerably higher in the first year than in the following years, which suggests that "drop-out" rates (from the first PSE program) decline substantially over the course of a program.

Focusing first on university students (Table 2b), the results show that the first-year "dropout rate" from the point of view of individual institutions – that is, including switchers to a different institution as well as those who leave PSE entirely – is 12.2 percent, 14.3 percent, and 16.0 percent under the three different treatments. But in each case approximately half of these "drop outs" are in fact switchers, thus giving a very different perspective of the "quit rate" when viewed from the system level rather than from the perspective of a given institution. The value of the YITS data in allowing us to track individuals across institutions in this way is obvious in this regard.

Leaving rates among college students are 4 to 6 percent higher than university students in the first year, and remain higher thereafter. Within-institution switching rates are also higher, but cross-institution switching occurs at about the same rate at the two levels of study: in the first year these are in the 4 to 6 percent range across the various treatments and levels. These include 2 to 3 percent who switch from university to college, and 1.1 to 1.6 percent who do the reverse. For all the switching between the college and university systems that is sometimes thought to occur, these data suggest that relatively little occurs in the year individuals start their first programs (i.e., by the beginning of their second year).

Graduation rates are, naturally, low in the first year, especially among university students, then rise, sooner for college students (whose programs are generally shorter) than university students.

Tables 3a and 3b show the cumulative transition rates by year which are calculated from the hazard rates shown in Tables 2a and 2b. These take into account those who first continue in their programs but then make a transition in a subsequent year, essentially adding the annual transition rates together to show how many of the starting population are still continuing in their studies and how many have made each of the relevant transitions by the point in time indicated (after one year, after two years, after three years).[15]

The first year rates are by definition the same as those already seen in Table 2, while second year cumulative transition rates are obviously higher as the transition rates from the two years are added together, and so on. The five-year dropout rates defined as including both switchers and leavers generated under the second (preferred) treatment is 41.4

15 These are calculated by adding the first year rates plus the second year rates applied to the proportion of students who had not made a transition in the first year and thus continued forward, plus the third year rates applied to the proportion of the initial population that had still not made a transition, and so on.

percent for college students and 37.5 percent for university students. Under the third treatment of ineligible programs (probably an upper bound), the rates increase to 47.8 percent for college students and 46.6 percent for university students.

But these rates change dramatically when switching is taken into account. Focusing on treatment 2, they drop from 41.4 to 20.4 percent, or by 50.8 percent in relative terms for college students, and for university students the decline is from 37.5 to 14.9 percent, or a 60 percent reduction. We shall see below how these rates change even further once we take into account those who leave PSE but then graduate from other programs, and those who are still in school in other programs.

Reasons for Switching and Leaving

Table 4 shows the reasons individuals who leave their program or switch to another program cite for doing so. These results are reported for the populations of leavers and switchers based on the second treatment of ineligible programs, as are all the other findings reported henceforth in the paper – except for those reported for the third treatment shown in Appendix B.

In the college sample, "didn't like it/not for me" is by far the most common reason for both switchers (44.1 percent) and leavers (37.0 percent). "To change schools or programs" is the second most common reason for switchers (30.4%), for whom it verges on being a meaningless answer but at least does rule out some of the other more specific reasons such as not having enough money. "Not enough money" is, interestingly, cited by just 2.8 percent of switchers, and 9.0 percent of leavers. The latter result implies that only 1.8 percent of all those who start a college program leave it because of money problems within their first five years (20.4 percent leave, and of these 9.0 percent cite money reasons.) Other specific reasons cited by college leavers include "wanted to work" (9.9 percent), and "marks too low" (8.8 percent). Other reasons are less common.

In the university sample, the most common reason for switchers is again "to change schools or programs" (40.5 percent), while 28.3 percent respond "didn't like it/not for me". For leavers, the first and second most important reasons are "didn't like it/not for me" (30.5 percent) and "not enough money" (15.2 percent). The latter number implies that 2.3 of all starting university students leave their programs due to funding problems – again a low number, although one that it would be desirable to improve upon yet further if effective policy measures could be found to do so. In short, students leave school mostly because the schooling is judged not to be the right thing for them or they want to do other things such as work, make a change, or take a break.

Only 8.8 percent of college leavers and 5.3 percent of university leavers say they left because their marks were too low. Of course this reason – as the others – must be seen in the perspective of the self-report nature of this variable. The true "objective" reasons for leaving and switching may differ from what students say.

How Many Return to PSE after Leaving

Tables 5a and 5b show the rates of returning to PSE among students who left their first program and did not immediately switch to another program. To analyse this dynamic, we take those identified as "leavers" in the first part of the analysis and follow them to see how many are found in another PSE program in subsequent years. The first panel of each table shows the hazard returning rates and the second panel shows the cumulative returning rates, calculated from the hazard rates shown in the first panel.

We find that by one year after first having left school, 22.3 percent of college leavers and 35.6 percent of university leavers have returned to PSE. By three years later (the furthest we can measure with sufficient precision in these data), the returns stand at 40.3 percent and 54.0 percent, respectively, for college and university leavers. These are substantial numbers.

The cumulative rates further indicate that after three years, of the university returners, just under one-quarter (12.5 percent of the leavers, or 23.1 percent of the 54 percent total who return) go back to the same institution (and same level) as their initial (first) program. Another 12.1 percent (22.5 percent of those who return) stay at the same level (i.e. university) but change institution, 16.7 percent (30.9 percent of the returners) change both level and institution, and 2.4 percent (4.4 percent) change level within the same institution.

For college leavers the distributions of where they return are roughly similar, although more change institutions while staying at the same level, and fewer change levels.

Overall Persistence and Total Graduation Rates

The overall graduation rates shown in Table 6a extend the definition of "persistence" to a more general level to include graduates not just from the first program as seen previously (Tables 2-3), but also those switchers and leavers who go on to graduate from another program they start either immediately (switchers) or after first being out of PSE (i.e., leavers who then return).

Taking these students into account, five-year graduation rates are raised from 56.5 percent to 73.1 percent for college students and from 52.1 percent to 69.4 percent for university students.[16] The "persistence" problem as defined with respect to graduation rates is thus seen to be significantly diminished when we are able to track individuals as they move to new institutions – and new levels of study – rather than being confined to the records of students within a given institution.

These results are relatively consistent with the other findings reported in the literature that are in any way comparable. According to three different national longitudinal studies of the 1990s, Adelman (2006) lists Bachelor's degree completion rates for U.S.

16 The graduation rates from the first program shown here are very close to, but not exactly the same as those shown earlier. This is due to a slight shift in the means of making the relevant calculations when estimating the two different sets of persistence rates.

students who began in four-year colleges to be 52.0 percent to 57.6 percent from the first institution, and 8.1 to 11.3 percent from a new institution.[17] These compare to our five-year graduation rates from the first institution of 57.9 percent (graduation rate from the first program plus the graduation rate from a new program in the same institution) plus the 9.2 percent of those who graduate from a different institution. The final total graduation rate for university of 69.4 percent is also close to Chen and Oderkirk's finding of 68 percent for all students entering universities in Ontario to pursue a bachelor's or first professional degree from 1980 to 1984.[18]

Table 6b extends the "persistence" analysis still further by looking at the status of students at the end of each year after they first enter PSE. This provides a different perspective from the hazard transition rates focused on thus far by aggregating across various sets of dynamics.

In each year, students are categorized into three mutually exclusive groups: having earned a degree, from the first program or another one; not having graduated but still being in PSE, regardless of where they were enrolled or the movements they had previously made in and out of the system; and not having graduated and not being in PSE. This table essentially adds those still in PSE to the graduates reported in Table 6b, including showing where exactly the on-going students are enrolled.[19]

After five years, for students who started in a college program, 73.1 percent had graduated, 8.8 percent were still enrolled in PSE, and 18.0 percent were not in PSE (without having earned a degree). For university students, 69.4 percent had earned a degree, 20.4 percent were still in PSE, and just 10.2 percent had left PSE without a degree.

Students still in PSE are further categorized into those in the same (first) program; those who were in a new program at the same institution (same or different level of study – most are in the former for obvious reasons); and those who were in a program at a different institution, at the same or different level as the original program. As time passes, fewer students are in the same (first) program and greater numbers become graduates, transfer to another program, or leave PSE.

The summary numbers here are very important. "Persistence rates" at the university level rise from 52.1 percent to 69.4 percent

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17 These three national longitudinal studies include: the national grad-cohort longitudinal studies conducted by the National Center for Education Statistics (NELS: 88/2000 Postsecondary Transcript Files); the Beginning Postsecondary Students Longitudinal Study, 1995/96-2001; and the Cooperative Institutional Research Project 1994-2000.

18 The Ministry of Training, Colleges and Universities (MTCU) also calculates graduation rates for Ontario universities. The MTCU methodology involves the selection of all new full-time, Year One undergraduate students on the official Fall 1996 enrolment file, who have a valid (and unique) student ID number and who were seeking either a bachelors or first professional degree. These records were then matched against the records for students who received a degree (in any program) from the same institution during the most current seven year period (1997 to 2003). They get an average graduation rate for all Ontario Universities of 74%. After using the YITS data to select a similar sample (new full-time, Year One undergraduate students who were seeking either a bachelors or first professional degree in Ontario), we get a seven-year graduation rate of 73%, which is quite close to the MTCU finding.

19 To make these calculations, we continue to use a hazard approach by following students for the period of time they can be followed, meaning we have data on more students for year one, fewer for year two, fewer again for year three, and so on.

to 89.8 percent as we add graduates from other programs and those still in PSE (wherever they are enrolled) to those who finish their first programs. Seen the other way around, "drop out rates" decline to a fraction of their initial level when the broader perspective is adopted. For college students, the comparable persistence rates are 56.5, 73.1, and 81.9 percent.

Transition Rates by Sample Characteristics

Tables 2 and Table 3 presented first-program transition rates for all students at each level (college, university) taken together. Tables 7a and 7b extend this analysis by showing transition rates for the first three years (for which time sample sizes are large enough to generate consistently significant estimates) by student characteristics, family background, and schooling experiences. Table 8 shows the associated five-year cumulative rates.[20]

Tables 7a and 7b show that men tend to have higher leaving rates than women during the first year at both the university level (9.7 percent versus 6.5 percent), and the college level (13.5 percent versus 11.7 percent). Table 8 shows that five-year cumulative leaving rates exhibit the same gender difference: 23.1 percent versus 17.9 percent for college students and 17.0 percent versus 13.2 percent for university students.

This means that not only do women enter university at higher rates than men (Finnie, Lascelles, Laporte 2004, Finnie and Mueller 2008, and others), they are also more likely to continue in their studies. Final graduation rates will, therefore, be skewed even further than the access rates we often rely upon as indicators of PSE achievement would indicate.

Women's switching rates are, conversely, a bit higher than men's: 14.4 versus 11.9 percent in the college sample and 10.4 versus 9.8 percent in the university sample. Note that if we put leaving and switching rates together, which is the "dropout rate" perspective of individual institutions, the gender differences in persistence in PSE is somewhat understated, as the two rates (leaving and switching) cancel each other out to some degree. The benefit of being able to include switchers in our analysis is again made clear.

In the college sample, the patterns by immigration and visible minority status are not consistent over the years. Table 7a shows that during the first year, immigrant and visible minority students are less likely to leave or switch, but in Table 8, the five-year transition rates take the reverse direction. In the university sample, the results are more consistent: immigrant and visible minority students are less likely to switch and leave not only during the first year, but also in the following years.

Table 7a shows that for college students, first-year leaving rates rise uniformly with age: 4.8, 11.7, 16.6, 18.9, and 18.0 percent for students who were, below 18, 18, 19, 20, and above 20 years old at enrolment, while switching rates, conversely, decline with age: 18.0, 15.7, 9.7, 9.3, and 6.7 percent for these same age groups.

20 The cumulative rates also use the hazard rates for years four and five, which are not shown.

The university sample shows roughly the same patterns except for students who were 19 years old when they entered PSE, who have both lower leaving rates and lower switching rates than students in other age ranges (except the very youngest in the case of switchers).

The leaving rate for university students who start their programs at age 21 or above is particularly noteworthy: 45.2 percent leave their programs by the five-year mark, which is almost three times the rate of the next closest group (those who start at age 20). This may have something to do with the different acceptance criteria that sometimes apply to "mature" students, but other factors are likely at play as well. The regression analysis reported below will help us sort out at least some of the underlying reasons of this dramatic age effect.

In any event, it would seem that older students, as a group, seem to know better what they want to study, and where (hence their lower switching rates), but are also more likely to leave PSE entirely. Of course the increased family and other responsibilities among older students might figure importantly in these dynamics: e.g., reducing mobility, while putting different pressures on the challenges of persisting.

In the college sample, individuals who study in Quebec and BC are much more likely to switch: by the five year mark their rates are 29.0 percent in Quebec and 25.6 percent in BC, versus 14.3 percent in Ontario (for example). These patterns are presumably at least partly driven by the CEGEP system in Quebec and the university transfer system in BC, where students who seek a university degree spend the first two years in a college and then switch to a university to continue their studies.

Table 8 shows that in the college sample, individuals from single parent families tend to have higher switching and leaving rates than students from two parent families: 26.6 versus 19.9 percent for switching rates and 25.0 versus 18.9 percent for leaving rates. In the university sample, students from single parent families still have higher leaving rates, but also relatively lower switching rates: 18.5 versus 14.2 in leaving rates, 15.7 versus 23.5 percent in switching rates. Again it will be interesting to see what happens to these patterns when we adopt a multivariate framework.

Table 8 also shows a negative relationship between leaving rates and parental educational attainment for college students, and a positive relationship between switching rates and parental educational attainment. After five years, the leaving rates are 25.7, 24.2, 18.6, and 16.6 percent, for students whose parents' education is below high school, high school completed, college completed, and university completed. Conversely, switching rates are 17.5, 19.6, 20.9, and 24.4 percent for these four groups.

It is, however, interesting to observe that in the university sample, there is no clear difference in switching and leaving rates according to parental educational attainment. While it is often alleged that family background plays an important role in persistence – as it does (and strongly) in access rates – perhaps once students are selected into the university

system further background effects are nullified.

Five-year cumulative switching and leaving rates are negatively related to high school grades in the university sample: switching rates are 35.5, 26.4, 27.6, and 20.2 percent, and leaving rates are 35.4, 32.3, 21.8, and 10.6 percent for students whose high school average is below 60 percent, 60 to 69 percent, 70 to 80 percent and 80 percent or above. Interestingly, there is no such pattern in the college sample.

Students who report they received scholarships or grants appear to be generally less likely to leave, while students who report they received a student loan are more likely to do so.

According to Tinto's model, PSE persistence is related not only to pre-entry characteristics, including those just discussed, but also to PSE experiences. In our analysis, the PSE experience variables include the overall average grade in the first year, students' opinions of their instructors' ability, the student's ability to keep up with the workload, the student's communication with his or her peers, and how much the student senses useful skills are being obtained from the program. Table 8 shows a substantially strong set of relationships between switching and leaving rates and these variables. However, whether these PSE experiences represent exogenous determinants of leaving or switching as opposed to outcomes that are wrapped up with these processes in a more endogenous manner is not clear.

Regression Analysis

The descriptive statistics presented thus far provide an overall view of PSE transitions and, in the case of the first transitions after entering PSE, how these vary by individual attributes, family background, high school outcomes, and PSE experiences. We now turn to a regression analysis in order to isolate the net effect of each factor, holding other influences constant, on two of the key underlying dynamic processes.

We begin with the first transitions after entering PSE, focusing on the switching and leaving dynamics (as discussed above). The model is first estimated for each single program year separately (i.e., t_1 through t_5) in order to allow the effects of the explanatory variables to vary over the years of a program. This model includes a restricted set of variables that can be relatively safely assumed to be exogenous to PSE persistence. Results are then presented for a model of these same dynamics that aggregates across all years and adds well relevant year (duration) terms which are characteristic of a hazard set-up, as well as (piece-wise) other regressors which capture more of the student's experiences but which may, in turn, be subject to endogeneity. In the last part of the section, the results for a model of re-entry for those observed to leave PSE are presented.

Switching and Leaving: Single-Year Results

Tables 9a (college) and 9b (university) show the marginal effects on the probability of being a switcher or a leaver (rather than a continuer) for each of the explanatory variables included in the models. (See Appendix C for a discussion of how these marginal ef-

fects are calculated in the context of the multinomial logit model employed here.) These are shown for each of the first three years over which the model is estimated.[21] These effects can be compared to the persistence rates for switchers and leavers presented in the first part of the paper to gain a sense of the relative magnitudes and importance of these effects.

The discussion will mostly focus on the first-year results. This is partly because sample sizes are greatest for this year (they diminish with the length of the spell due to the censoring processes discussed earlier), which means the findings tend to be more statistically significant. Also, transition rates (switching and leaving) tend to be highest in the first year, so the results are effectively more "important" as well, and there is essentially more room for the rates to vary with the variables included in the models.

In the college sample, being a woman (holding other factors constant) increases the probability of switching by 2.6 percent (holding other factors constant) in the first year, but has no significant effect on leaving. In the university sample, the female effects are reversed: being a woman decreases the probability of leaving by 3.1 percent, but has no effect on switching.

Among college students, being an immigrant decreases the probability of switching by 5.6 percent, and being a visible minority decreases the probability of leaving by 6.0 percent. These are very strong effects in a context where overall switching rates are 13.2 percent, and leaving rates 12.6 percent in the first year of college. In the university sample, being a visible minority decreases the probability of leaving by 3.6 percent on an overall leaving rate of 7.9 percent. The other effects related to immigrant and visible minority status are small and not statistically significant.

An individual's academic preparations and/or ability, as captured by their high school grade average, also has significant effects, although they are selective. Students – college or university – with an average above 80 percent are, in particular, significantly less likely to leave than others. The effect when these higher performers are compared to students whose average is 60 to 69 percent (the baseline/omitted group in the regression) is 7.8 percent lower leaving rates in the college sample and 6.3 percent lower rates in the university sample. The other grade effects are not statistically significant.

By age, the most dramatic result is the greatly increased leaving rates for university students who start their PSE schooling at age 21 or above (10.3 percent higher rates) – now verified in the multivariate framework, indicating (like the other effects reported here) that the effect observed in the simple descriptive analysis above is not just something about older students relating to any of the other variables now being controlled for (e.g., high school preparation, family background). That is, it appears to be a "true" age effect – although we cannot, of course, rule out that the possibility that age is capturing

21 The results for the fourth and fifth years are not presented because the numbers of observations are too small to compute marginal effects with sufficient reliability.

other unobservable influences with which it is correlated.

In the college sample, most regional differences are small and insignificant, but studying in Quebec increases the probability of switching by 5.3 percent (relative to Ontario) in the first year, and this difference soars to 12.0 percent in the third year. These are likely CEGEP effects. The point estimates are also positive for the Prairies and British Columbia in year two, perhaps the effect of the college transfer systems in place in those provinces, but the associated standard errors are relatively large, so the differences are not statistically significant. Interestingly, there are no statistically significant differences in leaving rates by province/region among college students.

In the university sample, studying in the Prairies region increases the probability of leaving by 6.2 percent, and there is evidence these effects persist in the following years (see the statistically significant difference in year 3 as well). Studying in British Columbia decreases the probability of switching by 3.8 percent in the first year, which would seem to run in the opposite direction to what might have been expected given the greater coherence of the college and university systems that has been established in that province precisely in order to allow students to move more easily between the two systems. Note that we are conditioning on high school grades here, so these provincial differences do not appear to be just a selection effect (e.g., perhaps the Prairie provinces admit greater proportions of weaker students who are then weeded out after arrival) – although we cannot rule out more complex selection processes not otherwise controlled for in the model which could perhaps result in this sort of dynamic.

Family structure and parental educational attainment appear to have perhaps surprisingly selective effects on persistence. In the college sample, students from single parent families are more likely to leave in the first year (6.6 percent) than students from two parent families, but are no more likely to switch – although their switching rates rise sharply in year two. In the university sample, students from single parent families are less likely to switch than students from two parent families (4.4 percent), but are no more likely to leave. Having parents with a college or university degree significantly reduces college leaving rates, but the only significant effect on university students is a lower switching rate for those with university educated parents.

These uneven family background effects – especially those pertaining to parental education – may be contrasted to the uniformly strong effects of family type and, in particular, parental education on access (i.e., the probability of *entering* PSE – see Finnie and Mueller 2008). It may be that once students from families that face certain disadvantages with respect to family background make it into the system, their chances of success are relatively more even. This could, of course, represent selection effects, whereby individuals from disadvantaged backgrounds who get into PSE might be particularly strong achievers and do well as a result of that – perhaps overcoming certain difficulties that may in fact continue to exist. The data, while rich, are limited in terms of what they can tell

us about such complex relationships, at least using relatively simple models of the sort employed here. This would be an interesting topic for further work.

Interestingly, the effects of the student's academic and social engagement while in high school are very mixed and generally small and not significant.

Switching and Leaving: All-Year Results (Hazard Models)

Having examined transition patterns in a regression context for each single year, we now stack the data across all spell years and estimate similar multinomial regressions using this pooled dataset. These models include a set of dummy variables that represent the current spell year to capture any general shifts in the transitions along this dimension. As discussed earlier, this corresponds to a hazard model set-up.

Five models are estimated: the first model includes the most basic (and most clearly exogenous) background factors, similar to those included in the single year models just presented; the second model adds indicators of student financial aid (i.e., the receipt of a scholarship, grant, or student loan); the third specification turns to schooling outcomes, starting with the individual's high school grade average and high school engagement variables; and the last two models add PSE grades and then the four descriptors representing individuals' PSE experiences. We also include the provincial unemployment rate, which can now be better identified by the variation that occurs over time in a given province (province/region is also included).

These models differ from those previously seen in several ways. First, in aggregating across all program years, they capture the average effects of the explanatory variables on the transitions in question across the different spell years (one through five), with the increased sample size of the aggregated model likely to result in more statistically significant results to the degree the effects are similar across years. Second, they provide for the estimation of duration effects – how the switching and leaving rates generally change over the course of a program. And finally, they include the different sets of explanatory variables which allow us to explore different sets of influences. The results for these regressions are presented in Tables 10a and 10b.

The results from the first model for the college sample indicate that the unemployment rate (defined with respect to those with no PSE – presumably the relevant job market if they were to drop out), gender, immigrant status, and visible minority status have no significant impact on the probability of switching or leaving in any given year. The significant results previously found for the single year models were in fact mostly concentrated in the first year, and mixing those effects with the later year effects (basically an exercise in model pooling) appears to largely wash out the significance of those effects. The two sets of findings thus together provide a more complete view of the related effects – not an inconsistent record.

The age effects are more directly comparable across the two college models: the few very young college entrants represented in the data are much less likely to leave PSE, while those age 18 are more likely to switch to other programs than are older entrants.

There is some evidence that the probability of switching to another program decreases with program year for college students (see the year two and year four coefficients), but leaving does not. The clearly declining switching and leaving rates seen in the simple hazard rates thus appear to weaken in the multivariate context, perhaps partly because graduates are included in the former calculations whereas they are censored in the latter, perhaps simply because college programs tend to be quite short to start with, or perhaps for other reasons.

The main regional differences found in the descriptive statistics and in the single year models are confirmed and seen to be even stronger than before: compared to Ontario, studying at the college level in Quebec increases the probability of switching by an average of 5.5 percent per year, and studying in BC increases the probability by (a now statistically significant) 5.0 percent. In addition, the Atlantic region is now associated with considerably higher leaving rates than elsewhere (a result that did not show up in the single year models).

Family background is found to matter significantly: coming from a single parent family increases the probability of switching programs for a college student in any given year by 4.0 percent (not found in the single year models) and increases the probability of leaving by 5.5 percent compared to coming from a two parent family, while students with parents holding a college or university diploma have substantially lower leaving rates than students with parents who only finished high school as well as those who did not graduate from high school.

The results for the university sample are (again) found to be substantially different than those for the college sample. Consistent with the single year results seen above, being a woman decreases the probability of leaving by 1.7 percent in any given year and being a visible minority does so by 2.6 percent, while there are no significant effects on switching in either case, and no immigrant effects. Switching and leaving rates of the youngest students (a small group) are lower than those of others, while those who start at age 20 or older again have much higher leaving rates than others.

It is interesting that the provincial unemployment rate appears to have no significant effect on leaving (or switching) rates for university students, which was the same as was found for college students. The lure of stronger labour markets (or the unattractiveness of weaker ones) does not appear to have much effect on PSE persistence. That said, it could be that the movements in unemployment rates over this period were not great enough to identify any such effects, and we consider this finding as being in the nature of “preliminary evidence”.

Both switching and leaving rates decrease significantly as university students progress through their programs – the biggest shift coming after the first year.

The regional effects for university students are stronger in the aggregate model than they were in the single year specification. Those who study in the Atlantic region, the Prairies, or British Columbia all tend to be significantly more likely to leave PSE than are students in Ontario, and those from the first two areas are also more likely to switch programs. Quebecois show some evidence of being slightly less likely to leave or switch.

In contrast to the college results, the family effects are again rather mixed among university students. Students from single parent families are 3.6 percent less likely to switch programs in any given year than are students from two parent families, while those with parents with the lowest and highest educational attainment (below high school and university completed) also appear – the joint effects being somewhat curious – to be less likely to switch programs. But family background, at least as measured by family structure or parental education, has no significant effect on leaving PSE. This is a significant finding in how it goes against the findings of some others, and with respect to the relevant policy implications: family background simply does not appear to be a "barrier" to moving through university. But see the further discussions on this below.

In the second model, the financial aid variables are added. Most of the findings reported above change very little as these variables are added to the model, which is also the case as the other extra variables are added below, so our focus in the remaining part of this section is mostly on the new variables, as they are added in groups.

In the college sample, both scholarships and grants are negatively related to the probability of leaving PSE, but the scholarship effect becomes weaker and loses its significance as the school performance variables (grades) are added in the subsequent regressions, indicating that to a large degree this variable is only capturing such related effects (ability, commitment, etc.) rather than any "pure" scholarship effect. The grant effect remains strong, but again it is difficult to interpret this finding since students who apply for and receive grants are different than other students in a variety of ways not controlled for in these models that may have their own effects on persistence. Still the result is interesting if only as a starting point for thinking about these effects: perhaps grants do indeed help cause college students to stick with their studies.[22]

In the university sample, only the scholarship variable is significant, with negative effects on the probability of both switching and leaving, but again these effects get smaller and largely disappear as the academic performance variables are included.

The third model includes high school grades and high school engagement. Having a high school average of 80 percent or more lowers the probability of leaving PSE among college students. But then we see that these

22 See Day, 2008, for an in-depth treatment of student financial aid measures and their effect on persistence in the face of concerns such as these (i.e., endogeneity and unobserved heterogeneity). Her findings are generally unstable and inconsistent across estimation methods that attempt to correct for these influences, and point to the need for other better data, including perhaps data generated by experimental or quasi-experimental mechanisms, in order to better identify the related effects.

effects become smaller and less significant when the even more significant PSE grade and engagement variables are added to the regressions. This sequence of findings presumably points to some of the pathways through which high school grades operate: those with higher grades in high school also tend to get higher grades in PSE, and it is the latter which has the greatest (direct) effect on persistence. Grades have a positive effect on switching in the more complete models, perhaps pointing to college students who move to university level studies before finishing their college programs.

High school academic engagement – work habits and so on – has a negative effect on college leaving, while high school social engagement has no significant influence. At face value, it appears that it is not having someone to talk to while you are in high school that is going to keep you in college, but rather your seriousness about your studies.

Having at least an 80 average in high school is associated with lower leaving rates among university students as well, but again the effect gets smaller and loses its statistical significance as the other schooling variables are added to the model. Furthermore, in contrast to the college results, high school engagement has little effect on leaving rates for university students, and only a small and limited effect on switching.

The last two columns show the regression results for the models which include PSE grades and PSE experiences. In the literature, the well known theoretical model of Tinto (1975, 1993) suggests that PSE experiences, including grade performance, academic engagement, social engagement, and other outcomes are important determinants of persistence, although other researchers have criticised this approach on the grounds that these variables may be endogenous to persistence (Bean and Metzer, 1985).

In the present case, PSE grades are available in the data, but PSE "engagement" (comparable to the high school engagement variables seen above) is not. Instead, we have four variables which provide information on the individual's PSE experiences with regard to the quality of instruction, the student's difficulty in keeping up with the work load, the presence of individuals to whom the student can talk (an element of "social engagement"), and the degree to which the student believes useful skills are being obtained.

There is a strong relationship between PSE grades and PSE persistence in both the college and the university samples: better performing students are considerably less likely to switch programs or leave, the effect being strongest for college students. While the interpretation of these results may be debated on theoretical grounds for the reasons mentioned, it is clear that grades are a very good predictor or who is likely to change programs and who is likely to leave PSE entirely.

In the college sample, the PSE experience effects are all strong, and in the expected directions. Reporting that "none of my instructors has strong teaching ability" increases the probability of leaving by 6.7 percent; saying that "I never have trouble with keeping up with the work load" decreases the leaving

rate by 2.8 percent (although there is a similar negative effect for often having trouble), thinking that "there are people at school that I can talk to about personal things" decreases the probability of leaving by 3.8 percent, and believing that "first year gave me skills that would help me in the job market" decreases the probability of leaving by a full 9.5 percent. These are strong effects. The latter indicator is also associated with lower switch rates.

In the university sample, in contrast, the PSE experience variables have no effect on leaving rates, while the "none of my instructors has teaching ability" indicator increases the probability of switching by 3.2 percent, and thinking that "there are people at school that I can talk to about personal things" decreases the probability of switching by 2.6 percent.

This difference between the college and university results is intriguing and bears further investigation. Are university students so used to mediocre teaching and not gaining (or caring about?) useful skills that their presence or absence have no effect on their persistence behaviour? But then, the workload indicator is not significant either, which seems like an even more curious result. We are likely at the limit of the YITS data in what can be learned about these relationships, but the observed patterns are interesting.

Leavers Who Return

Table 11 shows the results for a simple logit model in which the dependent variable is whether a student who left PSE after starting his or her first program returned to PSE in the following years. This represents a modelling of the empirical hazard rates previously seen in Tables 5a and 5b using a corresponding hazard model set-up (as discussed earlier).

Recall from those results that the overall hazard rates of return are, at the college level, 22.3 percent after one year, 14.1 percent after two years, and 10.7 percent after three years. Among university students the rates are 35.6 percent, 20.6 percent, and 10.0 percent. These hazard rates generate cumulative return rates at the three year mark of 40.3 percent at the college level, and 54.0 percent at the university level. Modelling this process allows us to see how these dynamics vary with the explanatory variables included in the model, which generally represent the simpler set of more clearly exogenous background factors found in the first set of first transition models seen above, plus the duration terms which characterise the hazard model set up.

Being a woman increases the probability of returning in any given year for leavers from both (5.6 percent) and university (6.8 percent), but there are no significant differences by immigrant or visible minority status, and the unemployment rate does not appear to matter either (again).

College students who were younger when they started their first PSE programs tend to be substantially more likely to return after leaving PSE than older ones, but there are no significant differences by age among university students. For both groups, the probability of returning to PSE drops with the number of

years the student has been out (thus corresponding to the patterns seen in the simple empirical hazard rates seen above).

By region, the only significant effects are that college students who were initially enrolled in the Prairies are less likely to return to their studies than those who studied in Ontario (the baseline or comparison group), while at the university level students who initially started in – and dropped out of – a program in British Columbia, are much less likely to re-enter the PSE system than others.

One interesting finding is that not only do college students with more educated parents tend to have lower leaving rates (as seen above), they are now found to also be more likely to return to PSE if they do leave than students with less educated parents. And of course parental education is – as previously noted – a very strong determinant of participation in PSE to begin with. Parental education is thus an important factor at all stages of PSE participation among college students.

Among university students, however, the effects of parental education are more ambiguous: returning rates are significantly higher for those with college educated parents, but – curiously – not for those whose parents have university level schooling. This following on the earlier finding that leaving rates were also not affected by parental education in any consistent fashion. Yet, parental education has already been noted to be a prime determinant of actually going to university to start with – i.e., when starting PSE. The effects of parental education are thus generally important to PSE participation profiles, but these effects take somewhat different patterns for college and university students.

For college students, there are no significant differences in return rates by family type, this after finding that those from single parent families are more likely to leave PSE. University leavers who come from single parent families actually have higher rates of returning than do those from two parent families (all other factors held constant), whereas their leaving rates were previously found not to be any different. Overall, family type is thus found to have a mixed set of effects on leaving PSE and returning among college and university levels students.

Conclusion

This paper has provided new and unique evidence on PSE pathways in Canada based on the Youth in Transition Survey, Cohort B ("YITS-B") database, which has allowed us to track a representative sample of PSE college and university students on a longitudinal basis from their point of entry into PSE, and to relate the different dynamics and pathways to a variety of student attributes.

Our analysis has shown that many individuals follow what might be referred to as "non-traditional" pathways which include switching programs, taking breaks, and otherwise moving in and out of PSE as they work their way through their studies. This evidence stands in clear contrast to previous Canadian studies, which have mostly been based on institution-level data which, by construction, lose track of students when they leave the particular college or university in question and thus miss switchers and those who re-

turn to their studies elsewhere after leaving their first program. The present research always goes well beyond the small number of other studies where slightly broader tracking has been attempted but only for very limited populations. In these respects, the analysis stands out at the international not only in Canada, but at the international level as well, as the authors are aware of only a few American studies that are comparable to the present analysis.

Persistence rates are found to be much higher when viewed from this broader perspective. We find, for example, that 25.8 percent of college students and 18.0 percent of university students leave their first PSE program by the end of the first year, but more than half of these switch immediately to another program, and many of those who do leave PSE return to the system in the next few years.

And thus, while five year graduation rates are only 56.5 percent at the college level and 52.1 percent at the university level when measured with respect to the initial program started, these rates rise to 73.1 percent (college) and 69.4 percent (university) when those who graduate from other programs are included. When those who have not graduated but are still in PSE are also included, persistence rates rise to 82.0 percent (college) and 89.8 percent (university). This analysis – and these numbers – thus have the potential to fundamentally change our view of persistence in PSE, and therefore to put related discussions on a new empirical footing.

This is not to say that there is no need to be concerned about persistence in PSE. Many individuals may struggle through programs they do not like, others may make changes that turn out not to be good for them, and the reasons for switching and leaving might point to specific problems that could and should be addressed.

Picking up on these ideas, we also provide an analysis of the reasons students switch and leave; of where exactly students go when they change programs or where they re-enter the system after leaving PSE entirely during their first program; and of the patterns of switching, leaving, and returning to PSE among leavers by a range of personal characteristics, family background, and schooling experience variables, using a combination of descriptive and hazard model approaches. Our findings include the following:

- While there is a significant amount of switching from the first program to another one directly (our definition of “switcher”), a significant amount of this switching is within the same institution, another substantial share is to a different institution at the same level, while relatively few students change immediately from college to university or vice versa. The patterns of where students subsequently return to PSE after first leaving their studies entirely (our definition of “leavers”) are, however, somewhat more evenly distributed among these different destinations (e.g., there are relatively higher proportions who switch levels of study than in the case of switchers).

- The greatest number of switchers and leavers say they did so because they did not like their current program or wanted a change. Few students switched programs due to financial reasons, while 9.0 percent of all college leavers and 15.2 percent of university leavers cited affordability issues – nontrivial proportions, but rather small numbers when placed in the context of cumulative rates of leaving by the five year mark, being just 20.4 percent at the college level and 14.9 percent at the university level. That is, only a few percent of all students who start PSE (1.8 percent of college students and 2.3 percent of university students) leave their studies due to money problems.

- Based on our regression (hazard model) analysis, female students, immigrants, and visible minorities tend to switch programs and leave PSE less than males, non-immigrants, and non-minorities, but the patterns are mixed, including differences at the college and university levels. The current unemployment rate appears to have no effect on persistence.

- Those who enter PSE at a very young age are less likely to leave their programs, while at the other extreme, those who start university for the first time at age 21 or older have much higher leaving rates than others.

- College students in Quebec and British Columbia switch more often than others, probably reflecting a CEGEP effect on the one hand, and formal university transfer programs on the other, while university students in Atlantic Canada, the Prairies and British Columbia are more likely to leave PSE after starting their first programs than those in Ontario and Quebec.

- University students switch and leave at declining rates as they move their programs, but for college students the simple descriptive patterns do not hold up as strongly when the modelling approach is used, perhaps pointing to a more complex set of relationships, or maybe only because college programs are generally quite short.

- The family background effects are perhaps surprisingly mixed. Students from single parent families tend to switch and leave at higher rates at the college level, whereas at the university level they switch less (not more) and their leaving rates are no different than others' (i.e., two parent families). College students whose parents have more schooling (e.g., a college or university diploma) tend to leave PSE at lower rates, but the only parental education effects at the university level are on switching, and they are mixed.

- Students with scholarships tend to leave at lower rates than others, but these appear to be primarily "ability" effects since they go away when grade averages and related variables are added. Student loan effects are small and in any event difficult to interpret. Although the grant variable may also capture various effects, including unobserved heterogeneity among students, it is interesting to note that the negative effect on leaving is more robust than the other financial aid variables, at least for college students.

- High school grades matter, at least as indicators of persistence behaviour, even if they are not necessarily easy to interpret in a causal sense. PSE grades have an even stronger influence, and tend to dominate the high school grade effects, but are even move likely to be endogenous to persistence behaviour (see below).

- When a student's (high school) "engagement" matters, it is the academic side that counts more than the social side (i.e., work habits are better predictors of persistence than is being connected to others).

- Post-secondary experiences related to instructional quality, work loads, having people to talk to, and the sense that the program is providing job skills are all strongly related to college students' persistence patterns, but have little effect at the university level.

The meaning of these associations is not always clear and must in any event be put in context. That context begins with the recognition that students have generally overcome certain hurdles just to get into PSE, and so there is likely to be a positive selection into our samples. This selection is, furthermore, likely to be strongest for those coming from more disadvantaged groups (e.g., those from single parent families or those whose parents have lower educational attainment), since we know from other research that these groups have generally lower access rates into PSE to begin with – so those that do make it are of a special quality. Hence, observed switching and leaving rates might not be lower for such students *even though they may continue to face certain disadvantages* precisely because they are relatively high achievers. Including high school grades and other control variables in the analysis (hazard models) are important in this respect, but selection effects with respect to unobservables might well remain.

Secondly, there is potential endogeneity in the case of at least some of the explanatory variables, including (especially) those related to PSE outcomes and the financial aid variables: those who are committed to continuing their studies will likely tend to get higher grades and perhaps qualify for more aid (especially merit based scholarships), meaning that causality runs from persistence to these measures even if there are also effects running in the opposite direction.

Finally, our analysis omits some potentially important explanatory variables, and the measures that are included may be capturing at least some of the relevant influences. For example, parental education may be picking up family income effects – even if the access literature has been increasingly finding that parental education dominates family income, at least when it comes to access effects. Without a fully specified model, the interpretation of at least some of the variables included in the analysis must remain open to question.

In conclusion, then, we do not consider this research to represent anything like the last word on PSE persistence in Canada. On the contrary, it perhaps provides more of a new starting point than anything else – but it is a new start that is based on a fundamentally improved understanding of overall persistence rates, of the dynamics underlying

these rates (switching, leaving, returning), of the reasons underlying these patterns, and of the factors related to individual characteristics, family background, and schooling experiences associated with these dynamics.

It will, therefore, be for further research to drill into these relationships more deeply – to probe some of the dynamics in further detail, to identify further associations of interest, to tease out the relevant causal relationships using advanced statistical methods and a good understanding of the institutional settings underlying the observed outcomes, and to otherwise advance our understanding of PSE persistence in Canada.

Such research could be based on the YITS-B dataset used here; on the (younger) YITS-A database as that cohort moves through the PSE system, perhaps taking particular advantage of the even richer set of background variables it has available; on other survey data; on administrative data, including the "PSIS" being built at Statistics Canada; on qualitative analyses which can probe the reasons for students' behaviour in a way that quantitative data probably never could; and other methods.

The present work has hopefully established a useful starting point for such future investigations while providing, in the meantime, a new empirical basis for on-going discussions of PSE persistence in Canada.

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Tables

Table 1. Sample Characteristics

	College (%)	University (%)
# of Obs.	6758	4839
Gender		
Male	47.6	44.0
Female	52.4	56.0
Immigrant Status		
Immigrant	7.6	12.9
Non-Immigrant	92.0	86.9
D.K.	0.4	0.2
Visible Minority Status		
Visible Minority	10.6	19.6
Others	88.8	80.1
D.K.	0.6	0.3
Age at Enrolment		
Below 18	25.6	1.9
18	29.2	35.7
19	24.0	48.9
20	11.1	8.9
Above 20	10.2	4.6
PSE Region		
Atlantic	6.0	13.5
Quebec	44.0	2.4
Ontario	31.4	48.7
Prairies	10.3	21.0
BC	8.2	14.3
Family Type		
Two Parents	80.0	86.4
Single Parent	18.2	11.8
Others	1.4	1.5
D.K.	0.4	0.4
Parental Education		
Below HS	9.5	4.2
HS Completed	25.3	17.5
Coll. Completed	32.4	25.5
Univ. Completed	28.6	49.2
D.K.	4.2	3.5
Average Grade in HS		
Below 60%	1.4	0.2
60%-69%	14.5	4.4
70%-79%	46.2	30.2
80% or Above	36.7	64.5
D.K.	1.2	0.7

	College (%)	University (%)
Average Grade in PSE		
Below 60%	5.2	5.3
60%-69%	13.5	22.3
70%-79%	38.5	46.5
80% or Above	36.5	23.1
D.K.	6.1	2.8
Scholarship		
Yes	16.6	50.5
No	82.4	49.0
D.K.	1.1	0.5
Grant		
Yes	10.5	22.9
No	88.4	76.6
D.K.	1.1	0.5
Student Loan		
Yes	31.5	29.0
No	67.3	70.4
D.K.	1.1	0.6
Instructors Have Strong Teaching Ability		
None	9.9	13.7
Some	18.0	27.6
Most	63.1	54.4
D.K.	9.1	4.3
Student Has Trouble Keeping Up With the Workload		
Never	51.0	35.1
Sometime	28.6	44.2
Most of the Time	11.8	16.7
D.K.	8.6	4.0
There Are People at School to Talk to		
Disagree	18.1	19.1
Agree	78.8	79.5
D.K.	3.1	1.3
The First Year Helped Student Obtain Skills		
Disagree	24.6	40.5
Agree	72.1	58.0
D.K.	3.3	1.5

Notes

1. --- indicates that results are suppressed to meet the confidentiality requirements of the Statistics Act.

Table 2a. Hazard Transition Rates by Year – College

				Switchers						
					Same Inst.		Diff. Inst.			
	# of Obs.	Continuers (%)	Graduates (%)	Total (%)	Same level (%)	Diff. Level (%)	Same level (%)	Diff. Level (%)	D.K. (%)	Leavers (%)
Treatment 1: All Ineligible programs are right-hand censored										
Year 1	6382	66.5	10.2	12.7	5.8	0.4	3.5	0.7	2.3	10.6
Year 2	3361	51.6	35.9	6.9	3.5	---	1.1	---	1.4	5.5
Year 3	1242	36.1	52.0	5.8	1.2	---	2.3	---	1.1	6.0
Year 4	321	43.1	46.9	4.3	---	---	---	---	---	5.7
Year 5	81	34.8	45.1	---	---	---	---	---	---	4.0
Treatment 2: Some Ineligible programs are kept, others are right-hand censored										
Year 1	6758	62.5	11.7	13.2	5.9	0.4	3.7	1.0	2.3	12.6
Year 2	3607	48.0	36.8	7.6	3.6	0.3	1.4	0.7	1.7	7.6
Year 3	1376	32.1	53.2	7.1	1.6	---	3.4	---	1.1	7.5
Year 4	371	37.2	51.0	4.4	1.8	---	---	---\	---	7.4
Year 5	99	28.8	53.5	13.9	---	---	---	---	---	3.9
Treatment 3: All Ineligible programs are kept										
Year 1	7053	59.7	11.2	14.5	6.9	0.5	3.7	1.1	2.4	14.6
Year 2	3802	45.7	35.0	9.2	3.9	0.3	1.4	1.7	1.9	10.1
Year 3	1455	30.2	50.0	9.6	2.2	---	3.5	---	1.4	10.3
Year 4	389	35.6	48.8	5.8	2.6	---	---	---	---	9.8
Year 5	101	28.6	53.2	14.4	---	---	---	---	---	3.8

Note: 1. --- indicates that results are suppressed to meet the confidentiality requirements of the *Statistics Act*.

Table 2b. Hazard Transition Rates by Year – University

				Switchers						
					Same Inst.		Diff. Inst.			
	# of Obs.	Continuers (%)	Graduates (%)	Total (%)	Same level (%)	Diff. Level (%)	Same level (%)	Diff. Level (%)	D.K. (%)	Leavers (%)
Treatment 1: All Ineligible programs are right-hand censored										
Year 1	4613	84.4	0.8	8.5	2.0	0.6	3.3	1.7	0.8	6.4
Year 2	3320	89.4	1.6	6.1	2.5	0.3	1.5	0.9	0.8	2.9
Year 3	2464	86.8	6.7	4.6	3.2	---	0.3	---	0.7	1.9
Year 4	1816	50.0	46.9	1.8	1.2	---	---	---	0.3	1.3
Year 5	669	34.1	60.6	3.0	1.9	---	---	---	---	2.3
Treatment 2: Some Ineligible programs are kept, others are right-hand censored										
Year 1	4839	80.9	1.1	10.1	3.0	0.8	3.5	2.0	0.9	7.9
Year 2	3436	86.2	2.0	7.9	3.4	0.5	1.8	1.3	0.8	3.9
Year 3	2562	83.4	7.7	5.6	3.5	---	0.5	---	0.9	3.3
Year 4	1886	47.8	48.5	2.2	1.5	---	0.1	---	0.3	1.5
Year 5	732	31.7	62.6	3.2	1.9	---	---	---	---	2.4
Treatment 3: All Ineligible programs are kept										
Year 1	5088	77.1	1.0	12.7	4.7	1.1	3.7	2.0	1.1	9.2
Year 2	3552	83.3	1.9	10.0	5.2	0.5	2.2	1.3	0.9	4.8
Year 3	2656	80.5	7.5	7.9	5.5	0.3	0.7	0.5	0.9	4.1
Year 4	1941	46.0	46.6	4.0	2.0	---	0.8	---	0.4	3.4
Year 5	754	31.1	61.4	4.3	2.3	---	---	---	---	3.2

Note: 1. --- indicates that results are suppressed to meet the confidentiality requirements of the *Statistics Act*.

Table 3a. Cumulative Transition Rates by Year - College

				Switchers						
					Same Inst.		Diff. Inst.			
	# of Obs.	Continuers (%)	Graduates (%)	Total (%)	Same level (%)	Diff. Level (%)	Same level (%)	Diff. Level (%)	D.K. (%)	Leavers (%)
Treatment 1: All Ineligible programs are right-hand censored										
Year 1	6382	66.5	10.2	12.7	5.8	0.4	3.5	0.7	2.3	10.6
Year 2	6382	34.3	34.1	17.3	8.2	0.5	4.3	1.1	3.2	14.3
Year 3	6382	12.4	52.0	19.3	8.6	0.6	5.1	1.5	3.6	16.3
Year 4	6382	5.3	57.8	19.8	8.8	0.6	5.3	1.5	3.6	17.0
Year 5	6382	1.9	60.2	20.7	8.9	0.6	5.3	1.5	4.4	17.3
Treatment 2: Some Ineligible programs are kept, others are right-hand censored										
Year 1	6758	62.5	11.7	13.2	5.9	0.4	3.7	1.0	2.3	12.6
Year 2	6758	30.0	34.7	18.0	8.1	0.5	4.5	1.5	3.3	17.3
Year 3	6758	9.6	50.7	20.1	8.6	0.6	5.6	1.8	3.6	19.5
Year 4	6758	3.6	55.6	20.5	8.8	0.6	5.7	1.8	3.7	20.3
Year 5	6758	1.0	57.5	21.0	8.9	0.6	5.7	1.8	4.1	20.4
Treatment 3: All Ineligible programs are kept										
Year 1	7053	59.7	11.2	14.5	6.9	0.5	3.7	1.1	2.4	14.6
Year 2	7053	27.3	32.1	20.0	9.2	0.7	4.5	2.1	3.5	20.6
Year 3	7053	8.2	45.8	22.6	9.8	0.9	5.5	2.6	3.9	23.4
Year 4	7053	2.9	49.8	23.1	10.0	1.0	5.6	2.6	3.9	24.2
Year 5	7053	0.8	51.3	23.5	10.1	1.0	5.6	2.6	4.3	24.3

Note: 1. Calculated from the annual (hazard) transition rates shown in Table 2a.

Table 3b. Cumulative Transition Rates by Year - University

				Switchers						
					Same Inst.		Diff. Inst.			
	# of Obs.	Continuers (%)	Graduates (%)	Total (%)	Same level (%)	Diff. Level (%)	Same level (%)	Diff. Level (%)	D.K. (%)	Leavers (%)
Treatment 1: All Ineligible programs are right-hand censored										
Year 1	4613	84.4	0.8	8.5	2.0	0.6	3.3	1.7	0.8	6.4
Year 2	4613	75.4	2.1	13.6	4.2	0.8	4.5	2.5	1.5	8.9
Year 3	4613	65.4	7.2	17.1	6.6	1.0	4.8	2.8	2.0	10.3
Year 4	4613	32.7	37.9	18.3	7.4	1.0	4.8	2.9	2.2	11.1
Year 5	4613	11.2	57.7	19.2	8.0	1.2	4.9	2.9	2.2	11.9
Treatment 2: Some Ineligible programs are kept, others are right-hand censored										
Year 1	4839	80.9	1.1	10.1	3.0	0.8	3.5	2.0	0.9	7.9
Year 2	4839	69.8	2.7	16.5	5.8	1.2	4.9	3.0	1.6	11.1
Year 3	4839	58.2	8.1	20.4	8.2	1.3	5.3	3.3	2.2	13.4
Year 4	4839	27.8	36.3	21.7	9.1	1.5	5.3	3.4	2.3	14.2
Year 5	4839	8.8	53.7	22.6	9.6	1.6	5.5	3.4	2.4	14.9
Treatment 3: All Ineligible programs are kept										
Year 1	5088	77.1	1	12.7	4.7	1.1	3.7	2	1.1	9.2
Year 2	5088	64.2	2.5	20.4	8.7	1.5	5.4	3	1.8	12.9
Year 3	5088	51.7	7.3	25.5	12.2	1.7	5.8	3.3	2.4	15.5
Year 4	5088	23.8	31.4	27.6	13.3	1.8	6.3	3.7	2.6	17.3
Year 5	5088	7.4	46	28.6	13.8	1.9	6.4	3.7	2.7	18

Note: 1. Calculated from the annual (hazard) transition rates shown in Table 2a.

Table 4. Main Reason for Leaving

	College			University		
	All (%)	**Switcher** (%)	**Leaver** (%)	**All** (%)	**Switcher** (%)	**Leaver** (%)
Not enough money	5.9	2.8	9.0	8.5	4.6	15.2
Wanted to work	6.0	2.1	9.9	4.6	2.7	7.8
Marks too low	6.2	3.6	8.8	4.8	4.5	5.3
Didn't like it/Not for me	40.5	44.1	37.0	29.1	28.3	30.5
To change schools or programs	17.8	30.4	5.5	29.4	40.5	10.3
Only missing a few credits, not worth continuing	2.0	1.1	2.8	---	---	---
Wanted a break	1.8	1.2	2.3	5.5	3.1	9.7
To Travel	0.7	---	---	2.2	1.8	2.9
Pregnant/Caring for own child	1.4	---	---	0.9	---	---
Own Health	2.3	2.1	2.5	1.7	1.5	2.1
Other	15.4	12.1	18.7	13.0	12.6	13.8
# of Obs.	1971			1397		

Note: 1. indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.

Table 5a. Hazard and Cumulative Rates of Return to PSE Among Leavers - College

			Returners					
				Same Inst.		Diff. Inst.		
		# of Obs.	**Total** (%)	Same Level (%)	Diff. Level (%)	Same Level (%)	Diff. Level (%)	**D.K.** (%)
Hazard Rates								
Year 1	Percentage	1168	22.3	5.6	1.1	6.6	3.7	5.2
	Distribution		100.0	25.2	5.0	29.5	16.8	23.6
Year 2	Percentage	716	14.1	3.6	---	4.1	---	3.8
	Distribution		100.0	25.5	---	29.0	---	27.1
Year 3	Percentage	509	10.7	2.5	---	2.4	---	3.7
	Distribution		100.0	23.4	---	22.6	---	34.5
Cumulative Rates								
Year 1	Percentage	1168	22.3	5.6	1.1	6.6	3.7	5.2
	Distribution		100.0	25.2	5.0	29.5	16.8	23.6
Year 2	Percentage	1168	33.2	8.4	1.2	9.7	5.7	8.2
	Distribution		100.0	25.3	3.6	29.3	17.0	24.7
Year 3	Percentage	1168	40.3	10.1	1.4	11.3	6.9	10.7
	Distribution		100.0	25.0	3.4	28.1	17.1	26.5

Notes

1. Cumulative transition rates shown in the second panel are calculated from the annual (hazard) transition rates shown in the first panel.
2. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.
3. Results for year 4 and year 5 are omitted due to small sample sizes.

Table 5b. Hazard and Cumulative Rates of Return to PSE Among Leavers - University

			Returners					
				Same Inst.		Diff. Inst.		
		# of Obs.	**Total** (%)	Same Level (%)	Diff. Level (%)	Same Level (%)	Diff. Level (%)	**D.K.** (%)
Hazard Rates								
Year 1	Percentage	1168	35.6	10.4	2.1	8.8	8.7	5.6
	Distribution		100.0	29.1	6.0	24.6	24.5	15.8
Year 2	Percentage	716	20.6	2.3	---	---	7.4	5.9
	Distribution		100.0	11.0	---	---	35.8	28.8
Year 3	Percentage	509	10.0	---	---	---	6.2	1.7
	Distribution		100.0	---	---	---	62.4	17.0
Cumulative Rates								
Year 1	Percentage	1168	35.6	10.4	2.1	8.8	8.7	5.6
	Distribution		100.0	29.1	6.0	24.6	24.5	15.8
Year 2	Percentage	1168	48.9	11.8	2.1	12.0	13.5	9.4
	Distribution		100.0	24.2	4.4	24.6	27.6	19.3
Year 3	Percentage	1168	54.0	12.5	2.4	12.1	16.7	10.3
	Distribution		100.0	23.1	4.4	22.5	30.9	19.1

Notes

1. Cumulative transition rates shown in the second panel are calculated from the annual (hazard) transition rates shown in the first panel.
2. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.
3. Results for year 4 and year 5 are omitted due to small sample sizes.

Table 6a. Cumulative Total Graduation Rates

			Graduate						
					Same Inst.		Diff. Inst.		
		N	**Total** (%)	**Same Prog** (%)	Same Level (%)	Diff. Level (%)	Same Level (%)	Diff. Level (%)	**D.K.** (%)
College									
Year 1	%	6758	12.0	11.7	---	---	---	---	---
	Dist		100.0	97.8	---	---	---	---	---
Year 2	%	6758	36.9	34.4	1.0	---	0.3	---	1.0
	Dist		100.0	93.2	2.7	---	0.9	---	2.7
Year 3	%	6758	57.0	50.1	2.5	0.3	1.8	0.1	2.2
	Dist		100.0	88.0	4.4	0.5	3.1	0.2	3.9
Year 4	%	6758	66.2	54.7	3.9	0.3	3.5	0.4	3.4
	Dist		100.0	82.6	5.9	0.5	5.3	0.6	5.2
Year 5	%	6758	73.1	56.5	4.9	0.3	5.2	1.8	4.4
	Dist		100.0	77.3	6.8	0.5	7.0	2.4	6.0
University									
Year 1	%	4839	1.1	1.1	---	---	---	---	---
	Dist		100.0	94.1	---	---	---	---	---
Year 2	%	4839	3.6	2.7	---	---	---	0.4	0.5
	Dist		100.0	72.8	---	---	---	10.5	12.9
Year 3	%	4839	11.2	8.1	0.3	---	---	1.2	1.2
	Dist		100.0	71.9	2.4	---	---	10.9	10.5
Year 4	%	4839	45.0	35.5	2.3	0.5	1.7	3.0	1.9
	Dist		100.0	78.9	5.2	1.2	3.8	6.7	4.3
Year 5	%	4839	69.4	52.1	4.9	1.1	4.4	4.6	2.3
	Dist		100.0	75.1	7.0	1.6	6.4	6.6	3.3

Notes: 1. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.

Table 6b. Overall Persistence Rates

				Returners							
						Same Inst.		Diff. Inst.			
		N	Graduate (%)	Total (%)	Same Prog (%)	Same Level (%)	Diff. Level (%)	Same Level (%)	Diff. Level (%)	D.K. (%)	Not in PSE (%)
College											
Year 1	%	6758	12.0	75.2	62.5	5.6	0.3	3.6	1.1	2.0	12.9
	Dist		100.0	100.0	83.1	7.5	0.4	4.8	1.4	2.7	100.0
Year 2	%	6758	36.9	45.8	29.3	6.3	0.5	5.0	1.6	3.0	17.3
	Dist		100.0	100.0	64.1	13.8	1.0	10.9	3.6	6.6	100.0
Year 3	%	6758	57.0	25.1	9.3	5.1	0.3	5.1	2.8	2.6	17.9
	Dist		100.0	100.0	36.9	20.4	1.2	20.3	11.0	10.1	100.0
Year 4	%	6758	66.2	14.8	3.2	2.4	0.2	3.7	3.3	1.9	19.0
	Dist		100.0	100.0	21.8	16.0	1.5	25.1	22.6	12.8	100.0
Year 5	%	6758	73.1	8.8	1.0	1.6	0.1	2.2	2.7	1.2	18.0
	Dist		100.0	100.0	11.4	18.4	0.9	25.3	30.0	14.0	100.0
University											
Year 1	%	4839	1.1	91.0	80.9	2.8	0.8	3.6	2.0	0.9	7.9
	Dist		100.0	100.0	88.9	3.1	0.9	3.9	2.2	1.0	100.0
Year 2	%	4839	3.6	86.7	69.3	5.9	1.1	5.2	3.7	1.6	9.6
	Dist		100.0	100.0	79.9	6.8	1.3	5.9	4.2	1.9	100.0
Year 3	%	4839	11.2	78.8	57.0	8.4	1.0	6.3	4.4	1.7	9.9
	Dist		100.0	100.0	72.4	10.6	1.3	8.0	5.6	2.1	100.0
Year 4	%	4839	45.0	45.2	26.7	7.2	1.1	5.8	3.3	1.1	9.8
	Dist		100.0	100.0	59.2	16.0	2.4	12.9	7.3	2.3	100.0
Year 5	%	4839	69.4	20.4	8.0	4.9	0.5	3.5	2.4	1.1	10.2
	Dist		100.0	100.0	39.1	24.2	2.5	17.1	11.8	5.3	100.0

Notes: By the end of each year, students are categorized into three groups: Graduate, Still in PSE, and Not in PSE. Students who are still in PSE are further categorized into six groups: in the same (first) program; in a new program in the same institution, at the same or different level of study; in a new program in a new institution, at the same or different level of study; Category Don't know includes students who have missing values in key variables.

Table 7a. Hazard Transition Rates by Individual Characteristics - College

	Year 1				Year 2				Year 3			
	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)
# of Obs.	**6758**				**3607**				**1376**			
All Respondents	62.5	11.7	13.2	12.6	48.0	36.8	7.6	7.6	32.1	53.2	7.1	7.5
Gender												
Male	63.0	11.6	11.9	13.5	50.9	30.3	9.1	9.7	37.6	46.5	8.4	7.5
Female	62.1	11.8	14.4	11.7	45.4	42.7	6.3	5.6	26.4	60.3	5.8	7.5
Immigrant Status												
Immigrant	72.7	9.8	8.5	9.1	64.5	18.5	6.6	10.3	32.9	33.2	21.4	12.5
Non-Immigrant	61.8	11.9	13.5	12.8	46.7	38.3	7.7	7.3	32.0	55.3	5.7	7.0
Visible Minority Status												
Visible Minority	70.1	7.1	13.2	9.7	59.5	25.5	4.5	10.5	38.2	30.8	18.2	12.8
Others	61.8	12.3	13.0	12.9	46.6	38.1	8.0	7.2	31.3	56.4	5.6	6.8
Age at Enrol-ment												
Below 18	74.9	2.3	18.0	4.8	47.8	39.3	8.6	4.3	26.7	61.0	9.0	3.3
18	60.0	12.7	15.7	11.7	45.6	35.8	10.3	8.3	35.9	51.8	6.3	6.0
19	60.9	12.8	9.7	16.6	50.5	35.0	4.7	9.8	34.1	51.4	5.1	9.4
20	55.7	16.1	9.3	18.9	49.5	36.2	5.2	9.1	34.5	45.4	6.8	13.2
Above 20	49.8	25.5	6.7	18.0	48.9	36.4	5.2	9.5	32.6	39.2	---	---
PSE Region												
Atlantic	42.7	31.6	6.9	18.8	28.2	61.9	1.8	8.2	25.5	56.0	---	---
Quebec	69.4	4.9	17.9	7.9	49.3	34.9	10.0	5.8	29.5	56.7	8.1	5.6
Ontario	61.6	11.5	10.1	16.8	51.8	34.2	4.5	9.5	34.6	51.0	3.1	11.2
Prairies	53.7	24.9	7.5	14.0	31.1	52.7	6.1	10.1	37.2	52.4	---	---
BC	54.7	18.3	11.9	15.0	55.1	27.0	9.6	8.3	36.7	38.3	---	---
Family Type												
Two Parents	64.2	11.9	12.7	11.3	48.8	37.8	6.3	7.2	32.2	53.9	7.4	6.5
Single Parent	57.4	10.5	15.9	16.2	45.4	31.9	14.0	8.6	32.7	48.6	5.8	12.9
Others	41.2	18.5	9.9	30.4	35.2	28.7	---	---	---	---	---	---
Parental Education												
Below HS	58.1	12.0	12.5	17.4	52.7	34.9	5.2	7.2	23.3	60.9	4.6	11.3
HS Completed	57.7	15.1	12.2	15.0	48.4	35.3	6.8	9.5	29.4	50.9	10.9	8.9
Coll. Completed	62.9	11.8	13.8	11.5	50.7	35.4	6.5	7.4	36.3	50.0	7.7	6.0
Univ. Completed	69.1	7.8	13.9	9.3	43.3	39.4	10.7	6.6	32.1	56.6	4.8	6.6
Average Grade in High School												
Below 60%	42.5	27.5	12.3	17.7	29.8	59.5	---	---	---	---	---	---
60%-69%	54.6	16.5	9.4	19.4	53.0	27.6	5.8	13.5	38.9	35.9	11.8	13.4
70%-79%	61.0	11.5	13.1	14.4	51.2	30.4	9.1	9.3	36.6	49.6	6.5	7.4
80% or Above	68.7	9.2	15.3	6.8	42.9	46.6	6.7	3.9	23.7	65.6	5.1	5.6
Average Grade in PSE												
Below 60%	31.8	---	---	35.3	46.3	---	---	20.9	26.1	---	---	45.3
60%-69%	53.0	3.9	19.2	23.9	54.2	16.8	15.6	13.3	44.9	30.3	10.5	14.2
70%-79%	68.2	7.2	13.4	11.1	54.0	30.1	7.0	8.9	31.9	54.4	8.5	5.1
80% or Above	67.6	20.5	7.4	4.5	42.2	49.7	4.7	3.4	29.9	62.9	2.0	5.3

Table 7a continued

	Year 1				Year 2				Year 3			
	Cont. (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)	**Cont.** (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)	**Cont.** (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)
Scholarship												
Yes	65.7	11.1	14.5	8.6	41.7	45.9	8.3	4.1	35.8	51.8	3.1	9.4
No	62.2	11.9	13.0	13.0	49.4	34.9	7.3	8.3	31.5	53.5	7.9	7.2
Grant												
Yes	63.1	16.7	11.6	8.7	52.2	38.7	3.1	5.9	39.3	44.4	7.2	9.1
No	62.8	11.2	13.4	12.6	47.5	36.7	8.0	7.8	31.1	54.4	7.1	7.3
Student Loan												
Yes	61.0	12.6	13.7	12.8	47.8	38.5	5.3	8.4	29.8	55.8	3.7	10.7
No	63.7	11.4	13.0	11.9	48.2	36.1	8.5	7.2	33.1	52.1	8.7	6.1
Instructors Have Strong Teaching Ability												
None	50.8	9.2	19.4	20.5	50.3	27.3	4.6	17.9	39.5	43.8	---	---
Some	63.1	6.9	17.2	12.8	49.7	33.1	9.7	7.5	36.5	48.5	6.9	8.2
Most	66.4	11.8	11.0	10.8	48.6	38.2	7.4	5.7	30.5	55.3	7.1	7.1
Student Has Trouble Keeping Up With the Workload												
Never	65.5	14.0	11.5	9.0	47.6	40.0	5.8	6.5	30.7	58.1	6.3	5.0
Sometime	64.7	8.0	12.7	14.5	49.0	34.9	8.4	7.7	30.5	47.9	9.5	12.1
Most of the Time	55.2	2.8	22.1	19.9	54.1	20.2	15.0	10.7	45.5	42.1	4.0	8.4
There Are People at School to Talk to												
Disagree	54.7	10.5	14.2	20.6	50.3	31.6	6.4	11.7	33.5	53.4	5.8	7.4
Agree	64.8	12.1	12.6	10.5	48.3	37.1	7.8	6.8	32.2	53.1	7.1	7.7
The First Year Helped Student Obtain Skills												
Disagree	53.9	4.3	20.5	21.3	44.1	32.3	14.3	9.3	27.9	48.4	12.6	11.2
Agree	66.1	14.3	10.3	9.3	49.7	37.4	5.7	7.2	33.6	53.9	5.6	6.8

Notes:

1. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.
2. Results for year 4 and year 5 are omitted due to small sample sizes

Table 7b. Hazard Transition Rates by Individual Characteristics - University

	Year 1				Year 2				Year 3			
	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)
# of Obs.	**4839**				**3436**				**2562**			
All Respondents	80.9	1.1	10.1	7.9	86.2	2.0	7.9	3.9	83.4	7.7	5.6	3.3
Gender												
Male	79.1	1.4	9.8	9.7	87.1	2.2	7.0	3.7	84.8	6.6	5.2	3.4
Female	82.3	0.9	10.4	6.5	85.5	1.8	8.5	4.1	82.3	8.7	5.9	3.2
Immigrant Status												
Immigrant	85.1	1.5	7.8	5.6	92.2	---	5.6	---	84.2	5.4	7.1	3.3
Non-Immigrant	80.3	1.0	10.5	8.1	85.2	2.1	8.3	4.4	83.3	8.1	5.3	3.2
Visible Minority Status												
Visible Minority	87.3	0.7	7.3	4.7	90.8	---	6.4	---	84.1	6.6	7.3	2.0
Others	79.4	1.2	10.9	8.6	85.0	2.3	8.3	4.4	83.3	8.1	5.1	3.6
Age at Enrol-ment												
Below 18	96.5	---	---	---	88.3	---	---	---	85.7	---	---	---
18	79.7	1.2	10.9	8.2	83.2	1.7	10.2	4.8	87.7	4.4	5.5	2.4
19	83.8	0.7	9.5	6.0	88.9	1.2	6.6	3.3	85.0	6.9	5.4	2.7
20	77.5	---	---	10.5	85.3	5.0	7.0	2.7	61.7	26.8	6.2	5.2
Above 20	59.5	4.5	13.0	23.0	77.7	---	7.8	---	64.4	---	---	---
PSE Region												
Atlantic	76.5	0.9	14.4	8.2	84.5	2.2	8.6	4.8	84.5	5.6	5.9	3.9
Quebec	90.3	---	---	---	94.2	---	---	---	96.1	---	---	---
Ontario	83.8	0.4	9.6	6.2	89.2	1.7	6.5	2.6	85.9	8.4	4.4	1.4
Prairies	73.1	2.4	11.3	13.2	80.8	2.6	11.0	5.6	78.2	10.2	7.7	3.9
BC	84.9	1.9	6.6	6.6	83.2	2.0	9.1	5.7	78.1	5.2	7.7	9.0
Family Type												
Two Parents	80.6	1.1	10.7	7.6	86.4	2.0	7.9	3.7	83.7	7.8	5.6	2.9
Single Parent	82.8	---	---	9.6	86.9	2.3	5.8	5.1	83.6	7.5	4.6	4.3
Others	88.3	---	---	---	74.4	---	19.1	---	68.1	---	---	---
Parental Education												
Below HS	83.6	---	8.8	---	83.9	---	7.4	---	81.8	---	---	3.8
HS Completed	76.1	1.9	12.8	9.2	85.1	2.6	7.8	4.5	80.3	8.8	7.4	3.5
Coll. Completed	78.8	1.3	11.1	8.8	85.5	1.7	8.1	4.7	78.7	9.7	8.2	3.3
Univ. Completed	83.4	0.7	8.9	7.0	86.7	2.1	8.2	3.1	86.3	6.7	3.8	3.3
Average Grade in High School												
Below 60%	66.5	---	---	---	---	---	---	---	---	---	---	---
60%-69%	64.9	---	---	20.3	82.9	---	9.6	---	71.1	7.9	6.6	14.4
70%-79%	76.4	2.1	11.5	10.0	80.2	2.2	10.8	6.8	75.4	10.0	8.2	6.4
80% or Above	84.2	0.6	9.3	5.9	88.8	1.9	6.6	2.7	86.8	7.0	4.6	1.6
Average Grade in PSE												
Below 60%	60.7	---	---	---	72.4	---	18.8	---	81.1	---	5.6	---
60%-69%	76.4	0.6	11.9	11.0	83.9	0.8	9.5	5.8	78.3	6.6	10.0	5.1
70%-79%	84.4	0.8	8.6	6.1	87.6	2.3	6.6	3.4	84.1	7.9	4.5	3.6
80% or Above	86.4	2.0	7.9	3.8	88.7	2.6	6.3	2.4	86.8	8.4	3.8	1.0

Table 7b continued

	Year 1				Year 2				Year 3			
	Cont. (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)	**Cont.** (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)	**Cont.** (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)
Scholarship												
Yes	85.3	0.9	8.5	5.2	88.4	2.2	6.1	3.3	84.4	8.4	4.5	2.6
No	76.4	1.2	11.8	10.6	83.8	1.7	9.9	4.7	82.1	6.9	7.0	4.1
Grant												
Yes	81.6	1.1	9.9	7.4	88.6	0.9	7.2	3.4	82.7	5.5	6.6	5.3
No	80.7	1.1	10.2	8.0	85.6	2.3	8.1	4.1	83.6	8.5	5.3	2.6
Student Loan												
Yes	79.9	1.2	10.7	8.2	85.4	1.4	8.0	5.1	84.5	5.9	6.0	3.7
No	81.3	1.0	9.9	7.8	86.6	2.2	7.8	3.4	83.0	8.5	5.4	3.1
Instructors Have Strong Teaching Ability												
None	72.9	0.6	15.1	11.4	85.5	---	8.2	---	82.1	7.9	6.8	3.2
Some	83.2	0.8	9.6	6.4	87.0	1.6	7.3	4.0	83.0	8.5	6.4	2.1
Most	83.1	1.0	8.6	7.3	86.7	2.0	7.8	3.4	84.3	7.5	5.0	3.2
Student Has Trouble Keeping Up With the Workload												
Never	83.5	1.3	8.9	6.2	86.0	2.6	8.0	3.3	84.0	10.5	3.5	2.1
Sometime	82.7	0.8	9.5	7.1	87.8	1.2	7.6	3.4	83.7	5.7	6.8	3.8
Most of the Time	75.0	---	12.3	---	84.8	1.9	7.5	5.9	83.0	8.0	7.3	1.7
There Are People at School to Talk to												
Disagree	74.4	1.4	13.1	11.1	85.8	1.0	8.3	4.9	81.1	5.5	8.8	4.6
Agree	82.8	0.9	9.2	7.1	86.5	2.2	7.6	3.7	83.8	8.2	5.0	3.0
The First Year Helped Student Obtain Skills												
Disagree	78.3	0.6	10.5	10.6	85.3	2.2	8.5	4.0	82.8	8.3	5.9	3.1
Agree	83.3	1.3	9.6	5.8	87.2	1.8	7.1	3.9	83.8	7.4	5.4	3.4

Notes:

1. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.
2. Results for year 4 and year 5 are omitted due to small sample sizes

Table 8. Five-Year Cumulative Transition Rates by Individual Characteristics

	College (5 yrs)				University (5yrs)			
	Cont. (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)	**Cont.** (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)
# of Obs.		**6758**				**4839**		
All Respondents	1.0	57.5	21.0	20.4	8.8	53.7	22.6	14.9
Gender								
Male	1.3	53.6	22.0	23.1	11.1	49.7	22.2	17.0
Female	0.8	61.1	20.2	17.9	6.8	57.2	22.8	13.2
Immigrant Status								
Immigrant	3.2	48.2	24.7	23.8	15.0	54.3	21.0	9.8
Non-Immigrant	0.9	58.2	20.8	20.2	8.0	53.6	22.9	15.6
Visible Minority Status								
Visible Minority	1.7	50.0	25.5	22.8	14.6	55.4	20.6	9.4
Others	1.0	58.4	20.5	20.1	7.6	53.3	23.1	16.1
Age at Enrolment								
Below 18	1.5	60.1	28.3	10.1	27.2	50.3	14.0	8.5
18	0.9	54.9	25.1	19.1	11.5	46.7	26.6	15.2
19	0.6	57.9	14.8	26.7	6.7	60.6	19.9	12.7
20	1.8	55.1	14.9	28.2	7.6	54.3	22.0	16.1
Above 20	0.0	61.0	11.8	27.2	7.1	26.8	20.9	45.2
PSE Region								
Atlantic	0.9	66.7	8.4	24.0	7.1	49.8	27.9	15.2
Quebec	1.0	55.0	29.0	14.9	7.0	76.2	13.1	3.8
Ontario	1.0	57.8	14.3	26.9	7.3	62.4	19.2	11.2
Prairies	0.6	66.2	11.2	22.0	9.2	42.3	27.8	20.8
BC	2.5	52.0	25.6	19.9	14.5	42.6	22.8	20.1
Family Type								
Two Parents	1.0	60.2	19.9	18.9	8.0	54.4	23.4	14.2
Single Parent	1.1	47.3	26.6	25.0	15.7	50.2	15.7	18.5
Other	0.0	41.4	14.9	43.6	2.7	48.1	28.4	20.8
Parental Education								
Below HS	1.8	55.1	17.5	25.7	16.9	45.8	18.4	18.8
HS Completed	0.5	55.7	19.6	24.2	8.2	50.2	25.8	15.8
Coll. Completed	1.1	59.3	20.9	18.6	6.9	52.2	24.3	16.6
Univ. Completed	1.0	58.0	24.4	16.6	9.3	56.2	21.3	13.2
Average Grade in High School								
Below 60%	1.4	64.1	14.0	20.5	0.0	29.1	35.5	35.4
60%-69%	2.2	47.4	19.0	31.5	15.0	26.3	26.4	32.3
70%-79%	1.0	54.3	21.2	23.5	10.2	40.4	27.6	21.8
80% or Above	0.6	65.8	22.1	11.6	8.1	61.1	20.2	10.6
Average Grade in PSE								
Below 60%	1.9	4.9	43.3	49.9	9.8	27.4	31.6	31.2
60%-69%	1.6	28.8	33.6	36.1	10.9	37.9	28.7	22.5
70%-79%	0.6	56.5	22.4	20.5	8.4	58.5	20.0	13.1
80% or Above	1.3	78.7	11.6	8.4	8.2	67.7	17.1	7.0
Scholarship								
Yes	0.9	63.8	21.4	14.0	7.3	62.1	19.4	11.2
No	1.1	56.6	20.9	21.4	10.7	44.6	25.9	18.8
Grant								
Yes	0.0	67.8	16.8	15.4	7.1	54.2	24.1	14.6
No	1.1	56.7	21.5	20.7	9.4	53.6	22.0	15.0

Table 8 continued

	College (5 yrs)				University (5yrs)			
	Cont. (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)	**Cont.** (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)
Student Loan								
Yes	0.4	59.5	18.8	21.4	10.8	50.0	22.6	16.6
No	1.3	57.1	22.1	19.4	8.0	55.3	22.5	14.2
Instructors Have Strong Teaching Ability								
None	0.7	42.7	23.6	33.1	14.2	37.3	31.5	17.0
Some	0.3	52.7	26.4	20.7	10.6	54.3	21.7	13.4
Most	1.3	61.6	19.3	17.8	6.8	58.7	20.4	14.1
Student Has Trouble Keeping Up With the Workload								
Never	0.9	65.3	18.0	15.8	7.9	61.1	19.6	11.4
Sometime	1.1	52.9	21.8	24.2	8.2	54.3	22.9	14.6
Most of the Time	2.1	34.7	34.2	29.0	13.8	39.6	26.7	19.9
There Are People at School to Talk to								
Disagree	0.3	49.5	19.8	30.3	11.5	41.8	28.5	18.3
Agree	1.2	59.7	20.9	18.1	8.3	56.7	20.9	14.1
The First Year Helped Student Obtain Skills								
Disagree	0.7	37.4	32.0	29.9	10.1	49.3	24.0	16.6
Agree	1.2	64.7	16.9	17.2	8.2	57.1	21.1	13.6

Note: 1. Calculated from the annual (hazard) transition rates shown in Table 7a and b plus the rates for year 4 and 5 (not shown in Tables 7a and 7b).

Table 9a. MNL Regression on the Probability of Switching/Leaving – Single -Year Results for College

	Year 1		Year 2		Year 3	
	Swit.	Leave	Swit.	Leave	Swit.	Leave
Female	0.0263*	-0.000653	-0.0203	-0.0186	0.0108	0.0841
	[0.015]	[0.017]	[0.022]	[0.025]	[0.037]	[0.054]
Immigrant	-0.0557*	-0.0413	0.0159	-0.00739	0.12	0.0224
	[0.028]	[0.039]	[0.049]	[0.056]	[0.092]	[0.080]
Visible Minority	0.0439	-0.0600▪	-0.0711◆	0.0117	0.0589	-0.00542
	[0.041]	[0.027]	[0.021]	[0.054]	[0.065]	[0.067]
Average Grade in HS (60%-69%)						
Below 60%	0.0851	-0.0217	---	---	---	---
	[0.083]	[0.090]	---	---	---	---
70%-79%	0.0262	-0.0278	0.0339	-0.0157	-0.120▪	-0.00584
	[0.022]	[0.031]	[0.033]	[0.048]	[0.061]	[0.064]
80% or Above	0.0334	-0.0781◆	0.0207	-0.0558	-0.135▪	0.0324
	[0.027]	[0.024]	[0.035]	[0.039]	[0.069]	[0.080]
Age at Enrolment (Age 19)						
Below 18	0.025	-0.0990◆	0.0266	-0.0365	0.0594	-0.136*
	[0.029]	[0.021]	[0.034]	[0.040]	[0.083]	[0.070]
18	0.0434*	-0.0326	0.0571*	0.00437	-0.0329	-0.062
	[0.023]	[0.026]	[0.030]	[0.044]	[0.045]	[0.071]
20	0.00562	0.023	0.017	-0.0228	-0.0181	0.0529
	[0.025]	[0.043]	[0.033]	[0.058]	[0.052]	[0.12]
Above 20	-0.0123	0.022	0.016	-0.0348	---	---
	[0.023]	[0.048]	[0.042]	[0.064]	---	---
PSE Region (Ontario)						
Atlantic	-0.0114	0.0209	-0.0275	0.0734	---	---
	[0.023]	[0.042]	[0.023]	[0.083]	---	---
Quebec	0.0532*	-0.0218	0.0513	-0.0196	0.120▪	0.00632
	[0.028]	[0.024]	[0.031]	[0.037]	[0.054]	[0.072]
Prairies	-0.0155	-0.0204	0.0418	0.0768	---	---
	[0.021]	[0.036]	[0.038]	[0.074]	---	---
BC	0.00642	0.0246	0.0485	-0.0162	---	---
	[0.030]	[0.047]	[0.042]	[0.052]	---	---
Trade School	-0.012	0.0606	-0.108◆	-0.0611	-0.000817	0.0223
	[0.036]	[0.055]	[0.013]	[0.051]	[0.13]	[0.16]
Family Type (Two Parents)						
Single Parent	0.022	0.0656◆	0.0935◆	0.0248	-0.056	0.119
	[0.021]	[0.025]	[0.035]	[0.033]	[0.037]	[0.078]
Other	0.00948	0.194*	---	---	---	---
	[0.059]	[0.10]	---	---	---	---
Parental Education (High School Completed)						
Less Than HS	-0.00847	0.0134	-0.0326	-0.0292	-0.0454	0.065
	[0.027]	[0.037]	[0.029]	[0.048]	[0.067]	[0.12]
Coll. Completed	0.00829	-0.0394*	0.00323	-0.0316	-0.0159	-0.0777
	[0.020]	[0.020]	[0.027]	[0.035]	[0.049]	[0.055]
Univ. Completed	-0.00824	-0.0490▪	0.0634*	-0.0408	-0.0824*	-0.0029
	[0.021]	[0.021]	[0.035]	[0.033]	[0.044]	[0.066]

Table 9a continued

	Year 1		Year 2		Year 3	
	Swit.	Leave	Swit.	Leave	Swit.	Leave
HS Engagement						
Academic Engage	-0.0187▪	-0.0102	0.00173	-0.0271▪	0.0273	-0.0593▪
	[0.0093]	[0.010]	[0.011]	[0.013]	[0.017]	[0.024]
Social Engage	0.00418	0.000378	-0.00883	0.0119	-0.0000368	0.000993
	[0.0081]	[0.0090]	[0.011]	[0.012]	[0.019]	[0.023]
Observations	5741	5741	2091	2091	622	622

Notes:

1. Average marginal effects are shown (see text and Appendix C for explanations).
2. Robust standard errors in brackets. * significant at 10%; ▪ significant at 5%; ♦ significant at 1%.
3. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.
4. Results for year 4 and year 5 are omitted due to small sample sizes

Table 9b. MNL Regression on the Probability of Switching/Leaving – Single -Year Results for University

	Year 1		Year 2		Year 3	
	Swit.	Leave	Swit.	Leave	Swit.	Leave
Female	0.0089	-0.0308*	0.0200	0.0056	0.0122	0.0022
	[0.014]	[0.017]	[0.014]	[0.011]	[0.014]	[0.012]
Immigrant	-0.0053	-0.0035	-0.0096	---	0.0088	0.0010
	[0.029]	[0.032]	[0.029]	---	[0.028]	[0.020]
Visible Minority	-0.0247	-0.0362*	-0.0083	-0.0164	0.0176	-0.0126
	[0.023]	[0.020]	[0.023]	[0.017]	[0.026]	[0.014]
Average Grade in HS (60%-69%)						
Below 60%	---	---	---	---	---	---
	---	---	---	---	---	---
70%-79%	-0.0213	-0.0465	0.00353	0.0286	0.0364	-0.0246
	[0.034]	[0.035]	[0.037]	[0.036]	[0.053]	[0.052]
80% or Above	-0.0396	-0.0633▪	-0.036	-0.0115	0.00327	-0.0519
	[0.033]	[0.032]	[0.033]	[0.023]	[0.032]	[0.042]
Age at Enrolment (Age 19)						
Below 18	---	---	---	---	---	---
	---	---	---	---	---	---
18	0.012	-0.00132	0.0215	-0.00368	-0.0258	-0.0349
	[0.019]	[0.017]	[0.019]	[0.015]	[0.022]	[0.021]
20	0.00908	0.0229	0.00247	-0.0137	0.0221	0.033
	[0.027]	[0.027]	[0.028]	[0.015]	[0.036]	[0.031]
Above 20	0.0268	0.103*	-0.00945	---	---	---
	[0.050]	[0.061]	[0.028]	---	---	---
PSE Region (Ontario)						
Atlantic	0.0341	0.0172	0.00473	0.0176	0.0282	0.0447▪
	[0.022]	[0.017]	[0.018]	[0.015]	[0.020]	[0.022]
Quebec	-0.00456	---	---	---	---	---
	[0.041]	---	---	---	---	---
Prairies	0.00757	0.0623▪	0.0238	0.0244	0.0471*	0.0353*
	[0.021]	[0.025]	[0.022]	[0.019]	[0.028]	[0.019]
BC	-0.0381▪	0.0113	0.0202	0.0401	0.0398	0.127
	[0.018]	[0.025]	[0.026]	[0.027]	[0.039]	[0.078]
Family Type (Two Parents)						
Single Parent	-0.0513♦	0.0098	-0.0207	0.00948	-0.0165	-0.00243
	[0.016]	[0.023]	[0.019]	[0.022]	[0.017]	[0.013]
Other	-0.0669♦	-0.023	0.119	---	---	---
	[0.026]	[0.038]	[0.080]	---	---	---
Parental Education (High School Completed)						
Less Than HS	-0.0348	-0.0144	-0.0164	0.0359	---	-0.00437
	[0.035]	[0.031]	[0.030]	[0.047]	---	[0.027]
Coll. Completed	-0.0268	-0.00176	-0.00259	0.00362	0.0137	-0.00525
	[0.024]	[0.023]	[0.021]	[0.018]	[0.029]	[0.017]
Univ. Completed	-0.0435▪	-0.0157	0.0056	-0.0119	-0.0323▪	-0.000777
	[0.021]	[0.018]	[0.019]	[0.013]	[0.016]	[0.016]

Table 9b continued

	Year 1		Year 2		Year 3	
	Swit.	Leave	Swit.	Leave	Swit.	Leave
HS Engagement						
Academic Engage	-0.00972	0.000552	-0.0166*	0.00193	-0.0165*	-0.00205
	[0.0082]	[0.0083]	[0.0090]	[0.0074]	[0.0084]	[0.0062]
Social Engage	-0.0112	0.00217	0.0170*	-0.00642	-0.00843	0.00615
	[0.0073]	[0.0083]	[0.0089]	[0.0065]	[0.0072]	[0.0065]
Observations	4753	4753	3359	3359	2376	2376

Notes:

1. Average marginal effects are shown (see text and Appendix C for explanations).
2. Robust standard errors in brackets. * significant at 10%; ▪ significant at 5%; ♦ significant at 1%.
3. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.
4. Results for year 4 and year 5 are omitted due to small sample sizes

Table 10a. MNL Regression on the Probability of Switching/Leaving - All-Year Results for College

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave
Unemployment Rate	0.00228	-0.00932	0.00261	-0.01	0.00268	-0.00939	0.00321	-0.0104*	0.000623	-0.00953*
	[0.0051]	[0.0064]	[0.0051]	[0.0063]	[0.0051]	[0.0058]	[0.0048]	[0.0054]	[0.0047]	[0.0051]
Female	0.00134	-0.0116	0.00167	-0.00988	0.00696	0.00393	0.0185	0.015	0.0177	0.00976
	[0.012]	[0.014]	[0.012]	[0.014]	[0.012]	[0.014]	[0.011]	[0.013]	[0.011]	[0.012]
Immigrant	-0.0191	-0.0325	-0.0185	-0.0384	-0.019	-0.0296	-0.037	-0.0525▪	-0.0339	-0.0527▪
	[0.024]	[0.029]	[0.024]	[0.027]	[0.025]	[0.029]	[0.023]	[0.024]	[0.023]	[0.022]
Visible Minority	0.0166	-0.0307	0.0168	-0.0342	0.0125	-0.0364	0.0154	-0.0265	0.00458	-0.0372*
	[0.026]	[0.024]	[0.026]	[0.023]	[0.026]	[0.023]	[0.027]	[0.023]	[0.026]	[0.020]
Age at Enrolment (Age 19)										
Below 18	0.0209	-0.0913◆	0.0205	-0.0916◆	0.0204	-0.0817◆	0.00949	-0.0876◆	0.00388	-0.0891◆
	[0.023]	[0.020]	[0.023]	[0.020]	[0.023]	[0.019]	[0.021]	[0.018]	[0.021]	[0.017]
18	0.0399▪	-0.0354	0.0394▪	-0.0341	0.0412▪	-0.0279	0.0316*	-0.0393▪	0.0327*	-0.0346*
	[0.018]	[0.023]	[0.018]	[0.023]	[0.018]	[0.022]	[0.017]	[0.020]	[0.017]	[0.019]
20	0.00755	0.0267	0.00783	0.0192	0.00869	0.00565	0.00784	0.00478	0.00996	0.0121
	[0.019]	[0.037]	[0.019]	[0.035]	[0.019]	[0.033]	[0.019]	[0.030]	[0.019]	[0.029]
Above 20	-0.00945	0.0334	-0.00832	0.0303	-0.0163	0.0168	-0.01	0.0431	-0.0275	0.0487
	[0.020]	[0.045]	[0.020]	[0.046]	[0.018]	[0.043]	[0.020]	[0.043]	[0.025]	[0.058]
Transition Year (Year 1)										
Year 2	-0.0299▪	-0.0154	-0.0299▪	-0.0138	-0.0305▪	-0.0139	-0.0248*	-0.00264	-0.0237*	0.00405
	[0.013]	[0.016]	[0.013]	[0.016]	[0.013]	[0.016]	[0.013]	[0.015]	[0.013]	[0.014]
Year 3	0.00501	0.0272	0.0047	0.033	-0.00477	0.0307	-0.00326	0.0382	0.000508	0.0472*
	[0.024]	[0.030]	[0.024]	[0.031]	[0.023]	[0.029]	[0.022]	[0.028]	[0.022]	[0.027]
Year 4	-0.0584▪	0.024	-0.0585▪	0.0268	-0.0577▪	0.0212	-0.0549▪	0.0269	-0.0492*	0.0395
	[0.024]	[0.047]	[0.024]	[0.046]	[0.025]	[0.044]	[0.025]	[0.042]	[0.025]	[0.041]
Year 5	0.133	-0.0403	0.13	-0.0424	0.143	-0.0522	0.15	-0.0454	0.171	-0.0248
	[0.13]	[0.056]	[0.13]	[0.055]	[0.13]	[0.048]	[0.13]	[0.048]	[0.13]	[0.050]
PSE Region (Ontario)										
Atlantic	-0.0182	0.109*	-0.0177	0.103*	-0.0146	0.0868	-0.0114	0.111▪	-0.000724	0.112▪
	[0.025]	[0.064]	[0.025]	[0.063]	[0.025]	[0.060]	[0.026]	[0.057]	[0.027]	[0.053]
Quebec	0.0545▪	0.00684	0.0530*	-0.00124	0.0536*	0.00621	0.0536▪	0.0127	0.0591▪	0.0101
	[0.027]	[0.030]	[0.028]	[0.030]	[0.028]	[0.029]	[0.026]	[0.026]	[0.026]	[0.025]
Prairies	0.00473	-0.00907	0.00378	-0.000532	0.0031	-0.0106	0.00954	-0.00264	-4.35E-05	-0.0103
	[0.019]	[0.036]	[0.019]	[0.036]	[0.019]	[0.033]	[0.019]	[0.031]	[0.018]	[0.028]
BC	0.0497*	-0.0101	0.0468*	0.00395	0.0391	0.00426	0.0409*	0.0151	0.0339	-0.00401
	[0.026]	[0.035]	[0.025]	[0.036]	[0.025]	[0.035]	[0.024]	[0.033]	[0.024]	[0.031]
Trade School	-0.0279	0.0714	-0.0276	0.064	-0.0256	0.0459	-0.017	0.073	-0.00604	0.0738*
	[0.030]	[0.060]	[0.030]	[0.058]	[0.030]	[0.048]	[0.032]	[0.048]	[0.032]	[0.043]
Family Type (Two Parents)										
Single Parent	0.0402▪	0.0548◆	0.0418▪	0.0525◆	0.0400▪	0.0499◆	0.0315▪	0.0357▪	0.0259*	0.0289*
	[0.017]	[0.020]	[0.018]	[0.020]	[0.017]	[0.019]	[0.016]	[0.017]	[0.015]	[0.016]
Other	0.0386	0.214▪	0.0365	0.223▪	0.0414	0.208▪	0.0315	0.154▪	0.0279	0.143*
	[0.053]	[0.092]	[0.053]	[0.091]	[0.054]	[0.083]	[0.051]	[0.072]	[0.052]	[0.074]

Table 10a continued

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave
Parental Education (High School Completed)										
Below HS	-0.0254	0.00754	-0.0242	0.00518	-0.0214	0.000876	-0.0286	-0.0165	-0.0289	-0.0156
	[0.020]	[0.032]	[0.020]	[0.031]	[0.020]	[0.030]	[0.020]	[0.026]	[0.019]	[0.024]
Coll. Completed	-0.00242	-0.0366▪	-0.00265	-0.0382▪	0.000743	-0.0429▪	0.00177	-0.0386▪	0.00192	-0.0395◆
	[0.016]	[0.018]	[0.015]	[0.018]	[0.016]	[0.017]	[0.015]	[0.016]	[0.015]	[0.015]
Univ. Completed	0.00357	-0.0391▪	0.00193	-0.0385▪	0.00461	-0.0436▪	0.0063	-0.0419▪	0.00134	-0.0459◆
	[0.017]	[0.019]	[0.017]	[0.018]	[0.017]	[0.018]	[0.016]	[0.016]	[0.016]	[0.015]
Scholarship			0.00395	-0.0426◆	0.0046	-0.0296*	0.0104	-0.0259*	0.0104	-0.0206
			[0.016]	[0.016]	[0.017]	[0.017]	[0.017]	[0.016]	[0.016]	[0.015]
Grant			-0.00101	-0.0698◆	0.00151	-0.0642◆	0.0127	-0.0570◆	0.0144	-0.0554◆
			[0.021]	[0.017]	[0.022]	[0.017]	[0.021]	[0.017]	[0.021]	[0.016]
Student Loan			-0.0107	0.0201	-0.0107	0.0236	-0.00803	0.0263*	-0.00648	0.0253*
			[0.012]	[0.016]	[0.012]	[0.015]	[0.012]	[0.014]	[0.012]	[0.013]
Average Grade in HS (60%-69%)										
Below 60%					0.0651	-0.0313	0.0616	-0.0235	0.0483	-0.0147
					[0.070]	[0.072]	[0.072]	[0.066]	[0.066]	[0.066]
70%-79%					0.00913	-0.014	0.0269*	0.0184	0.0215	0.0125
					[0.017]	[0.023]	[0.016]	[0.021]	[0.016]	[0.020]
80% or Above					0.0105	-0.0504▪	0.0495▪	-0.00473	0.0412▪	-0.0117
					[0.020]	[0.020]	[0.020]	[0.018]	[0.020]	[0.018]
High School Engagement										
Academic Engage					-0.00732	-0.0210◆	-0.00175	-0.0203◆	0.00162	-0.0186◆
					[0.0069]	[0.0081]	[0.0061]	[0.0075]	[0.0060]	[0.0071]
Social Engage					-0.00138	0.00365	-0.0021	0.00233	-0.000466	0.00441
					[0.0061]	[0.0072]	[0.0058]	[0.0067]	[0.0057]	[0.0064]
Average Grade in PSE (60%-69%)										
Below 60%							0.110◆	0.112◆	0.0878▪	0.0925▪
							[0.042]	[0.041]	[0.042]	[0.039]
70%-79%							-0.0683◆	-0.0773◆	-0.0644◆	-0.0662◆
							[0.017]	[0.019]	[0.017]	[0.018]
80% or Above							-0.118◆	-0.144◆	-0.108◆	-0.119◆
							[0.016]	[0.016]	[0.017]	[0.016]
Instructors Have Strong Teaching Abilities (Some)										
None									-0.00814	0.0667▪
									[0.024]	[0.028]
Most									-0.0233	0.0155
									[0.016]	[0.014]

Table 10a continued

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave
Student Has Trouble Keeping Up with the Workload (Sometime)										
Never									0.00758	-0.0284▪
									[0.012]	[0.013]
Often									0.00849	-0.0331*
									[0.017]	[0.018]
There Are People at School to Talk to									0.00135	-0.0384▪
									[0.015]	[0.017]
The First Year Helped Student Obtain Skills									-0.0570◆	-0.0954◆
									[0.014]	[0.017]
# of Observations	8683	8683	8683	8683	8661	8661	8661	8661	8661	8661

Notes:

1. Average marginal effects are shown (see text and Appendix C for explanations).
2. Robust standard errors in brackets. * significant at 10%; ▪ significant at 5%; ◆ significant at 1%.
3. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.

Table 10b. MNL Regression on the Probability of Switching/Leaving - All-Year Results for University

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave
Unemployment Rate	-0.000117	-0.00175	-0.000514	-0.00228	-0.000306	-0.0017	-0.000471	-0.0022	-0.000839	-0.00246
	[0.0025]	[0.0027]	[0.0024]	[0.0027]	[0.0025]	[0.0027]	[0.0025]	[0.0027]	[0.0024]	[0.0027]
Female	0.00309	-0.0170*	0.00521	-0.0154*	0.00891	-0.0105	0.00884	-0.0106	0.0103	-0.0111
	[0.0081]	[0.0088]	[0.0082]	[0.0089]	[0.0082]	[0.0086]	[0.0083]	[0.0086]	[0.0083]	[0.0088]
Immigrant	0.00051	-0.0136	0.00126	-0.0149	0.0027	-0.0159	0.00612	-0.0118	0.00298	-0.0131
	[0.017]	[0.014]	[0.017]	[0.014]	[0.017]	[0.014]	[0.018]	[0.015]	[0.017]	[0.015]
Visible Minority	-0.0115	-0.0260▪	-0.0121	-0.0265◆	-0.00973	-0.0250▪	-0.0132	-0.0284◆	-0.0153	-0.0297◆
	[0.013]	[0.010]	[0.013]	[0.010]	[0.013]	[0.010]	[0.013]	[0.0094]	[0.013]	[0.0092]
Age at Enrolment (Age 19)										
Below 18	-0.0417◆	-0.0333◆	-0.0387◆	-0.0306◆	-0.0345▪	-0.0281▪	-0.0328▪	-0.0269▪	-0.0361▪	-0.0296▪
	[0.014]	[0.011]	[0.014]	[0.012]	[0.016]	[0.013]	[0.016]	[0.014]	[0.015]	[0.013]
18	0.00378	-0.0183	0.007	-0.015	0.0101	-0.0138	0.00828	-0.0155	0.00635	-0.0171
	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]
20	0.0207	0.0154	0.0164	0.0102	0.0125	0.00368	0.0126	0.00684	0.0131	0.00568
	[0.017]	[0.015]	[0.017]	[0.014]	[0.016]	[0.013]	[0.016]	[0.014]	[0.016]	[0.014]
Above 20	0.0257	0.0877▪	0.0155	0.0707▪	0.00292	0.0620*	0.00713	0.0804▪	0.0172	0.129▪
	[0.028]	[0.039]	[0.026]	[0.035]	[0.025]	[0.035]	[0.026]	[0.038]	[0.031]	[0.056]
Transition Year (Year 1)										
Year 2	-0.0218▪	-0.0384◆	-0.0208▪	-0.0376◆	-0.0196*	-0.0360◆	-0.0168	-0.0346◆	-0.0153	-0.0338◆
	[0.0100]	[0.0087]	[0.010]	[0.0087]	[0.010]	[0.0087]	[0.010]	[0.0087]	[0.010]	[0.0086]
Year 3	-0.0423◆	-0.0412◆	-0.0409◆	-0.0398◆	-0.0393◆	-0.0378◆	-0.0358◆	-0.0359◆	-0.0337◆	-0.0351◆
	[0.010]	[0.011]	[0.010]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]
Year 4	-0.0632◆	-0.0480◆	-0.0629◆	-0.0480◆	-0.0617◆	-0.0460◆	-0.0595◆	-0.0446◆	-0.0578◆	-0.0441◆
	[0.0094]	[0.013]	[0.0094]	[0.013]	[0.0096]	[0.013]	[0.0099]	[0.013]	[0.0100]	[0.013]
Year 5	-0.00854	-0.0104	-0.0105	-0.0126	-0.0114	-0.0117	-0.00885	-0.0109	-0.0106	-0.0124
	[0.041]	[0.038]	[0.041]	[0.036]	[0.040]	[0.036]	[0.041]	[0.036]	[0.038]	[0.035]
PSE Region (Ontario)										
Atlantic	0.0327▪	0.0310▪	0.0298▪	0.0284▪	0.0277▪	0.0244*	0.0272*	0.0245*	0.0302▪	0.0265▪
	[0.014]	[0.014]	[0.014]	[0.013]	[0.014]	[0.013]	[0.014]	[0.012]	[0.014]	[0.013]
Quebec	-0.0218	-0.0234*	-0.0225	-0.0237▪	-0.0213	-0.0225*	-0.0211	-0.0198	-0.0166	-0.0193
	[0.020]	[0.013]	[0.020]	[0.012]	[0.021]	[0.013]	[0.021]	[0.015]	[0.022]	[0.015]
Prairies	0.0361▪	0.0468◆	0.0361▪	0.0444◆	0.0295▪	0.0378▪	0.0287▪	0.0357▪	0.0244*	0.0348▪
	[0.015]	[0.016]	[0.015]	[0.016]	[0.014]	[0.015]	[0.015]	[0.015]	[0.014]	[0.015]
BC	0.0116	0.0525▪	0.0142	0.0576▪	0.00729	0.0512▪	0.00853	0.0533▪	0.0079	0.0569▪
	[0.015]	[0.024]	[0.015]	[0.024]	[0.014]	[0.022]	[0.015]	[0.023]	[0.014]	[0.023]
Trade School										
Family Type (Two Parents)	-0.0360◆	0.00555	-0.0369◆	0.00252	-0.0371◆	0.00172	-0.0362◆	0.004	-0.0380◆	0.00311
	[0.0097]	[0.012]	[0.0098]	[0.012]	[0.0098]	[0.012]	[0.0099]	[0.012]	[0.0098]	[0.012]
Single Parent	0.0232	0.0148	0.0236	0.0163	0.0241	0.0162	0.0218	0.0084	0.0205	0.00879
	[0.039]	[0.029]	[0.038]	[0.031]	[0.038]	[0.031]	[0.037]	[0.026]	[0.035]	[0.027]
Other	[0.053]	[0.092]	[0.053]	[0.091]	[0.054]	[0.083]	[0.051]	[0.072]	[0.052]	[0.074]

Table 10b continued

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave
Parental Education (High School Completed)										
Below HS	-0.0326*	0.0121	-0.0327*	0.0106	-0.0367▪	0.00573	-0.0355*	0.00201	-0.0339*	0.00214
	[0.019]	[0.023]	[0.019]	[0.023]	[0.019]	[0.021]	[0.019]	[0.022]	[0.019]	[0.022]
Coll. Completed	-0.0096	0.00428	-0.0106	0.00412	-0.0109	0.00372	-0.0117	0.00343	-0.011	0.00411
	[0.014]	[0.012]	[0.013]	[0.012]	[0.013]	[0.012]	[0.014]	[0.012]	[0.013]	[0.012]
Univ. Completed	-0.0237▪	-0.00974	-0.0219*	-0.00714	-0.0216*	-0.00687	-0.0186	-0.0047	-0.0183	-0.00458
	[0.011]	[0.0093]	[0.011]	[0.0093]	[0.011]	[0.0091]	[0.012]	[0.0091]	[0.011]	[0.0091]
Scholarship			-0.0344◆	-0.0271◆	-0.0258◆	-0.0158*	-0.0194▪	-0.00773	-0.0186*	-0.00797
			[0.0085]	[0.0083]	[0.0094]	[0.0092]	[0.0099]	[0.0092]	[0.0097]	[0.0092]
Grant			0.0103	-0.00656	0.0121	-0.00711	0.0153	-0.00421	0.0155	-0.00317
			[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]	[0.011]
Student Loan			-0.000577	0.00992	-0.000979	0.00852	-0.0028	0.00464	-0.00124	0.00594
			[0.0099]	[0.0098]	[0.0099]	[0.0096]	[0.010]	[0.0095]	[0.010]	[0.0095]
Average Grade in HS (60%-69%)										
Below 60%					---	---	---	---	---	---
					---	---	---	---	---	---
70%-79%					0.00366	-0.00749	0.00863	-0.00615	0.00706	-0.00748
					[0.023]	[0.022]	[0.023]	[0.021]	[0.023]	[0.021]
80% or Above					-0.0179	-0.0302*	-0.00567	-0.0174	-0.0104	-0.0198
					[0.020]	[0.016]	[0.018]	[0.014]	[0.019]	[0.014]
High School Engagement										
Academic Engage					-0.00975▪	-6.91E-05	-0.00847*	0.000905	-0.00732	0.000283
					[0.0049]	[0.0046]	[0.0049]	[0.0045]	[0.0050]	[0.0046]
Social Engage					-0.00212	0.000121	-0.00344	0.000198	-0.00153	0.000295
					[0.0045]	[0.0044]	[0.0045]	[0.0044]	[0.0044]	[0.0044]
Average Grade in PSE (60%-69%)										
Below 60%							0.0252	0.0491*	0.0227	0.0428*
							[0.024]	[0.026]	[0.023]	[0.026]
70%-79%							-0.0274◆	-0.0272▪	-0.0242▪	-0.0248▪
							[0.010]	[0.011]	[0.010]	[0.010]
80% or Above							-0.0320◆	-0.0449◆	-0.0282▪	-0.0421◆
							[0.012]	[0.0089]	[0.012]	[0.0091]
Instructors Have Strong Teaching Abilities (Some)										
None									0.0316▪	0.00999
									[0.016]	[0.014]
Most									-0.00295	0.00598
									[0.0090]	[0.0088]

Table 10b continued

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave
Student Has Trouble Keeping Up with the Workload (Sometime)										
Never									-0.00361	-0.00548
									[0.0085]	[0.0081]
Often									-0.000672	0.00791
									[0.012]	[0.013]
There Are People at School to Talk to									-0.0258▪	-0.0129
									[0.012]	[0.011]
The First Year Helped Student Obtain Skills									0.000168	-0.00624
									[0.0084]	[0.0093]
# of Observations	11714	11714	11714	11714	11679	11679	11679	11679	11679	11679

Notes:

1. Average marginal effects are shown (see text and Appendix C for explanations).
2. Robust standard errors in brackets. * significant at 10%; ▪ significant at 5%; ♦ significant at 1%.
3. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.

Table 11. Simple Logit Regression on the Probability of Returning Among Leavers – All-Year Results

	College	University
Unemployment Rate	-0.00336	-0.00324
	[0.0084]	[0.010]
Female	0.0563◆	0.0681*
	[0.019]	[0.036]
Immigrant	0.0124	0.0795
	[0.068]	[0.10]
Visible Minority	0.0167	0.0727
	[0.058]	[0.083]
Age at Enrolment (Age 19)		
Below 18	0.155◆	0.0552
	[0.049]	[0.12]
18	0.0512▪	0.057
	[0.023]	[0.038]
20	-0.00706	-0.00469
	[0.029]	[0.051]
Above 20	-0.0960◆	-0.0283
	[0.020]	[0.067]
Transition Year (Year 1)		
Year 2	-0.0826◆	-0.117◆
	[0.024]	[0.042]
Year 3	-0.118◆	-0.224◆
	[0.026]	[0.043]
Year 4	-0.131◆	-0.176▪
	[0.025]	[0.073]
Year 5	-0.181◆	-0.265◆
	[0.019]	[0.037]
Region of the First PSE Program (Ontario)		
Atlantic	-0.032	-0.0373
	[0.043]	[0.071]
Quebec	-0.0538	---
	[0.042]	---
Prairies	-0.0579*	-0.0705
	[0.030]	[0.051]
BC	0.0452	-0.199◆
	[0.045]	[0.041]
Level of the First PSE Program (College)		
Trade School	0.0445	
	[0.053]	
University		
Above University		
Family Type (Two Parents)		
Single Parent	-0.0236	0.105*
	[0.022]	[0.056]
Other	---	0.13
	---	[0.13]
Parental Education (High School Completed)		
Below HS	-0.0319	0.0105
	[0.025]	[0.061]
Coll. Completed	0.0338	0.147◆
	[0.022]	[0.046]
Univ. Completed	0.0808◆	0.0582
	[0.030]	[0.042]
# of Observations	2948	1321

Notes:

1. Average marginal effects are shown (see text and Appendix C for explanations).
2. Robust standard errors in brackets. * significant at 10%; ▪ significant at 5%; ◆ significant at 1%.
3. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.

Appendix

Appendix A: First-Year Transition Rates for Different Cohorts Under Three Different Treatments of Ineligible Programs

Table A1. First-Year Transition Rates for Different Cohorts Under Three Different Treatments of Ineligible Programs

Cohort	All				College				University			
	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)
Treatment 1: All Ineligible Programs Are Right-Hand Censored												
Cohort 1996	78.1	2.2	15.7	4.0	76.8	---	---	---	99.5	---	---	---
Cohort 1997	74.4	5.0	13.4	7.2	69.0	7.0	16.5	7.5	86.0	0.4	7.3	6.3
Cohort 1998	71.6	5.6	13.2	9.7	65.0	8.9	15.0	11.0	80.8	0.6	10.7	7.9
Cohort 1999	77.4	6.0	8.4	8.2	68.2	11.0	9.6	11.3	87.4	0.8	6.8	5.0
Cohort 2000	73.7	8.1	8.8	9.3	61.9	14.8	8.2	15.2	85.7	0.6	8.6	5.1
Cohort 2001	73.2	8.4	8.1	10.3	67.6	---	8.6	12.0	86.1	---	---	7.5
Cohort 2002	45.6	30.2	10.3	13.9	44.4	34.4	8.1	13.1	60.3	---	---	15.7
Cohort 2003	64.6	13.9	---	---	60.7	---	---	---	75.3	---	---	---
Cohort 2004	56.0	24.3	---	---	54.8	22.1	---	---	81.6	---	---	---
Group 1	72.1	6.9	12.2	8.8	66.0	9.8	14.0	10.2	83.0	0.7	9.4	6.9
Group 2	76.3	6.7	8.1	8.9	67.7	11.4	9.1	11.9	87.0	1.0	6.6	5.4
Treatment 2: Some Ineligible Programs Are Kept, The Other Are Censored												
Cohort 1996	78.1	2.2	15.7	4.0	76.8	---	---	---	99.5	---	---	---
Cohort 1997	74.4	5.0	13.4	7.2	69.0	7.0	16.5	7.5	86.0	0.4	7.3	6.3
Cohort 1998	71.6	5.6	13.2	9.7	65.0	8.9	15.0	11.0	80.8	0.6	10.7	7.9
Cohort 1999	67.1	8.2	12.1	12.5	56.8	14.0	12.8	16.5	78.9	1.7	11.2	8.1
Cohort 2000	73.7	8.1	8.8	9.3	61.9	14.8	8.2	15.2	85.7	0.6	8.6	5.1
Cohort 2001	54.3	14.7	9.1	21.9	49.5	20.5	7.3	22.6	67.4	---	---	19.4
Cohort 2002	45.6	30.2	10.3	13.9	44.4	34.4	8.1	13.1	60.3	---	---	15.7
Cohort 2003	48.0	22.9	---	20.3	43.9	27.5	---	---	62.3	---	---	---
Cohort 2004	56.0	24.3	---	---	54.8	---	---	---	81.6	---	---	---
Group 1	72.1	6.9	12.2	8.8	66.0	9.8	14.0	10.2	83.0	0.7	9.4	6.9
Group 2	64.2	9.9	11.5	14.4	54.6	16.0	11.4	18.0	77.3	1.8	11.3	9.5
Treatment 3: All Ineligible Programs Are Kept												
Cohort 1996	78.1	2.2	15.7	4.0	76.8	---	---	---	99.5	---	---	---
Cohort 1997	74.4	5.0	13.4	7.2	69.0	7.0	16.5	7.5	86.0	0.4	7.3	6.3
Cohort 1998	71.6	5.6	13.2	9.7	65.0	8.9	15.0	11.0	80.8	0.6	10.7	7.9
Cohort 1999	57.8	7.1	18.2	16.9	48.4	11.9	18.0	21.8	68.8	1.5	18.3	11.4
Cohort 2000	73.7	8.1	8.8	9.3	61.9	14.8	8.2	15.2	85.7	0.6	8.6	5.1
Cohort 2001	49.9	13.5	9.5	27.0	44.6	18.5	7.8	29.2	64.3	---	---	21.7
Cohort 2002	45.6	30.2	10.3	13.9	44.4	34.4	8.1	13.1	60.3	---	---	15.7
Cohort 2003	48.0	22.9	---	20.3	43.9	---	---	---	62.3	---	---	---
Cohort 2004	56.0	24.3	---	---	54.8	---	---	---	81.6	---	---	---
Group 1	72.1	6.9	12.2	8.8	66.0	9.8	14.0	10.2	83.0	0.7	9.4	6.9
Group 2	56.2	8.7	16.5	18.6	47.4	13.9	15.5	23.2	68.3	1.6	17.6	12.5

Notes:

1. Group 1 includes cohort 1996, cohort 1997, cohort 1998, cohort 2000, cohort 2002, and cohort 2004, which do not across cycles during the first year. Group 2 includes cohort 1999, cohort 2001 and cohort 2003. These three special cohorts across cycles during the first year and suffer the ineligibility problem.
2. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.

Appendix B. Results under Treatment 3 of Ineligible Programs

Table B1. Sample Characteristics

	College (%)	University (%)
# of Obs.	7053	5088
Gender		
Male	47.7	44.3
Female	52.3	55.7
Immigrant Status		
Immigrant	7.4	12.7
Non-Immigrant	92.2	87.2
D.K.	0.4	0.1
Visible Minority Status		
Visible Minority	10.7	19.6
Others	88.7	80.1
D.K.	0.5	0.2
Age at Enrolment		
Below 18	24.4	1.8
18	29.2	35.9
19	24.4	48.7
20	12.0	9.1
Above 20	10.0	4.5
PSE Region		
Atlantic	6.1	13.5
Quebec	43.2	2.3
Ontario	31.9	48.4
Prairies	10.3	21.2
BC	8.4	14.6
First PSE Program		
Trade School	6.5	0.0
College	93.5	0.0
University	0.0	100.0
Above University	0.0	0.0
D.K.	0.0	0.0
Family Type		
Two Parents	80.1	86.4
Single Parent	18.1	11.7
Others	1.4	1.5
D.K.	0.3	0.3
Parental Education		
Below HS	9.5	4.2
HS Completed	25.7	17.6
Coll. Completed	32.2	25.7
Univ. Completed	28.4	48.9
D.K.	4.3	3.5
Average Grade in HS		
Below 60%	1.4	0.2
60%-69%	15.0	4.6
70%-79%	45.8	30.6
80% or Above	36.5	63.9
D.K.	1.2	0.7

	College (%)	University (%)
Average Grade in PSE		
Below 60%	5.2	5.2
60%-69%	13.9	22.6
70%-79%	38.2	46.2
80% or Above	36.3	23.1
D.K.	6.5	2.9
Scholarship		
Yes	16.6	50.2
No	82.2	49.3
D.K.	1.3	0.5
Grant		
Yes	10.4	22.6
No	88.3	76.9
D.K.	1.3	0.5
Student Loan		
Yes	31.3	29.0
No	67.4	70.5
D.K.	1.3	0.6
Instructors Have Strong Teaching Ability		
None	9.8	13.8
Some	17.7	27.2
Most	63.5	54.8
D.K.	9.0	4.2
Student Has Trouble Keeping Up With the Workload		
Never	51.3	35.3
Sometime	28.4	44.2
Most of the Time	11.8	16.7
D.K.	8.4	3.8
There Are People at School to Talk to		
Disagree	18.1	19.0
Agree	78.7	79.6
D.K.	3.2	1.3
The First Year Helped Student Obtain Skills		
Disagree	24.3	40.2
Agree	72.3	58.3
D.K.	3.4	1.5

Note: 1. --- indicates that results are suppressed to meet the confidentiality requirements of the Statistics Act.

Table B2. Hazard and Cumulative Rates of Return to PSE Among Leavers

College

	# of Obs.		Returners					
			Total (%)	**Same Inst.**		**Diff. Inst.**		**D.K** (%)
				Same Level (%)	Diff. Level (%)	Same Level (%)	Diff. Level (%)	
Hazard Rates								
Year 1	1510	Percentage	21.9	5.2	1.0	5.9	4.3	5.6
		Distribution	100.0	23.6	4.4	26.9	19.6	25.5
Year 2	920	Percentage	13.8	3.4	---	---	3.5	3.5
		Distribution	100.0	24.6	---	---	25.4	25.3
Year 3	686	Percentage	11.9	2.6	---	3.7	---	3.4
		Distribution	100.0	21.8	---	30.7	---	28.4
Cumulative Rates								
Year 1	1510	Percentage	21.9	5.2	1.0	5.9	4.3	5.6
		Distribution	100.0	23.6	4.4	26.9	19.6	25.5
Year 2	1510	Percentage	32.7	7.8	1.1	8.5	7.0	8.3
		Distribution	100.0	23.9	3.3	25.9	21.6	25.4
Year 3	1510	Percentage	40.7	9.6	1.2	10.9	8.5	10.6
		Distribution	100.0	23.5	2.9	26.8	20.8	26.0

University

	# of Obs.		Returners					
			Total (%)	**Same Inst.**		**Diff. Inst.**		**D.K** (%)
				Same Level (%)	Diff. Level (%)	Same Level (%)	Diff. Level (%)	
Hazard Rates								
Year 1	799	Percentage	36.1	10.3	2.8	8.7	8.7	5.6
		Distribution	100.0	28.6	7.8	24.0	24.0	15.6
Year 2	385	Percentage	20.3	---	---	5.2	6.6	5.6
		Distribution	100.0	---	---	25.7	32.3	27.7
Year 3	261	Percentage	9.0	---	---	---	5.1	1.4
		Distribution	100.0	---	---	---	56.6	15.3
Cumulative Rates								
Year 1	799	Percentage	36.1	10.3	2.8	8.7	8.7	5.6
		Distribution	100.0	28.6	7.8	24.0	24.0	15.6
Year 2	799	Percentage	49.1	12.0	3.0	12.0	12.9	9.2
		Distribution	100.0	24.5	6.1	24.4	26.2	18.8
Year 3	799	Percentage	53.7	12.6	3.5	12.2	15.5	9.9
		Distribution	100.0	23.5	6.6	22.7	28.8	18.5

Notes:

1. Cumulative transition rates shown in the second panel are calculated from the annual (hazard) transition rates shown in the first panel.
2. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.
3. Results for year 4 and year 5 are omitted due to small sample sizes.

Table B3a. Cumulative Total Graduation Rates

	# of Obs.		Returners						
			Total (%)	**Same Prog** (%)	**Same Inst.** Same Level (%)	**Same Inst.** Diff. Level (%)	**Diff. Inst.** Same Level (%)	**Diff. Inst.** Diff. Level (%)	**D.K** (%)
College									
Year 1	7053	Percentage	11.5	11.2	0.1	0.0	0.0	0.0	0.2
		Distribution	100.0	97.1	0.8	0.0	0.0	0.0	2.1
Year 2	7053	Percentage	34.8	32.0	1.2	0.2	0.3	0.0	1.0
		Distribution	100.0	92.0	3.5	0.6	0.9	0.1	3.0
Year3	7053	Percentage	53.0	46.0	2.8	0.3	1.6	0.1	2.3
		Distribution	100.0	86.8	5.2	0.5	3.0	0.2	4.3
Year 4	7053	Percentage	62.1	50.0	4.3	0.4	3.4	0.6	3.5
		Distribution	100.0	80.5	6.9	0.6	5.5	0.9	5.6
Year 5	7053	Percentage	69.0	51.6	5.4	0.4	5.0	2.0	4.5
		Distribution	100.0	74.8	7.8	0.6	7.3	3.0	6.6
University									
Year 1	5088	Percentage	1.1	1.0	0.0	0.0	0.0	0.0	0.0
		Distribution	100.0	92.7	4.1	0.0	0.0	3.2	0.0
Year 2	5088	Percentage	3.6	2.5	0.1	0.0	0.1	0.4	0.5
		Distribution	100.0	70.0	2.5	1.3	2.4	10.0	13.8
Year3	5088	Percentage	11.1	7.4	0.7	0.4	0.3	1.2	1.2
		Distribution	100.0	66.7	5.9	3.3	2.6	11.1	10.4
Year 4	5088	Percentage	43.2	31.5	4.3	0.7	1.8	2.9	2.0
		Distribution	100.0	72.8	10.0	1.7	4.2	6.7	4.6
Year 5	5088	Percentage	67.2	45.9	8.0	1.2	4.9	4.6	2.5
		Distribution	100.0	68.3	12.0	1.9	7.2	6.9	3.8

Note:

1. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.

Table B3b. Cumulative Total Graduation Rates

# of Obs.			Grad. (%)	Returners							Not in PSE (%)
				Total (%)	Same Prog (%)	Same Inst. Same Level (%)	Same Inst. Diff. Level (%)	Diff. Inst. Same Level (%)	Diff. Inst. Diff. Level (%)	D.K (%)	
College											
Year 1	7053	Percentage	11.5	73.6	59.7	6.6	0.4	3.6	1.1	2.2	14.8
		Distribution	100.0	100	81.1	9.0	0.6	4.9	1.5	2.9	100.0
Year 2	7053	Percentage	34.8	44.8	26.9	6.9	0.6	4.8	2.3	3.3	20.3
		Distribution	100.0	100	60.1	15.4	1.3	10.8	5.2	7.3	100.0
Year3	7053	Percentage	53.0	25.8	8.3	5.4	0.5	4.8	3.9	2.9	21.1
		Distribution	100.0	100	32.0	21.0	1.9	18.6	15.2	11.2	100.0
Year 4	7053	Percentage	62.1	16.1	2.8	2.8	0.5	3.8	4.1	2.1	21.8
		Distribution	100.0	100	17.5	17.6	2.8	23.3	25.5	13.2	100.0
Year 5	7053	Percentage	69.0	10.3	0.9	2.0	0.3	2.3	3.4	1.5	20.6
		Distribution	100.0	100	8.5	19.1	2.4	22.5	33.3	14.3	100.0
University											
Year 1	5088	Percentage	1.1	89.7	77.1	4.5	1.1	3.8	2.1	1.2	9.1
		Distribution	100.0	100	85.9	5.0	1.2	4.2	2.3	1.4	100.0
Year 2	5088	Percentage	3.6	85.7	64.2	8.8	1.3	5.7	3.7	2.0	10.8
		Distribution	100.0	100	74.9	10.3	1.5	6.7	4.3	2.3	100.0
Year3	5088	Percentage	11.1	77.7	51.5	11.7	1.1	6.9	4.4	2.1	11.2
		Distribution	100.0	100	66.3	15.1	1.4	8.9	5.7	2.7	100.0
Year 4	5088	Percentage	43.2	45.0	23.5	9.0	1.1	6.5	3.5	1.4	11.8
		Distribution	100.0	100	52.1	19.9	2.4	14.5	7.8	3.2	100.0
Year 5	5088	Percentage	67.2	21.3	6.9	5.7	0.7	4.1	2.6	1.3	11.5
		Distribution	100.0	100	32.5	26.7	3.1	19.3	12.2	6.2	100.0

Note: By the end of each year, students are categorized into three groups: Graduate, Still in PSE, and Not in PSE. Students who are still in PSE are further categorized into six groups: in the same (first) program; in a new program in the same institution, at the same or different level of study; in a new program in a new institution, at the same or different level of study; Category Don't know includes students who have missing values in key variables;

Table B4a. Hazard Transition Rates by Individual Characteristics - College

	Year 1				Year 2				Year 3			
	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)
# of Obs.	**7053**				**3802**				**1455**			
All Respondents	59.7	11.2	14.5	14.6	45.7	35.0	9.2	10.1	30.2	50.0	9.6	10.3
Gender												
Male	60.0	11.1	13.5	15.4	48.6	28.9	9.9	12.6	35.9	44.4	9.9	9.8
Female	59.5	11.3	15.4	13.8	43.1	40.6	8.5	7.8	24.4	55.6	9.2	10.8
Immigrant Status												
Immigrant	71.0	9.6	9.0	10.4	62.1	17.9	9.4	10.7	30.7	30.9	22.3	16.1
Non-Immigrant	59.0	11.3	14.9	14.9	44.4	36.4	9.2	10.1	30.1	52.0	8.2	9.7
Visible Minority Status												
Visible Minority	66.3	6.7	14.7	12.3	58.3	25.0	6.0	10.7	35.9	29.0	18.5	16.5
Others	59.1	11.7	14.3	14.8	44.2	36.2	9.6	10.1	29.3	52.9	8.3	9.4
Age At Enrolment												
Below 18	74.9	2.3	18.0	4.8	46.1	37.8	10.9	5.2	25.3	57.7	11.0	6.0
18	57.2	12.1	17.3	13.4	43.1	33.9	11.9	11.1	32.7	47.3	11.7	8.3
19	57.2	12.0	12.3	18.5	46.4	32.2	6.4	14.9	32.3	48.7	6.6	12.4
20	49.3	14.2	11.5	25.0	49.2	36.0	5.3	9.6	32.2	42.3	6.3	19.1
Above 20	48.6	24.8	6.9	19.7	47.5	35.3	5.1	12.1	32.6	39.2	---	---
PSE Region												
Atlantic	40.1	29.6	8.3	22.0	27.2	59.7	2.5	10.6	24.6	54.0	5.4	15.9
Quebec	67.6	4.7	18.0	9.6	46.9	33.2	12.0	7.9	27.6	53.0	11.5	7.9
Ontario	58.0	10.8	12.4	18.9	49.7	32.8	5.4	12.0	33.2	49.0	3.5	14.2
Prairies	51.2	23.7	10.1	15.0	29.6	50.2	6.7	13.5	34.2	48.1	---	---
BC	50.8	17.0	14.5	17.8	50.8	24.9	11.5	12.8	32.8	34.2	---	---
Family Type												
Two Parents	61.2	11.3	14.1	13.4	46.3	35.9	7.9	9.9	30.4	50.9	9.7	8.9
Single Parent	55.2	10.1	16.7	18.1	43.8	30.8	15.3	10.0	29.9	44.5	8.9	16.6
Others	39.0	17.5	13.6	30.0	33.3	27.1	---	---	---	---	---	32.7
Parental Education												
Below HS	55.3	11.4	13.2	20.1	50.6	33.5	6.2	9.7	20.9	54.7	9.6	14.8
HS Completed	54.3	14.2	14.3	17.1	46.0	33.5	8.5	12.0	27.8	48.1	12.9	11.2
Coll. Completed	60.6	11.3	14.4	13.6	47.9	33.5	7.8	10.8	33.9	46.7	10.5	8.9
Univ. Completed	66.5	7.5	15.4	10.6	41.3	37.6	12.6	8.5	30.6	53.9	6.5	9.0
Average Grade in High School												
Below 60%	38.7	25.1	17.1	19.1	29.8	59.5	---	---	---	---	---	---
60%-69%	50.4	15.2	11.9	22.5	50.1	26.1	6.9	16.8	36.5	33.7	14.2	15.6
70%-79%	58.8	11.1	14.2	15.9	48.4	28.8	10.0	12.8	34.5	46.8	8.5	10.2
80% or Above	66.1	8.9	16.2	8.8	41.1	44.7	9.0	5.2	22.3	61.6	8.2	8.0
Average Grade in PSE												
Below 60%	30.9	---	---	37.0	43.7	---	---	25.4	23.3	---	---	51.2
60%-69%	49.5	3.6	20.7	26.2	51.7	16.0	17.6	14.7	42.7	28.8	11.7	16.7
70%-79%	65.8	6.9	14.9	12.4	51.8	28.9	8.0	11.3	29.9	50.8	12.1	7.2
80% or Above	65.1	19.7	8.7	6.6	39.8	46.8	7.0	6.4	28.1	59.2	3.9	8.9
Scholarship												
Yes	62.8	10.7	15.9	10.6	39.7	43.8	10.1	6.3	31.7	45.8	7.2	15.4
No	59.6	11.4	14.2	14.9	47.1	33.3	8.8	10.9	29.9	50.8	10.0	9.4

Table B4a continued

	Year 1				Year 2				Year 3			
	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)
Grant												
Yes	60.7	16.0	13.4	9.9	50.7	37.6	4.1	7.7	35.4	39.9	9.9	14.8
No	60.0	10.7	14.6	14.7	45.2	34.8	9.6	10.4	29.4	51.4	9.5	9.6
Student Loan												
Yes	58.8	12.1	14.6	14.5	46.0	37.0	6.4	10.6	28.2	52.7	5.4	13.8
No	60.8	10.8	14.4	13.9	45.7	34.3	10.1	9.9	31.0	48.7	11.5	8.8
Instructors Have Strong Teaching Ability												
None	48.7	8.8	19.9	22.6	47.9	26.0	6.6	19.6	36.7	40.7	9.4	13.2
Some	61.2	6.7	18.4	13.7	47.6	31.7	10.9	9.9	33.9	45.1	10.4	10.6
Most	63.0	11.2	12.6	13.2	46.1	36.3	9.0	8.6	28.7	51.9	9.3	10.1
Student Has Trouble Keeping Up With the Workload												
Never	62.2	13.2	12.9	11.7	45.1	37.9	7.1	9.8	29.2	55.3	8.4	7.1
Sometime	62.3	7.7	13.9	16.1	46.9	33.4	10.7	9.0	28.3	44.4	12.2	15.0
Most of the Time	52.9	2.7	23.6	20.8	51.2	19.2	15.8	13.8	40.6	37.6	7.9	13.9
There Are People at School to Talk to												
Disagree	52.2	10.0	16.5	21.3	47.7	30.0	7.3	15.0	31.7	50.5	7.0	10.9
Agree	62.0	11.6	13.6	12.7	45.9	35.3	9.5	9.3	30.1	49.8	9.8	10.3
The First Year Helped Student Obtain Skills												
Disagree	52.2	4.1	21.3	22.3	42.8	31.4	15.0	10.8	24.5	42.6	17.5	15.4
Agree	62.9	13.7	11.7	11.7	47.0	35.4	7.5	10.1	32.1	51.4	7.3	9.2

Notes:

1. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.
2. Results for year 4 and year 5 are omitted due to small sample sizes

Table B4b. Hazard Transition Rates by Individual Characteristics - University

	Year 1				Year 2				Year 3			
	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)
# of Obs.	**5088**				**3552**				**2656**			
All Respondents	77.1	1.0	12.7	9.2	83.3	1.9	10.0	4.8	80.5	7.5	7.9	4.1
Gender												
Male	75.0	1.3	12.8	10.9	84.9	2.1	8.5	4.4	83.6	6.5	5.8	4.1
Female	78.8	0.8	12.6	7.8	82.0	1.7	11.1	5.1	78.0	8.2	9.6	4.1
Immigrant Status												
Immigrant	82.7	1.5	9.2	6.6	89.9	---	7.5	---	81.7	5.3	8.3	4.7
Non-Immigrant	76.4	1.0	13.2	9.5	82.2	2.0	10.4	5.4	80.3	7.9	7.8	4.0
Visible Minority Status												
Visible Minority	83.0	0.7	10.4	5.9	88.3	---	8.5	---	79.6	6.2	11.1	3.1
Others	75.7	1.1	13.3	9.9	82.0	2.2	10.4	5.4	80.8	7.8	7.0	4.4
Age At Enrolment												
Below 18	96.5	---	---	---	84.3	---	---	---	83.3	---	---	---
18	75.6	1.2	13.5	9.7	80.3	1.7	12.5	5.6	83.1	4.2	8.9	3.8
19	80.3	0.7	11.9	7.1	85.4	1.2	9.0	4.5	82.9	6.7	7.2	3.1
20	71.8	---	---	11.9	85.3	5.0	7.0	2.7	59.5	25.8	7.8	6.8
Above 20	58.2	4.4	13.0	24.4	77.7	---	7.8	---	64.4	---	---	---
PSE Region												
Atlantic	73.1	0.8	16.2	9.8	81.8	2.1	9.9	6.2	82.0	5.5	7.3	5.2
Quebec	87.8	---	7.7	---	88.5	---	7.4	---	89.6	---	---	---
Ontario	80.5	0.4	12.0	7.0	86.7	1.6	8.6	3.1	83.7	8.1	6.4	1.8
Prairies	69.1	2.2	13.9	14.7	77.9	2.5	12.2	7.5	74.0	9.7	10.4	6.0
BC	79.5	1.8	10.5	8.3	79.1	1.9	12.6	6.4	74.8	5.0	11.0	9.2
Family Type												
Two Parents	76.8	1.0	13.3	8.8	83.6	1.9	9.9	4.5	80.5	7.5	8.2	3.8
Single Parent	79.3	---	---	11.2	82.9	2.2	8.4	6.6	82.4	7.4	5.1	5.1
Others	82.7	---	7.6	---	68.4	---	23.9	---	68.1	---	---	---
Parental Education												
Below HS	79.5	---	11.1	---	81.7	---	8.3	---	71.9	9.2	---	---
HS Completed	72.1	1.8	15.6	10.5	81.9	2.5	10.1	5.6	77.7	8.5	9.1	4.8
Coll. Completed	74.5	1.2	14.4	9.8	81.5	1.7	11.0	5.9	75.8	9.4	10.6	4.2
Univ. Completed	79.9	0.7	11.0	8.3	84.3	2.0	9.9	3.8	84.1	6.5	5.3	4.1
Average Grade in High School												
Below 60%	66.5	---	---	---	---	---	---	---	---	---	---	---
60%-69%	58.7	---	---	20.9	80.6	---	10.4	---	66.6	7.4	10.4	15.6
70%-79%	71.9	1.9	14.4	11.8	77.5	2.1	12.1	8.3	72.5	9.6	10.7	7.2
80% or Above	81.0	0.6	11.4	6.9	85.7	1.8	9.2	3.3	84.0	6.7	6.8	2.5
Average Grade in PSE												
Below 60%	58.3	---	---	25.6	68.1	---	---	8.5	74.9	7.4	11.9	5.8
60%-69%	71.8	0.6	15.2	12.4	81.3	0.7	11.4	6.6	75.6	6.4	12.0	6.0
70%-79%	81.0	0.8	11.1	7.1	84.7	2.3	8.8	4.3	80.6	7.6	7.4	4.4
80% or Above	82.5	1.9	10.5	5.1	85.9	2.5	8.3	3.3	85.2	8.3	4.6	1.8
Scholarship												
Yes	81.7	0.9	11.2	6.1	85.7	2.1	8.4	3.8	81.1	8.1	7.0	3.8
No	72.4	1.2	14.2	12.2	80.7	1.6	11.8	5.8	79.7	6.7	9.1	4.6

Table B4b continued

	Year 1				Year 2				Year 3			
	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)	Cont. (%)	Grad. (%)	Swit. (%)	Leave (%)
Grant												
Yes	78.8	1.0	11.6	8.6	85.0	0.9	10.0	4.2	80.2	5.3	8.1	6.4
No	76.6	1.0	13.0	9.3	82.9	2.2	10.0	4.9	80.6	8.2	7.9	3.4
Student Loan												
Yes	76.3	1.2	13.1	9.4	83.5	1.4	9.5	5.6	81.0	5.6	8.9	4.4
No	77.5	1.0	12.5	9.0	83.3	2.1	10.2	4.4	80.3	8.2	7.5	3.9
Instructors Have Strong Teaching Ability												
None	68.9	0.6	18.2	12.3	83.5	---	10.1	---	78.3	7.5	8.5	5.7
Some	80.5	0.7	11.4	7.3	84.9	1.5	8.5	5.1	80.2	8.2	8.9	2.8
Most	78.6	1.0	11.6	8.9	83.2	1.9	10.6	4.2	81.5	7.2	7.5	3.8
Student Has Trouble Keeping Up With the Workload												
Never	79.3	1.3	12.1	7.4	83.4	2.5	9.6	4.5	80.4	10.0	6.8	2.8
Sometime	78.7	0.7	12.3	8.3	84.6	1.1	10.1	4.1	81.5	5.5	8.2	4.8
Most of the Time	71.8	---	13.7	---	82.0	1.8	10.0	6.2	79.4	7.7	10.3	2.6
There Are People at School to Talk to												
Disagree	71.3	1.3	15.1	12.3	82.1	1.0	11.4	5.5	76.4	5.2	12.5	5.9
Agree	78.9	0.9	11.9	8.3	83.8	2.1	9.5	4.5	81.3	7.9	7.0	3.8
The First Year Helped Student Obtain Skills												
Disagree	75.2	0.6	12.7	11.5	82.2	2.1	10.6	5.1	80.1	8.0	7.7	4.1
Agree	79.0	1.2	12.4	7.4	84.4	1.8	9.3	4.5	80.7	7.1	8.0	4.1

Notes:

1. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.
2. Results for year 4 and year 5 are omitted due to small sample sizes

Table B5. Five-Year Cumulative Transition Rates by Individual Characteristics

	College (5 yrs)				University (5yrs)			
	Cont. (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)	**Cont.** (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)
# of Obs.	**7053**				**5088**			
All Respondents	0.8	51.3	23.5	24.3	7.4	46.0	28.6	18.0
Gender								
Male	1.1	48.1	23.9	26.9	9.7	43.7	27.3	19.3
Female	0.6	54.3	23.1	22.0	5.5	47.8	29.6	17.1
Immigrant Status								
Immigrant	2.7	43.7	27.3	26.2	12.3	45.3	26.4	16.0
Non-Immigrant	0.7	51.8	23.2	24.2	6.8	46.0	28.9	18.3
Visible Minority Status								
Visible Minority	1.4	44.8	27.7	26.1	12.2	47.0	29.0	11.9
Others	0.8	52.1	23.0	24.2	6.3	45.7	28.5	19.5
Age at Enrolment								
Below 18	1.2	56.0	30.7	12.1	23.7	44.4	23.0	8.9
18	0.7	48.4	28.4	22.5	9.6	40.0	32.3	18.1
19	0.5	49.7	18.3	31.5	5.5	51.1	26.9	16.5
20	1.4	47.4	16.3	34.8	6.6	48.3	26.6	18.5
Above 20	0.0	58.6	11.7	29.7	7.0	26.2	20.7	46.1
PSE Region								
Atlantic	0.8	61.1	10.1	28.0	5.9	42.7	32.0	19.4
Quebec	0.8	49.1	31.3	18.8	5.2	58.0	25.5	11.3
Ontario	0.8	51.7	16.9	30.6	6.2	54.0	26.0	13.9
Prairies	0.5	60.2	15.1	24.3	7.6	35.8	31.6	25.0
BC	1.9	43.9	27.7	26.5	12.3	36.3	30.2	21.3
Family Type								
Two Parents	0.8	53.6	22.6	23.0	6.7	46.4	29.6	17.4
Single Parent	0.9	42.4	28.3	28.4	13.8	44.6	20.1	21.5
Other	0.0	36.1	18.0	45.9	2.1	38.8	34.6	24.5
Parental Education								
Below HS	1.4	48.5	20.1	30.0	13.4	36.9	28.7	20.9
HS Completed	0.4	49.4	22.6	27.7	7.1	43.6	31.2	18.1
Coll. Completed	0.9	52.6	22.9	23.7	5.7	43.9	30.6	19.8
Univ. Completed	0.8	52.5	27.1	19.5	7.9	48.6	26.8	16.7
Average Grade in High School								
Below 60%	0.7	53.8	19.3	26.2	0.0	29.1	35.5	35.4
60%-69%	1.7	41.1	21.6	35.6	12.0	21.5	32.8	33.7
70%-79%	0.8	48.6	23.1	27.5	8.5	34.7	32.0	24.8
80% or Above	0.4	59.3	25.2	15.1	6.9	52.5	26.9	13.8
Average Grade in PSE								
Below 60%	1.5	4.3	41.4	52.7	7.6	22.0	36.4	34.0
60%-69%	1.3	24.9	35.1	38.7	8.8	31.2	35.1	24.9
70%-79%	0.4	50.4	25.2	23.9	7.0	50.4	26.7	15.9
80% or Above	1.1	71.0	14.7	13.2	7.2	59.7	22.1	11.1
Scholarship								
Yes	0.7	56.1	24.6	18.6	6.2	53.6	25.9	14.3
No	0.9	50.8	23.2	25.1	8.9	37.9	31.5	21.7
Grant					100.0	0.0	0.0	0.0
Yes	0.0	61.1	19.8	19.1	6.1	47.4	28.9	17.6
No	0.9	50.7	23.8	24.5	7.8	45.6	28.5	18.1

Table B5 continued

	College (5 yrs)				University (5yrs)			
	Cont. (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)	**Cont.** (%)	**Grad.** (%)	**Swit.** (%)	**Leave** (%)
Student Loan								
Yes	0.3	54.2	20.6	24.9	9.3	43.7	27.8	19.2
No	1.1	50.7	24.8	23.5	6.6	47.0	28.9	17.4
Instructors Have Strong Teaching Ability								
None	0.5	37.6	25.8	36.1	11.9	31.6	36.7	19.8
Some	0.2	47.5	28.9	23.4	9.1	47.4	26.3	17.2
Most	1.0	54.4	22.0	22.6	5.6	49.6	27.7	17.1
Student Has Trouble Keeping Up With the Workload								
Never	0.7	58.0	20.5	20.8	6.5	51.4	26.9	15.1
Sometime	0.9	47.3	24.6	27.2	7.0	47.0	28.6	17.4
Most of the Time	1.7	29.5	36.3	32.5	11.4	33.5	31.9	23.2
There Are People at School to Talk to								
Disagree	0.3	44.0	22.8	32.9	8.9	33.4	34.8	22.8
Agree	1.0	53.4	23.3	22.4	7.1	49.2	26.9	16.8
The First Year Helped Student Obtain Skills								
Disagree	0.5	33.3	33.9	32.2	8.4	41.9	29.4	20.4
Agree	1.0	57.7	19.6	21.8	6.9	49.1	27.7	16.3

Note:

1. Calculated from the annual (hazard) transition rates shown in Table 7a and b plus the rates for years 4 and 5 (not shown in Tables 7a and b).

Table B6a. MNL Regression on the Probability of Switching/Leaving – Single -Year Results for College

	Year 1		Year 2		Year 3	
	Swit.	Leave	Swit.	Leave	Swit.	Leave
Female	0.0202	0.00695	-0.00151	-0.0173	0.0355	0.108▪
	[0.015]	[0.017]	[0.022]	[0.026]	[0.040]	[0.049]
Immigrant	-0.0719◆	-0.0532	0.0434	-0.0204	0.172	0.0119
	[0.027]	[0.037]	[0.055]	[0.057]	[0.11]	[0.076]
Visible Minority	0.0448	-0.0501*	-0.0755◆	-0.0246	0.0236	-0.0123
	[0.040]	[0.028]	[0.025]	[0.053]	[0.071]	[0.070]
Average Grade in HS (60%-69%)						
Below 60%	0.119	-0.0482	---	---	---	---
	[0.087]	[0.075]	---	---	---	---
70%-79%	0.0103	-0.0334	0.027	-0.00849	-0.117*	0.00504
	[0.023]	[0.030]	[0.033]	[0.051]	[0.065]	[0.070]
80% or Above	0.0187	-0.0697◆	0.0356	-0.0729*	-0.103	0.0291
	[0.027]	[0.025]	[0.039]	[0.041]	[0.075]	[0.079]
Age at Enrolment (Age 19)						
Below 18	0.0158	-0.136◆	0.0212	-0.0983▪	0.0361	-0.104
	[0.029]	[0.019]	[0.036]	[0.040]	[0.077]	[0.073]
18	0.0410*	-0.0452*	0.0423	-0.0272	0.00733	-0.079
	[0.023]	[0.024]	[0.030]	[0.045]	[0.056]	[0.064]
20	-0.00316	0.07	-0.00458	-0.0801	-0.0415	0.0824
	[0.025]	[0.043]	[0.033]	[0.058]	[0.053]	[0.14]
Above 20	-0.0437*	0.0209	-0.0107	-0.0565	---	---
	[0.022]	[0.048]	[0.041]	[0.078]	---	---
PSE Region (Ontario)						
Atlantic	-0.0193	0.0458	-0.0258	0.0867	0.0788	0.0449
	[0.023]	[0.040]	[0.025]	[0.080]	[0.076]	[0.15]
Quebec	0.0329	0.000375	0.0631▪	-0.00375	0.165◆	-0.0324
	[0.027]	[0.024]	[0.031]	[0.039]	[0.054]	[0.075]
Prairies	-0.00674	-0.029	0.0359	0.0906	---	---
	[0.024]	[0.033]	[0.037]	[0.072]	---	---
BC	0.0135	0.0421	0.0618	0.0137	---	---
	[0.031]	[0.044]	[0.044]	[0.061]	---	---
Trade School	-0.0195	0.0704	-0.0171	-0.0379	-0.0406	0.00441
	[0.034]	[0.051]	[0.094]	[0.085]	[0.11]	[0.14]
Family Type (Two Parents)						
Single Parent	0.0204	0.0594▪	0.0866▪	0.00395	-0.0642	0.126*
	[0.022]	[0.024]	[0.034]	[0.033]	[0.041]	[0.070]
Other	0.0471	0.144*	---	---	---	---
	[0.066]	[0.087]	---	---	---	---
Parental Education (High School Completed)						
Below HS	-0.0249	0.0198	-0.0474*	-0.0309	-0.00202	0.0764
	[0.028]	[0.037]	[0.029]	[0.050]	[0.083]	[0.10]
Coll. Completed	-0.00882	-0.0363*	-0.00732	-0.0263	-0.0164	-0.0694
	[0.020]	[0.020]	[0.027]	[0.037]	[0.054]	[0.059]
Univ. Completed	-0.0124	-0.0565◆	0.0626*	-0.0458	-0.100*	0.00109
	[0.021]	[0.021]	[0.034]	[0.034]	[0.053]	[0.069]

Table B6a continued

	Year 1		Year 2		Year 3	
	Swit.	Leave	Swit.	Leave	Swit.	Leave
HS Engagement						
Academic Engage	-0.0143	-0.0196*	0.00305	-0.0313▪	0.00686	-0.0254
	[0.0092]	[0.010]	[0.011]	[0.014]	[0.021]	[0.025]
Social Engage	0.000319	0.00302	-0.0128	0.0226*	-0.0136	0.012
	[0.0084]	[0.0090]	[0.010]	[0.013]	[0.022]	[0.024]
Observations	6035	6035	2286	2286	701	701

Notes:

1. Average marginal effects are shown (see text and Appendix C for explanation).
2. Robust standard errors in brackets. * significant at 10%; ▪ significant at 5%; ♦ significant at 1%.
3. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.
4. Results for year 4 and year 5 are omitted due to small sample sizes.

Table B6a. MNL Regression on the Probability of Switching/Leaving – Single -Year Results for College

	Year 1		Year 2		Year 3	
	Swit.	Leave	Swit.	Leave	Swit.	Leave
Female	0.0000696	-0.0274	0.0291*	0.008	0.0453♦	0.00143
	[0.015]	[0.017]	[0.015]	[0.012]	[0.016]	[0.014]
Immigrant	-0.0321	-0.00644	-0.0119	-0.0339▪	-0.0164	0.00515
	[0.027]	[0.032]	[0.030]	[0.016]	[0.029]	[0.030]
Visible Minority	-0.00392	-0.0362*	-0.0119	-0.0223	0.0543	-0.00402
	[0.028]	[0.020]	[0.024]	[0.017]	[0.041]	[0.020]
Average Grade in HS (60%-69%)						
Below 60%	---	---	---	---	---	---
	---	---	---	---	---	---
70%-79%	-0.0603	-0.0341	0.00835	0.0322	0.0167	-0.0263
	[0.040]	[0.037]	[0.039]	[0.039]	[0.059]	[0.061]
80% or Above	-0.0817▪	-0.0616*	-0.0209	-0.0181	-0.0153	-0.0653
	[0.041]	[0.032]	[0.035]	[0.025]	[0.046]	[0.054]
Age at Enrolment (Age 19)						
Below 18	---	---	---	---	---	---
	---	---	---	---	---	---
18	0.00774	-0.0000983	0.0222	-0.0192	-0.00587	-0.032
	[0.020]	[0.017]	[0.020]	[0.017]	[0.025]	[0.025]
20	0.0258	0.0219	-0.0202	-0.0288*	0.0316	0.0494
	[0.032]	[0.027]	[0.028]	[0.015]	[0.038]	[0.037]
Above 20	-0.0102	0.104*	-0.0296	---	---	---
	[0.045]	[0.061]	[0.030]	---	---	---
PSE Region (Ontario)						
Atlantic	0.0315	0.0244	-0.00673	0.0332*	0.0121	0.0529▪
	[0.022]	[0.018]	[0.019]	[0.017]	[0.021]	[0.024]
Quebec	-0.0295	-0.0217	-0.0181	---	---	---
	[0.041]	[0.030]	[0.042]	---	---	---
Prairies	0.0114	0.0675♦	0.014	0.0462▪	0.0409	0.0457*
	[0.022]	[0.024]	[0.024]	[0.023]	[0.029]	[0.024]
BC	-0.0197	0.0197	0.0283	0.0521*	0.0409	0.101
	[0.023]	[0.025]	[0.028]	[0.029]	[0.040]	[0.072]
Family Type (Two Parents)						
Single Parent	-0.0571♦	0.0138	-0.0136	0.0172	-0.0417▪	-0.00484
	[0.017]	[0.023]	[0.023]	[0.024]	[0.018]	[0.019]
Other	-0.0546	-0.0132	0.132	---	---	---
	[0.034]	[0.041]	[0.081]	---	---	---
Parental Education (High School Completed)						
Below HS	-0.0408	-0.00763	-0.0307	0.0367	---	-0.02
	[0.035]	[0.033]	[0.030]	[0.047]	---	[0.025]
Coll. Completed	-0.0217	-0.00529	0.00238	0.00547	0.0176	-0.00835
	[0.026]	[0.022]	[0.023]	[0.019]	[0.030]	[0.019]
Univ. Completed	-0.0500▪	-0.0137	-0.00215	-0.0138	-0.0353▪	-0.00323
	[0.021]	[0.018]	[0.020]	[0.014]	[0.017]	[0.018]

Table B6a continued

	Year 1		Year 2		Year 3	
	Swit.	Leave	Swit.	Leave	Swit.	Leave
HS Engagement						
Academic Engage	-0.0106	-0.00267	-0.0192*	0.00326	-0.0281♦	0.00502
	[0.0089]	[0.0084]	[0.010]	[0.0078]	[0.011]	[0.0070]
Social Engage	-0.00691	-0.00332	0.0134	-0.0057	0.00588	0.000383
	[0.0094]	[0.0088]	[0.0096]	[0.0068]	[0.011]	[0.0080]
Observations	5002	5002	3475	3475	2470	2470

Notes:

1. Average marginal effects are shown (see text and Appendix C for explanation).
2. Robust standard errors in brackets. * significant at 10%; ▪ significant at 5%; ♦ significant at 1%.
3. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.
4. Results for year 4 and year 5 are omitted due to small sample sizes.

Table B6b. MNL Regression on the Probability of Switching/Leaving – Single -Year Results for University

	Year 1		Year 2		Year 3	
	Swit.	Leave	Swit.	Leave	Swit.	Leave
Female	0.0000696	-0.0274	0.0291*	0.008	0.0453♦	0.00143
	[0.015]	[0.017]	[0.015]	[0.012]	[0.016]	[0.014]
Immigrant	-0.0321	-0.00644	-0.0119	-0.0339▪	-0.0164	0.00515
	[0.027]	[0.032]	[0.030]	[0.016]	[0.029]	[0.030]
Visible Minority	-0.00392	-0.0362*	-0.0119	-0.0223	0.0543	-0.00402
	[0.028]	[0.020]	[0.024]	[0.017]	[0.041]	[0.020]
Average Grade in HS (60%-69%)						
Below 60%	---	---	---	---	---	---
	---	---	---	---	---	---
70%-79%	-0.0603	-0.0341	0.00835	0.0322	0.0167	-0.0263
	[0.040]	[0.037]	[0.039]	[0.039]	[0.059]	[0.061]
80% or Above	-0.0817▪	-0.0616*	-0.0209	-0.0181	-0.0153	-0.0653
	[0.041]	[0.032]	[0.035]	[0.025]	[0.046]	[0.054]
Age at Enrolment (Age 19)						
Below 18	---	---	---	---	---	---
	---	---	---	---	---	---
18	0.00774	-0.0000983	0.0222	-0.0192	-0.00587	-0.032
	[0.020]	[0.017]	[0.020]	[0.017]	[0.025]	[0.025]
20	0.0258	0.0219	-0.0202	-0.0288*	0.0316	0.0494
	[0.032]	[0.027]	[0.028]	[0.015]	[0.038]	[0.037]
Above 20	-0.0102	0.104*	-0.0296	---	---	---
	[0.045]	[0.061]	[0.030]	---	---	---
PSE Region (Ontario)						
Atlantic	0.0315	0.0244	-0.00673	0.0332*	0.0121	0.0529▪
	[0.022]	[0.018]	[0.019]	[0.017]	[0.021]	[0.024]
Quebec	-0.0295	-0.0217	-0.0181	---	---	---
	[0.041]	[0.030]	[0.042]	---	---	---
Prairies	0.0114	0.0675♦	0.014	0.0462▪	0.0409	0.0457*
	[0.022]	[0.024]	[0.024]	[0.023]	[0.029]	[0.024]
BC	-0.0197	0.0197	0.0283	0.0521*	0.0409	0.101
	[0.023]	[0.025]	[0.028]	[0.029]	[0.040]	[0.072]
Family Type (Two Parents)						
Single Parent	-0.0571♦	0.0138	-0.0136	0.0172	-0.0417▪	-0.00484
	[0.017]	[0.023]	[0.023]	[0.024]	[0.018]	[0.019]
Other	-0.0546	-0.0132	0.132	---	---	---
	[0.034]	[0.041]	[0.081]	---	---	---
Parental Education (High School Completed)						
Below HS	-0.0408	-0.00763	-0.0307	0.0367	---	-0.02
	[0.035]	[0.033]	[0.030]	[0.047]	---	[0.025]
Coll. Completed	-0.0217	-0.00529	0.00238	0.00547	0.0176	-0.00835
	[0.026]	[0.022]	[0.023]	[0.019]	[0.030]	[0.019]
Univ. Completed	-0.0500▪	-0.0137	-0.00215	-0.0138	-0.0353▪	-0.00323
	[0.021]	[0.018]	[0.020]	[0.014]	[0.017]	[0.018]

Table B6b continued

	Year 1		Year 2		Year 3	
	Swit.	Leave	Swit.	Leave	Swit.	Leave
HS Engagement						
Academic Engage	-0.0106	-0.00267	-0.0192*	0.00326	-0.0281♦	0.00502
	[0.0089]	[0.0084]	[0.010]	[0.0078]	[0.011]	[0.0070]
Social Engage	-0.00691	-0.00332	0.0134	-0.0057	0.00588	0.000383
	[0.0094]	[0.0088]	[0.0096]	[0.0068]	[0.011]	[0.0080]
Observations	5002	5002	3475	3475	2470	2470

Notes:

1. Average marginal effects are shown (see text and Appendix C for explanation).
2. Robust standard errors in brackets. * significant at 10%; ▪ significant at 5%; ♦ significant at 1%.
3. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.
4. Results for year 4 and year 5 are omitted due to small sample sizes.

Table B7a - MNL Regression on the Probability of Switching/Leaving - All-Year Results for College

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave
Unemployment Rate	-0.00900*	-0.0120*	-0.00860*	-0.0125*	-0.00862*	-0.0119▪	-0.00853*	-0.0135▪	-0.0114▪	-0.0131▪
	[0.0052]	[0.0065]	[0.0052]	[0.0065]	[0.0052]	[0.0060]	[0.0050]	[0.0058]	[0.0050]	[0.0056]
Female	0.00722	-0.00456	0.00768	-0.00306	0.0133	0.0108	0.0236▪	0.0212	0.0221*	0.0182
	[0.012]	[0.014]	[0.012]	[0.014]	[0.012]	[0.014]	[0.012]	[0.013]	[0.012]	[0.013]
Immigrant	-0.0213	-0.0464	-0.0201	-0.0518*	-0.0209	-0.0418	-0.0357	-0.0652◆	-0.0337	-0.0668◆
	[0.025]	[0.028]	[0.025]	[0.027]	[0.025]	[0.028]	[0.024]	[0.024]	[0.024]	[0.023]
Visible Minority	0.0146	-0.0341	0.0148	-0.0379	0.0107	-0.0394*	0.0116	-0.0312	0.000308	-0.0395*
	[0.026]	[0.024]	[0.026]	[0.024]	[0.026]	[0.024]	[0.027]	[0.023]	[0.026]	[0.021]
Age at Enrolment (Age 19)										
Below 18	0.0286	-0.115◆	0.0282	-0.116◆	0.0284	-0.105◆	0.0192	-0.112◆	0.0121	-0.111◆
	[0.023]	[0.020]	[0.023]	[0.020]	[0.023]	[0.020]	[0.022]	[0.018]	[0.021]	[0.018]
18	0.0417▪	-0.0527▪	0.0412▪	-0.0520▪	0.0422▪	-0.0447▪	0.0331*	-0.0558◆	0.0331▪	-0.0509◆
	[0.018]	[0.022]	[0.018]	[0.022]	[0.018]	[0.021]	[0.017]	[0.020]	[0.017]	[0.019]
20	-0.00558	0.0489	-0.00519	0.0421	-0.00604	0.0301	-0.00845	0.0253	-0.00701	0.0326
	[0.019]	[0.036]	[0.019]	[0.036]	[0.019]	[0.034]	[0.019]	[0.032]	[0.019]	[0.031]
Above 20	-0.0348*	0.0222	-0.0334*	0.0213	-0.0431▪	0.011	-0.0384▪	0.0323	-0.0544▪	0.0551
	[0.019]	[0.045]	[0.020]	[0.046]	[0.018]	[0.044]	[0.019]	[0.044]	[0.024]	[0.060]
Transition Year (Year 1)										
Year 2	-0.0308▪	0.000384	-0.0307▪	0.00178	-0.0310▪	0.00188	-0.0256▪	0.0153	-0.0244*	0.0209
	[0.013]	[0.016]	[0.013]	[0.016]	[0.013]	[0.016]	[0.013]	[0.015]	[0.013]	[0.015]
Year 3	0.017	0.0514*	0.0165	0.0588▪	0.00853	0.0571▪	0.00935	0.0678▪	0.0114	0.0724◆
	[0.024]	[0.029]	[0.024]	[0.029]	[0.023]	[0.028]	[0.022]	[0.027]	[0.022]	[0.026]
Year 4	-0.0594▪	0.0488	-0.0597▪	0.0523	-0.0585▪	0.0482	-0.0566▪	0.0578	-0.0510▪	0.0691
	[0.024]	[0.049]	[0.024]	[0.048]	[0.025]	[0.047]	[0.025]	[0.046]	[0.025]	[0.045]
Year 5	0.118	-0.0633	0.115	-0.0652	0.121	-0.0717	0.126	-0.0655	0.147	-0.0489
	[0.12]	[0.053]	[0.12]	[0.052]	[0.12]	[0.047]	[0.12]	[0.047]	[0.12]	[0.049]
PSE Region (Ontario)										
Atlantic	0.0107	0.204◆	0.012	0.198◆	0.0159	0.184◆	0.0196	0.207◆	0.0324	0.209◆
	[0.028]	[0.057]	[0.028]	[0.056]	[0.028]	[0.055]	[0.029]	[0.052]	[0.030]	[0.050]
Quebec	0.0904◆	0.0639▪	0.0892◆	0.0545*	0.0914◆	0.0598▪	0.0924◆	0.0668▪	0.0990◆	0.0648▪
	[0.026]	[0.031]	[0.026]	[0.030]	[0.026]	[0.029]	[0.025]	[0.027]	[0.025]	[0.026]
Prairies	0.00258	-0.0374	0.00135	-0.0301	-4.74E-04	-0.0398	0.00436	-0.0321	-0.00724	-0.0391
	[0.021]	[0.032]	[0.020]	[0.032]	[0.020]	[0.031]	[0.020]	[0.029]	[0.019]	[0.027]
BC	0.0641▪	0.0293	0.0598▪	0.0414	0.0509▪	0.0432	0.0502▪	0.0501	0.0422*	0.0284
	[0.027]	[0.036]	[0.026]	[0.037]	[0.025]	[0.036]	[0.025]	[0.034]	[0.025]	[0.033]
Trade School	-0.0168	0.0889	-0.0159	0.0805	-0.0143	0.0622	-0.00437	0.0855*	0.00875	0.0831▪
	[0.031]	[0.054]	[0.031]	[0.053]	[0.030]	[0.045]	[0.033]	[0.045]	[0.034]	[0.041]

Table B7a continued

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave
Family Type (Two Parents)										
Single Parent	0.0346▪	0.0490▪	0.0368▪	0.0473▪	0.0355▪	0.0456▪	0.0276*	0.0307*	0.0211	0.0252
	[0.017]	[0.020]	[0.018]	[0.019]	[0.017]	[0.019]	[0.016]	[0.017]	[0.015]	[0.016]
Other	0.0461	0.201▪	0.0446	0.211◆	0.051	0.200◆	0.0463	0.161▪	0.04	0.158▪
	[0.057]	[0.082]	[0.057]	[0.080]	[0.058]	[0.075]	[0.056]	[0.068]	[0.057]	[0.071]
Parental Education (High School Completed)										
Below HS	-0.0313	0.0132	-0.0299	0.0113	-0.0276	0.00679	-0.0334*	-0.0107	-0.0332*	-0.0101
	[0.021]	[0.030]	[0.021]	[0.030]	[0.021]	[0.029]	[0.020]	[0.027]	[0.020]	[0.025]
Coll. Completed	-0.0134	-0.0291	-0.0137	-0.0310*	-0.00999	-0.0369▪	-0.00888	-0.0332▪	-0.00883	-0.0343▪
	[0.015]	[0.018]	[0.015]	[0.018]	[0.015]	[0.017]	[0.015]	[0.017]	[0.015]	[0.016]
Univ. Completed	0.00163	-0.0430▪	-7.36E-04	-0.0431▪	0.00117	-0.0492◆	0.00278	-0.0490◆	-0.0022	-0.0517◆
	[0.017]	[0.018]	[0.017]	[0.018]	[0.017]	[0.017]	[0.016]	[0.016]	[0.016]	[0.016]
Scholarship			0.00515	-0.0318*	0.0055	-0.0176	0.0112	-0.0145	0.0114	-0.0108
			[0.016]	[0.017]	[0.017]	[0.018]	[0.017]	[0.017]	[0.016]	[0.017]
Grant			-0.00111	-0.0765◆	0.00123	-0.0710◆	0.0108	-0.0635◆	0.0116	-0.0626◆
			[0.021]	[0.018]	[0.021]	[0.018]	[0.021]	[0.018]	[0.021]	[0.017]
Student Loan			-0.0158	0.0166	-0.0162	0.0185	-0.0139	0.0225	-0.0119	0.0226
			[0.013]	[0.016]	[0.013]	[0.015]	[0.013]	[0.015]	[0.013]	[0.014]
Average Grade in HS (60%-69%)										
Below 60%					0.0862	-0.00585	0.0836	-2.37E-04	0.074	0.00781
					[0.073]	[0.076]	[0.078]	[0.068]	[0.075]	[0.066]
70%-79%					-0.00274	-0.0152	0.0142	0.0163	0.00885	0.0114
					[0.018]	[0.024]	[0.018]	[0.022]	[0.017]	[0.022]
80% or Above					0.00827	-0.0487▪	0.0446▪	-0.0059	0.0362*	-0.0116
					[0.021]	[0.021]	[0.021]	[0.020]	[0.021]	[0.020]
High School Engagement										
Academic Engage					-0.00585	-0.0236◆	-0.00184	-0.0227◆	0.00145	-0.0220◆
					[0.0068]	[0.0082]	[0.0062]	[0.0077]	[0.0060]	[0.0076]
Social Engage					-0.00671	0.00986	-0.00725	0.00815	-0.005	0.00902
					[0.0062]	[0.0073]	[0.0060]	[0.0069]	[0.0058]	[0.0066]
Average Grade in PSE (60%-69%)										
Below 60%							0.0848▪	0.128◆	0.0626	0.114◆
							[0.041]	[0.042]	[0.040]	[0.041]
70%-79%							-0.0621◆	-0.0753◆	-0.0578◆	-0.0673◆
							[0.018]	[0.019]	[0.018]	[0.018]
80% or Above							-0.106◆	-0.127◆	-0.0950◆	-0.109◆
							[0.017]	[0.018]	[0.018]	[0.019]

Table B7a continued

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave
Instructors Have Strong Teaching Abilities (Some)										
None									-0.011	0.0680▪
									[0.024]	[0.028]
Most									-0.0217	0.024
									[0.016]	[0.015]
Student Has Trouble Keeping Up with the Workload (Sometime)										
Never									0.00606	-0.0179
									[0.013]	[0.014]
Often									0.0109	-0.0298
									[0.019]	[0.019]
There Are People at School to Talk to									-0.00435	-0.0343*
									[0.016]	[0.018]
The First Year Helped Student Obtain Skills									-0.0610◆	-0.0877◆
									[0.015]	[0.017]
# of Observations	9272	9272	9272	9272	9249	9249	9249	9249	9249	9249

Notes:

1. Average marginal effects are shown (see text and Appendix C for explanation).
2. Robust standard errors in brackets. * significant at 10%; ▪ significant at 5%; ◆ significant at 1%.
3. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.

Table B7b. MNL Regression on the Probability of Switching/Leaving - All-Year Results for University

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave
Unemployment Rate	0.00026	-0.00123	-0.000211	-0.00172	0.000068	-0.0012	-0.000173	-0.00148	-0.000369	-0.00202
	[0.0029]	[0.0028]	[0.0028]	[0.0028]	[0.0029]	[0.0028]	[0.0029]	[0.0028]	[0.0028]	[0.0028]
Female	0.00984	-0.00965	0.012	-0.00787	0.0163*	-0.00168	0.0161*	-0.00166	0.0178*	-0.00218
	[0.0091]	[0.0095]	[0.0091]	[0.0096]	[0.0091]	[0.0095]	[0.0092]	[0.0095]	[0.0093]	[0.0095]
Immigrant	-0.0156	0.0093	-0.0143	0.00869	-0.0126	0.00706	-0.00936	0.0125	-0.01	0.0102
	[0.018]	[0.025]	[0.018]	[0.025]	[0.018]	[0.024]	[0.019]	[0.025]	[0.018]	[0.024]
Visible Minority	0.00187	-0.0359◆	0.0011	-0.0363◆	0.00492	-0.0349◆	0.00106	-0.0376◆	0.000494	-0.0389◆
	[0.017]	[0.012]	[0.017]	[0.012]	[0.018]	[0.012]	[0.017]	[0.011]	[0.017]	[0.011]
Age at Enrolment (Age 19)										
Below 18	-0.0408▪	-0.0503◆	-0.0372*	-0.0479◆	-0.0316	-0.0451◆	-0.0296	-0.0444◆	-0.0325	-0.0465◆
	[0.020]	[0.0097]	[0.021]	[0.010]	[0.023]	[0.012]	[0.023]	[0.012]	[0.022]	[0.011]
18	0.00241	-0.0297▪	0.00564	-0.0262▪	0.00867	-0.0241▪	0.00717	-0.0266▪	0.00601	-0.0278▪
	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]	[0.011]	[0.012]	[0.011]
20	0.0182	0.0103	0.0139	0.00541	0.0102	-0.00235	0.0111	-0.000158	0.0103	-0.000707
	[0.020]	[0.016]	[0.019]	[0.015]	[0.019]	[0.014]	[0.018]	[0.015]	[0.018]	[0.015]
Above 20	0.00249	0.0806▪	-0.00466	0.0657*	-0.0181	0.0549	-0.013	0.0701*	-0.00405	0.125▪
	[0.028]	[0.038]	[0.026]	[0.036]	[0.025]	[0.036]	[0.027]	[0.038]	[0.032]	[0.056]
Transition Year (Year 1)										
Year 2	-0.0256▪	-0.0427◆	-0.0247▪	-0.0419◆	-0.0232▪	-0.0401◆	-0.0209*	-0.0386◆	-0.0195*	-0.0377◆
	[0.011]	[0.0090]	[0.011]	[0.0090]	[0.011]	[0.0090]	[0.011]	[0.0090]	[0.011]	[0.0089]
Year 3	-0.0420◆	-0.0451◆	-0.0404◆	-0.0436◆	-0.0385◆	-0.0414◆	-0.0354◆	-0.0393◆	-0.0337◆	-0.0383◆
	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]	[0.012]	[0.013]	[0.012]	[0.013]	[0.012]
Year 4	-0.0524◆	-0.0211	-0.0521◆	-0.0206	-0.0502◆	-0.0176	-0.0483◆	-0.0157	-0.0469◆	-0.0147
	[0.015]	[0.021]	[0.015]	[0.022]	[0.015]	[0.022]	[0.016]	[0.022]	[0.016]	[0.022]
Year 5	-0.0115	0.00105	-0.0132	-0.00135	-0.0137	-0.000289	-0.0121	0.000262	-0.0129	-0.000736
	[0.039]	[0.038]	[0.039]	[0.037]	[0.039]	[0.037]	[0.039]	[0.037]	[0.038]	[0.036]
PSE Region (Ontario)										
Atlantic	0.0232	0.0401◆	0.0214	0.0380◆	0.0192	0.0335▪	0.0192	0.0337▪	0.0218	0.0364▪
	[0.016]	[0.015]	[0.016]	[0.015]	[0.016]	[0.014]	[0.016]	[0.014]	[0.016]	[0.014]
Quebec	-0.00672	-0.00723	-0.00871	-0.0091	-0.00948	-0.00574	-0.0078	-0.000966	-0.00375	0.00054
	[0.030]	[0.021]	[0.029]	[0.019]	[0.031]	[0.021]	[0.031]	[0.024]	[0.031]	[0.024]
Prairies	0.0313▪	0.0645◆	0.0310▪	0.0619◆	0.0232	0.0534◆	0.0225	0.0526◆	0.0201	0.0502◆
	[0.015]	[0.017]	[0.015]	[0.017]	[0.015]	[0.016]	[0.015]	[0.016]	[0.014]	[0.016]
BC	0.016	0.0525▪	0.0188	0.0563▪	0.011	0.0483▪	0.0126	0.0505▪	0.0128	0.0527▪
	[0.017]	[0.022]	[0.016]	[0.022]	[0.016]	[0.020]	[0.016]	[0.021]	[0.016]	[0.021]

Table B7b continued

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave
Family Type										
(Two Parents)										
Single Parent	-0.0444◆	0.00383	-0.0447◆	0.00142	-0.0449◆	0.000319	-0.0436◆	0.00269	-0.0454◆	0.00179
	[0.011]	[0.013]	[0.011]	[0.013]	[0.011]	[0.013]	[0.011]	[0.013]	[0.011]	[0.013]
Other	0.0294	0.0257	0.0291	0.0257	0.0284	0.0243	0.0248	0.016	0.0245	0.0181
	[0.039]	[0.031]	[0.038]	[0.033]	[0.036]	[0.032]	[0.035]	[0.029]	[0.034]	[0.030]
Parental Education										
(High School Completed)										
Below HS	-0.013	0.0123	-0.0119	0.0117	-0.0164	0.00681	-0.0139	0.00459	-0.0108	0.00442
	[0.032]	[0.027]	[0.033]	[0.027]	[0.032]	[0.025]	[0.033]	[0.025]	[0.033]	[0.025]
Coll. Completed	-0.00661	0.00775	-0.00758	0.00751	-0.00809	0.00707	-0.00864	0.00704	-0.0067	0.00814
	[0.015]	[0.013]	[0.014]	[0.012]	[0.014]	[0.012]	[0.014]	[0.012]	[0.014]	[0.012]
Univ. Completed	-0.0268▪	-0.00666	-0.0261▪	-0.00485	-0.0261▪	-0.00419	-0.0231*	-0.0017	-0.0208*	-0.00154
	[0.012]	[0.0099]	[0.012]	[0.0098]	[0.012]	[0.0097]	[0.012]	[0.0096]	[0.012]	[0.0097]
Scholarship			-0.0326◆	-0.0279◆	-0.0235▪	-0.0152	-0.016	-0.00748	-0.0149	-0.00682
			[0.0095]	[0.0091]	[0.010]	[0.0099]	[0.010]	[0.0098]	[0.010]	[0.0100]
Grant			0.00408	-0.00539	0.00523	-0.0055	0.00781	-0.00271	0.00801	-0.00143
			[0.011]	[0.012]	[0.012]	[0.011]	[0.012]	[0.012]	[0.011]	[0.012]
Student Loan			-0.00345	0.00537	-0.00455	0.0042	-0.00707	0.000423	-0.00587	0.00193
			[0.011]	[0.010]	[0.011]	[0.010]	[0.011]	[0.0100]	[0.011]	[0.0099]
Average Grade in HS										
(60%-69%)										
Below 60%					---	---	---	---	---	---
					---	---	---	---	---	---
70%-79%					-0.0208	-0.00479	-0.0161	-0.00285	-0.0193	-0.00472
					[0.027]	[0.023]	[0.027]	[0.023]	[0.027]	[0.023]
80% or Above					-0.0356	-0.0324*	-0.0209	-0.02	-0.0251	-0.0234
					[0.025]	[0.018]	[0.024]	[0.016]	[0.024]	[0.017]
High School Engagement										
Academic Engage					-0.0148▪	3.74E-05	-0.0134▪	0.00103	-0.0129▪	0.000717
					[0.0058]	[0.0050]	[0.0058]	[0.0049]	[0.0059]	[0.0050]
Social Engage					0.00237	-0.00505	0.00131	-0.0051	0.00284	-0.00446
					[0.0058]	[0.0051]	[0.0058]	[0.0051]	[0.0057]	[0.0050]
Average Grade in PSE (60%-69%)										
Below 60%							0.018	0.0501*	0.0172	0.0445*
							[0.025]	[0.026]	[0.024]	[0.026]
70%-79%							-0.0292▪	-0.0286◆	-0.0294▪	-0.0265▪
							[0.012]	[0.011]	[0.012]	[0.011]
80% or Above							-0.0417◆	-0.0414◆	-0.0432◆	-0.0397◆
							[0.013]	[0.012]	[0.013]	[0.011]

Table B7b continued

	MNL (1)		MNL (2)		MNL (3)		MNL (4)		MNL (5)	
	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave	Switcher	Leave
Instructors Have Strong Teaching Abilities (Some)										
None									0.0400▪	0.00375
									[0.017]	[0.015]
Most									0.0126	0.00327
									[0.0099]	[0.010]
Student Has Trouble Keeping Up with the Workload (Sometime)										
Never									0.00491	-0.00139
									[0.010]	[0.0094]
Often									-0.00179	0.0084
									[0.013]	[0.013]
There Are People at School to Talk to									-0.0330▪	-0.0188
									[0.013]	[0.013]
The First Year Helped Student Obtain Skills									0.00421	-0.00801
									[0.0092]	[0.0096]
# of Observations	12250	12250	12250	12250	12215	12215	12215	12215	12215	12215

Notes:

1. Average marginal effects are shown (see text and Appendix C for explanation).
2. Robust standard errors in brackets. * significant at 10%; ▪ significant at 5%; ♦ significant at 1%.
3. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.

Table B7b. Simple Logit Regression on the Probability of Returning of Leavers – All - Year Results

	College	University
Unemployment Rate	0.000224	-0.00337
	[0.0071]	[0.0091]
Female	0.0436▪	0.0497
	[0.017]	[0.032]
Immigrant	0.0178	-0.0443
	[0.058]	[0.082]
Visible Minority	0.0171	0.150*
	[0.047]	[0.082]
Age at Enrolment (Age 19)		
Below 18	0.132◆	0.0795
	[0.041]	[0.12]
18	0.0504▪	0.0631*
	[0.021]	[0.034]
20	0.00637	0.00956
	[0.026]	[0.050]
Above 20	-0.0755◆	-0.00887
	[0.022]	[0.069]
Transition Year (Year 1)		
Year 2	-0.0781◆	-0.138◆
	[0.022]	[0.036]
Year 3	-0.0983◆	-0.254◆
	[0.024]	[0.035]
Year 4	-0.145◆	-0.207◆
	[0.019]	[0.066]
Year 5	-0.147◆	-0.287◆
	[0.023]	[0.031]
Region of First PSE Program (Ontario)		
Atlantic	-0.0295	-0.00745
	[0.044]	[0.063]
Quebec	-0.0737▪	---
	[0.034]	---
Prairies	-0.0624▪	-0.0588
	[0.027]	[0.045]
BC	0.0473	-0.156◆
	[0.039]	[0.043]

	College	University
Level of First PSE Program (College)		
Trade School	0.051	
	[0.050]	
University		
Above University		
Family Type (Two Parents)		
Single Parent	-0.015	0.0959*
	[0.021]	[0.050]
Other	---	0.153
	---	[0.11]
Parental Education (High School Completed)		
Below HS	-0.0315	0.00719
	[0.022]	[0.054]
Coll. Completed	0.0147	0.130◆
	[0.019]	[0.041]
Univ. Completed	0.0797◆	0.0568
	[0.027]	[0.037]
# of Observations	3855	1680

Notes:

1. Average marginal effects are shown (see text and Appendix C for explanation).
2. Robust standard errors in brackets. * significant at 10%; ▪ significant at 5%; ◆ significant at 1%.
3. --- indicates results are suppressed to meet the confidentiality requirements of the Statistics Act.

Appendix C: Average Marginal Effects in the Multinomial Logit Specification

The "average marginal effect" represents an established means of presenting the results of a multinomial logit model. By this approach, each individual (observation) is put at the actual values of their explanatory variables (i.e., their true characteristics), and the marginal effects are estimated by observing the (average) change in the probability of the event in question for a one unit change in any given explanatory variable as applied to all individuals. Repeating this exercise for each explanatory variable allows the full set of average marginal effects to be calculated, one at a time.

The calculations thus have an appealing empirical basis with respect to the estimated effects, since they are based on individuals' actual characteristics across the sample. They also tend to generate results that are similar to those found using a representative individual assumed to have the sample mean characteristics. In the present case, this method is implemented using the dummy variable option, which takes special account of such variables – which are the ones which tend to cause the greatest problems in this respect. These and related issues are discussed in Bartus (2005) and Werlinda (2007).[23, 24]

Such calculations are especially important in the case of multinomial logit models, because not only are coefficient estimates not inherently meaningful on their own (as is also the case with the simpler binomial case), and any estimated marginal probability subject to the sensitivities just discussed, but the joint estimation properties of the model mean that coefficient estimates and marginal effects may even take on opposing signs. That is, a variable might have a positive coefficient for a given outcome, but nevertheless be associated with a *decrease* in the probability of that event occurring.

This apparent paradox is seen to make sense when it is realised that coefficient estimates in a multinomial logit represent the effect of the variable on the outcome in question relative to the baseline category, but the overall effect on the probability of the outcome also depends on how the probabilities of the other outcomes change at the same time. For example, a given variable might increase the probability of outcome B relative to outcome A (assumed to be the baseline outcome in the model), but if that effect is relatively small and the variable has an even greater positive effect on, say, outcome C, then outcome B might become relatively more probable in comparison to outcome A (which becomes considerably less probable overall) but less probable overall, as the probability of outcome C grows even more. The coefficient estimate on variable B reflects the first effect (i.e., the change in the probability relative to the baseline category), but the estimated marginal effect reflects the latter (i.e., the overall change in the probability of the outcome).[25]

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23 The authors are grateful to Marc Frenette, Rene Morissette, Yuri Ostrovski, and Yan Chang for useful discussions on these issues.

24 Calculating these effects can take a large amount of computer time because it requires extensive sets of probability calculations at the individual level and then aggregating across these. But the calculations can nevertheless be carried out automatically, and tweaked as desired, as part of the estimation procedure using certain statistical packages, such as STATA, which is employed here.

25 Again see Bartus (2005) and Werlinda (2007).

More specifically, the average marginal effect (*AME*) is defined as the average partial change in probability associated with a given explanatory variable, and is calculated over all observations. Consider a multiple equation regression model:

$$E(y) = F(\beta^{1}x,\ldots,\beta^{H}x)$$

where β_i^h denotes the parameter (coefficient) estimate of x_i in equation *h* (*h*=1,…, *H*) where *H* is the number of possible outcomes.

For a *continuous* variable, the average marginal effect (*AME*) of the *i*th variable is given by

$$AME_i = \frac{1}{n}\sum_{k=1}^{n}\sum_{h=1}^{H}\frac{\partial F_m(\beta^{1}x,\ldots,\beta^{H}x)}{\partial\beta_h^1}\beta_h^1$$

For a *dummy* variable, the average marginal effect (*AME*) of the *i*th variable is given by

$$AME_i = \frac{1}{n}\sum_{k=1}^{n}[F(\beta^{1}x,\ldots,\beta^{H}x \mid x_i^k = 1) - F(\beta^{1},\ldots,\beta^{H}x \mid x_i^k = 0)].$$