Student Transitions and Adjustments in Canadian Post-Secondary Education

Felice Martinello

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

A longitudinal sample of Canadian post-secondary students, 1997 to 2003, is used to examine the transitions and adjustments made during post-secondary education (PSE). Separate analyses are conducted for students whose first program was bachelors level at a university and students in two (or more) year programs at a college or CEGEP. The proportions who do not complete their first PSE program; switch to other programs at the same, higher, or lower levels; or leave PSE are documented along with the outcomes of the second programs. Similarly, the proportions of graduates who enroll in second PSE programs at the same, higher, or lower levels are documented along with their outcomes. Regression analysis estimates correlates of students' decisions to: a) leave their first program without graduating, b) attempt a second program at the same level, and c) attempt a second program at a lower level. Correlates include students' family characteristics, living arrangements, high school grades, and loans for financing PSE.

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Introduction

Students learn a lot more than course material when they attend post-secondary education (PSE). They also learn about their own abilities and preferences at that level of schooling, along with course requirements, the likelihood of completing programs, and the employment and career opportunities enabled by various programs. Once in PSE, students use this new information to adjust their education plans and decisions. They may change their major, institution or level of study, or choose to leave PSE entirely. Alternatively they may decide, based on the new information, that their current program is still their best choice and continue on to graduation. But even after graduation, students use the information gathered along the way to decide whether to pursue another PSE program, the type of program to pursue, or whether to halt PSE and enter market or home production.

This study examines some of the adjustments that students make during their PSE. Specifically, a longitudinal sample of students is constructed from the Youth in Transition Survey, Cohort B (YITS-B) to document the proportions who do not complete their first PSE program and switch to another program at the same, higher, or lower level; or leave PSE (i.e., do not enroll in a second program). The outcomes of second programs are shown for those who choose to pursue them.

Similar analysis is done for students who graduate from their first program by documenting the proportions who enroll in second PSE programs at the same, higher, or lower levels and the outcomes of those second programs. Some limited evidence is also presented for the proportions of students who change their major field of study within their first program – another type of adjustment and transition.

Separate analyses are done for two groups of students; namely, students whose first program was:[1]

- at a bachelors level in a university;
- in a college or CEGEP with an expected length of two or more years or more years of full time study.

Lastly, regression analysis is used to estimate correlates of students' decisions to: a) leave or transfer out of their first program without graduating, b) attempt a second program (given that they did not complete their first), and c) attempt their second program at the same level as their first, or switch to a lower level (given they choose to pursue a second program). Potential correlates include students' personal, family, and high school characteristics; high school achievement; loans for financing PSE; and choice of major in the first program.

Conceptual Model

Comay, Melnik and Pollatchek (1973) provide the model which underlies the analysis. They model the accumulation of human capital (i.e., the education process) as a dynamic, multistage process operating under uncertainty. Consider high school graduates who have been accepted into at least one

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post-secondary education (PSE) program at a PSE institution. Students decide to enroll in a specific program at a specific institution if they expect the benefits (monetary, non-monetary and consumption) to outweigh the costs (again, monetary, non-monetary, and consumption). Expected (rather than actual) costs and benefits are compared because there is uncertainty about:

- the actual requirements and content of the courses in that and other alternative programs;
- students' abilities; i.e., their eligibility to progress through and ultimately complete their program or other possible alternative programs;
- the academic abilities of other students at that institution or other alternative institutions;
- how much the student will like their program as compared to other alternative programs;
- the nature of the personal and social experiences at that institution as compared to other institutions;
- how much the student will like that institution as compared to other alternative institutions;
- the labour market outcomes enabled by that program and by other alternative programs. These include earnings as well as other characteristics of the career and occupation such as job safety, flexibility, prestige, etc.;
- the alternative labour market outcomes that result from not doing PSE. Again, these include earnings and the characteristics of the career and occupation;
- the costs of the education and students' ability to finance those costs;

- what new alternatives (e.g., previously unknown programs) will emerge after starting or completing their first PSE program.

Students gain more information about all of these uncertainties after starting their post-secondary education and progressing through its various stages. They also suffer random shocks that affect the costs and benefits. At each stage, and even after graduating or dropping out, students reweigh the expected costs and benefits given the information available at that time to decide whether to acquire more education (within the same program, or in some alternative program) or to stop education and do labour market or home production.

Thus some students find, in the midst of their first post-secondary program, that their original decision turned out to be a poor one. Continuing their current program may no longer be the best alternative in their choice set (or may no longer be in their choice set if they have become academically ineligible). For some, the best feasible alternative will be another PSE program and so they transfer to another program, institution, or level of study, and persist in their post-secondary education. The best feasible alternative for others will be to cease post-secondary education and enter the labour market or home production. Any factor increasing the likelihood that another PSE program is the best alternative (e.g., by reducing the costs of transferring to alternative programs) increases the likelihood that students persist in their post-secondary education.

For students who complete their first post-secondary education program, the same reasoning applies. After graduation, students weigh the expected costs and benefits and choose their best available alternative, be it a second post-secondary program at a higher, similar, or lower level, or no further PSE and instead the labour market or home production.

The analysis below adopts this model of students making a sequence of decisions over time. To keep the analysis simple, however, the temporal aspects of the analysis are limited to keeping students' first PSE before their second PSE program. The actual dynamics - how long they persist in their first program, whether they transfer to a second program or institution without a stop-out, or whether they leave PSE for a while and then re-start a second program later - are not considered. All of the timing decisions are simply collapsed into a discrete first PSE program and a discrete second PSE program (which comes after), if there is one.

Survey of the Literature

There is a large, mainly US literature examining the progress of students through their PSE. One group of papers[2] adopts the approach of Comay et al. (1973) and explicitly models the sequence of decisions that students make over time. The models in these papers allow students to update and change their decisions as they accumulate more information over the course of their PSE. The various papers cover students' decisions about whether to attend PSE, how long

to attend, the quality of the school chosen, students' major field of study, and whether to interrupt PSE and then re-enroll.

Another section of the literature consists of purely empirical studies of student decisions and switches in PSE. In this work, one must distinguish between studies that only follow the students within one institution and studies that follow students' decisions across institutions. The former count any transfer to another institution as a dropout. Thus they grossly overstate the student attrition rate and understate the amount of adjustment (switching) that students do in their PSE. In view of this, mainly the latter type of study is included here.

Another complication arises from the fact that some US studies include the progression or transfer from two-year to four-year colleges. This sort of progression does occur in Canada (more so in the western provinces) but it is not nearly as common as in the US. Thus the US data often shows more transfers across institutions than comparable Canadian data.

All of these studies use data on individual students over time to examine their persistence, degree completion, changes of major, and transfers across institutions. Prominent US studies in this group include Adelman (2006), Grubb (1989), and Cabrera, Burkum and La Nasa (2005). Choy (2002) surveys the finding of three longitudinal surveys of US high school and PSE students, and Simpson (1987) provides an institutional study that

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2 For example: Altonji (1993); Arcidiacono (2004); DesJardins, Ahlburg and McCall (2002); Cameron and Heckman (1998); and Light (1996). A Canadian contribution is Montmarquette, Mahseredjian, and Houle (2001).

tracks changes of major at a large US university at a very detailed level.

The Canadian contributions to this area of the literature are surveyed below. Most focus on program completion and there is little study of changes in major, level of study, or transfers across institutions. Exceptions are noted below.

Gilbert (1991) uses data provided by several Canadian universities on students who enrolled full time in the fall of 1985. He reports that the five year non-completion rate of 42 percent was increasing, mainly due to increases in the time required for degree completion. Gilbert uses more limited data to estimate that 10 percent of the initial cohort transferred to another institution.

Gilbert and Auger (1988) follows students who entered their first year at the University of Guelph in 1986 over their next two years. After two semesters, 76 percent of the initial cohort persisted, and the leavers were split evenly between voluntary leavers (12 percent) and those required to withdraw (12 percent). A telephone survey of the leavers estimates that 67 percent of them were transfers to other institutions, 38 percent were stop-outs, and only 13 percent left PSE completely.

Shaienks, Eisl-Culkin, and Bussiere (2006) examine young Canadians' education and transition to work from the mid 1990s to 2003 using three cycles of the YITS-B survey. This is a follow-up to Zeman, Knighton and Bussiere (2004) who do similar analysis on Cycles 1 and 2. The studies report on initial completion rates, drop-out rates, and re-

enrolment rates for high school and PSE. They also show full and part time labour market participation rates. Shaienks, Eisl-Culkin, and Bussiere (2006) report that nearly half of PSE drop outs returned within the period of the survey, often to a different institution.

Lambert, Zeman, Allen, and Bussiere (2004) is a similar study, using the first two cycles of YITS-B, but with more emphasis on the characteristics of leavers and why they left. After two cycles approximately 15 percent of those who had taken any PSE left without completing their program. This is very close to the 15.7 percent that can be calculated from the Shaienks et al (2006) percentages. By far the most common reasons for leaving are "did not like it/ not for me" and "wanted to change programs". Only about 11 percent of leavers cited financial concerns, 7 percent left because they wanted to work, and 6 percent preferred to rest or travel. The authors note that many of the leavers will return to PSE.

Chen and Oderkirk (1997) use USIS data on students entering the Ontario university system between 1980 and1984 to estimate completion rates and time to degree. The data follow transfers across Ontario universities, but transfers to colleges or other provinces are classified as leavers. By 1993 (i.e., after 8 to 12 years) 68 percent had graduated from a university in Ontario, 2 percent were continuers, and 30 percent had not graduated and were not continuing. Of the leavers, 51 percent left after 1 year, 19 percent after 2 years, 10 percent after 3 years, and 20 percent after 4 years,

Butlin (2000) uses data on 22-24 year old Canadian youths from the 1995 School Leavers Followup to run logistic regressions on the probability of dropping out, versus the probability of continuing or graduating. Transfers across institutions are followed and separate regressions are estimated for university and college/CEGEP students. Demographic and socio-economic regressors were mostly insignificant for university students while mostly significant for college/CEGEP students. The estimated regional effects were very large and some variables covering high school or earlier schooling experiences (e.g., low grades, problems with science, failed a grade in elementary school) were positively related to the probability of dropping out for both college/CEGEP and university students.

This paper contributes to the Canadian literature by reporting the proportions of students who do not complete their first post-secondary program, who transfer to a different type of institution, and who switch to programs at higher or lower levels. In addition, there are separate analyses of university and college/CEGEP students and this has only been done previously by Butlin (2000). The literature is also extended by estimating correlates of students' decisions to not complete their first program, attempt (or not) a second program, and switch to a lower level program or try again at the same level. Finally, the literature is extended by showing the second program choices of students who successfully completed their first program.

Data

Data on students' post-secondary education programs are taken from the Youth in Transition Survey Cohort B (YITS-B). The YITS-B interviewed Canadian youth who were 18, 19 or 20 years of age in 1999 about their work and education activities over the period 1995 to December 2003. Three interviews of the same respondents, conducted in the spring of 2000, 2002, and 2004, form the three cycles of the YITS-B. The first cycle covers the period January 1995 to December 1999, the second January 2000 to December 2001, and the third January 2002 to December 2003, inclusive. Thus the survey provides longitudinal data on individuals from 1995 to December 2003. The population weights provided by the survey are used to weight the observations for all of the work that follows.

Only respondents interviewed in all three cycles are included in the analysis. Further, respondents who reported a PSE program that was declared ineligible in a later cycle are excluded. Although YITS-B asks students about up to nine post-secondary education programs, only the first three are considered in this analysis, with emphasis on the first and second.

Students' PSE program, as defined by YITS-B, is the basic unit of observation and analysis. YITS-B defines students' first post-secondary program as their first formal education above the high school level towards a diploma, certificate or degree, and requiring three months or more to complete. A new (second) program is recorded if the student enrolls in another education institution, changes their level of study (e.g., from a bachelors level to a diploma or certificate), changes to a program with a different name (e.g., from a bachelor of arts to a bachelor of education or bachelor of science program) or

interrupts their studies and the interview occurs during the interruption.

It is important to note that, if a student changes their major field of study, e.g., from economics to philosophy, but their degree or diploma retains the same name (e.g., both are bachelor of arts or just arts programs) then the student is not deemed to have changed his/her program. Similarly, if a student changes their level of study within a YITS-B category (e.g., from an Honours (20 credit) to a Pass (15 credit) university bachelors program, or from a three year to a two year college diploma program), or changes from full time to part time study, then the student is not deemed to have changed his/her program.

If the student graduates from their first program, then that program is deemed ended and any further PSE is recorded as a new (second) program, regardless of institution, level, or name of field of study. The same rules apply for students' second, third and subsequent PSE programs.

The YITS-B survey also asked students whether they changed their major field of study in each program. Unfortunately the question was only asked for programs that were started in that cycle. Any changes of major occurring in programs carried over from previous cycles were not recorded, and so the variable undercounts the number of changes. The results from this question are reported below, however, because they still provide data that can be compared across different groups of students. The actual numbers of changes are understated, but the rates of change recorded across different groups of students can be compared and significant differences identified.

A major complication arises from the CEGEP system which operates in Quebec but no other provinces. Under the Quebec system, students generally complete two years of CEGEP (in an academic stream) before entering university and their time in CEGEP is considered a valid post-secondary program in the YITS survey. Thus, very few students studying in Quebec show university as their first post-secondary program and almost all first PSE programs in Quebec are in the "college or CEGEP" category used by YITS-B.[3] In other provinces, students usually enter university right after completing high school. Correspondingly, YITS shows that the first PSE program of many students (usually well over 50 percent) in provinces outside of Quebec is at a university. The proportion of Quebec students going to universities in their second post-secondary program is within the range shown for students' first program outside of Quebec. So, for most students attending university in Quebec, their post-secondary programs are lagged one program compared to other provinces in the YITS.

The following adjustment was done to include Quebec students in the sample of students whose first program is a bachelors level program at a university. All students whose first post-secondary program was in a college or CEGEP in Quebec, with an expected length of two years, and classified as being at the level of a college or CEGEP pro-

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3 The few first post-secondary programs occurring in a university in Quebec are likely students who graduated from high school in another province and transferred to a Quebec university for their first PSE program .

gram (around 80 percent of the cases) or a university transfer program at a college/ CEGEP (around 20 percent of the cases), had their programs moved forward by one, so that their second program is re-classified as their first, and their third program is re-classified as their second. Then the analysis was restricted to students whose first program (given the adjustment above) was at the bachelors level in a university. Table 8 shows that the adjustment is only partially successful and Quebec students are still underrepresented in that sample.

No adjustment for the CEGEP system is required for students whose first program was in a college or CEGEP program with an expected length of three or more years of full time study. But another adjustment is required for those in two year first programs in colleges or CEGEPs. This group included large numbers of Quebec students who are in the academic stream and ultimately headed for university. But the observations from the other provinces include a different group; namely, students enrolled in two year college level programs after completing high school. A solution is to remove all students whose first program was expected to be two years in a college or CEGEP in Quebec. Thus the college level sample includes students whose first PSE program was in a college or CEGEP, with an expected length of two or more years of full time study, but with Quebec college or CEGEP students in two year programs excluded.

The data are also restricted to students who either graduated or left their first program within the time frame of the survey. If the outcome of students' first program is not resolved or known (i.e., they are classed as first program continuers by the end of the third cycle) then they are not included in the samples.

The sample initially contained 12,101 students who started any PSE program with expected length between two and 5½ years. Of those, only 9,019 were interviewed for all three cycles and only 5,584 of those had resolved first programs. 2,333 of the 5,584 chose a bachelors program at a university for their first program (including 443 students from Quebec who had their second program renamed to be their first). 2,181 university bachelors' students were left after deleting 152 with ineligible programs. 2530 of the 5,584 were college/CEGEP students in two or more year programs. This left 1,810 students, after 118 students with ineligible programs and 602 two year college/CEGEP students in Quebec were deleted.

Documenting the Flows

Students in a Bachelors Level Program in a University

Table 1 shows outcomes for students whose first PSE program was bachelors level at a university. Again, first program continuers are excluded. Only those with resolved first programs are included and of those, 60 percent graduated while 40 percent left or changed their program within the timeframe of the survey. The 40 percent leaver/changer rate appears to be very close to the 42 percent five year non-completion rates calculated by Gilbert (1991) and the rates reported in US studies, but they are measuring different things and are not comparable.

Recall that YITS underreports the number of changes of major but the underreporting occurs in a systematic way so that the rates across different groups of students can be compared. Not surprisingly, leaver/changers were more likely to change their major field of study. 18.2 percent of leaver/changers changed their major as compared to 11 percent of graduates and the difference is statistically significant. Over both groups, 13.9 percent (7.3 plus 6.6) reported changing their major field of study but, again, the true figure is a higher rate of change.

Only 8.7 percent of all students who started university left their first program without graduating and stopped post-secondary education entirely (i.e., they did not attempt another program) during the time frame of the sample. This low percentage occurs because more than three quarters (78.3 percent) of those not completing their first program transferred to or enrolled in a second post-secondary program. Of that group, almost a third subsequently graduated, 42.5 percent were continuing, and 25.2 percent left without completing their second program.

The second program outcomes imply that 70.1 percent (60.0 plus 10.1) of all initial university bachelors students were able to complete a PSE program within the YITS-B survey, and 10.1 of those percentage points were acquired in students' second program. Further, another 13.3 percent of those students were still continuing their second program and only 16.6 percent (8.7 plus 7.9) left post-secondary education without graduating after two program attempts. Some of those students will retry PSE by transferring to or

enrolling in a third program, but that analysis is left for future work. The outcomes for the first program continuers will also affect the rates cited above, but that analysis must wait for another cycle of YITS.

University students who graduated from their first program were much less likely to start a second program than those who ended their first program early, and the difference is statistically significant. 56.1 percent of graduates stopped their post-secondary education after receiving their degree (within the time frame of the survey), while 43.9 percent went on to enroll in another post-secondary program. Of those, almost 30 percent subsequently graduated, and only 10.5 percent left their second program. The high percentage of continuers (almost 60 percent) is not surprising due to the time required to complete a bachelors level program and then a second PSE program.

Comparing the second program outcomes of first program changers and graduates is difficult because of the different proportions of continuers. One solution is to ignore the continuers and compare the 'grad/leaver rate', which equals the ratio of graduates to graduates plus leavers. A Wald test shows that first program graduates continue their success in their second programs. Their second program grad/leaver rate is higher than first program changers and the difference is statistically significant.

Table 1 shows that 57.6 percent (31.3 plus 26.3) of all initial university bachelors students transfer to or re-enroll in a second program. Tables 2 and 3 show the types of

second programs chosen, separately, for first program changers and graduates.

(i) second program destinations and outcomes of first program changers

As noted above, only 21.7 percent of students who did not complete their first university program ended their post-secondary education. The remaining 78.3 percent continued their post-secondary education in a second program. Again, students may have transferred to the second program with no break in their studies, or they may have quit their first program, spent some time out of school, and then re-enrolled. An analysis of the timing of the decisions is left for future work.

Table 2 shows that most students who attempt a second program try again at the same level and type of institution, namely, another bachelors program at a university. It would be interesting to examine how many students changed institutions or just changed programs at their original institution, but large numbers of missing institution codes makes this problematic. 72.1 percent of changers start a second program at the bachelors level or above but almost all of these are at the bachelors level. The small number of above bachelors programs include a few professional programs (e.g., a student is accepted into and starts law school after their second year before completing their first degree). The rest are classed as "graduate level diploma or certificate programs above bachelors and below Masters" by YITS.

Less than five percent of first program changers switch to a certificate or diploma program at a university or university college,

and most of these are at universities. The remaining 23 percent transfer to a college, CEGEP, or public trade/technical or vocational institute, with most enrolling in college level programs at colleges or CEGEPs.

A non-trivial number of the second program attempts at a bachelor's degree were successful. 18.4 percent of all first program changers completed their bachelor's degree (or higher) within the timeframe of the survey and another 34 percent were continuing. In addition, a further 14.8 percent (2.8 plus 12.0) of first program changers completed PSE programs below the bachelor's level, with another 7.6 percent (0.7 plus 6.9) continuing.

The larger percentage completing bachelor's programs is due to the large number of students who chose another bachelor's program and not their success rate. In fact, students were much more successful if they switched to programs below the bachelor's level. The grad/leaver rate is much higher for below bachelor's level programs and the differences are statistically significant even at very low significance levels.

(ii) second program destinations and outcomes of first program graduates

Table 3 shows the PSE decisions for the 43.9 percent of university bachelor's graduates who decided to continue their education. Of those opting for a second program, 37.1 percent progressed to a program above bachelor's level at a university or university college, while 39 percent enrolled in another bachelor's level program at a university or university college. A further 6.5 percent enrolled in second programs that were below

the bachelor's level, but at a university or university college. Most of these were at universities. Very few of the university graduates went to a university college for a second program, which is why the two categories were merged.

The common perception that large numbers of university students attend a college after they graduate (so that they can then find a job) receives little support from the YITS survey. Table 3 shows that only 17.5 percent of graduates' second programs are at a college, CEGEP, or technical/trade or private business college. Of those, approximately 60 percent are at colleges or CEGEPs and the remaining 40 percent are at technical/trade or private business colleges. Most of the latter group are in programs that lead to certificates or licenses from professional associations in business or finance, or private business schools or training institutes.

As for the outcomes of the second programs, over 85 percent of the students in above bachelor's level programs were still continuers by the end of Cycle 3, which is to be expected given the time required to completed those programs. Table 3 also shows that the greater success enjoyed by first program graduates (compared to first program leavers/changers) carried over to their second bachelor's programs as well. Their continuer rates in second bachelor's level programs are identical, but first program graduates have much higher graduation rates (and correspondingly much lower leaving rates) than first program changers and the differences are statistically significant. It is also interesting to note that while first program changers were much more successful if they

switched to a college level program (as compared to if they tried bachelors level again), first program university graduates do worse in lower level second programs, (according to the grad/leaver rate) although the difference is not statistically significant.

Students in College or CEGEP Programs of Two or More Years

Table 4 shows the outcomes for students whose first program was two or more years in a college or CEGEP. Again, continuers are excluded so only students with resolved first programs are considered. Of those with resolved programs, 53 percent graduated while 47 percent left or changed their program. This is a lower graduation rate than for university bachelors students and the difference is statistically significant.

As with university students, first program leavers or changers at the college level were significantly more likely to change their major field of study than graduates. In fact, the reported rate at which college graduates changed their major is very low and significantly lower than the rate reported by university graduates.

In addition to being less successful in their first programs than university students, college students were also discouraged from post-secondary education more easily. 35 percent of the college students who did not complete their first program, did not transfer to or enroll in a second program during the time frame of the sample. This compares to 21.7 percent for university students, and the difference is statistically significant. Conversely, 65 percent of college leaver/changers do start a second program and this is signifi-

cantly lower (obviously) than the 78.3 percent rate for university first program leaver/changers. Out of the college leaver/changers who attempted a second program, 39.2 percent subsequently graduated, 23 percent were continuing, and 37 percent left without completing their second program.

Overall, after taking into account second program attempts, 65.0 percent (53 plus 12) of all students who started a college program were able to complete a post-secondary program, with 12 of those percentage points coming in their second program. Another 7.0 percent are still continuing their second program and some second program leavers will attempt third programs.

University and college graduates have very similar propensities for enrolling in second post-secondary programs. The majorities of both groups (around 56-57 percent) do not pursue any more post-secondary education (within the time frame of the survey) after graduating from their first program. Of the roughly 43 percent of college graduates who do enroll in a second PSE program, 47 percent graduated, 43.5 percent were continuers, and 9.5 percent left before graduation. As with university students, college graduates carry their success over to their second programs and their grad/ leaver rate is significantly higher than college first program changers.

Altogether, 53.2 percent (30.5 plus 22.7) of initial college students re-enroll in a second program. Tables 5 and 6 show the types of second programs chosen, separately for first program changers and graduates.

(i) second program destinations and outcomes of first program changers

As noted above, 65.0 percent of college changers/leavers enroll in a second post-secondary program. As was the case with university changers, Table 5 shows that most (72.1 percent) switched to another program at the same level and in the same type of institution as their first program. The percentage is slightly higher than for university changers but it rounds to the same number. Again it would be interesting to track how many students transfer to another institution and how many leave PSE for a period of time before restarting their second program, but those questions are left for future work.

Table 5 also shows that 9.3 percent of the college changers transferred to a bachelors level program at a university or university college, although almost all were at a university. Another 4.3 percent started a second program below the bachelors level at a university or university college and again, most of these were at universities. The remaining 14.2 percent transferred to a technical/trade or private business college and their programs were split fairly evenly between college level programs and certificates/diplomas/licenses from private business schools, training institutes, or professional associations in business or finance.

As for the outcomes, college changers who re-enrolled in a second college program were not more likely to be successful than college changers who transferred up to a bachelors level program. The grad/leaver rate for bachelors level second programs was higher than the rate for college/CEGEP second programs and the difference was signifi-

cant at the 5.2 percent level. This differs from the first program university changers who had better success if they transferred to a college, compared to a second program at a bachelors level. College changers who transferred to or enrolled in a technical/trade or private business college second program had a much higher grad/leaver rate than those re-trying in a college or CEGEP, but the difference was not statistically significant.

(ii) second program destinations and outcomes of first program graduates

Table 6 shows that, of the college graduates who continued their PSE, 47.7 percent started a bachelors program at a university or university college. Another 6.8 percent also transferred to a university or university college, with most going to universities, but they enrolled in second programs below the bachelors level. 39.9 percent of graduates' second programs were repeats of their first; namely below bachelors level at a college or CEGEP while 5.6 percent of were below bachelors level at a technical/trade or private business college. Most of the latter group were in programs classed as college level.

Like university students, college graduates were generally more successful than changers in their second programs. This was especially true for second programs that remained at the college or CEGEP level but not true for second programs attempted at the bachelors level. College graduates had significantly higher grad/leaver rates in their second programs if they did another college or CEGEP level program as compared to a bachelors level second program. Surprisingly, college graduates had virtually the same grad/leaver rate if they moved up to bache-

lors second programs as college non-graduates who made the same move up for their second program.

Correlates of Student Decisions to Change or Leave Their First Program, Re-Enter a Second Program, or Change Their Level of Study

Table 7 provides definitions of the variables used in the regression analysis. The personal characteristics (gender, urban/rural, mother tongue) and parents' characteristics (highest level of education, PSE important to them, number and type of parents in the home during high school) are all taken from the 2000 interviews. The high school variables (private, did coop, grades, took a break) were collected after the respondent completed high school so they are taken from any of the three cycles. All of the other variables refer to the period of the students' first program so they are taken from and refer to whatever cycle is appropriate. Table 8 shows the means and standard deviations for the sample used in the first regression.

(i) students in a bachelors level program in a university

Three probit regressions are estimated. The first includes all students whose first program was bachelors level at a university, and the dependent variable equals one if the student graduated from that first program and zero if he/she did not.

The second regression is restricted to students with a zero dependent variable in the first regression; i.e., students who discovered, ex post, that their first program decision was not a good one and so did not complete that first program. Its dependent variable equals one if the student changed to

or enrolled in a second program and equals zero if the student did not pursue any more PSE over the YITS survey period.

Third regression is restricted to students with dependent variable equal to one in the second regression; i.e., those who, after stopping their first PSE program, changed to or enrolled in a second program. Its dependent variable equals one if the second program was also at the bachelors level and zero if the second program was below bachelors level.

The regressions are estimated independently even though the three decisions are clearly inter-dependent, with many aspects decided simultaneously rather than sequentially. The three binary choices specified, however, capture the essence of the students' decisions. It also simplifies the econometrics and interpretations of the estimates enormously and is adopted for those reasons.

Table 9 reports estimates of the marginal effects of the right hand side variables for the three probits. Rather than considering each equation separately, it is more instructive to look at the estimates for each right hand side variable across the three regressions. Starting at the bottom of Table 9, students' province or region was not significantly correlated with whether they completed their first program, or tried a second program. But if they did try a second program, B.C. students were less likely to re-try at the bachelors level and more likely to try a program below the bachelors level, compared to the omitted province of Ontario. This may be due more to supply rather than demand on the part of

students. BC has a large university college system (compared to other provinces) that likely provides more opportunities for certificate and diploma level programs than are available in other provinces. The other western provinces also provide more university college type opportunities than the rest of Canada and their coefficients and standard errors also suggest a negative effect, but they are not significantly different from zero at conventional levels

Students' first program completion varied significantly across first program major fields of study. This is likely due to the selection or sorting of students across majors as well as the different requirements of each major. Undecided students and science students were much more likely to leave or change their first program than those in the omitted group; namely, agriculture, recreation, health. Humanities or social sciences students were also more likely to leave or change than the omitted group, but the differences were only significant at the 8.5 percent level. Undecided students were also less likely to graduate than those in humanities, social sciences, or business, but the differences were only significant around the 10 percent level. Other differences across majors were statistically insignificant. While students' major was strongly associated with the decision to leave or change their first program, it had no effect on the subsequent decisions about whether to attempt a second program or the level of that program. Science and undecided students were just as likely to transfer to or enroll in a second program at the bachelors or lower level as other students after stopping their first program before completion.

The PSE financing variables show big differences across the various sources of funding compared to the implicit alternative that students are paying the cost of PSE out of their current income or savings. Table 9 shows that students with student loans or funding that did not have to be repaid (from their parents or others) were much more likely to graduate from their first program. But students with non-repayable support are less likely to attempt a second program if things did go badly and they did not complete their first. (A parental/family recrimination effect, perhaps). Finally, a second program was more likely to be at the bachelors rather than a lower level if the student had non-repayable support in their first program. Receipt of a student loan in the first program was uncorrelated with all of the decisions made after the first program and other types of loans were not correlated with any of the decision considered.

Given the results in Table 1, one expects a lower probability of graduation from students who changed their major in their first program. The point estimate in Table 9 is consistent with that, but controlling for the other factors, it is not statistically significant at conventional levels. Further, changing major is not significantly related to the decision to re-enroll or the level of any second program, but these results may be due to the undercounting of changes in major.

Spending time as a part time PSE student had effects similar to first program major field of study. Any part time study in the first program was strongly associated with not graduating from that program, but was unre-

lated to the re-enrolment decision or subsequent levels of PSE.

As for living arrangements, students who permanently moved out of their parents' home before the end of their first program were more likely to graduate from that program. But those who did not graduate were less likely to attempt a second program and there was an insignificant relation to the level of a second program.

The presence and characteristics of parents had mixed correlations with the decisions. Living with a single (or no) parent during high school was not significantly related to any of the three decisions while students who lived with two adults who were not both biological parents were much less likely to graduate from their first PSE program. After stopping that first program, however, family status was not correlated with the decision to re-enroll or the level of a second program.

Surprisingly, parents' education and the importance of PSE to parents were unrelated to students' success in their first program. Apparently, high parental education brought no better information or decision making to students' first program choices and did not improve the likelihood of a good initial decision (ex post) and completion of the first PSE program. However, for students who left their first program, parents' education was positively and significantly related to the decision to re-enroll in another PSE program. Thus parents' education appears to be correlated with students ability to adjust to adversity in their first program by finding and undertaking alternative programs. PSE important to parents was also positively related to

the decision to do a second program, but only at the 7.6 percent significance level. As for the level of the second attempt at PSE, neither parents' education nor the importance to parents were significantly related.

High school characteristics generated surprisingly few statistically significant coefficients for the outcome of students' first programs. High school grade average was strongly correlated with completion, but the other high school variables were insignificant. High school grades were also strongly correlated with attempting a second program – and at the bachelors level - if the first was not completed. Students who attended a private high school were more likely to start a second program if they did not complete their first, (although the estimate is only significant at the 7.1 percent level) and they were also more likely to choose the bachelors level. Surprisingly, spending more than 12 months out of school before PSE was not significantly related to any of the decisions, although it was correlated with not attempting a second program at close to the 10 percent significance level.

The most unexpected result was the insignificance of gender for all three of the student decisions. Other personal characteristics considered - rural address and first language not French or English - were not related to first program outcomes. But students with another mother tongue were more likely to start another program if they did not complete their first (although only significant at

7.8 percent) and their second program was more likely to be bachelors level. Rural students were more likely to choose programs below bachelors level if they attempted a second program after quitting their first.

(ii) students in a two or more year program at a college or CEGEP

The first two regressions are repeated for students who started two year (or more) programs in a college or CEGEP. The only difference is that the changed major variable is dropped from the first regression since it is almost perfectly correlated with the dependent variable. This occurs because very few students who graduated from their first program changed major (See Table 4). The third regression (examining the level of the second program) needs to be modified for college students and is not reported.[4] Marginal effects are reported in Table 10.

The results differ from those for university students. Starting from the bottom of Table 10, students in the western provinces were much less likely to graduate from their first program compared to the omitted province of Ontario. This contrasts with university students where province and region had insignificant effects. The coefficient for Alberta is statistically significant while the coefficient for BC is only significant at the 10.2 percent level. Manitoba/Saskatchewan also has a negative coefficient but it is not significant at conventional levels. This may be due to the greater integration and coordination of college and university programs in the Western provinces. Students may be less likely to

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4 Only 9.3 percent of the changers tried a bachelors level second program and an appropriate classification of the other second programs is not clear. Further, estimation difficulties arose because the second program destinations were closely correlated with the province and major field of study dummy variables. These difficulties lead me to leave analysis the level of college students' second programs for later work.

complete their college programs because they were transferring from college to university. This view is supported by the much higher probability that BC students do start second programs if they do not complete their first, although the second regression coefficients for Alberta and Manitoba/ Saskatchewan are statistically insignificant. It would also explain the why the levels of second programs were so closely correlated with province/region in the unreported third regression.

College students' major field of study in their first program was not related to any of the outcomes considered, which again contrasts to university students who experienced big differences in first program completion rates across major fields of study.

The financing of PSE also provided different and surprising estimates. As with university students, students with a student loan or funding that will not be repaid, were more likely to complete their first program, although the former was only significant at the 10 percent level. Unlike university students, college students with other types of loans were also much more likely to graduate from their first program, but (as with university students) it had no effect on second programs. Non-repayable support was not related to second program attempts for those who did not complete their first, while student loans made second program attempts less likely.

Unlike university students, permanently moving out of the parents' home or part time study were not significantly related to either first program completion or pursuit of a sec-

ond program. Also unlike university students, college students who lived with one (or no) parents during high school were less likely to complete their first programs, while other living arrangements yielded insignificant estimates. However, college students mimicked university students in that who they lived with (parent wise) was unrelated to attempts at second PSE programs.

College and university students are similar in that parents' education and the importance of PSE to parents were unrelated to students' achievements in their first programs, but higher parental education made students more likely to attempt a second program if they did not finish their first. They are also similar in that more than 12 months out of school before PSE had no significant correlation with any of the outcomes that followed.

College students with higher high school grades were also much more likely to graduate from their first program but, unlike university students, high school grades were unrelated to second program attempts if the first was not completed. Attending a private high school or doing coop yielded insignificant effects on later PSE decisions.

The big surprise is that gender was strongly related to outcomes for college students but was insignificant for university students. Male college students were much less likely to graduate from their first program and much less likely to try a second program if they did not complete the first. Other personal characteristics – rural address and other mother tongue – were not significantly

related to the first program outcomes or the decision to pursue a second program.

Conclusions

Out of the PSE students with resolved first program outcomes, only 50 to 60 percent graduated from the first program they started. This suggests that there is room for improvement in communicating information about different PSE programs to students and helping students make good decisions about their first program. University students were more likely to complete their first program than college students and, out of those who did not, university students were also more likely to attempt a second program. Another 10 to 12 percent of the initial PSE starters obtained a PSE credential by completing their second program within the time frame of the YITS survey while 7 to 13 percent were still continuing their second program.

College and university students who stopped their first programs followed similar strategies for their second. Almost three quarters of both groups tried another program at the same level and type of institution. Most of the rest tried lower level programs, but approximately 9 percent of college students moved to bachelors level at a university after stopping their college program. University students who switched to colleges (after not completing their bachelors) had greater success than those who re-tried a bachelors program. College students who did not complete their first program experienced greater success if they switched to technical/trade or private business colleges, but the difference was not statistically significant. Surprisingly, college students who switched to bachelors programs (after stopping their college program) had greater success than those who attempted a second program at a college or CEGEP. The higher success rates of students who changed levels for their second program (both up and down) provide further evidence of poor first decisions and room for improving the matching of students to first PSE programs.

College and university students who completed their first program also behaved similarly after their graduation with 42 to 44 percent starting a second program. One third to one half of those second programs were at a higher level, while about 40 percent were at the same level as the first. Around 18 percent of university graduates went to a college, CEGEP, or technical/trade or private business college for their second program. First program graduates generally had more success in their second programs than those who did not complete their first programs.

Regression estimates for the province variables reflect the greater integration and coordination of the college and university systems in the western provinces. BC students were more likely to move from a university to a college level program if they did not complete their first (university) program and were more likely to move to university before completing their college programs.

PSE outcomes and student decisions varied with how students financed their PSE. University and college students who received funding for their education were more likely to successfully complete their first programs, although the estimates for different types of loans differed across college and university

students. For those students who encountered difficulties and did not complete their first program, however, receipt of loans or non-repayable funds in their first program made it less likely that they would attempt a second. But non-repayable funding in the first program did increase the likelihood that university students would re-try at the bachelors level if they attempted a second program.

Surprisingly, more educated parents did not appear to help students make good initial decisions about their PSE. Parents' education was not correlated with successful completion of first program. However, more educated parents were correlated with students' ability to find and start second programs if they did not complete their first. Thus students with higher education parents appear more able to adjust to adversity or surprises within their PSE.

High School grades are highly correlated with almost all of the PSE outcomes and student decisions. Family status and living arrangements have some significant coefficients but the estimates vary across university and college students. By far the most unexpected result was that the outcomes and decisions of university students were unrelated to gender, while male college students were much less likely to complete their first program and start a second.

As noted above, more information about PSE programs would likely increase the quality of students' decisions about their first programs and increase the proportion who successfully complete them. Other policies, such as delaying decisions about PSE or defining more general programs of study would likely have similar effects. However, all of these policies have costs, and the costs must be weighted against the benefits. Another policy which would also lead to better final outcomes would be to facilitate the transfers and switches noted above. (Increasing information would also be an important component in facilitating adjustments.) This alternative highlights the fact that not completing ones' first program and choosing the best alternative (e.g., a second program or stopping PSE) are not failures of the individual or the system. They are responses to the uncertainties inherent in the process and the accumulation of more information during the process. In theory there should be optimal rates of stoppage, dropouts and transfers which correctly weigh costs and benefits within the context of the uncertainties and randomness of the system. While this paper stops far short calculating such optimal rates, the flows and correlations presented above may contribute to their development.

References

Adelman, C. (2006). The toolbox revisited: Paths to degree completions from high school through college. Washington DC: US Department of Education.

Altonji, J.G. (1993). The demand for and return to education when education outcomes are uncertain. Journal of Labor Economics, 11(1), 48-83.

Arcidiacono, P. (2004). Ability sorting and the returns to college major. Journal of Econometrics, 121(1-2), 343-75.

Butlin, G. (2000). Determinants of university and community college leaving. Education Quarterly Review, 6(4), 8-23.

Cabrera, A.F., Burkum, K., & La Nasa, S.M. (2005). Pathways to a four-year degree. In A. Seidman (Ed.), College student retention: Formula for student success (pp.155-214). Washington DC: American Council on Education.

Cameron, S.V. & Heckman, J.J. (1998). Life cycle schooling and dynamic selection bias: Models and evidence for five cohorts of American males. Journal of Political Economy, 106(2), 262-333.

Chen, E. & Oderkirk, J. (1997) Varied pathways: The undergraduate experience in Ontario. Education Quarterly Review. Statistics Canada Catalogue 81-003-XPB, Vol. 4 #3 47-62.

Choy, Susan P. (2002) Access and Persistence: Findings from 10 years of longitudinal research on students. Washington DC: American Council on Education.

Comay, Y., Melnik, A., & Pollatschek, M.A. (1973). The option value of education and the optimal path for investment in human capital. International Economic Review, 14(2), 421-35.

DesJardins, S.L., Ahlburg, D.A., & McCall, B.P. (2002). Simulating the longitudinal effects of changes in financial aid on student departure from college. Journal of Human Resources, 37(3), 653-79.

Gilbert, S. (1991). Attrition in Canadian universities. (Research Report No.1). Commission of inquiry on Canadian University Education.

Gilbert, S.N., & Auger M. (1988). Student finances and university attrition. (Document No. PCS-6-00173). Ottawa, ON: Department of the Secretary of State of Canada.

Grayson, P.J. (1995). Race and first year retention on a Canadian campus. Toronto, ON: York University Institute for Social Research.

Grubb, N. W. (1989). Dropouts, spells of time, and credits in postsecondary education: Evidence from longitudinal surveys. Economics of Education Review, 8(1), 49-67.

Lambert, M., Zeman, K., Allen, M., & Bussiere, P. (2004). Who pursues postsecondary education and why: Results form the youth in transition survey. Research Paper prepared for the Culture, Tourism and Centre for Education Statistics Division. Statistics Canada Catalogue Number 81-595-MIE - No. 026. Ottawa, ON: Statistics Canada & Human Resources and Skills Development Canada.

Light, A. (1996). Hazard model estimates of the decision to reenroll in school. Labour Economics, 2(4), 381-406.

Manski, C.F. (1989). Schooling as experimentation: a reappraisal of the postsecondary dropout phenomenon. Economics of Education Review, 8(4), 305-12.

Montmarquette, C., Mahseredjian, S., & Houle, R. (2001). The determinants of university dropouts: A bivariate probability model with sample selection. Economics of Education Review, 20(5), 475-484

Shaienks, D., Eisl-Culkin, J., & Bussiere, P. (2006). Follow up on education and labour market pathways of young Canadians Aged 18 to 20 – Results from YITS Cycle 3. Statistics Canada Catalogue Number 81-595-MIE #45. Ottawa, ON: Statistics Canada.

Simpson, W.A. (1987). Tracking students through majors. Journal of Higher Education, 58(3), 323-43.

Zeman, K., Knighton, T., & Bussiere, P. (2004). Education and labour market pathways of young Canadians between age 20 and 22: An overview. Statistics Canada Catalogue Number 81-595-MIE #18. Ottawa, ON: Statistics Canada.

Tables

Table 1. Outcomes for students whose first program was bachelors level in a university and who either graduated from or left that first program (i.e., first program continuers are excluded)

```
                    Started bachelors level program in a university
                                    2,181 students
```

Changer or leaver 40.0%			**Graduate** 60.0%		

| **Changed major** (more than) 7.3% [18.2%] | **Kept same major** (less than) 32.8% [81.8%] | | | **Changed major** (more than) 6.6% [11.0%] | **Kept same major** (less than) 53.4% [89.0%] |

| **Leaver** No 2nd prog 8.7% [21.7%] | **Changer** Has 2nd prog 31.3% [78.3%] | | **Ends PSE** No 2nd prog 33.6% [56.1%] | **More PSE** Has 2nd prog 26.3% [43.9%] |

| **Graduate** 10.1% [32.3%] | **Continuer** 13.3% [42.5%] | **Leaver** 7.9% [25.2%] | **Graduate** 7.9% [29.9%] | **Continuer** 15.7% [59.6%] | **Leaver** 2.8% [10.5%] |
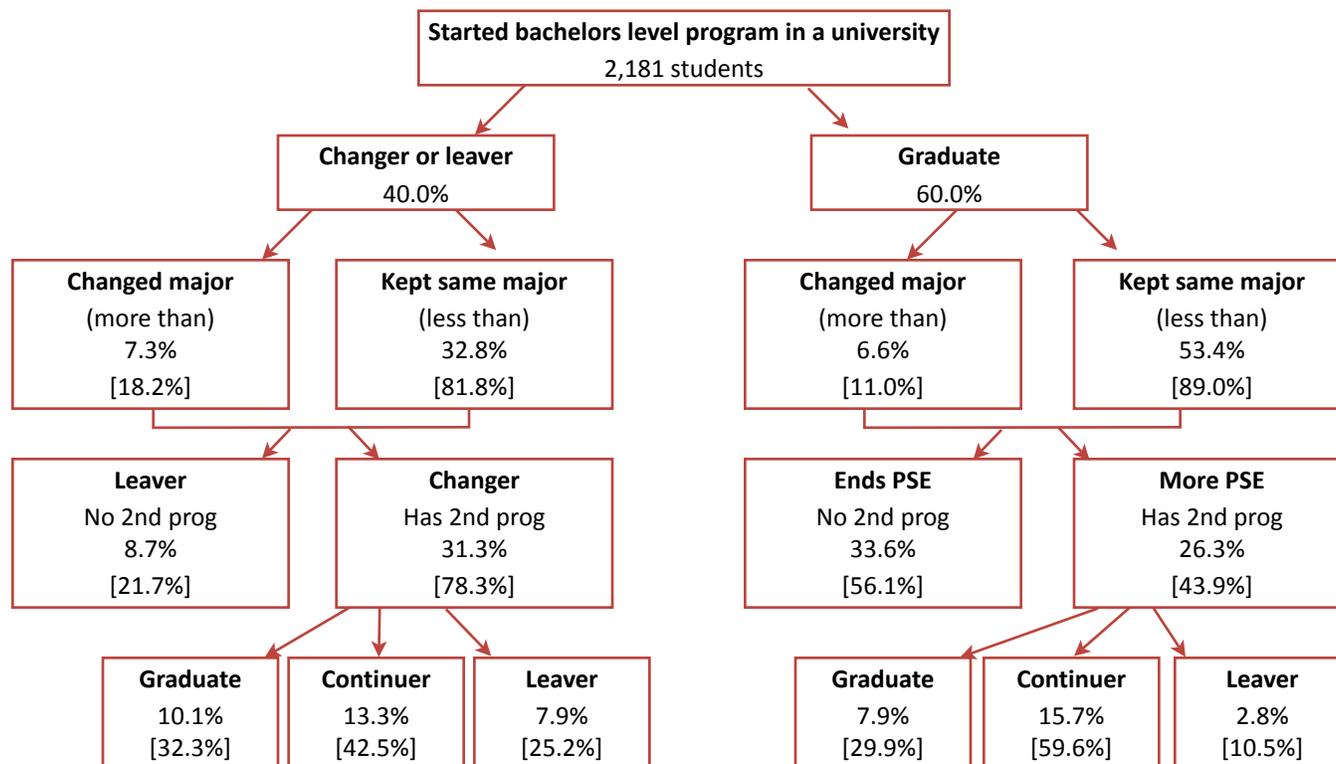
The upper percentage is the percentage of all 2,181 students in this category.
Square brackets indicate the percentage of students in the category immediately above.
The definition of this category is altered for students who attended a CEGEP in Quebec. See the data section for details.

Table 2. Destination and outcomes for students whose first program was bachelors level in a university who changed to (or left and restarted) a second program before graduating from the first

```
              Bachelors leavers/changers' second program
                           698 students
```

| **Bachelors or above at a university or univ college** 72.1% | | | **Below bachelors at a university or univ college** 4.9% | | | **Below bachelors at a college/ CEGEP or tech/bus coll** 40.0% | | |

| **Graduate** 18.4% [25.6%] | **Continuer** 34.0% [47.2%] | **Leaver** 19.6% [27.2%] | **Graduate** 2.8% [56.2%] | **Continuer** 0.7% [14.2%] | **Leaver** 1.5% [29.6%] | **Graduate** 12.0% [51.9%] | **Continuer** 6.9% [30.2%] | **Leaver** 4.1% [17.9%] |

The upper percentage is the percentage of all 698 students in this category.
Square brackets indicate the percentage of students in the category immediately above.

Table 3. Destination and outcomes for students who graduated from their first program at the bachelors level in a university and enrolled in a second PSE program

Bachelors graduates' second program
544 students

Above bachelors at a university or univ college	Bachelors at a university or univ college	Below bachelors at a university or univ college	Below bachelors at a college/ CEGEP, tech/bus coll
37.1%	39.0%	6.5%	17.5%

Graduate	Continuer	Leaver	Graduate	Continuer	Leaver	Graduate	Continuer	Leaver	Graduate	Continuer	Leaver
3.5%	31.9%	1.6%	17.0%	18.4%	3.6%	3.3%	--%	--%	6.4%	6.4%	4.7%
[9.5%]	[86.1%]	[4.4%]	[43.7%]	[47.2%]	[9.1%]	[51.6%]	[--%]	[--%]	[36.8%]	[36.3%]	[26.9%]

The upper percentage is the percentage of all 544 students in this category.
Square brackets indicate the percentage of students in the category immediately above.

Table 4. Outcomes for students whose first program was at the college level in a college or CEGEP, with expected length of two or more years of full time study, who either graduated from or left that first program (i.e., first program continuers are excluded)

Started college program of two or more years
1,810 students

Changer or leaver	Graduate
47.0%	53.0%

Changed major (more than)	Kept same major (less than)	Changed major (more than)	Kept same major (less than)
8.6%	38.4%	2.0%	51.0%
[18.3%]	[81.7%]	[3.9%]	[96.1%]

Leaver No 2nd prog	Changer Has 2nd prog	Ends PSE No 2nd prog	More PSE Has 2nd prog
16.5%	30.5%	30.3%	22.7%
[35.0%]	[65.0%]	[57.1%]	[42.9%]

Graduate	Continuer	Leaver	Graduate	Continuer	Leaver
12.0%	7.0%	11.6%	10.7%	9.9%	2.2%
[39.2%]	[23.0%]	[37.9%]	[47.0%]	[43.5%]	[9.5%]

The upper percentage is the percentage of all 1,810 students in this category.
Square brackets indicate the percentage of students in the category immediately above.
The definition of this category is altered for students who attended a CEGEP in Quebec. See the data section for details.

Table 5. Destination and outcomes for students whose first program was at the college level in a college or CE-GEP, two or more years in length, and who changed to (or left and restarted) a second program before graduating from the first

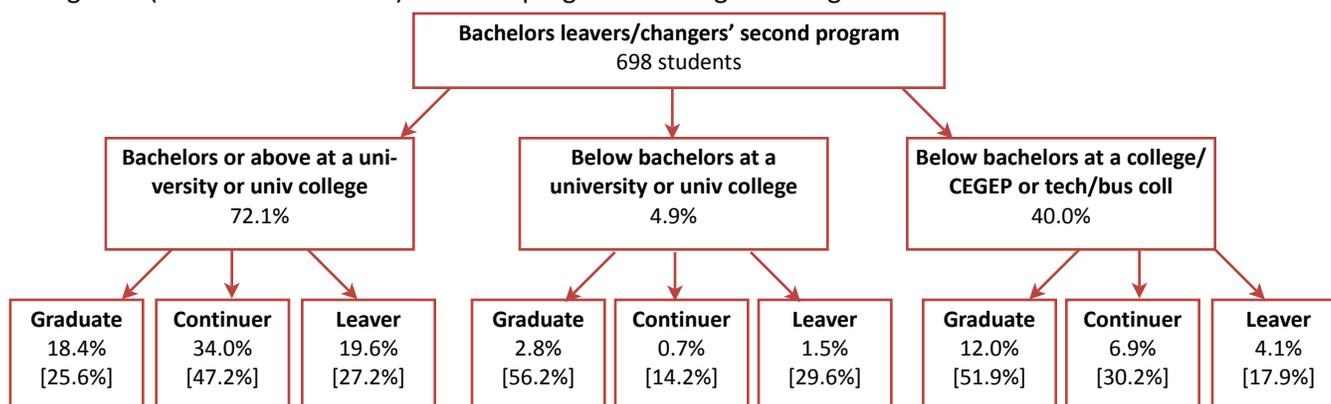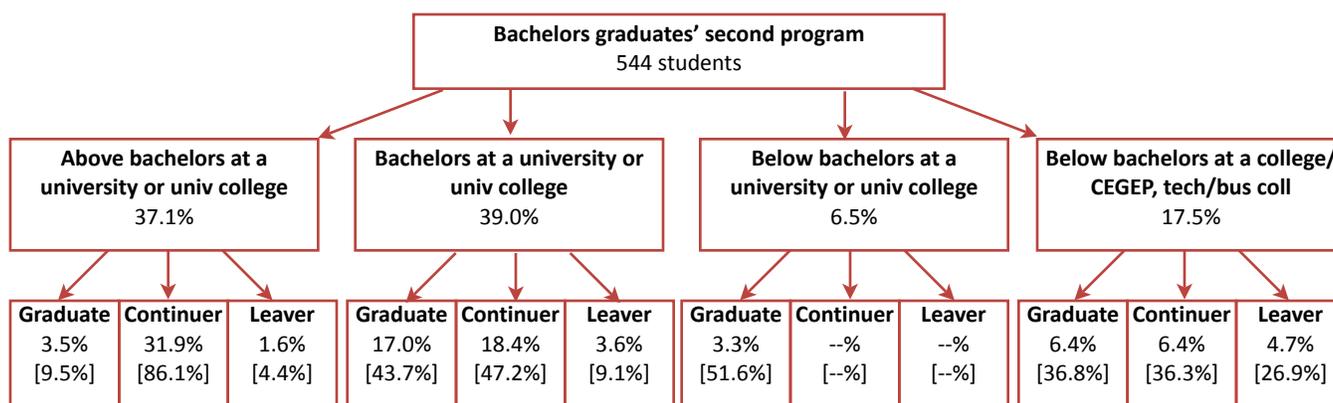| College leaver/changers' second program 492 students											
Bachelors or above at a university or univ college 9.3%			**Below bachelors at a university or univ college** 4.3%			**Below bachelors at a college or CEGEP** 72.1%			**Below bachelors at a tech or business college** 14.2%		
Graduate 4.1% [44.2%]	**Continuer** 3.2% [34.2%]	**Leaver** 2.0% [21.6%]	**Graduate** --% [--%]	**Continuer** --% [--%]	**Leaver** --% [--%]	**Graduate** 27.5% [38.1%]	**Continuer** 12.8% [17.8%]	**Leaver** 31.8% [44.1%]	**Graduate** 6.7% [47.1%]	**Continuer** 3.7% [25.7%]	**Leaver** 3.9% [27.1%]

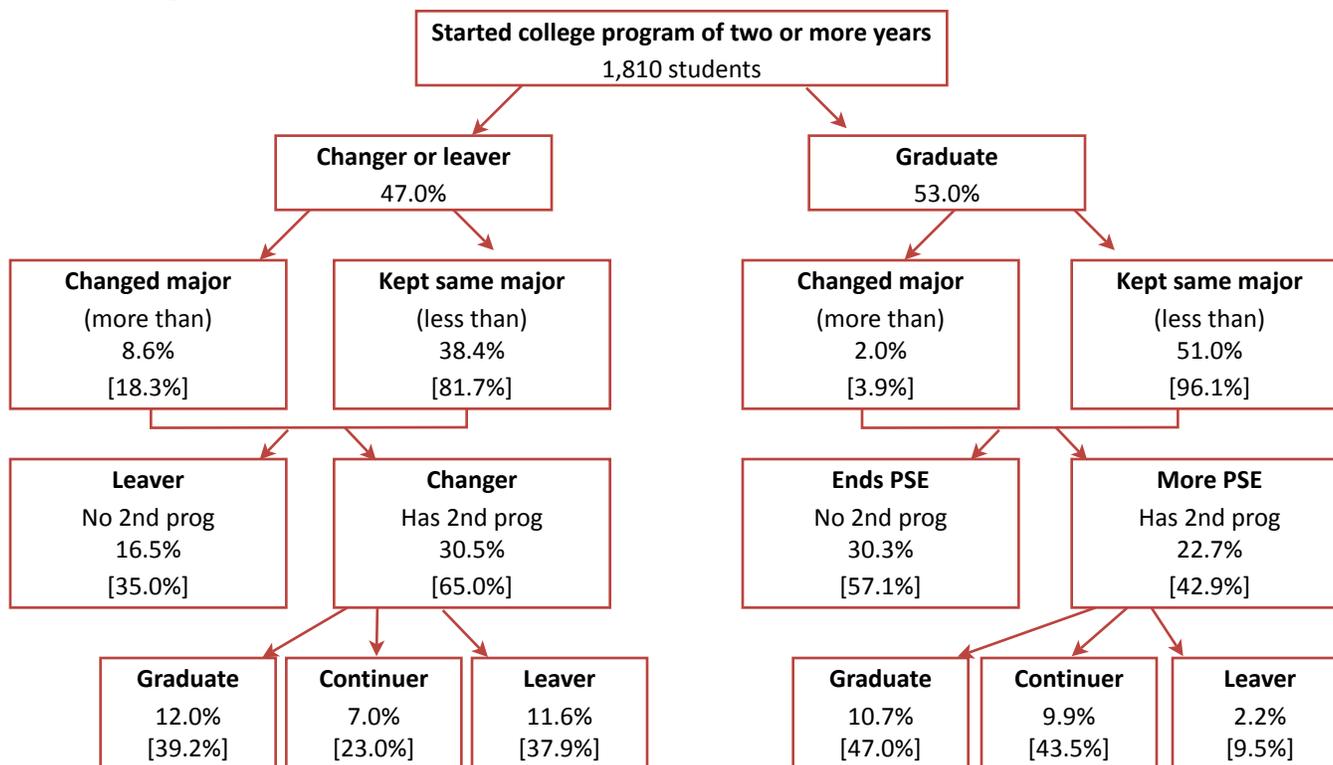The upper percentage is the percentage of all 492 students in this category.
Square brackets indicate the percentage of students in the category immediately above.

Table 6. Destination and outcomes for students who graduated from their college level first program (of two or more expected years) and enrolled in a second PSE program

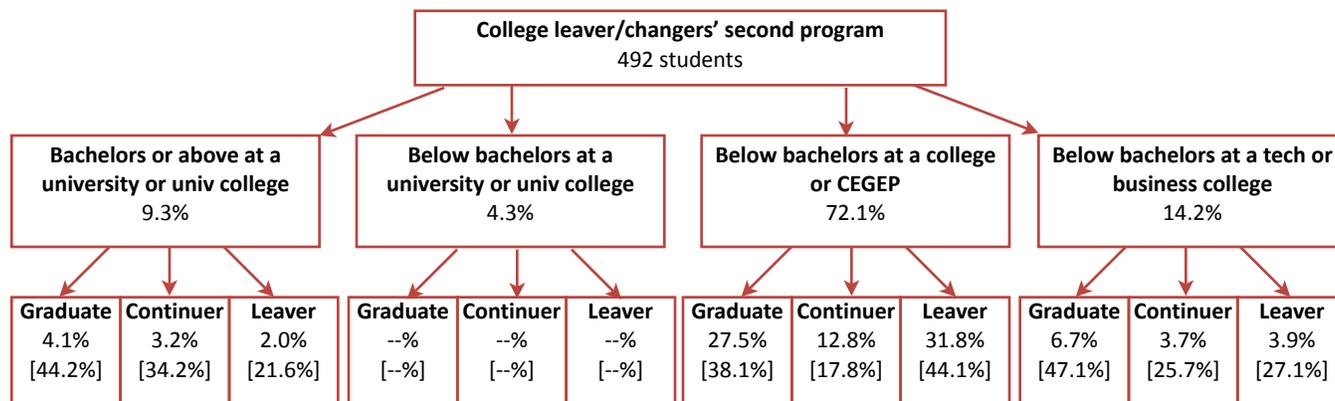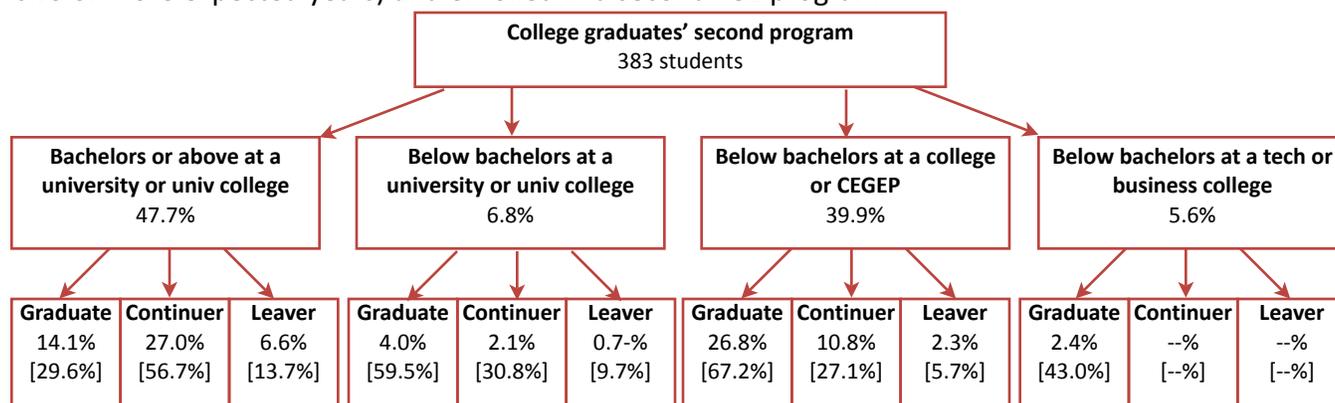| College graduates' second program 383 students											
Bachelors or above at a university or univ college 47.7%			**Below bachelors at a university or univ college** 6.8%			**Below bachelors at a college or CEGEP** 39.9%			**Below bachelors at a tech or business college** 5.6%		
Graduate 14.1% [29.6%]	**Continuer** 27.0% [56.7%]	**Leaver** 6.6% [13.7%]	**Graduate** 4.0% [59.5%]	**Continuer** 2.1% [30.8%]	**Leaver** 0.7-% [9.7%]	**Graduate** 26.8% [67.2%]	**Continuer** 10.8% [27.1%]	**Leaver** 2.3% [5.7%]	**Graduate** 2.4% [43.0%]	**Continuer** --% [--%]	**Leaver** --% [--%]

The upper percentage is the percentage of all 383 students in this category.
Square brackets indicates the percentage of students in the category immediately above.

Table 7. Right hand side variables used in the regression analysis

Personal Characteristics	
male	dv, male
rural	dv, gave rural address
other mother tongue	dv, French or English is not the first language learned
Characteristics of High School	
private HS	dv, attended private high school for at least one year
did coop in HS	dv, took a work experience course in high school
HS grade average	average grade in last year of high school in tens
took break before PSE	dv, interrupted schooling for at least 12 months after end of high school
Characteristics of Parents	
Parents' highest educ	index of the highest level of education achieved by either parent
pse important to parents	index of how important PSE is to parents. Four increasing categories.
had one or no parents	dv, lived with only one or fewer parents in high school
two parents, but step	dv, lived with two parents in high school, but not both biological
Decisions during First PSE Program	
moved out	dv, permanently moved out of parents home before end of first PSE program
part time	dv, was a part time student for some portion of their first PSE program
changed major	dv, changed their major field of study in their first PSE program
PSE Financing	
funding, no repayment	dv, received funding for pse that did not have to be repaid, from parents or others, during first PSE program
student loan	dv, received a student loan during first PSE program
other loan	dv, received any other type of loan during first PSE program
Major Field of Study (agriculture, recreation, health, transportation is omitted category)	
humanities major	dv, majored in humanities, education, fine arts, comm. in first PSE program
social science major	dv, majored in social, behavioural sciences or law in first PSE program
business major	dv, majored in business management or public admin in first PSE program
science major	dv, majored in math, science, engineering, architecture in first PSE program
undecided major	dv, was undecided, did not have a major field of study in first PSE program
Province or region of institution of first program (Ontario is the omitted province/region)	
Atlantic	dv, Newfoundland, PEI, Nova Scotia, New Brunswick
Quebec	dv, Quebec
Manitoba, Saskatchewan	dv, Manitoba or Saskatchewan
Alberta	dv, Alberta
British Columbia	dv, British Columbia

Table 8. Means and standard deviations. Full samples

	First program is bachelors level at a university		First program is two or more years in college or CEGEP	
	mean	std err	mean	std err
male	0.4438	0.0193	0.4825	0.0214
rural	0.1580	0.0127	0.2339	0.0148
other mother tongue	0.1311	0.0132	0.0800	0.0142
private HS	0.0922	0.0103	0.0925	0.0126
did coop in HS	0.2241	0.0170	0.2967	0.0209
HS grade average	8.4341	0.0241	7.8105	0.0323
took break before pse	0.1083	0.0121	0.2164	0.0184
parents' highest educ	7.6144	0.0951	6.2165	0.1250
pse important to parents	3.8041	0.0213	3.6900	0.0301
had one or no parents	0.1113	0.0126	0.1758	0.0163
two parents, but step	0.0676	0.0094	0.0886	0.0149
moved out	0.3895	0.0191	0.2585	0.0179
part time	0.0523	0.0076	0.0741	0.0131
changed major	0.1185	0.0112	0.0970	0.0117
funding, no repayment	0.8101	0.0148	0.6814	0.0207
student loan	0.3868	0.0186	0.3917	0.0209
other loan	0.2604	0.0168	0.1511	0.0140
humanities major	0.1517	0.0134	0.1362	0.0147
social science major	0.2012	0.0152	0.0852	0.0122
business major	0.1145	0.0127	0.1694	0.0164
science major	0.3167	0.0181	0.2286	0.0174
undecided major	0.1258	0.0114	0.2467	0.0190
rec, agric, health major	0.0901	0.0121	0.1339	0.0138
Atlantic	0.1493	0.0094	0.0404	0.0047
Quebec	0.1128	0.0114	0.4114	0.0211
Ontario	0.4424	0.0199	0.4013	0.0215
Manitoba, Saskatchewan	0.0920	0.0074	0.0253	0.0040
Alberta	0.0938	0.0118	0.0679	0.0089
British Columbia	0.0973	0.0105	0.0506	0.0089

Table 9. Probit estimates of marginal effects for students whose first PSE program was at the bachelors level in a university

Sample: Dependent Variable:	First program is bachelors level at a university 1 =Grad from 1st prog 0 =Left/changed 1st prog	Left/changed first program 1 =Did 2nd prog 0 =No 2nd prog	Took a second PSE Program 1 =2nd prog at bach level 0 =2nd prog below bach
male	-0.0462 (-1.23)	-0.0431 (-0.99)	-0.0225 (-0.39)
rural	-0.0663 (-1.10)	-0.0993 (-1.34)	-0.1428** (-1.97)
other mother tongue	0.0476 (0.81)	0.0907* (1.76)	0.1842** (2.98)
private HS	0.0362 (0.63)	0.0852* (1.81)	0.1546** (2.11)
did coop in HS	-0.0578 (-1.24)	0.0700* (1.66)	-0.0550 (-0.83)
HS grade average	0.1274** (5.00)	0.1066** (3.78)	0.1659** (4.32)
took break before pse	-0.0004 (-0.01)	-0.1089 (-1.56)	-0.0452 (-0.51)
parents' highest educ	0.0036 (0.52)	0.0173** (2.17)	0.0068 (0.67)
pse important to parents	-0.0035 (-0.12)	0.0629* (1.77)	-0.0800 (-1.50)
had one or no parents	0.0527 (0.96)	0.0237 (0.45)	-0.0688 (-0.74)
two parents, but step	-0.2367** (-3.25)	-0.0332 (-0.45)	0.0667 (0.75)
moved out	0.1189** (3.11)	-0.1069** (-2.04)	0.0857 (1.45)
part time	-0.2228** (-2.87)	-0.0455 (-0.51)	0.0082 (0.09)
changed major	-0.0831 (-1.45)	0.0595 (1.35)	0.0980 (1.39)
funding, no repayment	0.1674** (3.42)	-0.0826** (-2.23)	0.1556** (2.13)
student loan	0.0981** (2.37)	0.0343 (0.88)	0.0438 (0.72)
other loan	0.0073 (0.17)	0.0055 (0.12)	-0.0118 (-0.18)

Table 9 continued

Sample: Dependent Variable:	First program is bachelors level at a university 1 =Grad from 1st prog 0 =Left/changed 1st prog	Left/changed first program 1 =Did 2nd prog 0 =No 2nd prog	Took a second PSE Program 1 =2nd prog at bach level 0 =2nd prog below bach
humanities major	-0.1337*	-0.0996	0.1187
	(-1.73)	(-0.90)	(1.06)
social science major	-0.1347*	-0.0666	0.0451
	(-1.74)	(-0.68)	(0.38)
business major	-0.0785	-0.1289	-0.0233
	(-0.79)	(-0.80)	(-0.15)
science major	-0.1823**	-0.0221	0.0572
	(-2.67)	(-0.24)	(0.47)
undecided major	-0.2396**	0.0427	0.0429
	(-3.14)	(0.55)	(0.38)
Atlantic	-0.0548	0.0282	-0.0135
	(-1.14)	(0.55)	(-0.19)
Quebec	0.0376	0.0674	-0.1303
	(0.58)	(1.01)	(-0.79)
Manitoba, Saskatchewan	-0.0563	0.0697	-0.1295
	(-1.09)	(1.58)	(-1.59)
Alberta	-0.1144	0.0391	-0.1381
	(-1.35)	(0.63)	(-1.09)
British Columbia	0.0796	-0.1016	-0.3967**
	(1.43)	(-1.01)	(-2.97)
N	1750	632	511
Mean of dependent variable	0.6736	0.8048	0.7053

** indicates statistically significant at the 5 percent level
* indicates statistically significant at the 10 percent level

Robust z statistics are in parentheses.

Table 10. Probit estimates of marginal effects for students whose first PSE program was in a college or CEGEP program of two or more years in length

Sample: Dependent Variable:	First program two or more years in college/CEGEP 1 =Grad from 1st prog 0 =Left/changed 1st prog	Left or changed first program 1 =Took 2nd prog 0 =No 2nd prog
male	-0.1298**	-0.2141**
	(-2.83)	(-3.66)
rural	-0.0537	-0.0242
	(-1.23)	(-0.38)
other mother tongue	0.0301	0.0997
	-0.33	(0.91)
private HS	0.0558	0.1018
	(0.84)	(1.18)
did coop in HS	-0.0265	-0.101
	(-0.49)	(-1.34)
HS grade average	0.1169**	-0.0006
	(4.36)	(-0.02)
took break before pse	-0.0119	-0.0512
	(-0.22)	(-0.73)
parents' highest educ	-0.0111	0.0282**
	(-1.27)	(2.36)
pse important to parents	0.0381	0.026
	-1.1	(0.7)
had one or no parents	-0.2505**	-0.0362
	(-4.62)	(-0.47)
two parents, but step	0.0238	-0.0361
	-0.28	(-0.30)
moved out	0.0751	0.104
	(1.55)	-1.59
part time	-0.1401	-0.1215
	(-1.54)	(-0.99)
changed major		0.1695**
		(2.82)
funding, no repayment	0.0981**	-0.0044
	(2.06)	(-0.07)
student loan	0.0737*	-0.1532**
	(1.65)	(-2.12)
other loan	0.1758**	-0.0446
	(3.64)	(-0.54)

Table 10 continued

Sample:	First program is bachelors level at a university	Left/changed first program
Dependent Variable:	1 =Grad from 1st prog 0 =Left/changed 1st prog	1 =Did 2nd prog 0 =No 2nd prog
humanities major	0.0099	-0.0725
	-0.13	(-0.53)
social science major	-0.0733	-0.2608
	(-0.70)	(-1.60)
business major	-0.089	-0.1121
	(-1.13)	(-0.85)
science major	-0.08	0.0066
	(-1.11)	-0.06
undecided major	-0.107	-0.1942
	(-1.50)	(-1.58)
Atlantic	0.0199	0.0763
	-0.27	(0.9)
Quebec	-0.0617	0.0862
	(-1.10)	(1.08)
Manitoba, Saskatchewan	-0.1323	-0.0192
	(-1.44)	(-0.17)
Alberta	-0.2697**	0.0462
	(-3.58)	(0.53)
British Columbia	-0.1673	0.2495**
	(-1.64)	-4.88
N	1213	472
Mean of dependent variable	0.5908	0.6915

** indicates statistically significant at the 5 percent level

* indicates statistically significant at the 10 percent level

Robust z statistics are in parentheses.