TRANSFER STUDENT PERSISTENCE AT ALGONQUIN COLLEGE AND UNIVERSITY OF OTTAWA

by

Ross Finnie

Graduate School of Public and International Affairs and
Education Policy Research Initiative, University of Ottawa

Dejan Pavlic

Education Policy Research Initiative, University of Ottawa

Stephen Childs

Education Policy Research Initiative, University of Ottawa

Victoria E. Díaz

School of Political Studies and Institutional Research and Planning, University of Ottawa

Pierre Mercier

School of Psychology and Institutional Research and Planning, University of Ottawa

Wayne Lewrey

Institutional Research and Planning, Algonquin College

***Corresponding Author**:* Ross Finnie (rfinnie@uottawa.ca)

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ABSTRACT

This report examines the persistence – or retention – of students who transfer from Algonquin College to the University of Ottawa or vice versa by comparing transfer student retention rates to students who are directly admitted at either institution on the basis of their high school record. After identifying the overall differences in the rates of each group at each institution, we use a logistic regression framework to examine the extent to which various student characteristics (age, sex, high school performance, etc.) explain these differences.

Algonquin College transfer students are considerably more likely to leave the University of Ottawa than our high school comparison group. The risk is especially pronounced for transfer students who begin their university studies on a part-time basis. We are not able to identify any clear reasons for the higher leaving rates based on the explanatory variables included in our models. Perhaps most notably, high school grades do not explain them. While the transfer effect disappears when entry age is taken into account, due to transfer students being older, on average, and leaving rates being generally higher in the estimated models, closer inspection reveals that the effects of age are quite different for the two groups, meaning that a different analytical approach is needed to identify the sources of the observed differences in retention rates between the high school entry and transfer groups.

In contrast, the University of Ottawa transfer students are no more likely to leave Algonquin College than the high school comparison group at that institution. Interestingly, they are *more* likely to leave, other factors held constant, when we take high school grades – which are higher for the transfer students – into account.

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Responsibility for the analysis and the opinions expressed in the report remain solely with the authors.

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Introduction

Once students are at a given PSE institution, a number of pathways are open to them, including graduation, switching to a different program, or leaving the PSE institution altogether, either abandoning PSE studies or choosing to study elsewhere. Differing pathways also exist upon graduation: some students will enter the workforce, others will choose to pursue more education.

Education in Ontario is provided by universities and colleges. The two systems have different governing structures, government oversight and often differing mandates and are thus often seen as entirely separate vehicles for providing post-secondary education (PSE). However, the two systems are not mutually exclusive. Students attending (or graduating from) college may wish to continue their studies at a university. Indeed, universities may have collaborative programs with colleges, or policies to recognize some college credits either on the basis of a college program or on a case-by-case basis. Conversely, students attending universities may choose to transfer to college either before graduating or after. Indeed, colleges can attract university graduates by offering a number of accelerated programs that specifically target university students.

Certain Canadian provinces, Alberta and British Columbia in particular, have moved to a more articulated education system where education received in college will formally qualify for transfer credit at a given university institution. The recognition of credits under an articulated system is based on a broader list of programs and collaborating institutions. Indeed, the college system in these provinces is meant to provide a host of programs with educational content in some ways parallel to that of the affiliated university providers.

In comparison, the PSE system in Ontario is more fractured. Historically, it has not been designed in such a way as to ensure that the content of college courses is substantially similar to courses in a university program even within the same subject matter, and articulation agreements between colleges and universities are generally structured on a program by program basis at the institutional level. Nonetheless, college students do transfer from college to university and the opposite pathway also occurs.

In this context, the Government of Ontario has indicated its desire for greater collaboration between colleges and universities, and more standardized procedures for recognition of college credit in university programs, in particular. Essentially, transfers to be made easier.

In this report, we investigate one important aspect of this set of issues by presenting the findings of an empirical analysis of the persistence – or retention – of transfer students in comparison to students entering university or college taking a more 'standard' pathway by entering university or college directly after high school.

To carry out this this analysis, we use data from one college and one university across which transfers are, in relative terms, fairly common – the University of Ottawa and Algonquin College. The two institutions collaborated in this project by providing data on transfer students before and after their moves, along with comparable data on comparison groups of high school entry students at each institution.

Administrative data have much to recommend them for the analysis of student persistence. Firstly, usual concerns about sample attrition and bias are minimized as the researchers have access to the whole population of students in any given year at each institution. Secondly, administrative data are

by nature longitudinal – or at least can be arranged into a longitudinal form from the cross-sectional files which are initially provided – which allows us to track students year-over-year and thus determine their persistence.

In this analysis, we examine both sides of the transfer equation. Firstly, we compare students who transfer from Algonquin College to the University of Ottawa with direct high-school entry students attending the University of Ottawa. We then reverse the exercise and compare transfer students from the University of Ottawa with direct high-school entry students attending Algonquin College.

To make the comparisons in which we are interested, we use a modeling framework which allows us to first identify the extent of any overall differences in persistence rates across the different groups, and to then identify which student characteristics (e.g., gender, high school grades, program of study) are positively or negatively related to student retention, to finally assess whether differences in these factors help explain the observed differences.

The report is organized as follows. We begin by describing the administrative data of the University of Ottawa and Algonquin College and how we constructed the datasets used in our analysis, including the restrictions that were imposed in order to generate the specific samples employed, and the definition of the persistence measures used in the analysis. Next, we lay out the descriptive statistics, which includes plotting the leaving rates of high school entry and transfer students across cohorts. The following section presents our regression modeling results, where we identify the overall differences in leaving rates between high school entry and transfer students, and investigate the degree to which differences in the underlying student characteristics drive the observed differences. We conclude the report by summarising our main findings and noting possible avenues for further research.

Methodology

Dataset Construction

One challenge in working with institutional data is that many key variables needed for any analysis must be constructed from a variety of different administrative databases held by the institutions. Our challenge here was all the greater due to the uniformity of data required from transfer and non-transfer students in order to estimate models where direct comparisons are possible. This uniformity was required in a context where there is little similarity in the general structures of the underlying databases from which data were drawn. Therefore, our challenge was not only to navigate through each administrative system on its own, but also to construct datasets, and undertake the analysis, in such a way as to make our analysis files essentially similar and thus comparable across the two institutions.

Institutional Samples

Our analysis is not based on the entire student body at University of Ottawa and Algonquin College. At both institutions, we look at two separate samples. The first sample is what we term our *high school entry* sample. This includes students who enter either institution on the basis of their high school grades, and *not* on a transfer basis from another PSE institution. It is important to note that while it is expected that most of the students opting for this path are likely to enroll right after

completion of high school, this need not be the case. An older student who nevertheless applies to either institution based on his or her high school record will also be included in this sample.

The second sample is our *transfer* sample which includes students who transfer from Algonquin College to the University of Ottawa or vice versa. Whereas the high school entry samples are provided by each institution, more effort is required to match the transfer students at their origin and destination institutions, which we discuss in greater detail below. Finally, we combine these two samples to obtain our *pooled* sample that contains all of our high school entry and transfer students.

It should be noted that that each institution collects different kinds of information on a student transferring in from another institution depending on the receiving institution's need. For example, while the University of Ottawa does not record high school grades for students admitted on the basis of college studies nor their place of residence before entering PSE, this information might be useful for analysis. One richness of the matching procedure is to add this possibility

We test the value of this superior information by comparing models which include only the information on transfer students held by the destination institution to models which take advantage of the data exchange conducted between the two institutions for this study. In particular, estimating the former restricted information models also allows us to compare the results obtained for transfer students from Algonquin College to the University of Ottawa with all Ontario college transfer students admitted to the University of Ottawa, and thus assess the likely generalisability of our Algonquin-specific analysis to the more general population of college student transfers. We present those results after the main findings of the report which focus on the richer data available from the data transfers carried out for the study.

Explanatory Variables

To capture changes in the institutional environment over time, we separate students into cohorts. At the University of Ottawa cohorts are identified according to the first fall session in which a student registered after being admitted to that institution. At Algonquin College, cohorts are identified by observing the first term the student appears in the Algonquin registration file. We assign them a cohort by looking at the fall term of that academic year.

The cohort variable is also used to calculate the student's age at entry at Algonquin College. The student's date of birth is provided in the student records and their age as of September 1st of their cohort year is therefore straightforward to calculate. Rather than including the age directly into our models, we construct several age categories for students from either institution: Below 18, 18, 19, 20-22, 23-26 and 27 and above.

As gender continues to be a source of significant difference in research on postsecondary education access and persistence, it is one of our basic variables.

High school grades have proven to be a strong predictor of future success in a number of persistence studies; therefore, we were highly interested in obtaining high school grades for as many students as possible. The University of Ottawa calculates and provides a high school admission average for all students whose basis of admission is the high school record. This average is based on the top six strongest high school grades in the final year of high school. Algonquin College does not necessarily place the same weight on high school grades: grades calculations in

college are generally of lesser import than in university, and individual college programs will place varying degrees of importance on a student's high school record. Nonetheless, as our overall goal is to make our data as comparable as possible, Algonquin College is able to provide a high school grade flat file. This file details the student's high school performance course-by-course. Since Ontario Academic Credits[1] (OAC) was only a requirement for University and not for college when it existed, we calculate the student's top six grades for college either from grade 12 or grade 12 and any OAC courses available. These high school grades enter into the model using a set of standard high school categories corresponding to letter grades: A+, A, A-, B+, B, C+, C or below.

We expect differences in persistence to emerge based on a student's post-secondary program choice. Considering the number of programs available at both institutions studied, we need to aggregate a number of programs based on their similarity. For the University of Ottawa, we choose the *faculty* a student enrolls into. No exact analogue to faculty exists at Algonquin College, but the *program owner* classification captures similar information. Since program owner categories are slightly more fluid than university faculties, that is, college programs may change their respective owners over time, we match that program level data to the **current** (as of the 2013 academic year) program owner. This means that we may not match historical program owner definitions, but this solution allows for a consistent definition for the analysis. Many program owners at Algonquin College are faculties; therefore, to make our terminology between the University of Ottawa and Algonquin College consistent, we will refer to all program owners as faculties in this report. We note that although students may change faculties over the course of their studies, to simplify the analysis, we concern ourselves only with the first faculty of registration and we do not take into account switching to other faculties.

We include two variables based on geographic information contained within the student records. Past research suggests that geography plays a role not only in access to PSE but also persistence. For both institutions, students were classified as coming from a rural or urban area and as being local or non-local student based on the postal code of their address of origin and classified according to Statistics Canada's definitions of census metropolitan areas.

Two variables included for analysis at the University of Ottawa cannot be constructed at Algonquin College. The first is a student's main official language. This variable is available at the University of Ottawa as it is a bilingual institution. The main usage language is recorded for all students, including not only for students entering from high school, but also for Algonquin College transfers. The second variable included in the University of Ottawa analysis is a student's early Grade Point Average (GPA at the end of the first semester). Therefore, we are able to analyze how student performance in the first semester affects persistence at the university. Unfortunately, we are not (yet) able to do this on the Algonquin side of the analysis.

Finally, in pooled models, where transfer and high school entry students are present together, a transfer variable is coded in order to 'flag' students who are transferring Algonquin College to the University of Ottawa, or vice versa. The transfer variable therefore allows us to compare the two groups. In addition, at the University of Ottawa, we have the ability to identify students who

[1] The Ontario Academic Credit was a fifth year of secondary school education designed for students preparing for post-secondary education that previously existed in the province of Ontario until 2003.

transfer into the university with enough extra credit to advance into an upper year (generally, year 2). We can also identify those students who are enrolled on a part-time basis as early as in the middle of their first semester. This is more frequently the case for the transfer students.

Matching Transfer Students

When the University of Ottawa admits a student, it identifies his or her "basis of admission", i.e. the main past academic record on which the decision is made. Since the University of Ottawa records the name of the institution where the basis of admission was acquired, this was used to identify students coming from Algonquin College. These records were selected and an encrypted list of names and birth dates was sent to Algonquin College where staff were able to match their own records for the students that had transferred to the University of Ottawa based on a student's first name, last name, and birthdate. Algonquin College also utilized Soundex matching in order to capture spelling variations of phonetically similar names.

The matching of students transferring from the University of Ottawa to Algonquin College proceeded slightly differently, as there was no specialized 'university' basis of admission from which we could narrow down the list of student records at the destination institution. Fortunately, Algonquin College does have access to the information contained in the Ontario College Application Service (OCAS) database for its students. OCAS specifically asks the applicants for names of institutions they have either attended or have also applied to. This text field was parsed by Algonquin College for all the different variants of the name "University of Ottawa" (in English and French). This list was then given to the staff at the University of Ottawa who proceeded to match all the records on the basis of first and last name, as well as birth date. The information given by Algonquin College includes all the students who applied to Algonquin College – they did not necessarily attend the college. Therefore, students who cancelled their enrollment at Algonquin College were dropped from this dataset: although their intention was to transfer to Algonquin College, they never, in fact, did. In addition, our matches included students who did not necessarily attend the University of Ottawa but who declared the university as one of the places they applied. This creates a situation where a student very well may attend Algonquin College *first*, followed by attending the University of Ottawa – rather than the other way around. In order to make sure that our transfer students are real transfers, students whose start dates at Algonquin College precede their start dates at the University of Ottawa are excluded from the analysis since they are not actual transfer students.

Persistence Measure

Although the concept of persistence is relatively simple, student persistence can be measured in a number of ways. We may be interested in knowing student persistence in the next semester, next year, or some other time period.

We are interested in observing whether a student leaves over a certain time period (which, as described, will vary depending on the institution). For example, if our persistence measure is persistence up to the beginning of second year, then a student is counted as a ***leaver*** if he or she leaves by that point; otherwise, he or she is counted as a ***continuer***. The leaving variable is thus binary in nature: a student either leaves or does not. However, other possibilities exist: most notably, a student may also graduate.

Since we have two distinct samples – one from a university, and one from a college – it becomes difficult to enact the same persistence measure on both due to differing lengths of programs. For example, most undergraduate programs at the University of Ottawa have a normal completion time of four years. As with most universities, some three-year and five-year programs also exist. For university students, we therefore look at students who are still in attendance by the third year. We censor students who graduate before this time, but expect that very few students will be able to graduate by then.

As with the University of Ottawa, programs at Algonquin College can be of varying length; however, program length – with some exceptions – is generally shorter, and can be as little as one year in certain instances. Therefore, the persistence measure we adopt is shorter: we look at the number of students who still attend college by the second (rather than third) year.

Rather than bring the two measures back to their lowest common denominator, namely one year, we chose to measure retention as far into the program as possible on the grounds that all occurrences of leaving before the degree is complete are part of one and the same phenomenon of "unsuccessful studies".

The treatment of graduates depends on the institution. We add the graduates and continuers together into our 'positive' outcome at Algonquin College. The reasoning here is pragmatic: whereas there will be very few students graduating University of Ottawa by the beginning of third year, there will be a substantially larger group of students who finish a program at a college in a year. Censoring these students from our models may skew our persistence model in unintended ways.

Model Framework

A standard logit regression framework is used in this research which may be expressed as follows:

$$Y = X\beta + \varepsilon$$

where Y is the leaving measure (with a null value indicating a student has continued and the value of one indicating a student has left), X represents a set of covariates that influence Y, and β represents the coefficients associated with each of the variables included in X; ε is the error term. Once the raw logit model results are generated, we compute the marginal effects for each model in order to facilitate the interpretation of the results. The results presented in this report can be interpreted as the change in the leaving rate (in percentage points) for students with that characteristic.

We calculate several model specifications. In one set of models, henceforth termed ***separate*** variables models, the explanatory variables are included individually without controlling for any other independent variables. The purpose of this is to understand the relationship between retention and each predictor under study. These results are provided in Appendix tables. However, the main focus of the paper is on a set of ***joint*** variables models where independent variables are included simultaneously in the equation system in order to assess their unique effects.

In addition, the models are computed either for high school entry alone, pooled high school entry and transfer entry, and, finally, transfer entry alone. These sets of analyses are conducted for both the University of Ottawa and Algonquin College.

Results

Descriptive Results

Although the primary focus of this paper is retention modeling, raw leaving rates and sample distributions by different characteristics are detailed in the Appendix for the University of Ottawa (Table A1) and for Algonquin College (Table A2). The leaving rate of the University of Ottawa students by cohort vary whether they are high school entry students or transfers. However, it is clear from the outset that transfer students have higher leaving rates. Their leaving rates vary from 25% to 38%, with the lowest being observed in the first cohort analyzed. Leaving rates rise thereafter and peak in 2003 at 37.5%. They then fall to 26.1% and begin to sharply increase again from 2007 onwards. High school student leaving rates vary between 17% and 22%. Interestingly, leaving rates shrink from 1997 to 2003 when they are lowest (16.7%). This is the same year when transfer leaving rates are highest. Whereas the transfer dropout rate decreases thereafter, it increases for the high school entry students, peaking at 22.4% in 2005 stabilizing in the vicinity of 21% thereafter. One possible explanation for this can be the change in the Ontario High School curriculum introduced around 2003, the year of the so-called double cohort. Ontario abolished year 13, which was only required for the students in tending to attend university, thus potentially diminishing their level of readiness. At the same time, some of the material which used to be covered in year 13 was adapted and inserted in years 11 and 12 for all, potentially increasing the level of readiness for students going to college relative to their predecessors.

The raw leaving rate of Algonquin College students varies from 21% to 31% for high school students and from 23% to 39% for transfer students. The trend in leaving rates between the two groups is almost diametrically opposed, especially in the beginning: high school students are least likely to leave in 2003 (21.2%); in contrast, this is the year that the transfer students are most likely to leave (38.6%). Leaving rates for high school students rise thereafter and stabilize between 28% and 30%, though the peak leaving rate is observed in the final cohort analyzed, at 30.5%. This pattern is consistent with the explanation offered above about the impact of the change in the Ontario High School curriculum. Transfer student leaving rates decrease every year after 2003 until 2009 when they record their lowest rate (23.4%). An uptick (to 27.2%) occurs in the final year we observe where the leaving rates in both groups are much closer We have no explanation for the retention pattern of university to college transfers but also no clear expectation of it to be influenced by the high school curriculum change.

Models

This section presents the modeling results, first at the University of Ottawa and then at the Algonquin College. Interesting similarities or differences in transfer leaving patterns between the two institutions are noted.

University of Ottawa Models

We start the University of Ottawa analysis by focusing on the university's high school sample. We present the joint model analysis of this sample in Table 1; we also make the results of the separate model available in Appendix Table B.

The joint high school model includes only the University of Ottawa students who are admitted to the university on the basis of their high school record. We present this model briefly in order to give

context to our pooled model which will follow. We note that a number of variables affect retention. As was the case in the univariate results, students from earlier cohorts are less likely to leave than those entering university after the double cohort year (2003) even when multiple other variables are part of the equation. Males are more likely to leave, as are rural and students who reside outside the Ottawa area. Younger students are considerably less likely to leave than older ones (in particular, the 20-22 and 23-26 age categories). These general patterns are maintained once we take high school grades into account. High school performance itself seems to have a large effect on retention, with the students with highest grades being significantly less likely to leave than those with the lowest grades. The addition of the faculty variable to the model does not dramatically affect the overall pattern; however, it does show us that choice of faculty plays a considerable effect on persistence. In particular, students from Arts and Engineering faculties appear to be considerably more likely to leave than students from Business Administration and especially our reference group, Health Sciences. Finally, we add in University of Ottawa grades for the first fall semester; although the overall results remain similar, the effect of the high school grades is greatly diminished. This is not surprising since significant correlation between high school and PSE grades is inevitable.

Next, we turn to the pooled sample, which include the students having transferred from Algonquin College to the University of Ottawa in addition to the high school entry students. The analysis proceeds in a fashion similar to the joint model just described and the results are presented in Table 2 and the separate model available in Appendix Table C. A separate model block is added which captures our set of transfer variables: the transfer indicator, year of study upon entrance (advanced standing), and attendance status. In this first model block, we find that transfer students from Algonquin College are more than 6 percentage points more likely to leave by the third year of their studies at the University of Ottawa than high school entry students. The role that attendance status plays in this model is striking: part time students are more than 24 percentage points more likely to leave than those attending full time. Finally, we note that whether a student is entering first or second year does not appear to play a large effect in transfer persistence; however, those entering into third year are considerably less likely to leave. This is perhaps unsurprising, considering their advanced standing.

Our second model block adds background information, such as cohort, gender, age, and geographical origin, to both the high school and transfer students. Once we add this information, transfer students are no more likely to leave than high school students. The transfer effect disadvantage disappears as soon as we add the background variables, and this is maintained when we take high school grades, faculty and the University of Ottawa starting grades into account. The various independent variables from gender through to PSE grades behave similarly to what was observed in the high school sample alone.

The disappearance of the transfer disadvantage is striking. Since the transfer effect disappears as soon as we add our background variables, a stepwise approach is used to back up and isolate which specific independent variable(s) capture the variance initially associated with being a transfer student. As shown in Table 4, the transfer effect remains largely unchanged with the addition of most independent variables, even increasing slightly when adding only the non-local variable to the transfer variables.

The only exception is that the transfer effect is effectively wiped out when age is entered. This occurs because in effect transfer students are systematically older by virtue of having gone to college first. In Table A1, we can see that the majority of high school entry students (48%) are 18 while the majority of transfers (47%) are 25. Once age is *controlled for*, the different leaving rates of transfer students disappears.

At least a couple of hypotheses can be offered. One would be that what causes the elevated risk for Transfer/Older students is something about their academic path. For example, students who go to college do not generally take the same courses during their final high school year as those who go to university, so they may be less well prepared for university-type courses when they transfer. We cannot test this hypothesis with the data at hand, but this could be investigated by including the specific types of courses taken in high school (and the marks gained in these different types of courses) in the analysis.

Another hypothesis relates to how the social interests and pressures of older students may be different from younger students. For example they may be under higher pressure to work while studying because they are beginning a family or have otherwise established a lifestyle that takes more money to support. There is one piece of evidence in the data which converges with this and it is the fact that they more frequently study part time at the university. This would be consistent with more hours being devoted to work outside the program of study.

We now turn our attention to the transfer-only model in order to examine the particular characteristics which may affect persistence among transfer students alone. The effects of these characteristics may be partly or wholly different than the effects found in the high school only or in the pooled models.

The transfer-only joint variables results are presented in Table 3, while the separate variable models are in Appendix Table D. The transfer model block is no longer present since, by definition, all students in this sample are transfers. We do keep the attendance status and year of study upon entrance indicators, however. The part-time effect here is even larger than it is in the pooled models, with students who start part-time being 27.5 percentage points more likely to leave than those entering as full time students. This is a very large effect that could be explained by a host of possibilities, including labour force attachment, family obligations, motivation, etc. Clearly, more data are necessary to explain this effect.

The effects of the year of study upon entrance are not significant in any year, although they become so once the background variables are added to the model. Transfer students entering in second year are 10 percentage points less likely to leave in the model which includes background characteristics; and those entering in third year are 12.7 percentage points less likely to leave. Attendance status is the only other significant variable.

No other variable is significant in the background model and even our point estimates sometimes follow different patterns than what we see in the pooled model. In general, the addition of high school grades does not seem to play a significant role, unlike for high school students.

The addition of faculty is notable insofar as it does not seem to matter: unlike in our pooled model, faculty selection does not have statistically significant effects on persistence. Finally, the addition of starting first semester post-secondary grades does little to change our estimates. The large part-time effect is slightly diminished, while the year of study upon entrance persistence effects shrink

in the second year and are no longer statistically significant in the third. Interestingly, the choice of faculty, in particular engineering, becomes important, as engineering students are 16.9 percentage points less likely to leave than those in health sciences once their first semester grades are taken into account. Post-secondary grades themselves do matter, with students with very low grades far more likely to leave. Considering that persistence and PSE grades are inevitably linked, it is in fact surprising that higher leaving rates are only associated with students with very low grades (D+ or below).

We now turn back to our pooled models in order to investigate the specific background variable(s) which explain the transfer effect. To do so, we run a set of regressions using our pooled sample where we add the background variables one at a time. These results are shown in Table 4. The transfer effect remains largely unchanged with the addition of our variables, even increasing slightly when we only add the non-local variable to our transfer variables. The only exception is that the transfer effect is effectively wiped out when we add the age variable. This would suggest that it is a difference in the average age of the transfer group that explains their higher leaving rates, this conclusion is further substantiated by our observation that most students in the high-school entry model are in the youngest age categories, whereas transfer students are likely to be older.

However, recalling our previous analysis of the transfer-only model, age does not actually appear to have any significant effect on leaving rates for transfer students specifically. This is unlike high school entry students and also somewhat unexpected given the stepwise regressions on the pooled direct entry and transfer models reported above, which showed that the older age of transfer students seems to be related to the higher overall leaving rates of transfer students.

age seems to be a transfer disadvantage. It should be noted however, referring back to Table A1, that the majority of the transfer students fall in the categories of age 20 and above and that, in these age categories, their leaving rates fall in the same range (24-35%) as high school entry students (25-29%). So the lack of an age effect may not necessarily contradict the rest of the evidence.

We also wish to briefly discuss the results we obtain by running the alternative Algonquin College sample and all Ontario colleges sample which is based only on the information obtained from the University of Ottawa without applying our matching procedures. The results are very similar to our matched Algonquin sample, particularly as they pertain to transfer student effects and how they change across the different specifications of our pooled models (found in Appendix Tables H and J). This provides at least some evidence that the results we find for Algonquin transfers may generalise to the more general population of college transfers.

Algonquin College Models

We now reverse our analysis by examining students transferring from the University of Ottawa to Algonquin College and comparing them with students who attend the college on the high school basis of admission.

Once again, we start with the high school entry model which we present in Table 5. The separate model specifications are available as a reference in Appendix Table E. Turning to our background model, we see similar – but not identical patterns – as what we observe in our corresponding University of Ottawa model. Males are more likely to leave than females, although this effect is halved once we take high school grades into account. Interestingly, rural students are slightly less

likely to leave, a result opposite to what we find at the University of Ottawa. However, the effect is small and disappears when we add high school grades. The non-local effect exists and mirrors what we find at the University of Ottawa: students outside the Ottawa area are more likely to leave. Not only does this effect not disappear when adding faculty or high school variables but it becomes *larger* once we do this. Students starting at age 18 or less are more likely to leave than those aged 19 while those in the 20-22 age bracket are more likely to leave than those aged 19. The leaving rates return to below that of the 19 years old for students aged 23 and above, although the importance of this observation is diminished by the fact that they represent less than 7% of the sample. This general pattern does not vary dramatically when faculty and high school grades are added to the model. As with the University of Ottawa, faculty selection itself matters. With high school grades in the model, students entering the areas of Health, Public Safety & Community, Business, or Algonquin College in the Ottawa Valley are less likely to leave than Hospitality and Tourism, while Arts, Media and Design, and Technology and Trades (once we add in high school grades) faculties are considerably more likely to leave than students from other faculties. Finally, high school grades follow the expected pattern: students with higher grades are less likely to leave than those with lower grades.

The results of the Algonquin College pooled models are presented in Table 6 and the separate models are available in Appendix Table F. These are constructed in a manner similar to the equivalent for the University of Ottawa with the following caveats. To start, we only include the transfer variable. Unfortunately, we do not (yet) have information on attendance status as we do with the University of Ottawa set, so we cannot include an analogous variable. Also missing is a variable which includes any advanced standing at Algonquin College.

At first, the findings appear very different from those at the University of Ottawa as students transferring from the University of Ottawa to Algonquin College are no more likely to leave than those entering from high school. Furthermore, leaving rates of university to college students become negative with the addition of the faculty variable. However, in the full model which includes high school grades, transfer students are shown to be 4.9% more likely to leave than the direct entry from high school students. Hence, for the same set of high grades, the transfer students have higher leaving rates than their counterparts who enter on the high school basis of admission. In other words, a transfer student is more likely to leave his or her chosen program than an Algonquin student with the same top six high school average. These results show the importance of taking account of an extended set of factors when analysing the relative leaving rates of direct entry and transfer students.

Other variables from our background, faculty and high school models change slightly, but not dramatically; perhaps most interestingly, the higher leaving rates among males are entirely erased once we take high school grades into account.

We next present a similar model specification computed only for the University of Ottawa students transferring to Algonquin College. These results are available in Table 7 and separate specification models are in Appendix Table G. Our examination of the transfer students immediately shows differences from both high school entry and (to a slightly lesser extent) pooled models. Whereas the 2003 (double) cohort shows the lowest rates of leaving in the high school model, the trend among the transfer students is reversed and they are most likely to leave in that year. The effect is large, although only slightly statistically significant ($p < 0.1$).

Unlike what we find in our analysis of the University of Ottawa dataset, a relatively large number of variables retain their statistical significance in the transfer model. Unexpectedly, we have an interesting switch in gender persistence. While not statistically significant in the background model, once we add the faculty and high school grades to our model, males are over 5 percentage points *less* likely to leave. The rural and non-local effects are not statistically significant in any of our model specifications. However, age has dramatic effects on persistence. Younger students are considerably more likely to leave. The sample size, especially for students below 18 years of age, is small but the effects large. Clearly, there is something unpredictable for a group of students who have managed to attend university at such an early age and then transfer to college. Students younger than 18 are 36.6 percentage points more likely to leave than our reference group by second year in our background model, and the effect is diminished by just over a percentage point when we add faculty choice and high school grades into our model. Those who are 18 years of age do only slightly better: they are over 29 percentage points more likely to leave than our omitted group (19) across our different model specifications. Whereas the 20 to 22 age category is associated with higher leaving rates in both our high school and pooled models, here they are almost 8 percentage point less likely to leave in every specification. The leaving rates are even lower for our next two age categories: the 23 to 26 year olds have leaving rates that are over 11 percentage points lower than our reference group, while those 27 and above are around 10 percentage points (and over 11 percentage points once we add all the variables) less likely to leave.

Since colleges have set up a concerted effort to appeal to university graduates by offering short intensive skill training and enhancement programs, the low leaving rates of older age groups may possibly be explained by relatively short nature of such programs, as well as increased motivation from students to obtain or enhance particular skills. More information about program pathways would help us in disentangling these effects. Interestingly, and somewhat similar to what we find at the University of Ottawa, choice of faculty does not seem to have a statistically significant positive or negative persistence effect.

As with the University of Ottawa, high school grades seem to play little overall effect for the transfer students from this set. Students with the highest grades (A+) are considerably less likely – by 11.5 percentage points – to leave than the reference group (B+), although the effect is not reliable at the .05 level. No other high school grade category provides statistically significant results.

Further Work

This report presents some initial results from ongoing research collaboration between the University of Ottawa, Algonquin College and the Education Policy Research Initiative (EPRI). The work of gathering the data and putting it into a form suitable for analytical work represents the majority of person-hours of this project.

In the immediate future, two key sets of data could be added to the existing file. The first is data on student grades earned at Algonquin College. The time and resource requirements for calculating a grade point average for each student over the entire time period prevented its inclusion in this report. We anticipate that work will proceed as resources become available at Algonquin.

The second dataset that can be added is census information based on the student's postal code from their original application to the University of Ottawa or Algonquin College. This includes

information of the average socio-economics status in the student's neighbourhood. This can serve as a proxy for students' family background characteristics that are otherwise unavailable.

Overall, it becomes clear that we need to take into account the different underlying model structure between transfer and high school entry students. This is especially true for our University of Ottawa analysis. We may be able to refine our models either by adding interaction terms to our pooled model, or possibly employing some sort of a non-linear decomposition technique.

Conclusion

The use of datasets from the University of Ottawa and Algonquin College has enabled us to undertake a rich multivariate analysis of the comparative leaving rates of students at the college and at the university, including those who switch from one to the other.

We find that Algonquin College students transferring to the University of Ottawa are considerably more likely to leave their studies by year 3 (the leaving measure used in the analysis) than direct entry students. This effect appears to be explained by transfer students being older, but further investigation would be required to better understand what these age effects are capturing.

Also of interest is that few of the explanatory variables included in the retention models turned out to be statistically significant for the transfer-students-only sample, further pointing to the precise reasons for their higher leaving rates being left unexplained in our analysis. Of most interest in this respect is, perhaps, that high school grades do little to explain the higher leaving rates of transfer students: they do not appear to be leaving more because they were poorer students to start with.

The reverse analysis – of University of Ottawa students transferring to Algonquin College – gives us a different picture. Overall, these transfer students prove to be no more likely to leave than high school entry students.

After controlling for faculty selection using our modelling analysis, however, transfer students are, *ceteris paribus,* found to be less likely to leave – suggesting that they tend to have higher enrolment rates in programs which have higher leaving rates overall, but do not have the overall higher leaving rates one might expect as a result.

Conversely, we find higher leaving rates on the part of university transfer students to college than for non-transfer direct entry college students when grades are controlled for. In other words, the University of Ottawa transfer students to Algonquin College have better grades than non-transfer students, but their leaving rates are not as a result of that lower than direct entry Algonquin College students.

This analysis has used an innovative data matching approach and a variety of empirical methods to provide a unique analysis of leaving rates of college and university students to compare the record of direct entry students to those who transfer from the other sector. Further analysis could go in a number of directions.

One such direction would be to extend the analysis to other/more institutions either side in order to see how the results found here compare to other sets of students. One way to do this would be to restrict the analysis to using the data directly available to each institution on their transfer students, thus rendering any such analysis much less complex as compared to going to the first institution attended to get data for the transfer students. Such an analysis could likely scale up

relatively easily, especially if based on the use of the PSIS (Post-secondary Information System) administrative data available already being gathered from PSE institutions by Statistics Canada.

An alternative approach would be to dig *deeper* into the leaving rates found here to help us better understand the observed patterns and what gives rise to them. In this case, *more* data would be required on students' backgrounds, including their detailed post-secondary and even high school records – such as which particular courses they took, how they did in each course, etc. Such an approach may be possible with PSIS, but would require a much more complex analysis which linked students to their prior histories in this way. The other option would be more data sharing across PSE institutions of the type used here.

We are just beginning to tap into the potential of administrative data. The analysis reported here is but one step on that path.