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## **Transfer Pathways in Postsecondary Education: York University and Seneca College as a Case Study**

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## Executive Summary

Despite research interest in the motivations, experiences and challenges of Ontario postsecondary students who have transferred from college to university, there has been too little in-depth quantitative analysis on these topics. This study contributes to the literature by documenting transfer between York University and Seneca College – two institutions whose strong partnership has encouraged a high volume of transfer in both directions – over a period of 12 years (2000-2012).

Using this partnership as a case study, we investigate how students acquire postsecondary credentials by examining the characteristics of students who transfer between the two institutions. To understand the factors behind credential attainment, we seek to determine the relative importance of socio-demographic characteristics, program attributes (including program affinity) and student academic performance in predicting the time to completion and probability of graduation. The research questions were:

1. How many students and graduates are moving from Seneca College to York University and vice versa?
2. What are the socio-demographic characteristics and academic backgrounds of college-to-university and university-to-college transfer students? How long does it take for them to graduate?
3. What is the probability of the students persisting to a credential at either institution and how long does it take to attain the credential relative to the standard program length?

## Methods

This study developed a matching algorithm using student enrolment history and administrative information to identify students who moved between the two institutions between 2000 and 2012. The final sample consisted of 9,330 students who went from Seneca to York and 5,413 from York to Seneca. The effects of student demographics, program features and academic factors on credential attainment and time to completion were measured. Demographic factors included gender, mother tongue, immigration status, age, neighbourhood income and parental education. Program features included admission basis, program of entry, program length, relatedness of program pre- and post- transfer, and transfer credits granted. Academic factors included the course type and final grade in grade 12 English, credential attainment at the sending institution, and cumulative standing or graduation GPA at the sending and receiving institution. For Seneca-to-York transfers, aspirations for university at the point of entry to Seneca were also studied.

## Results

### *College-to-University Transfer*

Of the 9,330 students who transferred from Seneca College to York University, 64% were Seneca graduates. By 2012, 47% had graduated, 20% were still enrolled and 33% had withdrawn from York. In total, 14% did not graduate from either York or Seneca.

Of the Seneca-to-York transfer students, 59% were female, 74% were Canadian citizens, 32% were older than 25, 39% did not have French or English as their mother tongue, and 27% did not have at least one parent with some postsecondary education. At the start of their Seneca studies, 68% reported aspirations for university.

Students who completed their Seneca credential before transferring were most likely to have completed a two-year diploma (72%), while 17% had a three-year diploma. Seneca transfer students who went on to graduate from York were more likely to complete a three- (55%) rather than a four-year degree (45%). The major university programs for Seneca-to-York transfer students were social sciences (44%), business (20%) and humanities (14%), with 51% entering a program that was related to their college program. The average amount of transfer credit provided by York was 25.6 credits, equivalent to almost one year at York. Transfers who went on to graduate from York were provided more transfer credits at entry (30 credits, compared to 21 for those who did not graduate).

College-to-university transfer students who ultimately graduated from York were academically stronger throughout college and university. Overall, the average sending GPA at Seneca was 73%, and the receiving GPA at York was 69%. Those who eventually graduated from York had a sending GPA at Seneca of 77% and a York average of 75%. In comparison, those who withdrew from York had a Seneca average of 69% and a York average of 59%. Of those who graduated from a four-year degree, 76% did so within four years, whereas 57% of those who completed a three-year degree did so within three years.

Although grades appear to matter for credential attainment, not all higher-achieving students graduated, indicating that other factors than just academic performance are important. Regression analysis showed that transfer students who were female, younger, non-citizens and non-native English speakers were more likely to graduate from York. Those who had achieved higher Seneca and/or York grades and those who received more transfer credit were more likely to graduate, but those who entered business or natural and applied science were less likely to graduate. Aspirations for university at the start of college and relatedness of program pre- and post-transfer had little or no influence. For the time to completion models, similar factors as the graduation models were significant in reducing the time to completion- minus standard program length variable. The exceptions were citizenship and age, which did not influence time to completion.

### *University-to-College transfer*

Of the 5,413 students who moved from York to Seneca between 2000 and 2012, 61% had not graduated from York. Of those who transferred, by 2012 25% had withdrawn completely from Seneca, 59% had graduated, and the remainder were still enrolled. In total, 18% did not graduate from either York or Seneca.

Of the York to Seneca transfer students, 61% were female, 91% were Canadian citizens, 27% were older than 25, 13% did not have French or English as their mother tongue, and 21% did not have at least one parent with some post-secondary education. When entering Seneca, almost two-thirds reported plans to enter the workforce following graduation.

Among the transfer students who had graduated from York before transferring, 48% completed a three-year degree and 52% a four-year degree. Of the 59% of transfer students who went on to graduate from Seneca, 56% graduated from a two-year diploma, 26% from a graduate certificate (2nd entry program) and 10% from a three-year diploma. The major university programs for York to Seneca transfer students were business (25%) humanities

and related (21%), and social sciences (19%). Almost half (49%) entered a Seneca program that was related to their university program.

Like Seneca to York transfer students, York to Seneca transfer students who ultimately graduated from Seneca were academically stronger throughout college and university. For the entire York- Seneca population, the average sending GPA was 64% at York and 76% at Seneca. Those who eventually graduated from Seneca had a sending GPA York average of 67%, and a Seneca average of 83%. Those who withdrew from Seneca only had a York average of 61% and a Seneca average of 64%. Of those who graduated from Seneca, 78% did so within the standard program length.

Regression analysis showed that transfer students who had obtained higher York and/or Seneca grades were more likely to graduate from Seneca, whereas international students were less likely to complete. Students who entered education/physical education, fine arts, or social sciences were more likely graduate from Seneca than those in humanities and related program groups. Gender, age, mother tongue, and relatedness of program pre- and post-transfer had little or no influence on graduate outcomes. For the time-to-completion regression models, females and younger students complete faster than the standard program length. Those who took education/physical education or natural and applied sciences took longer to complete than those in humanities and related programs, whereas those who took social sciences took less time. Additionally, those who had graduated from York and those with a higher GPA from York and/or Seneca were also likely to complete faster.

## Conclusions

Bidirectional movement of students between colleges and universities in Ontario is known to be extensive. Determining the amount of movement, the student characteristics and the factors that influence success are key questions for students, institutions and policy-makers. Ontario currently lacks a formalized data infrastructure with common identifiers to study these pathways at a system-wide level. This study demonstrated that it is possible to match students in two unrelated datasets and draw relevant policy conclusions. It makes it clear that academic performance is a chief ingredient in student success for those moving in either direction between college and university. Students who are younger or female are more likely to persist after transferring from college to university and are more likely to complete faster after transferring from university to college. Transition factors, such as amount of transfer credit awarded, proved important for those moving from college to university, even after controlling for academic performance and graduation status.

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## Introduction

The attainment of a postsecondary credential offers the possibility of enhanced career prospects and greater economic mobility, and students can pursue a postsecondary credential in a variety of different ways. Increasingly, pathways to a credential from an Ontario institution may involve transfer to or from a college or university. Although students' postsecondary education transfer opportunities have increased over the years in Ontario, greater choice in achieving their educational and career objectives does not necessarily make their path easier to navigate (Ontario Council on Articulation and Transfer, 2013, p. 6).

Transfer students do not necessarily reach their intended goals. Some may change program or institution mid-stream to pursue new aspirations or interests (Lang, 2009; 2013), while others may suspend their studies and then return at a later date (i.e., stop-out). Others may take a reduced load and extend their program because they have to work part-time or deal with additional family responsibilities, possibly delaying graduation (Hango & de Brouker, 2007; Desjardins, Ahlburg & McCall, 2002). Spreading education over more than the minimum program time represents a potential cost for the student in delayed credential attainment and future employment income.

To enhance their educational goals and career prospects, college students may supplement their practical and applied education with theoretically oriented education offered through a university baccalaureate program (Durham College, 2012). University students — who may or may not have attained their university credential — may supplement their education with the practical/applied education offered through a college program (Decock et al., 2011; Usher & Jarvey, 2012, Wilson, 2009). A report by Colleges Ontario indicated that 9% of college graduates transferred to a university to pursue a degree — 7% at Ontario universities (Colleges Ontario, 2009). Furthermore according to the report, 17% of Ontario college students had some university experience (but no degree) and 9% had attained a previous undergraduate degree prior to their college program.

Ontario college students who meet entrance standards and transfer to university may not always get all of their prior work recognized,<sup>1</sup> which can lead to delays in degree attainment. This situation has been complicated by the historic bifurcation of the Ontario postsecondary system, established in the 1960s as two separate sectors: academically focused universities and technically/vocationally focused colleges (Skolnik; 2008, 2010; Wilson, 2009). This structure was unique to Ontario in Canada. Since that time, Ontario universities and colleges have moved somewhat closer to a transfer system like those that exist in British Columbia, Alberta and some American states (Skolnik, 2010).

The York University and Seneca College of Applied Arts and Technology relationship represents one attempt to bridge the divide between colleges and universities in Ontario. ONTransfer lists 78 formal pathways that map Seneca college programs onto York degree programs,<sup>2</sup> but there are myriad more informal transfer routes through York University's block transfer policy.<sup>3</sup> Indeed, through their partnership, Seneca College and York University have benefited from relatively high volumes of college-to-university transfers (Craney, 2012; Heath, 2012, Trick, 2013; see Inset 1).

1 As an example, see Inset 1. York University's block transfer policy has certain conditions that must be met in order for students to earn transfer credit.

2 See [http://www.ontransfer.ca/index\\_en.php](http://www.ontransfer.ca/index_en.php)

3 See <http://futurestudents.yorku.ca/sites/all/files/pdfs/ug-transfer-brochure.pdf>

Although the Ontario college and university sectors were originally designed to fulfill different mandates, their relationship has grown closer over time. Working together, York and Seneca have the potential to generate data to help answer questions about the characteristics of students who have moved between the two institutions. What are their socio-demographic attributes, what programs do they take and what paths do they follow? Can these data and academic performance help predict their probability of graduation and their time to completion?

## Literature Review

### A Brief History Colleges and Universities in Ontario since 1965

Colleges of Applied Arts and Technology (CAATs) were established in 1965 as non-university alternatives for grade 12 and grade 13 high school graduates (Wilson, 2009). At that time, there were 4,000 students in Ontario enrolled in seven technical institutes and 36,000 undergraduates in 14 universities (Skolnik, 2010). To ensure that there were enough individuals to address the perceived shortfalls in the technically skilled labour market, the province decided to require the CAATs to educate job-ready graduates. These programs were not to duplicate the function of universities. The CAATs had advisory committees to maintain their program currency with business and industry trends.

In contemplating the design of the college system, one option was to have the CAATs combine both technical and general education as had been done in British Columbia, Alberta and many American states. These colleges could provide the first two years of an undergraduate curriculum, after which students would transfer to a university. However, to ensure the success of the newly formed CAATs, which had a strong emphasis on technical education, the government created a non-overlapping binary education system in which transfer between colleges and universities was not intended (Skolnik, 2010).

In the 1990s, a major review was undertaken regarding the mandate of the CAATs. College leaders argued that the provincial economy needed workers not only with hands-on training, but with analytical, theoretical and transferable skills (Ontario Ministry of Colleges and Universities, 1990; Skolnik, 2008). In response, colleges and universities began to develop various models of college-to-university transfer through bilateral and multilateral arrangements between individual institutions and through articulation agreements, block transfer policies and collaborative programs. These changes were facilitated by the College University Consortium Council (CUCC), established in 1996, which promoted college-university educational and training ventures designed to facilitate the transfer of students from one sector to another.

Indeed, the development of joint diploma and degree programs led to the development of shared campuses such as Seneca@York (Wilson, 2009). In 2000, the Ontario government allowed colleges to award degrees, which included a 14-week period of paid work experience, in “applied fields of study” (Skolnik, 2008). The distinction between two components of Ontario’s postsecondary education system began to blur, but there still existed no formal mechanism to coordinate articulation and transfer at the provincial level (Wilson, 2009). CUCC continued to keep track of the existing articulation agreements that allowed for the transfer of students between institutions, it and disseminated this information in the Ontario College University Transfer Guide (OCUTG). This guide was the precursor to ONTransfer: a web portal and database that tells students where transfer between the various

programs and institutions is possible.<sup>4</sup> This portal is a service provided by the Ontario Council on Articulation and Transfer (ONCAT). Established in 2011 and replacing the CUCC, ONCAT supports research with a view to reducing the barriers associated with articulation and transfer.

### **Inset 1. The Seneca College-York University Partnership: Formal models of transfer**

Over the last 35 years, the Seneca College and York University partnership has resulted in more college students enrolling in a baccalaureate program than at any other college in Ontario. York University is also the largest recipient of transfer students in Ontario — the majority of whom are students from Seneca College (Decock, Lacoste & Pitt, 2014). Between 2000 and 2012, approximately 14,700 students transferred between the two institutions in either direction. Over the course of this partnership, a number of transfer models have been developed.

*Block transfer.* In 1991, York University established a block credit transfer policy (Decock, Lacoste & Pitt, 2014) that enables students to obtain credit or course waivers based on college courses with a grade of 70% or greater, subject to space availability (see Trick, 2013, p. 20). The policy allows for the transfer of a predetermined number of university credits based on a number of factors, such as the alignment of the college program with the university program and the duration of the college program (Craney, 2012). The block transfer policy does not require the student to make a special application to the university. For example, a student with a liberal arts diploma (which requires two years of study) would be able to obtain transfer credits toward a Bachelor of Arts degree (which would then require less than 2.5 years to complete).

*Dual credential model.* The dual credential model allows students to obtain a credential from both institutions. This can be achieved sequentially. For example, students in the civil engineering technology advanced diploma program (which requires three years of study) can obtain an honours bachelor's degree in environmental studies with two additional years of study at York University. Alternatively, both credentials can be obtained in an integrated fashion. For example, students with a three-year bachelor's degree in communications studies at York University can do two additional years at Seneca College in several communication diploma options such as broadcasting (radio, television), journalism or creative advertisement. Alternatively, students with a three-year advanced diploma from Seneca College in any of the aforementioned programs could do two additional years at York University in communication studies.

*Collaborative and joint programs.* Students in the collaborative program in nursing enrol in the first two years at college and the last two years at university. The program is designed to meet the requirements of an external accreditation body. Joint programs allow the student to follow a three- or four-year university degree program and then add an extra year to obtain practical experience while earning a college certificate. Examples include the joint program in psychology and rehabilitation services.

<sup>4</sup> See [http://www.ontransfer.ca/index\\_en.php](http://www.ontransfer.ca/index_en.php)

## Student Motivations for Transfer

*College-to-university transfer.* Recent surveys indicate that Ontario students transfer from college to university because they want to prepare for further training in their field, are interested in a different field, or want to upgrade or improve skills (Colleges Ontario, 2009; ONCAT, 2013; Usher & Jarvey, 2012). However, as indicated earlier, the number one reason students cite for college-to-university transfer is to prepare for future career opportunities and career advancement, followed closely by the desire to attain a university credential (Colleges Ontario, 2009; Decock, McCloy, Liu & Hu, 2011; Usher & Jarvey, 2012). Research also suggests that the timing of students' decision to transfer from college to university may depend upon the college program itself. Graduates of preparatory programs such as pre-health and general arts and sciences will likely decide on further education prior to the start of their program. Graduates from engineering, hospitality, applied arts, community service and business are more likely to decide on further education during their college program (Kerr, McCloy & Liu, 2010). As will be noted below, there are a number of important student demographic characteristics to consider with respect to transfer success, where success is defined as persistence to credential attainment and timely completion of the degree program.<sup>5</sup>

*University-to-college transfer.* As indicated earlier, a report by Colleges Ontario (2009) indicates that approximately 9% of college enrolments were students who had previously completed a university degree. Seventeen percent reported that they had some university experience but did not complete a degree. These two categories of students may have different motivations for attending college following their university experience, as has been acknowledged in both Canadian (e.g., Wilson, 2009) and American research (e.g., Townsend, 2000; 2003; Winter, Harris & Ziegler, 2001). The first group — those with a university credential — are motivated to attend college because they want to supplement their university credential with a vocationally focused college credential to make themselves more marketable for employment (Townsend, 2003; Wilson, 2009). The second group are those students who may have performed poorly in university but did not want to drop out of PSE altogether (Hossler, Shapiro, Dundar, Chen, Zerquera, Ziskin & Torres, 2012). Ontario students indicate that they transfer from university to college because their field of interest has changed, they did not like university or the teaching style of their current institution, they wanted to be closer to their home or the cost of university was too high (ONCAT, 2013; Usher & Jarvey, 2012, p. 15).<sup>6</sup>

<sup>5</sup> Persistence is defined as continuous enrolment from one term to another, with no stop-out. Stop-out refers to a break that is greater than four months.

<sup>6</sup> Note that the Usher and Jarvey (2012) paper examined transfer into Ontario colleges, regardless of whether the sending institution was a university or college. Thus student comments could also include those who transferred from college to college or university to college.

### **Inset 2. Students' Experience of College-to-University Transfer: Challenges/Barriers**

Building structures to support transfer does not guarantee that the process will take place as expected. A recent ONCAT report (2013) identified a number of challenges in Ontario's college-to-university transfer process. Students found the process of transfer generally confusing, which could be attributed to their "lack of effort in degree program selection, unrealistic expectations about transfer credits and inadequate understanding of the competitive nature of higher education program admissions." For example, students did not accept the explanations about why college credits were not granted, which left them with the perception that they would have to repeat previously learned material for lower-level university courses. Sometimes students received unassigned credits that could only be used under specific conditions, depending upon the program structure or design. When students switched university majors, they did not understand why some credits that had previously been granted were no longer applicable. Students reported inconsistencies in terms of what was required to show evidence of prior learning or how this information would be used in the transfer process, which led them to perceive that the assignment of transfer credit was arbitrary and subjective. In addition, some students were not given timely responses to their requests for credit transfer.

After transfer was granted, former college students reported that they had to make adjustments to their new university programs. For example, students had to adjust to the faster pace of learning and the higher workload, and they had fewer graded components and therefore had fewer opportunities to demonstrate what they knew. That being said, a number of students wanted more information on how they could succeed in their courses. Orientation activities (organized for 18-year olds) did not cater to more mature transfer students (e.g., 21-24), nor did they have time to attend them (ONCAT, 2013).

### **Developing a Profile of Student Transfer based on Administrative Data: Factors to consider**

Understanding the characteristics of transfer students will help administrators and policy-makers make informed decisions to support students in the timely completion of their credentials at the receiving institution. Previous research has revealed a number of factors (listed below) that are captured in the administrative processes of student transfer between Seneca College and York University.

*Gender.* A number of Ontario studies have revealed that female students are more likely than male students to engage in college-to-university transfer (Kerr, McCloy & Liu, 2010; Stuart & Martinello, 2012). Confederation College (2012) indicated that 56% of its transfer students from Lakehead University were female and 44% male. Research at Trent University showed a similar pattern, with 60.4% of college-to-university transfer students being female (Drewes, Maki, Lew, Wilson & Stringham, 2012). American research reports that more female students than



male students transfer from university-to-college (Pope, Turner & Barker, 2001; Hillman, Lum, Hossler, 2008). Leigh (2009, p. 15) also cites a number of American studies (three-fifths of which are dissertations) indicating greater numbers of females who are engaged in university-to-college transfer (Brand, 2005; Becker, 2000; Reusch, 2000; Townsend, 2003; Winter, Harris & Ziegler, 2001). However, her own research revealed the opposite pattern. The distribution of transfer students by gender does not indicate transfer success, and it remains unknown whether gender predicts university-to-college transfer success in terms of probability of credential attainment and time to completion of the college program.

*Age.* Across a number of Canadian studies, the best estimate of the average age of college-to-university transfers is between 19 and 22 years of age. This is an estimate because the sources differ in sample size and how they were reported.<sup>7</sup> The fact that transfer students are older than non-transfer students is relevant because researchers identify a link between age and lack of persistence, and between lack of persistence and lower probability of graduation (Conrad & Morris, 2010). Research indicates that mature students have additional responsibilities and external demands on their time, such as part-time employment (ONCAT, 2013; Trick, 2013). Students who work part-time are more likely to leave their programs (i.e., stop out or drop out) compared to those who attend full-time (ONCAT, 2013). Additionally, part-time students are less likely to become involved with student social life and in events like orientation. They have less free time and often feel that campus events are designed for a younger audience (ONCAT, 2013).

Usher and Jarvey (2012) indicated that the largest numbers of university students who transferred to Ontario colleges were in the age range of 21 to 25. This range is slightly older than for college-to-university transfers. These students include those who attained a university credential and those who did not. Some research has indicated that university-to-college transfer students who have attained a university credential will likely be older than non-transfer students, while more than half of those students without a university credential transferred during their second or third year of university, making them older than non-transfer college students (Hossler, Shapiro, Dundar, Chen, Zerquera, Ziskin & Torres, 2012).

*Immigration status/mother tongue.* Canadian research revealed that, in general, children of immigrants were more likely to pursue and attain a university education compared to non-immigrant minorities (Abada & Tenkorang, 2009).<sup>8</sup> The same research revealed that students who conversed in a mother tongue other than English or French with their friends but were able to use either of the two official languages were more likely to attain a university credential compared with those who were not proficient in one of the official languages.

*Prior academic preparation/Academic performance.* College-to-university transfer students with weak academic preparation and lower incoming GPAs are less likely to persist in their new program (Feldman, 2009; Trick, 2013). Research about how college-to-university transfer students fare in a university program is mixed. A review paper by ONCAT (2013) reports that college-to-university transfer students have higher cumulative GPAs than non-transfer students, particularly if the program discipline is related and students receive a substantial block of transfer credits (ONCAT, 2013). Trick (2013) indicates that once at university, transfer students have GPAs that are

<sup>7</sup> Decock et al. (2011, p. 24) indicated that between 2002 and 2007 the largest percentage of Ontario college students transferring to university were those who were under the age of 22. This finding converges with Heath (2012, p. 30), who indicated that approximately two-thirds of the Ontario college students transferring into university were between the ages of 19 and 22.

<sup>8</sup> This group includes the “1.5 generation”: children who were born in a different country but arrived in Canada before adolescence.



equal to or slightly lower than those of non-transfer students. Finally, Stuart & Martinello (2012) found no differences between transfer and non-transfer students in terms of first-year GPA.

American research reveals that university-to-college transfer students tend to have low university grades. Hillman, Lum and Hossler (2008) indicated that 72% to 75% of students had a grade of C or lower in their first year of university.<sup>9</sup> They also noted that university-to-college transfer students tended to be in the bottom half of their high school class and thus were less prepared to attend university.

*Students' program at sending/receiving institution and program affinity.* Program affinity or match between the sending and receiving program has an impact on transfer student performance at the receiving institution (ONCAT, 2013). According to Kerr et al. (2010), college-to-university transfer students are most likely to come from early childhood education, followed by general arts & sciences (one-year and two-year), police foundations, social service worker and business administration programs. Conversely, the destination program for college-to-university transfer students is most likely commerce, followed by management, business administration, administrative studies/science and psychology (Kerr et al., 2010).

*Transfer credit.* Transfer success is more likely for students who receive block credit transfer or large amounts of credit because it leaves students with fewer credits remaining to complete their program. Ontario research has revealed that college-to-university transfer students who received advanced standing or block transfer outperformed direct-entry students in terms of GPA in the first semester of university (Brown, 2012; Drewes et al., 2012).

*Parental education.* In terms of direct access to university, research has shown that parental education is a powerful predictor of postsecondary educational attainment (Abada & Tenkorang, 2009). Educated parents are able to provide both monetary and non-monetary supports for their children (Corak, 2001). It is an open question as to how this factor may impact college-to-university transfer success. On a separate note, American research suggests that university-to-college transfer is significantly less likely among students whose parents are highly educated and/or wealthy (Goldrick-Rab & Pfeffer, (2009).

*Aspiration.* In their examination of the 1986 follow-up survey of the *National Longitudinal study of the High school class of 1972* (US), Pascarella and Whitaker (1994) showed that students with high educational aspirations had higher educational attainment, particularly if their initial attendance was at university rather than at college, where the effect is smaller. A similar pattern was revealed for occupational status aspiration. Those with high occupational status aspiration appeared to derive the greatest pay-off, particularly if they started their pathway at university rather than at a college. Canadian research (Decock, 2006) demonstrated that between 1992 and 2004 there was an increase in the proportion of Seneca College students who wished to attend university rather than start work following graduation.

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<sup>9</sup> In the Hillman, Lum and Hossler (2008) study, university-to-college transfer students were defined as students who transferred to college in their second year after completing their first year of university. Thus no students had completed their university credential before transferring (p. 119).

## Focus of the Present Investigation

This investigation seeks to examine student transfer between Seneca College and York University. With a view to understanding the factors affecting credential attainment, we seek to determine the relative importance of various socio-demographic characteristics, program attributes (including program affinity) and student academic performance in predicting time to completion relative to the standard program length and probability of graduation. In doing so, we aim to address three sets of questions:

1. How many students, graduates and early leavers (i.e., stop-out or left the institution) are moving from Seneca College to York University and vice versa?
2. What are the socio-demographic characteristics and academic backgrounds of college-to-university and university-to-college transfer students? How long does it take for them to graduate?
3. What is the probability of students persisting to a credential at either institution and how long does it take to attain the credential relative to the standard program length?

## Method

This study uses student enrolment history and administrative information to match and combine records from both York University and Seneca College. It focuses primarily on two outcomes: credential attainment and time to completion relative to the standard program length.

### *Data Merging and Cleaning*

*Developing the analytical sample.* The analytical sample included students who have entered either institution between 2000 and 2012 but previously attended the other at any time from as early as the 1980s. Because there was no common unique identifier, 1.2 million valid Seneca records were compared against 407,000 valid York records. The match was made using combinations of surname, first initial, gender, date of birth, permanent and secondary telephone numbers. The initial match identified 20,407 “active registrants.”<sup>10</sup> We then excluded students whose entire enrolment history at Seneca College contained only “non-regular” programs such as continuing education (CED) ( $N = 3,625$ ).<sup>11</sup> Collaborative nursing students were also excluded ( $N = 2,039$ ) because they are admitted to Seneca College and continue seamlessly to York University in third and fourth year as though they were in a single program. The final sample consisted of 14,743 students.

<sup>10</sup> Seneca College defined active registrants as registrants, graduates, those who withdrew but attended past certain cut-offs, or those who withdrew due to strikes. York University excluded students who were admitted and were in the Student Information System (SIS), but ended up not showing up. York University also excluded non-credit students.

<sup>11</sup> The technical definition of “regular” and “non-regular” Seneca programs was based on whether a five-digit Approved Program Sequence (APS) number was given by the Ministry of Training, Colleges and Universities (MTCU). If the APS number was absent, the program was not considered an “Ontario college credential” and thus excluded. For a full description of Seneca programs with APS numbers, refer to Appendix B.

*Determining transfer paths.* Longitudinal enrolment records were merged and sorted chronologically. Examination revealed complex cases in which individuals switched between institutions more than five times, were registered at either institution for more than 20 years combined, or were registered at both institutions during the same academic year. To render the study analytically meaningful, we simplified the pattern by assigning the first institution in the history as sending and the last institution as receiving. Following this definition, we divided the total sample into two directions: from Seneca to York ( $N = 9,330$ ) and from York to Seneca ( $N = 5,413$ ). To reduce complexity we combined semester records into years, which may cause some overestimation of the time spent at each institution.

*Determining student credential attainment, time spent at the sending/receiving institution and demographic/academic information.* We subsequently focused on the outcomes at the receiving institution, ignoring intervening switches. We derived variables from the pooled enrolment history to determine start and final year, total time spent at each institution, and number of years of stop-out. We also determined demographic and academic variables associated with a specific time point,<sup>12</sup> which were later merged into a cross-sectional dataset for analysis.

*Grouping students for descriptive analysis.* Within the selected sample, we categorized individuals into three groups based on credential attainment and registration status in 2012, the last year of the study: (1) no credential obtained from the receiving institution and not registered in 2012; (2) at least one credential obtained from the receiving institution, and (3) no credential obtained but still registered in 2012 at the receiving institution. The vast majority of the third group only started at the receiving institution in 2009 or later, and therefore can be considered as a fairly good proxy for students still “in progress” towards attaining a credential.

## Analyses

*Descriptive analysis.* We compared the demographic controls, program and transition features, and academic performance indicators of these groups in both the Seneca-to-York and York-to-Seneca directions. Demographic controls consisted of gender, mother tongue, immigration status and age upon entering the receiving institution. Program features included admission basis, first program registered at the receiving institution, standard length of the program, relevance of program change, transfer credits granted, and aspiration of the student upon entering higher education for the Seneca-to-York direction. Academic performance indicators were high school grade 12 English course type and its corresponding grade, credential attainment at the sending institution, and cumulative standing or graduation GPA at the sending and receiving institution.

*Regression analysis.* The outcomes of interest are credential attainment (binary) and time to completion (continuous, measured in years as difference between actual time spent and standard program length). We used a logit regression to examine the odds of obtaining at least one credential from the receiving institution, and an

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<sup>12</sup> Immigration status, age, median family income, mother tongue, program group and admission basis associated with first-time registration at the receiving institution were selected if there were changes over the years. Parental education and aspiration were based on a questionnaire Seneca College administers to students upon entering the institution. Academic performances in high school, the sending institution and the receiving institution were based on final or last known results.

ordinary least square (OLS) model in the analysis of time to completion. Because we do not yet know whether they will complete or not, we excluded the “in progress” population in the logit model and restricted the sample size to graduates only in OLS.<sup>13</sup>

Within each set of regressions, we included sets of explanatory variables in blocks and presented changes in coefficients and standard deviation to explain the outcomes. A variety of goodness-of-fit indicators were tested and provided.

### *Description of Variables*

*First-generation status.* We constructed first-generation status using parental education data provided by Seneca College. Students were asked to identify the highest level of education achieved by their mother and father in a questionnaire administered upon entering Seneca College. Nine categories were provided: elementary school, some high school, high school graduates, college or CEGEP,<sup>14</sup> trade or vocational training, some university, bachelor’s degree, advanced degree and professional degree. We labelled the first three categories as “no post-secondary education (PSE)” and the other six “with PSE.” We adopted the Ontario Ministry of Training, Colleges and Universities (MTCU) definition of “first generation” of whether at least one parent had some PSE experience. This element, however, was only added to the questionnaire in 2006, resulting in many missing values over the time-span of the present study. For this reason, we dropped it from the regression analysis but included it in the descriptive analysis.

*Basis of admission.* Categories of “bases of admission” were administratively coded by the receiving institution and generally reflected the stage of previous study. While Seneca-to-York students were expected to be admitted into York University under “previous college” and York-to-Seneca students into Seneca College under “previous university,” they could also be categorized under other categories such as “high school,” “mature student” and “previous student” to maximize chances of being admitted. In the analysis, we grouped all the other categories further but left “high school” and the “expected” basis (i.e., “previous college” for Seneca-to-York and “previous university” for York-to-Seneca) separate.

*Program grouping.* Programs were sorted into nine “specialization major” (SPEMAJ) categories as defined in the University Statistical Enrolment Report (USER) reporting guide: general arts and science and interdisciplinary studies, education and physical education,<sup>15</sup> fine and applied arts, humanities and related, social sciences and related, agricultural and biological sciences, engineering and applied sciences, health professions, mathematics and physical sciences.<sup>16</sup> Given their sizable population and distinct characteristics, we separated business (SPEMAJ = 41200) and public administration (SPEMAJ = 41401) from social sciences into one distinct group. To balance the sample sizes in the regressions, we grouped the last four into natural and applied sciences. The appendices provide

13 A very small proportion of graduates from concurrent Bachelor of Education programs at York University and special programs at Seneca College were excluded ( $N = 132$ ) because these programs did not have standard program lengths.

14 CEGEP stands for *collège d'enseignement général et professionnel*.

15 The full name is education, physical education, sports, recreation and leisure. Throughout this paper, we have shortened this to education and physical education.

16 We considered both SPEMAJ and Classification of Instructional Programs (CIP) coding systems. Although CIP would have been more suitable for both college and university programs, the coding was not readily available from either institution’s student information system. For a full description of SPEMAJ groups, refer to Appendix C.

a list of Seneca program groups with APS and assigned SPEMAJ codes, as well as detail about disciplines included in each SPEMAJ code.

*Affinity/Match of transition programs.* We used SPEMAJ codes to test the affinity of sending and receiving programs. If the SPEMAJ codes for the last or graduating program at the sending institution and the first program at the receiving institution matched on a five-digit basis, then it was deemed “matched.” If only their first digits agreed, then the transfer was considered “related.” If the first digits were not the same, it was categorized as “unrelated.” The “other” category included cases where either the last program at the sending institution or the first program at the receiving institution had an APS code, but was missing, undetermined, or did not fall into any other regular program groups (e.g., undeclared major).

*Standard program length.* Standard program lengths were determined by the type of credential obtained. Seneca College offers college bachelor’s degrees (four years), advanced diplomas (three years), diplomas (two years), graduate certificates and certificates (both one year). York University offers ordinary bachelor’s degrees (three years) and honours bachelor’s degrees (four years). A very small proportion of transfers was found to have obtained a consecutive Bachelor of Education (BEd) from York University.

*Aspiration.* Through a questionnaire administered to students when they enter, Seneca College collects information regarding intentions after graduation. The original options (“program at this college,” “program at other college,” “different Seneca degree,” “part-time job,” “full-time job,” “university,” “personal business” and “other”) were grouped into “employment,” “college,” “university” and “other.” Because the questionnaire is not administered to students in graduate certificate programs, the variable was dropped in the regression analysis for the York-to-Seneca direction.

*High school English.* Grade 12 English was used as a proxy for high school academic performance. Not surprisingly, the vast majority (97%) of York-to-Seneca students had a grade 12 English course in the University (U) or Academic (A) streams on their transcripts, compared with only 77% for Seneca-to-York students. However, this distinction of English course type is only meaningful within the Ontario context. International students and students from other Canadian provinces lack such comparable proxies to represent their academic preparation in high school. This variable was therefore removed in the regression analysis.

*College/University GPA.* Cumulative standing or graduating GPA at the sending and receiving institution was normalized to 100 using segmental linear approximation with fixed end points because York University and Seneca College use different scales (9.0 and 4.0 or 4.5, respectively).<sup>17</sup> In the regressions, however, un-normalized original GPAs were used to achieve higher accuracy.

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<sup>17</sup> This is a variant of linear interpolation that corrects for the differences in the numerical span associated with each letter grade. For example, in York University’s marking scheme, the span from E to D is 10 points (40 to 49), whereas from C to C+ it is only 5 points (60 to 64).

## Results

The present study seeks to determine the factors that explain successful college-to-university transfer or university-to-college transfer by examining students' enrolment patterns between Seneca College and York University between 2000 and 2012. As outlined in the introduction, three main questions are addressed through the examination of descriptive statistics and regression analyses. By relying on administrative data – which include socio-demographic and academic characteristics – and aspects of the transition features of the sending and receiving programs, we examined whether or not transfer students attained their target credential and how quickly they did so.

### College-to-University Transfer

*How many students, graduates and early-leavers (i.e., who stopped out or left the institution) are moving from Seneca College to York University?*

*Number of college-to-university transfer students and number who attained a university credential.* Between 2000 and 2012, a total of 9,330 students transferred from Seneca College to York University (see Tables 1 and 1a).<sup>18</sup> Slightly more than two-thirds (67% or 6,280/9,330) of college-to-university transfer students attained at least one university credential or were progressing toward a university credential. It is important to note that slightly more than one-third of the college-to-university transfer students (36% or 3,343/9,330<sup>19</sup>) did not complete their Seneca College credential prior to entering York University. Excluding students who were “in progress,” 59% (4,368/7,418)<sup>20</sup> of transfer students attained at least one York University credential. However, not all college-to-university transfer students were successful in attaining a university credential. Approximately one in six students (17% or 1,315/7,418) never attained a credential at either college or university.

*What are the socio-demographic characteristics and academic backgrounds of the college-to-university transfer students?*

*Socio-demographic characteristics.* Based on the total frequency counts (see Table 2), college-to-university transfer students within our sample were likely to be: female (59%), Canadian citizens (74%), less than 25 years of age (68%), to have a mother tongue of either French or English (61%), to have at least one parent with some postsecondary education (73%) and to aspire to go to university (68%). This pattern was more or less consistent across the three categories of students – those who attained a credential, those in progress and those who did not attain a credential.

<sup>18</sup> See Appendix A for tables and statistics.

<sup>19</sup> We are including “in progress” in the denominator because we are discussing the proportion of transfer students entering the receiving institution and not credential attainment at the receiving institution.

<sup>20</sup> When calculating the proportion of students acquiring a credential at the receiving institution, “in progress” students are excluded from the calculation because it is unclear whether they will indeed attain their credential. However, when calculating the proportion of transfer students for items other than credential attainment, we included “in progress” as part of the count.

*Transition features.* Based on the total frequency counts (see Table 3), three-quarters of college-to-university transfers were admitted to York on the basis of their college academic performance (74% or 6,928/9,330). The top three programs to which students transferred were social sciences (44% or 4,085/9,330), business and commerce (20% or 1,892/9,330) and humanities (14% or 1,260/9,330). Almost half of the students (49% or 4,538/9,330) transferred into a program that was not related to their college program. Program match/affinity has implications for the number of transfer credits granted (see Inset 1, Block Transfer) and consequently the time to attain the credential. As a point of interest, Table 8 shows the average number of transfer credits that students were granted as a function of how long students spent at York University to attain their first credential. As can be seen, the higher the average number of transfer credits awarded, the less time students took to attain their three- (ordinary) or four-year (honours) degree. Table 9 shows that transfer students who attained a York University credential had a greater number of transfer credits than those who did not. As noted in the introduction, the amount of transfer credit received has an impact not only on GPA in the first semester at university following transfer but also on transfer success in terms of credential attainment (Brown, 2012; Drewes et al., 2012).

*Prior academic performance.* Based on the total frequency counts in Table 4, many college-to-university transfer students took pre-university English courses in high school. Over three-quarters (78% or 4,865/6,523) took academic/university-level grade 12 English. Almost two-thirds of college-to-university transfer students attained a Seneca College credential (64% or 5,987/9,330). Nine out of ten students (90% or 8,391/9,330) did not stop out (i.e., students did not have more than a 12-month break in their studies) during their university program. Table 5 indicates that college-to-university transfer students who attained a York credential had higher grades in terms of: grade 12 English, Seneca GPA and cumulative York GPA. However, it should be also noted that there is high variability for the latter two measures, particularly for students who did not attain the York credential. Although grades appear to matter for credential attainment, not all higher-achieving students attained the credential.

***What is the probability of the Seneca College transfer students persisting to a York University credential? How long does it take to attain the credential relative to the standard program length?***

*Time to attain the university credential.* As seen in Tables 6 and 6a, frequency counts indicate that 46% (4,297/9,330) of Seneca-to-York transfer students were in a two-year program at Seneca College before transferring. Approximately 12% (1,154/9,330) were in a three-year program at Seneca College before transferring. According to Table 4, approximately nine out of 10 students (90% or 8,391/9,330) did not stop out (i.e., students did not have more than a four-month break in their studies) during their university program. Excluding those students “in progress,” Table 5 indicates that approximately one-third of transfer (33% or 2,412/7,418) students graduated from a three-year program at York and one-quarter (25% or 1,855/7,418) graduated from a four-year program. Although there was some variation, Tables 7 and 7a show that most students generally took the same number of years as the standard program length to attain the university credential. Note that this is over and above the time spent in the college program. That is, if transfer students enrolled in a three-year program, 18% (431/2,412) took two years, 38% (914/2,412) took three years and 27% (654/2,412) took four years. If transfer students enrolled in a four-year program, 32% (592/1,855) took three years, 37% (679/1,855) took four years and 19% (354/1,855) took five years.

Those who transferred into a four-year program on average completed faster than the standard program length; those who transferred to a three-year program on average took longer than the standard program length. As seen in Table 9 “S to Y Honours,” a four-year degree took on average 3.86 years; “S to Y ordinary,” a three-year degree



took on average 3.45 years. There can be various possible explanations for this. There is a relationship between the number of transfer credits awarded by the university and the time spent at York University to attain the credential (as seen in Table 8). However, as noted earlier, almost half of students (49% or 4,538/9,330, Table 3) are transferring into university programs that are not related to their college programs. The change in major may have consequences for the student because these prior credits are less likely to be applied to the major program and more likely to be applied to elective credits, which are limited in number. In contrast, four-year degree programs can accommodate a greater number of credits overall, including elective credits, thus possibly explaining why those enrolled in a four-year program are able to complete faster than the standard program length.

### *Factors that predict the probability of university credential attainment: Logit regression analyses*

In determining the factors that predict the probability of credential attainment, we present a series of models in a manner that roughly traces the time course in which student information becomes available. For example, socio-demographic characteristics are available prior to transfer and were part of Model I. Transition features become relevant at the time of transfer and thus were included in Model II. Prior academic performance (GPA) at the sending institution was examined in the Model III, and receiving institution academic performance (GPA) is examined in Model IV. Because sending institution GPA and receiving institution GPA were highly correlated,<sup>21</sup> we did not include both variables in Model IV. In addition, as part of the analyses that follow we not only report those individual variables that are significant, but we also report the proportion of unique solution variance that each new set (or linear combination) of variables explains in the outcome variable. Such reporting allows us to determine the relative importance of the set of variables that each new model includes. Because the unique variance is additive, we are able to utilize information from across the different models.

*Model I: Baseline (socio-demographic characteristics).* Table 10 depicts the baseline model with socio-demographic characteristics like gender, immigration status and mother tongue (Model I). The model was significantly different from the null model, indicating that the addition of the parameters over and above the constant-only model<sup>22</sup> leads to a better fit of the data. The baseline model itself was not very impressive. McFadden's pseudo  $R^2$  indicates that the model explains only 2% of the variance of the outcome variable (attaining a credential or not). However, the model correctly classifies 62% of individuals in terms of whether they ultimately attained a credential or not, which is better than chance.<sup>23</sup>

An examination of the parameters within the model reveals that females are 1.45 times more likely than males to attain a credential. Permanent residents were 1.59 times more likely to attain a credential compared to Canadian citizens, and visa students 1.84 times more likely. Those who spoke a language other than English were 1.22 times more likely to attain the credential compared to those whose mother tongue was English. Furthermore, age was also a significant parameter: the older a student is, the less likely he or she is to attain a credential. Indeed the likelihood of attaining a credential is less than 1 (.96) for every additional year older.<sup>24</sup>

21 Both variables were examined together within a single model, and collinearity diagnostics indicated that these variables were not multicollinear. However, for ease of interpretation, we examined the variables separately.

22 The constant-only or "null model" represents the simple probability of credential attainment without knowing any other information.

23 Logistic post-regression estimates used a threshold of 0.5 to categorize the fitted values to yes (1) or no (0).

24 In other words, younger transfer students are 1/.96 times or 1.04 more likely to attain their first credential. Note that in cases where the odds ratio is less than one, instead of stating B is 0.xy times less than A, it will be restated in the text as A is 1/0.xy times greater than B.



*Model II: (Baseline + Transition features).* As seen in Table 10, Model II includes the baseline (socio-demographic) characteristics, transition features such as the program group, program affinity or relevance (how related the new program is to prior studies), admission basis and students' aspirations. Model II was significantly different from the null model, indicating that the addition of the parameters (variables) over and above the constant-only model led to a better fit of the data. However, McFadden's pseudo  $R^2$  indicates that Model II only explains 7% of the variance, which is 5% above Model I: only a slight improvement. The model correctly classifies 66% of individuals in terms of whether they attained a credential or not, which is an improvement over Model I. The *AIC* and *BIC* values were lower for Model II compared to Model I, indicating that Model II had a better fit with the data given the number of parameters utilized.<sup>25</sup>

An examination of the parameters within Model II reveals that all of the socio-demographic characteristics remained significant as reported for Model I. Of the transition features, transfer students who enrolled in humanities and related program groups were 1.61 times more likely to attain their first credential than students who enrolled in a business program group, and 1.61 times more likely than students who enrolled in the natural and applied sciences. Students who transferred into a "matched" program were 1.37 times more likely to attain their first credential at the receiving institution than those who were enrolled in a "related program," 1.30 times more likely than those enrolled in a non-related program and 1.92 times more likely than those enrolled in a Seneca College continuing education or "other" program. Students who were admitted to York University on the basis of their Seneca College grades were 1.84 times more likely to attain their first credential than those admitted on high school grades. On average, the probability of credential attainment increased by a factor of 1.02 times per transfer credit awarded. Aspiring to attend college or university made no difference in probability of credential attainment compared to those who chose "employment" (at least for Model II).

*Model III (Baseline + Transition features + sending institution academic performance).* As seen in Table 11, the model was significantly different from the null model, indicating that the addition of the parameters led to a better fit of the data. McFadden's pseudo  $R^2$  indicates that Model III explains 9% of the variance, which is only a 2% improvement over Model II. The model correctly classifies 67% of individuals in terms of whether they attained a credential or not, which is a slight improvement over Model II. The *AIC* and *BIC* values were lower for Model III compared to Model II, indicating that Model III had a better fit with the data given the number of parameters utilized.

Within Model III, one can see that of the socio-demographic characteristics, gender remains predictive of credential attainment for transfer students. According to the model, female transfer students are 1.20 times more likely than males to attain a credential, permanent residents are 1.41 times more likely to attain a credential compared to Canadian citizens, and visa students are 1.98 times more likely to attain a credential compared to Canadian. Those transfer students who have a mother tongue other than English are 1.21 times more likely to attain a credential compared to those reporting English as their mother tongue. Focusing on the transition

25 The Akaike Information Criterion or *AIC* enables one to consider the fit of the model to the data relative to the number of parameters that are required to achieve that fit. Generally simpler models with few parameters are seen to be better than more complex models with a larger number of parameters. A smaller *AIC* value represents a better model in terms of relying on fewer parameters to achieve model fit. The Bayesian Information Criterion or *BIC* also considers the fit of the model to the data and penalizes the number of parameters more heavily than does the *AIC* (Dziak, Coffman, Lanza & Li, 2012). Thus, when comparing across models, those models with the lowest *AIC* or *BIC* values are preferable.

features, transfer students enrolled in a humanities or related program are 1.89 times more likely to attain a credential compared to those enrolled in the area of general arts and science, 1.61 times more likely than business students and 1.66 times more likely than students enrolled in a natural and applied science program group. Students are 1.02 times more likely to attain their first credential the more transfer credits they are granted. The higher the Seneca GPA, the more likely transfer students will attain a credential by a factor of 1.60. However, earning a Seneca credential was not predictive of attaining a York credential. The basis for admission to York University, whether it was a college grades or other bases, was no more predictive of credential attainment than high school grades. It is worth pointing out that the latter finding was true after controlling for Seneca College GPA and attaining a Seneca credential. Admission basis is correlated with high school GPA, which in turn is correlated with attaining a Seneca GPA. Finally, level of aspiration was not predictive of credential attainment, at least for Model III.

*Model IV: (Baseline + Transition features +Receiving institution academic performance).* Table 11 depicts a model that includes the baseline (socio-demographic characteristics), transition features and academic performance at the receiving institution (York). As indicated earlier, the sending institution GPA was not included in the present model because this variable was highly correlated with receiving institution GPA, leading to difficulties in estimating and interpreting the individual beta weights associated with these variables (Cohen & Cohen, 1983; Tabachnick & Fidell, 2012). Model IV was significantly different from the null model, indicating that the addition of the parameters (variables) over and above the constant-only model was able to predict which individuals attained a credential and which did not. McFadden's pseudo  $R^2$  indicates that Model IV explains 32%, which represents an improvement of 23% over and above Model III and a 25% improvement over Model II. Not surprisingly, this result indicates that academic performance at the receiving institution is highly predictive of the probability of credential attainment. Model IV correctly classifies 81% of individuals in terms of whether they attained a credential or not, which is a large improvement over Model II and Model III. The AIC and BIC values were the lowest among all the models presented, indicating that Model IV had the best fit of the data despite utilizing more parameters to achieve that fit.

In Model IV, one can see that most of the same parameters described for Model III are significant, with roughly the same magnitude of odds and standardized betas. With respect to Model IV, receiving institution cumulative GPA is indeed significantly predictive of credential attainment, with each unit gain in GPA resulting in an increase in probability of credential attainment by a factor of 2.57 times. Transfer credits significantly improved the probability of attaining the credential by a factor of 1.01 times. Students in humanities program groups are 2.17 times more likely to attain a credential than those in general arts program groups, similar to Model III.

However, there are a number of discrepancies between Model III and Model IV, largely in the area of program group and program relevance. For instance, in Model IV students who aspired to go to university when they entered college were significantly more likely to attain a university credential by a factor of 1.22 times; this was non-significant in Model III. Similarly, students enrolled in a social science program group were 1.30 times more likely to attain the credential compared to students in a humanities program group; again, this was not significant in Model III. This latter set of findings should be interpreted with caution, because these findings were non-significant when controlling for sending institution GPA but not when controlling for receiving institution GPA, despite the fact that both variables are highly correlated.

Other differences in Model IV (which controls for receiving institution GPA) were that students who enrolled in the areas of business or natural and applied science were no longer more likely to attain a credential relative to the reference group (humanities), but were in Model III (which controls for sending institution GPA). With respect to program relevance variables, matched, related and unrelated were significantly associated with credential attainment as reported for Model II, yet this association of matched and related was not significant after controlling for Seneca GPA as in Model III, and all three were not significant after controlling for York University GPA as in Model IV. Although both sending and receiving institution GPA variables are highly correlated and explain shared variance in the outcome variable, they also explain some unique variance in the outcome variable (especially the sending institution GPA). This could explain the latter pattern of findings.

*Summary of logit regression analyses: Factors that predict university credential attainment in college-to-university transfer students.* According to the logit regression analysis reported across all four models, it is clear that the baseline characteristics explained approximately 2% of the total variance. The significant baseline characteristics include: gender (i.e., females are more likely to attain the credential), immigration status (i.e., permanent residents and visa students are more likely than Canadian citizens to attain the credential), age (i.e., there is a negative relationship between age and credential attainment), and mother tongue (i.e., those who have a mother tongue other than English are more likely to attain the credential).

Transition features explained an additional 5% of the variance. Significant transition features include program group (though the results vary from one model to another), transfer credits (i.e., the more transfer credits granted, the more likely the student will attain the credential), program relevance/matching under certain conditions (i.e., some of the results are significant unless controlling for receiving institution GPA), and transfer credits (i.e., the more transfer credits granted, the more likely the student will attain the credential).

Prior academic performance explained an additional 2% of the variance (i.e., students with higher sending institution GPA were more likely to attain the credential). Finally, without controlling for sending institution GPA, receiving institution cumulative GPA explained an additional 25% of the variance (i.e., the higher the cumulative GPA, the more likely the student will attain the credential). The effect of prior academic performance, transfer credits and cumulative GPA can be confirmed by examining the descriptive statistics presented in Table 5. Based on Table 5, it is apparent that students who attained a credential had higher grades in each of the categories. All of the remaining effects that were found in the regression analysis can be confirmed by examining the frequency counts of each of the factors presented in Table 2 (socio-demographic characteristics), Table 3 (transition features) and Table 4 (prior-academic performance) by comparing the percentages under “Yes” and “No” columns and noting where the values differ. Table 5 includes additional information on sending and receiving institution academic performance.

### ***Factors that predict how quickly college-to-university transfer students attain their first credential relative to the standard program length: OLS regression analyses***

*Model I: Baseline (Socio-Demographic Characteristics).* Table 12 depicts the baseline model that includes the socio-demographic characteristics such as gender, immigration status and mother tongue (Model I). Recall that the outcome variable was the time spent at the receiving institution (York University) minus the standard program length. Thus for each outcome score, a negative value reflects that the student completed faster than the standard program length and a positive value reflects that the student took slower than the standard program length. Model

I explained a small but significant amount of variance in how quickly students attained their first credential relative to the standard program length. Of the factors that contributed to the model, it appears that gender was significant: females are relatively faster in attaining their first credential relative to the standard program length compared to males. Age was negatively related to the difference between the actual time spent and the standard program length. Transfer students who had a mother tongue other than English were faster at attaining their credential relative to the standard program length compared to those who spoke English as their mother tongue.

*Model II: (Baseline + Transition features).* As seen in Table 12, Model II includes both the baseline (socio-demographic characteristics) and transition features (such as the program students transferred to, program type, relevance, aspiration). Relative to Model I, Model II explained an additional 18% of the variance in terms of predicting how quickly transfer students attained their first credential relative to the standard program length. In terms of the baseline variables, females were relatively faster than the standard program length compared to males. Age was negatively related to the difference between the actual time spent and the standard program length. Transfer students who had a mother tongue other than English were faster at attaining their credential relative to the standard program length compared with those who spoke English as their mother tongue. In terms of the transition features, transfer students took significantly longer than the standard program length if they enrolled in general arts and sciences program group or education/physical education relative to students enrolled in the humanities and related studies program group. However, transfer students took less time than the standard program length if they took social sciences compared to those taking humanities and related studies. Students enrolled in a four-year honours degree took longer than the standard program length compared with those enrolled in a three-year ordinary degree. The more transfer credits students received, the faster students proceeded through their program relative to the standard program length. Students who were enrolled in a continuing education program at Seneca or “other” program took longer to proceed through their program than the standard program length compared with students who were in a matched program. All other parameters were non-significant.

*Model III: (Baseline + Transition features + Sending institution academic performance).* Table 13 depicts Model III, which includes the transition features and the sending institution academic performance. Relative to Model II, this model did not explain any additional variance in terms of the time to attain the first credential at York University. This pattern signals that sending institution academic performance (Seneca GPA) explains the same variance in the outcome measure as the variables in Model II (i.e., baseline plus transition features). Model III shows that females attained their university credentials faster than males. Transfer students whose mother tongue was a language other than English took less time to attain their credential relative to the standard program length, compared to students whose mother tongue was English. In terms of transition features, students who transferred into the social sciences took less time to attain their credential relative to the standard program length compared to students in the humanities and related program groups. Students who transferred into the general arts and science program group or into the education/physical education program group took longer than the standard program length. Transfer students who pursued a four-year honours degree took less time than the standard program length compared to students who pursued a three-year ordinary degree. The greater the number of transfer credits that were granted, the less time it took to complete the program relative to the standard program length. The higher the students’ cumulative GPA at the sending institution, the less time it took to complete their program relative to the standard program length. All other parameters were non-significant.

*Model IV: (Baseline + Transition features + Receiving institution academic performance).* Table 13 depicts Model IV, which includes socio-demographic characteristics, transition features (part of Model II) and receiving institution academic performance. Relative to Model II and to Model III, this model explains 1% additional variance in the outcome measure. Many of the same variables that were significant for Model III are also significant for Model IV, with the beta weights having roughly the same magnitude and direction. Model IV demonstrates that the higher cumulative GPAs were at the receiving institution, the less time students took to complete their program relative to the standard program.

*Summary of OLS regression analysis: Predicting time to completion relative to the standard program length in college-to-university transfer students.* The OLS regression models (Table 12 and Table 13) revealed that baseline factors explained approximately 4% of the variance in time to completion relative to standard program length. As such, baseline factors that predict time to completion relative to the standard program length include gender (i.e., female students complete faster), age (i.e., younger students complete faster) and mother tongue (i.e., those whose mother tongue is other than English complete faster). The age factor was not significant once academic performance (sending institution or receiving institution GPA) was included in the model (Models III and IV).

Transition features explained an additional 18% of the variance. Of the transition features, the following factors are significant: specific program group in which the student enrolls (i.e., across models students in social sciences program group were slower to complete than those in humanities and related program groups and students in education/physical education were faster — also note Table 13). Relative to standard length, students who pursued a four-year honours degree completed faster than those who pursued a three-year ordinary degree. Program affinity was not significant, except for transfer students who came from Seneca continuing education/other, who took significantly longer to complete.

Sending institution academic performance (i.e., cumulative GPA) did not explain any additional unique variance in the time to completion, but was significant for Model III. This suggests that the sending institution GPA explains common variance in the outcome, as do the baseline variables and the transition features. In terms of receiving institution GPA (though not controlling for sending institution GPA), this variable was significant and explained an additional 1% of the variance in predicting time to completion relative to the standard program length. The findings of the OLS regression analysis can be confirmed by examining the “time to completion” column in Table 2 (socio-demographic characteristics), Table 3 (transition features), Table 4 and Table 5 (prior-academic performance).

## University-to-College Transfer

*How many students, graduates and early leavers (i.e., stop-out or left the institution) are moving from York University to Seneca College?*

*Number of university-to-college transfer students and number who attained a university credential.* Between 2002 and 2012, a total of 5,413 students transferred from York University to Seneca College (see Tables 14, 14a and 14b). Approximately three-fifths of York University to Seneca College transfer students (61% or 3,270/5,413) did not have a York University credential before transferring to Seneca College. The finding raises the possibility that one group of students may be using the university-to-college transfer as a mechanism to mitigate loss of invested time in their attempt to attain a university credential (Townsend, 2000; 2003). This observation is consistent with a

finding in Colleges Ontario (2009), which indicated that 17% of all college students had some experience with university and 9% had a university degree. Conversely, 40% did indeed have at least one York University credential prior to entering Seneca College. Regardless of whether individuals attained a credential in the past, 59% (3,211/5,413) of the university-to-college transfer students earned at least one credential and 15% (828/5,413) were in progress. In other words, almost three-quarters of university-to-college transfers attained at least one college credential or were in progress.

Excluding those students who were still “in progress,” almost one-third of the university-to-college transfer students did not earn a Seneca College credential (30% or 1,374/4,585). Within this group of students, approximately 9% (410/4,585) did not earn a Seneca College credential even though they earned at least one York University credential. Furthermore, 21% (964/4,585) of university-to-college transfer students did not earn a credential at either institution.

### *What are the socio-demographic characteristics and academic backgrounds of university-to-college transfer students?*

*Socio-demographic characteristics.* Based on the total frequency counts in Table 15, university-to-college transfer students within our sample were likely: to be female (61%), Canadian citizens (91%), under 25 years of age (73%), have a mother tongue of either French or English (87%), have at least one parent with some postsecondary education (79%), and aspire to enter the workforce following Seneca College (68%). The magnitude of these proportions is similar across students who attained a credential, those in progress and those who did not attain a credential. However, note that these characteristics are markedly different from the college-to-university transfer group. The university-to-college transfer group has a greater concentration of Canadian citizens, they are slightly younger, they are more likely to have a mother tongue that is either English or French, and are more likely to have parents who have experience with PSE.

*Transition features.* Based on the total frequency counts in Table 16, slightly more than two-fifths of university-to-college transfers were admitted to Seneca College on the basis of their high school academic performance (44% or 2,387/5,413). There was some variability across the three categories of students: those who attained a credential, those who were in progress and those who did not attain a credential. For instance, of those who attained a credential, approximately 38% were admitted on the basis of their high school grades, while 36% were admitted on the basis of their university grades. Based on the total frequency counts, the top three program groups into which university-to-college students transferred were business and commerce (26% or 1,379/5,413), humanities and related programs (21% or 1,140/5,413) and social sciences (19% or 1,043/5,413). A majority of students (51% or 2,742/5,413) transferred into a program that was not related to their university program.

*Prior academic performance.* As seen in Table 17, most university-to-college transfer students did not have a university credential (61% or 3,270/5,413). Almost all transfer students took advanced or university preparation-level grade 12 English (97% or 4,419/4,539). Approximately nine out of 10 students (95% or 5,147/5,413) did not stop out (i.e., students did not have more than a four-month break in their studies) during their college program. Table 18 indicates that university-to-college transfer students who attained a Seneca College credential had higher grades in grade 12 English and higher cumulative GPAs at York and Seneca. Grades appear to matter for credential attainment.



*What is the probability of York University transfer students persisting to a Seneca College credential?  
How long does it take to attain the credential relative to the standard program length?*

***Logit regression analyses – Predicting the probability of attaining the first credential: York University to Seneca College***

**Model I: Baseline (Socio-Demographic Characteristics).** Table 22 depicts the baseline model, which includes socio-demographic characteristics like gender, immigration status, median family income by census geography, and mother tongue (Model I). The model was significantly different from the null model, indicating that the addition of the parameters over and above the constant-only model led to a better fit of the data. The baseline model itself was not very impressive. McFadden's pseudo  $R^2$  explained only 2% of the variance of the outcome variable. The model correctly classifies 71% of individuals in terms of whether they attained a credential or not, which is above chance.

An examination of the parameters within the model reveals that females were 1.67 times more likely to attain a credential compared with males. Canadian citizens were more likely to attain the Seneca credential by 3.13 times relative to visa students and 1.64 times relative to permanent residents. Age was also a significant parameter: older individuals are more likely to attain a Seneca credential by a factor of 1.04 times.

**Model II: (Baseline + Transition features).** As seen in Table 22, Model II includes the baseline (socio-demographic) characteristics, transition features (such as the program to which students transferred, program type, relevance, aspiration) and the sending institution academic performance (such as the cumulative GPA and whether a York credential was attained or not). Model II was significantly different from the null model. McFadden's pseudo  $R^2$  indicates that Model II explains 8 % of the variance (6% above Model 1), which indicates a slight improvement over Model I. In addition, Model II correctly classified 71% of the cases, the same as Model I. However, both the *AIC* and *BIC* values were lower for Model II compared to Model I, indicating that Model II had a better fit with the data given the number of parameters utilized.

A closer inspection of Model II reveals that York-to-Seneca transfer students who were Canadian citizens were 2.94 times more likely to attain a credential from Seneca College compared with transfer students who were visa students. Of the transition features, transfer students who enrolled in the program groups of education/physical education, fine arts or social sciences were more likely to attain a Seneca College credential compared to students in the humanities and related program groups, by a factor of 2.03, 1.56 and 3.01 times, respectively. Students enrolled in the humanities and related program group were 1.96 times more likely to attain a credential compared to the students in natural and applied sciences program group. Students admitted to Seneca College on the basis of their university performance were 1.31 times more likely to attain a credential compared to those admitted in terms of their high school basis. All other parameters were non-significant.

**Model III: Baseline + Transition features + Receiving academic performance.** Table 23 depicts Model III, which includes the baseline (socio-demographic characteristics), transition features and academic performance at the receiving institution (in this case Seneca College). The model was significantly different from the null model. Indeed, McFadden's pseudo  $R^2$  indicates that Model III explains 9% of the variance, which is a 1% improvement over Model II. This model correctly classified 71% of the cases, which is the same as Models I and II. However, both

the *AIC* and *BIC* values were lower for Model III compared to Model I and Model II, indicating it had a better fit with the data given the number of parameters utilized.

In Model III, one can see that Canadian citizens are 2.78 times more likely to attain a Seneca College credential compared to visa students. Students enrolled in the program areas of education/physical education, fine arts and social sciences are more likely to receive a Seneca credential (by a factor of 2.36, 1.72, and 3.24 times respectively) compared with students who enroll in the program group of arts and science.

*Model IV: Baseline + Transition features + Receiving institution academic performance.* Table 23 depicts Model IV, which includes socio-demographic characteristics, transition features and receiving institution academic performance. The model was significantly different from the null model. McFadden's pseudo  $R^2$  indicates that Model IV explains 28% of the variance in the outcome variable. This model correctly classified 81% of the cases, which is greater than the previous models. In addition, this model had the lowest *AIC* and *BIC* values, indicating that it had a better fit with the data compared to the other models given the number of parameters utilized.

A closer look at this model reveals that York-to-Seneca transfers students who were Canadian citizens were 3.7 times more likely to attain a Seneca credential compared to transfer students who were also visa students. Age appeared to be negatively associated with credential attainment in Model IV but was not significant in Models II and III. Students enrolled in the program groups of education/physical education, fine arts, social sciences and business were more likely to receive a Seneca College credential (by a factor of 2.02, 2.45, 5.29 and 1.91 times, respectively), compared with students who enrolled in the program group corresponding to general arts and science at Seneca College. Note that the finding that students enrolled in a business program group are more likely to attain a credential was true for Model IV (which controls for receiving institution GPA) but not for Models II and III (which controls for sending institution GPA). By the same token, the finding that students who enrolled in the program group of natural and applied sciences are more likely to attain a credential was significant for Model II and III but not Model IV. In addition, the admission basis cluster of variables appears to change signs across models, in particular for university grades at admission to Seneca. After controlling for Seneca College GPA, students admitted to Seneca College on the basis of their high school GPA were 1.56 times more likely to attain a credential compared to those admitted in terms of their university grades. The opposite pattern was shown in Model II, where students admitted on the basis of their university grades were more likely to attain the credential. Given that there are a number of inconsistencies across models, variables that were not significant across the models need to be interpreted with caution. Finally, receiving institution GPA predicted the probability of credential attainment. Each unit of increase in GPA led to a 4.44 times increase in the probability of credential attainment.

### ***Summary of logit regression analyses: Factors that predict college credential attainment in university-to-college transfer students.***

According to the logit regression models in Tables 22 and 23, baseline characteristics explained 2% of the variance in the probability of credential attainment. Across the models, only immigration status was consistently significant: visa students were less likely to attain the credential. Other baseline variables such as gender were significant in Models I and II, but became non-significant once measures of prior academic performance and current academic performance were included (Models III and IV).

Transition features explained an additional 6% of the variance. Across models, students who enrolled in the program groups of education/physical education, fine arts or social sciences were more likely to attain the Seneca



credential than those in humanities and related program groups. Those students enrolled in the area of natural and applied science appeared to have a lower probability of credential attainment compared to the reference group, but this difference was non-significant once receiving institution GPA was included in the model. The logit regression analysis was inconclusive regarding which admission basis for college to university transfer was predictive of credential attainment.

Sending institution academic performance explained only 1% additional variance. Those with higher university GPA were more likely to attain a college credential. Cumulative GPA at the receiving institution explained an additional 20% variance (over Model II, not controlling for sending institution GPA) in terms of predicting the probability of attaining the credential. The effect of sending institution cumulative GPA and Seneca College GPA can be confirmed by examining the descriptive statistics presented in Table 16. All of the remaining effects that were found in the regression analysis can be confirmed by examining the frequency counts of each of the factors presented in Tables 15 (socio-demographic characteristics), 16 (transition features) and 17 (academic performance) by comparing the percentages under “Yes” and “No” columns and noting where the values differ.

### *How long does it take to university-to-college transfer students to attain the college credential relative to the standard program length?*

*Time to attain the college credential.* Tables 19, 19a and 19b show that for university-to-college students, excluding students who were “in progress,” 20.4% (936/4,585) attained their first credential from a three-year program at York and 21.9% (1,002/4,585) graduated from a four-year program at York before transferring. Approximately 21.9% of university-to-college transfer students (1,003/4,585) graduated from a one-year program at Seneca College (e.g., certificate). Based on Table 21, excluding students who were “in progress,” approximately two out of five university-to-college transfer students (39.2% or 1,799/4,585) graduated from a two- or three-year diploma program at Seneca College. Finally, 8% (378/4,585) of university-to-college transfer students attained a three-year credential from Seneca College (e.g., advanced diploma, college bachelor’s). Although there was some variation, generally students took as long as the standard program length to complete their college credential (as seen in Table 20). This time would be over and above the time spent at York University. The average number of years to complete a given program was slightly higher than the program length (as seen in Table 21). The standard deviations would indicate considerable variation (both above and below) in the average times.

### *Predicting how quickly transfer students attain their first credential relative to the standard program length: York University to Seneca College transfer*

*Model I: Baseline (Socio-Demographic Characteristics).* Table 24 depicts the baseline model, which includes the socio-demographic characteristics such as gender, immigration status and mother tongue (Model I). The outcome variable was the time students spent at the receiving institution (Seneca College) to attain the first credential minus the standard program length. A negative value shows that the student took less time than the standard program length to complete and a positive value reflects that the student took more time than the standard program length. Model I explained a small but significant amount of variance in the time spent to attain the first credential at the receiving institution relative to the standard program length. Of the factors that contributed to the model, it appears that gender was significant: females were faster in attaining their first credential relative to the standard program length compared to males. Age was negatively related to the time to attain the credential minus the standard program length. York-to-Seneca transfer students who had a mother tongue other than English

took slightly longer relative to the standard program length to attain their Seneca credential compared to those who spoke English as their mother tongue.

*Model II: (Baseline + Transition features).* As seen in Table 24, Model II includes both the baseline (socio-demographic characteristics) and transition features (such as the program to which students transferred, program type, relevance, aspiration). Relative to Model I, Model II explained an additional 14% variance in the time spent to attain the first credential at the receiving institution minus the standard program length. In terms of the baseline variables, females were relatively faster than males to attain their first credential relative to the standard program length. Students who had a mother tongue other than English took longer than the standard program. There was a negative relationship between age and the outcome variable. In terms of the transition features, transfer students took more time than the standard program length if they were enrolled in the program group of education/physical education or natural and applied science relative to students enrolled in the program group of humanities and related studies. However, transfer students took less time than the standard program length if they enrolled in the social sciences program group compared with those taking humanities and related studies. Transfer students enrolled in an advanced diploma or college bachelor's degree took less time than the standard program length compared to those enrolled in a diploma program. Students admitted on the basis of university grades took less time relative to the standard program length to attain their college credential compared with those admitted on high school grades. All other parameters were non-significant.

*Model III: Baseline + Transition features + Sending institution academic performance.* Table 25 depicts Model III, which includes the transition features and the sending institution academic performance. Relative to Model II, this model explained 5% additional variance in terms of the time spent to attain the first credential at the receiving institution minus the standard program length. Females attained their credentials faster than males. As with Model II, there was a negative relationship between the outcome variable and age. In terms of the transition features, York-to-Seneca transfer students took longer than the standard program length if they were enrolled in the program group of education/physical education or natural and applied science relative to students enrolled in the area of humanities and related studies. However, transfer students took less time than the standard program length if they enrolled in the program group of social sciences compared to those enrolled in the area of humanities and related studies. York-to-Seneca transfer students who enrolled in a graduate certificate took longer than the standard program length compared to those in a diploma program. However, transfer students enrolled in an advanced diploma or college bachelor's degree took less time than the standard program length compared to those enrolled in a diploma program. Students admitted on the basis of university grades took less time than the standard program length to attain their college credential compared to those admitted on high school grades. Finally, there was evidence that students who had a York University credential completed faster than the standard program length. Also, York University GPA varied inversely with faster completion relative to the standard program length.

*Model IV: Baseline + Transition features + Receiving institution academic performance.* Model IV, depicted in Table 25, includes all the variables in Model II plus receiving institution academic performance. Relative to Model II, this model explains 8% additional variance in the outcome measure. Model IV also explains 3% more variance compared to Model III. As can be seen in Table 25, many of the same variables that were significant for Model III are also significant for Model IV, with the beta weights having roughly the same magnitude and direction. Model IV demonstrates that the higher students' cumulative GPA at the receiving institution, the less time it took to complete their program relative to the standard program length. There were some differences for credential type

when examining the various models. As in Model II, Model III exhibited no differences between those students pursuing a certificate compared with a diploma, whereas there was indeed a significant difference in Model IV. Finally, Model IV indicates no difference between students pursuing an advanced diploma and a diploma, whereas this difference was indeed significant in Models II and Model III. With respect to Model IV, the cumulative GPA at Seneca predicted the time to attain the Seneca credential. All other variables were non-significant.

*Summary of OLS regression analysis:* The baseline variables explained approximately 6% of the variance of the time to completion relative to the standard program length. Across the models, gender and age were significant factors (i.e., females completing faster than the standard program length compared to males, and a negative association between the outcome variable and age). Compared with Canadian citizens, permanent residents were slower at attaining a credential relative to the standard program length, though this difference was non-significant once transition features and academic performance were included in the model. Mother tongue was a significant factor in Models I and II, which did not include academic performance: those who spoke a first language other than English took longer to attain the credential relative to the standard program length. Mother tongue became non-significant after controlling for sending institution GPA or receiving institution GPA.

Transition features explained an additional 14% of the variance. In the program group component, across models, students who took education/physical education or natural and applied sciences took longer than the standard program length compared to those in humanities and related programs. Those who took social sciences took less time. Students who were admitted on the basis of university performance completed the college credential faster than the standard program length compared to those who entered on the basis of their high school record.

Prior academic performance explained 5% additional variance. Those who had a prior university credential attained their college credential faster than the standard program length. Those with a higher sending GPA from York were likely to complete faster relative to the standard program length. The effect of prior education, which includes grade 12 English, sending institution cumulative GPA and Seneca College GPA, can be confirmed by examining the descriptive statistics presented in Table 18. Based on this table, it is apparent that students who attained a Seneca College credential had higher grades in each of the categories. Cumulative GPA at the receiving institution explained 5% of the total variance. All of the remaining effects that were found in the OLS regression analysis can be confirmed by examining the “time to completion” column in Table 15 (socio-demographic characteristics), Table 16 (transition features) and Table 17 (academic performance).

## Discussion

A growing body of literature has documented the motivations, experiences and challenges of Ontario postsecondary students who have transferred from college to university (e.g., Colleges Ontario, 2009; ONCAT, 2013, Usher & Jarvey, 2012), as well as those who have transferred from university-to-college (e.g., Confederation College, 2012; Stuart & Martinello, 2012; Wilson, 2009). The present investigation contributes to this literature by documenting transfer over a period of 12 years (2000-2012) between York University and Seneca College. By utilizing academic and administrative data, the present investigation focused on two outcomes: the probability of credential attainment and time to completion relative to the standard program length. In doing so, we examined the number of students, graduates and early leavers (i.e., stop-out or left the institution) who are moving from Seneca College to York University and vice-versa, and the socio-demographic characteristics and academic

backgrounds of the students, with the aim of identifying the relative importance of the factors in predicting the aforementioned major outcomes.

Attaining a postsecondary credential represents an important milestone on the path to economic independence. Life-course developmental theorists like Arnett (2000, 2004) have argued that the ages of 18 to 25 years — a time when most students are pursuing postsecondary education — is a unique period termed “emerging adulthood.” During this time, individuals are relatively free from permanent and enduring social roles, but are often expected to have some sort of “plan” to achieve their career goals and objectives. Emerging adulthood is characterized by identity exploration, instability, self-focus, and feeling in-between possibilities with respect to a broad range of life issues including education and work (Arnett, 2004; also Wintre & Morgan, 2009 in terms of PSE transfer). It is in this context that students pursue an educational path that is not always straightforward: students can change majors or transfer between institutions of various types, including colleges and universities, which in turn can add time to credential attainment.

Failure to attain a credential in a timely fashion can have negative consequences for students, like delayed entry to the labour market and lower starting wages (Hango & de Brouker, 2007; Hango, 2008). If transfer students fail to attain a credential at the receiving institution, or take an inordinate amount of time to do so, one can question whether the lack of transfer success can be attributed to factors that are built into the structure of the educational system (e.g., transition features) or to individual/personal factors like socio-demographic characteristics or academic performance (GPA). If the goal is to optimize the numbers of students who experience transfer success, then understanding the relative importance of these factors offers insights into where attention might be paid.

College-to-university transfer is an important vehicle not only for access to university for those who did not enter directly, but to prepare students for future career opportunities and career advancement, more depth of training in their field, to explore new interests or improve skills (Colleges Ontario, 2009, Decock, McCloy, Liu & Hu, 2011; ONCAT, 2013; Usher & Jarvey, 2012). Indeed the present investigation showed that over the of course 12 years, a total of 9,330 students transferred from Seneca College to York University. Of this number, 47% attained at least one credential and 20% were in progress. Slightly more than one-third (36%) of the Seneca College to York University transfer students did not complete their Seneca College credential prior to transferring (see Tables 1 and 1a). Indeed, it could be argued that this latter group entered university indirectly, rather than directly from high school. One troubling aspect of the findings was that approximately one in six students (17%) did not attain a credential from either institution. As reviewed below, the regression models in the present study reveal the factors that could predict transfer success. Such knowledge can be utilized in the early detection of students who may be at risk for failure (i.e., Model III for all regression analyses, which included socio-demographic, transition features and sending institution GPA) and possibly be targeted for early intervention (see Table 11 and Table 13).

University-to-college transfer serves two groups of students: those who wish to supplement their university credential with a vocationally focused college credential to make themselves more employable (Townsend, 2003; Wilson, 2009), and those who may have performed poorly at university and/or did not attain a credential. For the latter group, university-to-college transfer offers students a “second chance” at attaining some form of credential (e.g., Townsend, 2003), thereby mitigating the loss associated with time invested in postsecondary education and maintaining potential for employability, rather than dropping out of PSE altogether (Hossler, Shapiro, Dundar, Chen, Zerquera, Ziskin & Torres, 2012). Between 2000 and 2012, there were 5,413 students who transferred from York University to Seneca College. Approximately three-fifths of university-to-college transfer students did not

complete their York University credential prior to transferring to Seneca College (Table 14). However, approximately one in five (21%) university-to-college students did not attain a credential at either institution. Similar to the concerns raised in the context of college-to-university transfer and the lack of transfer success, the factors in Model III can help with early detection of students at higher risk for failure (see Table 23 and Table 25).

### In terms of transfer success, what characteristics and features matter?

In addressing the two main outcomes of the present study, we examined three sources of information: socio-demographic characteristics (which include gender, immigration status, age and mother tongue), transition features (which include program group, program relevance/match and specific characteristics pertaining to the receiving institution) and academic performance, such as GPA at both the sending and receiving institution. Table 26 and Table 27 summarize the regression analyses. Based on the OLS regression analyses, it became apparent that *transition features* explained the largest proportion of unique explained variance in terms of the *time spent at the receiving institution* to attain the credential for both college-to-university transfer (18%) and university-to-college transfer (14%). In contrast, the logistic regression analyses revealed that *GPA at the receiving institution* explained the greatest amount of variance in terms of the *probability of credential attainment* for both college-to-university transfer (23%) and university-to-college transfer (19%). Across both types of transfer, socio-demographic characteristics played a relatively small but significant role in predicting the outcome variables. Specific characteristics and features are discussed below.

#### *Socio-demographic characteristics*

**Gender.** Based on the analyses, females who transferred from college to university were more likely than males to attain their credential. This pattern of findings is consistent with the existing Ontario research on college-to-university transfer indicating that females are more likely to transfer (Kerr, McCloy & Liu, 2010; Stuart & Martinello, 2012). For students who transferred from university to college, the effect of gender was non-significant after controlling for sending institution or receiving institution GPA. Drewes et al. (2012) reported a gender effect for university-to-college transfer but did not control for GPA. Female transfer students had a lower difference between the time to attain the credential and the standard program length compared to males with respect to college-to-university and university-to-college transfer.

**Immigration status.** For college-to-university transfer, permanent residents and visa students were more likely to attain their credential compared to Canadian citizens, but were no different from Canadian citizens with respect to time to completion relative to the standard program length. This finding is similar to previous research demonstrating that students of non-European descent within the first-year university student population at York University (that may have included both transfer and non-transfer students) were not necessarily academically disadvantaged (Grayson, 1995). However, the present research also revealed that university-to-college visa students were less likely to attain the college credential than Canadian citizens. The reasons for this are a topic for further research.

**Mother tongue.** College-to-university transfer students whose mother tongue was a language other than English or French were more likely to attain a credential compared to transfer students whose mother tongue was English or French. This pattern mirrors Canadian research on non-transfer students demonstrating that students of Chinese and South Asian heritage were more likely to pursue university studies, and those who were able to converse in

either of the official languages were more likely to attain a university credential (Abada & Tenkorang, 2009). However, the present investigation also reveals that students with a non-English mother tongue spent more time at the receiving institution to attain their credential relative to the standard program length compared to transfer students whose mother tongue was English. The present study did not consider the reasons behind this observation. In terms of university-to-college transfer, mother tongue is not a significant factor after controlling for sending GPA or receiving GPA.

*Age.* With respect to college-to-university transfer, age was negatively related to credential attainment and the time spent at the receiving institution relative to the standard program length. For university-to-college transfer, age was negatively related to credential attainment when receiving institution GPA was controlled. Age was also negatively related to the time spent at the receiving institution minus the standard program length. Across both types of transfer, these patterns are consistent with the notion that older students are likely to have additional responsibilities outside of their education (ONCAT, 2013; Trick, 2013).

### *Transition features*

*Transfer credit.* The present investigation revealed that transfer credit appears to be an important variable in college-to-university transfer for credential attainment and for reducing difference between the time spent at the receiving institution and the standard program length. This finding is consistent with a number of ONCAT (2013) sponsored studies that took place at a number of Ontario universities such as Trent, Lakehead and Ottawa.<sup>26</sup>

*Program group.* For some programs, this variable is important in terms of the probability of credential attainment, and the time spent at the receiving institution varied for both college-to-university transfer and for university-to-college transfer. However, as revealed in the regression analyses, the fact that there was variability across different program groups suggests that further analyses (beyond the scope of the present investigation) are required to understand why students are able to complete some program groups faster than others, relative to the standard program length.

*Program match/affinity.* College-to-university transfer students who were in continuing education or had an undeclared major at the sending institution had a lower probability of credential attainment at the receiving institution compared to those students who had transferred into a matched program. On average, these students spent more time at the receiving institution relative to the program length compared to students in a matched program. Program match does not appear to be relevant for university-to-college transfer in terms of credential attainment, but is relevant in terms of the time spent at the receiving institution.

*Degree/credential type.* Based on the present investigation, degree type appears to be a relevant factor in the sense that college-to-university students who enroll in a four-year honours degree spend less time than the standard program length compared with students who enroll in a three-year ordinary degree. This counter-

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<sup>26</sup> While this finding is certainly of interest, it is important to note that the mere number of credits granted is not necessarily the only consideration when predicting the timely completion of the degree program. A post hoc analysis (not reported here) revealed that there is a significant interaction between program match and transfer credit. This implies that the importance of transfer credit depends upon the degree to which the programs match between with the sending and receiving institution.



intuitive observation could be attributed to the way transfer credits are allocated. Four-year degrees have more room and flexibility in which transfer credits can be allocated compared to three-year degrees. Credential type matters for university-to-college transfers. It appears that students in certificate and graduate certificate programs exhibited a larger time difference between the time spent at the receiving institution and the standard program length compared to those in diploma programs. Students in an advanced diploma or college bachelor's degree generally exhibit a smaller difference between the time spent at the receiving institution and standard program length. This pattern is similar to that found for degree type for college-to-university transfer, in the sense that students save time in longer programs compared to shorter programs.

*Admission basis.* For the purposes of this investigation, this variable applies to university-to-college transfer only. In terms of the time spent at the receiving institution minus the standard program length, students who were admitted to the college program on the basis of their university grades exhibited a lower difference, compared with those admitted on the basis of their high school grades. University graduates also spent less time at the institution to attain their college credential.

### *Academic Performance*

For college-to-university transfer, sending institution GPA was predictive of credential attainment. This finding is consistent with Cejda, Rewey and Kaylor (1998), who demonstrated that in transfer students, college GPA is associated with persistence and graduation at university. The present investigation also demonstrated that receiving institution GPA was highly predictive of credential attainment. The same pattern of findings was evident for university-to-college transfer with respect to credential attainment. Regardless of whether the context was college-to-university transfer or university-to-college transfer, the present investigation revealed that the higher the sending institution GPA, the less time students spent at the receiving institution relative to the standard program length. The same pattern was true for receiving institution GPA. Finally with respect to prior credential attainment, this study revealed that for university-to-college transfer, attaining a prior credential was associated with less time spent at the receiving institution relative to the standard program length.

## Additional Considerations

There are two important observations from the regression analyses that have implications beyond the study. First, if we wish to understand further the factors that influence the probability of credential attainment, an important area to examine is academic performance at the receiving institution. A large body of literature has been developed that focuses on the ways in which students at the receiving institution are indeed supported in their learning through teaching practices that promote active learning (e.g., Bonwell & Eison, 1991); deep learning (Biggs & Tang, 2011; Prosser, Trigwell & Waterhouse, 1997; Ramsden, 1992); student engagement (e.g., Bowen, 2005); and generally those practices that promote high educational impact (e.g., Brownwell & Swaner, 2010) to ensure that students are proceeding through their programs as expected (e.g., Tinto, 1975). Although this literature has usually considered the broader student population, exactly how it applies to transfer students needs to be considered in future research.

Second, given the importance of timely completion of the credential, an important consideration is the further examination of transition features and how transfer students are navigating the existing structure. Based on the

present study, it was clear that students’ program choices had an impact on how quickly they would proceed through the program. In the case of college-to-university transfer, if their sending programs matched their receiving programs, students proceeded through their programs more quickly than others relative to the standard program length. This would likely be due to the fact that eligible transfer credits could be assigned not only to electives but to the program itself. Program relevance/match was a factor in the present investigation: 49% of college-to-university transfer students enrolled in programs that were not matched. This observation is consistent with Arnett (2000, 2004), in the sense that these students are considering different areas of study as part of their personal exploration.



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## Appendix A: Tables

**Table 1: Number of individuals who earned between zero and three credentials at York University after transferring from Seneca College with zero to five credentials**

Number of credentials attained at the <b>sending institution</b> (Seneca)	Number of credentials attained at the <b>receiving institution</b> (York)					Total
	0	1	2	3	"In progress" <sup>1</sup>	
0	1,315	1,290	74	2	662	3,343
1	1,570	2,661	189	4	1,177	5,601
2	154	128	6	0	71	359
3	9	12	1	0	2	24
4	0	0	0	0	0	0
5	2	1	0	0	0	3
Total	3,050	4,092	270	6	1,912	9,330

Note. <sup>1</sup> No credential but still registered in 2012

**Table 1a: Percentage of individuals who earned between zero and three credentials at York University after transferring from Seneca College with zero to five credentials (row total = 100%)**

Number of credentials attained at the <b>sending institution</b> (Seneca)	Number of credentials attained at the <b>receiving institution</b> (York)					Total
	0	1	2	3	"In progress" <sup>1</sup>	
0	39.3%	38.6%	2.2%	0.1%	19.8%	100.0%
1	28.0%	47.5%	3.4%	0.1%	21.0%	100.0%
2	42.9%	35.7%	1.7%	0.0%	19.8%	100.0%
3	37.5%	50.0%	4.2%	0.0%	8.3%	100.0%
4	0	0	0	0	0	0
5	66.7%	33.3%	0.0%	0.0%	0.0%	100.0%
Total	32.7%	43.9%	2.9%	0.1%	20.5%	100.0%

Note. <sup>1</sup> No credential but still registered in 2012

**Table 2: Demographic characteristics of Seneca-to-York transfer students who attained at least one credential, or are "in progress," or did not attain a credential from York University, as well as average time to attain first York credential**

Socio-demographic Characteristics									Time to completion (yrs)  Graduates only (at least 1 credential)
	Obtained at least one credential from <b>receiving institution</b> (York)								
	No		Yes		In progress		Total		
	count	col %	count	col %	count	col %	count	col %	
Gender									
Male	1,365	44.75%	1,585	36.29%	872	45.61%	3,822	40.96%	3.71
Female	1,685	55.25%	2,783	63.71%	1,040	54.39%	5,508	59.04%	3.50
Total	3,050	100.00%	4,368	100.00%	1,912	100.00%	9,330	100.00%	3.57
Immigration status									
Canadian citizen	2,427	79.57%	2,923	66.92%	1,528	79.92%	6,878	73.72%	3.70
Permanent resident	406	13.31%	765	17.51%	238	12.45%	1,409	15.10%	3.32
Student visa	217	7.11%	680	15.57%	146	7.64%	1,043	11.18%	3.32
Total	3,050	100.00%	4,368	100.00%	1,912	100.00%	9,330	100.00%	3.57
Age upon entering receiving institution (York)									
Less than 25	1,855	60.82%	3,173	72.64%	1,280	66.95%	6,308	67.61%	3.68
Equal or greater than 25	1,195	39.18%	1,195	27.36%	632	33.05%	3,022	32.39%	3.29
Total	3,050	100.00%	4,368	100.00%	1,912	100.00%	9,330	100.00%	3.57
Mother tongue									
English or French	2,019	66.20%	2,450	56.09%	1,230	64.33%	5,699	61.08%	3.72
Other languages only	1,025	33.61%	1,914	43.82%	680	35.56%	3,619	38.79%	3.39
Not reported	6	.20%	4	.09%	2	.10%	12	.13%	NA
Total	3,050	100.00%	4,368	100.00%	1,912	100.00%	9,330	100.00%	3.57



Table 2. <i>continued...</i>			Obtained at least one credential from <b>receiving institution</b> (York)						Time to completion (yrs)
									Graduates only (at least 1 credential)
No			Yes		In progress		Total		
	count	col %	count	col %	count	col %	count	col %	
Highest education level of parents									
Elementary school	10	2.55%	11	2.95%	18	1.82%	39	2.22%	2.55
Some high school	18	4.59%	25	6.70%	71	7.16%	114	6.49%	3.28
Completed high school	73	18.62%	69	18.50%	177	17.86%	319	18.17%	3.25
Trade/vocational	16	4.08%	13	3.49%	28	2.83%	57	3.25%	3.23
Completed college/CEGEP	69	17.60%	80	21.45%	209	21.09%	358	20.39%	3.29
Some university	54	13.78%	49	13.14%	125	12.61%	228	12.98%	3.16
Bachelor's degree	85	21.68%	63	16.89%	213	21.49%	361	20.56%	3.19
Professional degree	32	8.16%	40	10.72%	69	6.96%	141	8.03%	3.23
Advanced/grad degree	35	8.93%	23	6.17%	81	8.17%	139	7.92%	3.39
Total	392	100.00%	373	100.00%	991	100.00%	1,756 <sup>a</sup>	100.00%	3.22
First-generation status									
Neither parent had PSE	101	25.77%	105	28.15%	266	26.84%	472	26.88%	3.18
At least one parent had some PSE	291	74.23%	268	71.85%	725	73.16%	1,284	73.12%	3.24
Total	392	100.00%	373	100.00%	991	100.00%	1,756 <sup>a</sup>	100.00%	3.22
Aspiration upon entering Seneca									
Other	63	2.51%	90	2.58%	56	3.31%	209	2.72%	3.68
Employment	680	27.09%	785	22.51%	308	18.21%	1,773	23.06%	3.48
College	173	6.89%	209	5.99%	109	6.45%	491	6.39%	3.72
University	1,594	63.51%	2,403	68.91%	1,218	72.03%	5,215	67.83%	3.62
Total	2,510	100.00%	3,487	100.00%	1,691	100.00%	7,688 <sup>a</sup>	100.00%	3.60

Note. <sup>a</sup> If the dataset did not contain missing records, this number would be 9,330. pct = percentile; yrs = years.

**Table 3: Admission basis, program and program relevance of Seneca-to-York transfer students who attained at least one credential, or were still "in progress," or did not attain a credential from York University, as well as average time to attain first York credential**

	Transition Features								Time to completion (yrs) Graduates only (at least 1 credential)
	Obtained at least one credential from <b>receiving institution</b> (York)								
	No		Yes		In progress		Total		
	count	col %	count	col %	count	col %	count	col %	
Admission basis at <b>receiving institution</b> (York)									
High school	200	6.56%	157	3.59%	68	3.56%	425	4.56%	4.39
CAAT or previous college	2,043	66.98%	3,422	78.34%	1,463	76.52%	6,928	74.26%	3.63
Other bases	698	22.89%	530	12.13%	331	17.31%	1,559	16.71%	3.49
Not reported	109	3.57%	259	5.93%	50	2.62%	418	4.48%	2.54
Total	3,050	100.00%	4,368	100.00%	1,912	100.00%	9,330	100.00%	3.57
Program group, 1st program at receiving institution (York)									
Gen arts & sci, Inter-dis	63	2.07%	35	0.80%	8	0.42%	106	1.14%	4.26
Education	69	2.26%	155	3.55%	30	1.57%	254	2.72%	2.67
Fine arts	46	1.51%	75	1.72%	47	2.46%	168	1.80%	4.07
Humanities	387	12.69%	529	12.11%	344	17.99%	1,260	13.50%	3.92
Social sciences (excl. business)	1,217	39.90%	2,030	46.47%	838	43.83%	4,085	43.78%	3.59
Business & commerce	574	18.82%	954	21.84%	364	19.04%	1,892	20.28%	3.45
Agriculture & bio	38	1.25%	77	1.76%	28	1.46%	143	1.53%	2.94
Engineering	7	0.23%	4	0.09%	4	0.21%	15	0.16%	NA
Health	12	0.39%	49	1.12%	4	0.21%	65	0.70%	2.82
Math & physics	380	12.46%	460	10.53%	154	8.05%	994	10.65%	3.69
Other/Undecided major/Missing	257	8.43%	0	0.00%	91	4.76%	348	3.73%	NA
Total	3,050	100.00%	4,368	100.00%	1,912	100.00%	9,330	100.00%	3.57

Table 3 *continued...*

Table 3 continued...	Transition Features								Time to completion (yrs)  Graduates only (at least 1 credential)
	Obtained at least one credential from <b>receiving institution</b> (York)								
	No		Yes		In progress		Total		
	count	col %	count	col %	count	col %	count	col %	
Relevance of sending and receiving programs (Seneca to York)									
Match	589	19.31%	1,160	26.56%	392	20.50%	2,141	22.95%	3.43
Related	604	19.80%	959	21.96%	472	24.69%	2,035	21.81%	3.44
Not related	1,466	48.07%	2,128	48.72%	944	49.37n%	4,538	48.64%	3.67
NA (CED/Missing/Other)	391	12.82%	121	2.77%	104	5.44%	616	6.60%	4.43
Total	3,050	100.00%	4,368	100.00%	1,912	100.00%	9,330	100.00%	3.57

Note. CED = Continuing Education (Seneca), yrs = years.

**Table 4: Prior academic performance (including persistence) of Seneca-to-York transfer students who attained at least one credential, or were still "in progress," or did not attain a credential from York University, as well as average time to attain first York credential**

	Prior Academic Performance								
	Obtained at least one credential from <b>receiving institution</b> (York)								
	No		Yes		In progress		Total		Time to completion (yrs) Graduates only (at least 1 credential)
	count	col %	count	col %	count	col %	count	col %	
Whether obtained at least one credential from <b>sending institution</b> (Seneca)									
No	1,315	43.11%	1,366	31.27%	662	34.62%	3,343	35.83%	3.79
Yes	1,735	56.89%	3,002	68.73%	1,250	65.38%	5,987	64.17%	3.47
Total	3,050	100.00%	4,368	100.00%	1,912	100.00%	9,330	100.00%	3.57
Grade 12 English stream									
College (C / G)	439	21.03%	525	19.32%	424	29.26%	1,388	22.20%	3.66
University (A / U)	1,648	78.97%	2,192	80.68%	1,025	70.74%	4,865	77.80%	3.73
Total	2,087	100.00%	2,717	100.00%	1,449	100.00%	6253 <sup>a</sup>	100.00%	3.71
Stop-out during study period (up to 1st credential) at receiving Institution (York)									
No stop-out	2,727	89.41%	3,925	89.86%	1,739	90.95%	8,391	89.94%	3.50
1 yr	205	6.72%	300	6.87%	99	5.18%	604	6.47%	4.15
>=2 yrs	118	3.87%	143	3.27%	74	3.87%	335	3.59%	4.31
Total	3,050	100.00%	4,368	100.00%	1,912	100.00%	9,330	100.00%	3.57

Note. <sup>a</sup> If the dataset did not contain missing records, this number would be 9,330. pct = percentile; yrs = years.

**Table 5: Degree type earned by Seneca-to-York transfer students broken down by grade 12 English performance, sending institution GPA, receiving institution GPA and time of stop-out**

	Grade 12 English grade (%)			Cumulative GPA at <b>sending institution</b> (Seneca) (%)			Cumulative or graduation GPA at <b>receiving institution</b> (York) (%)			Stop-out (in years) during study period to attain the first credential at <b>receiving institution</b>		
	Count	Mean	Std. Dev.	Count	Mean	Std. Dev.	Count	Mean	Std. Dev.	Count	Mean	Std. Dev.
Whether attained a credential/Credential type at receiving institution (York)												
No	1,998	66.59	13.18	3,033	69.47	20.33	2,769	59.04	21.27	3,050	.18	.65
Yes	2,623	68.37	11.52	4,356	77.12	12.14	4,353	74.74	7.22	4,368	.16	.60
S to Y – Honours	1,203	68.67	11.75	1,852	78.57	11.53	1,850	77.57	6.53	1,855	.09	.42
S to Y – Ordinary	1,359	68.02	11.35	2,403	76.01	12.26	2,402	72.15	6.56	2,412	.22	.70
S to Y – BEd	61	70.07	10.70	101	77.10	16.84	101	84.44	6.41	101	.11	.53
In progress	1,376	68.26	13.10	1,895	71.44	17.23	1,892	70.22	11.19	1,912	.16	.64
Total	5997 <sup>a</sup>	67.75	12.49	9284 <sup>a</sup>	73.46	16.65	9014 <sup>a</sup>	68.97	15.40	9,330	.17	.63

**Table 6: Transfer pattern of students moving from a Seneca program to a York program in terms of standard program length**

Standard program length of the first credential attained at <b>sending institution</b> (Seneca)	Standard program length of the first credential attained at <b>receiving institution</b> (York)							Total
	1 yr	2 yrs	3 yrs	4 yrs	Other <sup>1</sup>	No credential <sup>2</sup>	"In progress" <sup>3</sup>	
1 year	0	0	67	77	16	137	172	469
2 years	0	0	1,236	954	53	1,186	868	4,297
3 years	0	0	328	238	8	380	200	1,154
4 years	0	0	5	3	1	12	7	28
Other <sup>2</sup>	0	0	12	4	0	20	3	39
No credential <sup>2</sup>	0	0	764	579	23	1,315	662	3,343
Total	0	0	2,412	1,855	101	3,050	1,912	9,330

Note. <sup>1</sup> Concurrent Bachelor of Education – BEd, N/A; <sup>2</sup> No credential and not still registered in 2012; <sup>3</sup> No credential but still registered in 2012

**Table 6a: Transfer pattern of students moving from a Seneca program to a York program in terms of standard program length (column total = 100%)**

Standard program length of the first credential attained at <b>sending institution</b> (Seneca)	Standard program length of the first credential attained at <b>receiving institution</b> (York)							Total
	1 yr	2 yrs	3 yrs	4 yrs	Other <sup>1</sup>	No credential <sup>2</sup>	"In progress" <sup>3</sup>	
1 year	0	0	2.8%	4.2%	15.8%	4.5%	9.0%	5.0%
2 years	0	0	51.2%	51.4%	52.5%	38.9%	45.4%	46.1%
3 years	0	0	13.6%	12.8%	7.9%	12.5%	10.5%	12.4%
4 years	0	0	0.2%	0.2%	1.0%	0.4%	0.4%	0.3%
Other <sup>2</sup>	0	0	0.5%	0.2%	0.0%	0.7%	0.2%	0.4%
No credential <sup>2</sup>	0	0	31.7%	31.2%	22.8%	43.1%	34.6%	35.8%
Total	0	0	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note. <sup>1</sup> Concurrent Bachelor of Education – BEd, N/A; <sup>2</sup> No credential and not still registered in 2012; <sup>3</sup> No credential but still registered in 2012

**Table 7: Number of Seneca transfer students who spent between one and six years at York University to receive their first York credential as a function of York standard program length**Standard program length of the first credential attained at **receiving institution** (York)

	3 years	4 years	Other <sup>1</sup>	Total
Years spent to attain the first credential at receiving institution (York)				
1 year	33	1	82	116
2 years	431	129	9	569
3 years	914	592	9	1,515
4 years	654	679	1	1,334
5 years	272	354	0	626
>= 6 years	108	100	0	208
Total	2,412	1,855	101	4,368

Note. <sup>1</sup> Concurrent Bachelor of Education – BEd, N/A**Table 7a: Number of Seneca transfer students who spent between one and six years at York University to receive their first York credential as a function of York standard program length (column total = 100%)**Standard program length of the first credential attained at **receiving institution** (York)

	3 years	4 years	Other <sup>1</sup>	Total
Years spent to attain the first credential at receiving institution (York)				
1 year	1.4%	0.1%	81.2%	2.7%
2 years	17.9%	7.0%	8.9%	13.0%
3 years	37.9%	31.9%	8.9%	34.7%
4 years	27.1%	36.6%	1.0%	30.5%
5 years	11.3%	19.1%	0.0%	14.3%
>= 6 years	4.5%	5.4%	0.0%	4.8%
Total	100.0%	100.0%	100.0%	100.0%

Note. <sup>1</sup> Concurrent Bachelor of Education – BEd, N/A



**Table 8: Average number of transfer credits granted by York University to Seneca students, by actual time to completion of first York credential and corresponding standard program length**

	Standard program length of the first credential attained at the <b>receiving institution</b> (York)			
	3 years	4 years	Other <sup>1</sup>	Total
Years spent to attain first credential at <b>receiving institution</b> (York)				
1 year	47.73	†	3.62	16.91
2 years	38.64	53.81	23.33	41.84
3 years	31.17	38.25	3.33	34
4 years	26.66	27.92	0	27
5 years	21.09	22.87	NA	22.1
>= 6 years	18.42	19.32	NA	18.85
Total	30	32	5.32	30

Note. <sup>1</sup> York concurrent Bachelor of Education – BEd, N/A, † = insufficient data

**Table 9: Average number of years Seneca transfer students spent at York University as a function of whether a York credential was attained or not, or in progress, as well as number of transfer credits granted**

	Time Spent (no credential) / Time to completion (first credential) at <b>receiving institution</b> (York)			Transfer credits granted		
	Count	Mean	Std. Dev.	Count	Mean	Std. Dev.
Whether attained a credential at receiving institution (York)						
No	3,050	1.91	1.22	3,050	20.93	19.64
Yes	4,368	3.57	1.18	4,368	30.01	21.07
S to Y – Honours	1,855	3.86	1.06	1,855	31.62	22.48
S to Y – Ordinary	2,412	3.45	1.15	2,412	29.80	19.43
S to Y – BEd	101	1.30	.67	101	5.32	16.04
In progress	1,912	2.25	1.35	1,912	22.89	18.78
Total	9,330	2.76	1.45	9,330	25.58	20.59

**Table 10: Seneca College to York University transfer – Logit models predicting the probability of students attaining at least one credential at the receiving institution (York): Model I and Model II**

		Model I: Baseline					Model II: Baseline + Transition Features				
Categories	Independent Variables	St. Beta	Std. Err	Odds Ratio	Wald (z)	sig.	St. Beta	Std. Err	Odds Ratio	Wald (z)	sig.
Gender (ref=male)	Female	.10	.08	1.45	6.46	***	.07	.08	1.30	4.23	***
Immigration Status (ref=Canadian Citizen)	Permanent Resident	.09	.15	1.59	4.78	***	.07	.15	1.51	4.05	***
	Visa Student	.09	.23	1.84	4.95	***	.10	.26	1.98	5.25	***
	Age	-.09	.01	.96	-5.75	***	-.13	.01	.94	-7.53	***
Mother Tongue (ref=Eng)	Other Language	.05	.09	1.22	2.81	**	.05	.09	1.24	2.84	**
Had Credential from Sending Institution (ref=No)	Yes										
	Cumulative or Graduation GPA at Sending Institution										
Program Group (ref=Humanities & related)	Gen. Arts & Science						-.03	.18	.57	-1.83	
	Educ'n/ Phys Ed						.01	.24	1.09	.37	
	Fine Arts						.02	.34	1.35	1.17	
	Social Sciences <sup>1</sup>						.03	.10	1.12	1.21	
	Business						-.10	.08	.62	-3.71	***
	Natural & Applied Sci <sup>2</sup>						-.09	.07	.62	-4.02	***
Relevance (ref=Matched)	Related						-.07	.09	.73	-2.55	*
	Not Related						-.07	.08	.77	-2.52	*
	CED/Other						-.05	.14	.52	-2.41	*
Admission Basis (ref=High School)	CAAT						.12	.35	1.84	3.23	***
	Other Bases						.04	.25	1.23	1.02	
	Transfer Credits Granted						.23	.00	1.02	13.05	***
Aspiration (ref=Employment)	Other						.01	.21	1.08	.37	
	College						-.01	.13	.94	-.49	
	University						-.02	.07	.92	-1.06	
	Cumulative or Graduation GPA at Receiving Inst.										
Total N				5367.00					5367.00		
Prob > LR chi2 (DF)				Prob > 153.48 (5) = .000					Prob > 494.49 (20) = .000		
Pseudo R-square				.02					.07		
AIC				7003.52					6692.51		
BIC				7043.05					6830.86		
Correctly Classified				.62					.66		

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . <sup>1</sup> Excludes business. <sup>2</sup> Includes biology, chemistry, engineering, physics and mathematics; St. = Standardized; Std. = Standard; CED = Continuing Education (Seneca Only); CAAT = College of Applied Arts & Technology; Eng = English; Gen. = General; geo. = geography; GPA = Grade Point Average; Inst. = Institution; pct. = percentile; Prob = probability; ref = reference group; Sci = Science; sig. = significance level

**Table 11: Seneca College to York University transfer – Logit models predicting the probability of students attaining at least one credential at the receiving institution (York): Model III and Model IV**

		Model III: Baseline +Transition Features + Sending Inst. Academic Performance					Model IV: Baseline + Transition Features + Receiving Inst. Academic Performance				
Categories	Independent Variables	St. Beta	RStd. Err	Odds Ratio	Wald (z)	sig.	St. Beta	RStd. Err	Odds Ratio	Wald (z)	sig.
Gender (ref=male)	Female	.05	.08	1.20	2.98	**	.06	.10	1.39	4.38	***
Immigration Status (ref=Canadian Citizen)	Perm Resident	.06	.14	1.41	3.31	***	.04	.17	1.40	2.78	**
	Visa Student	.10	.26	1.98	5.19	***	.07	.29	1.90	4.21	***
	Age	-.12	.01	.95	-6.52	***	-.17	.01	.90	-11.09	***
Mother Tongue (ref=Eng)	Other Language	.05	.09	1.21	2.43	*	.04	.12	1.28	2.66	**
Had Credential from Sending Institution (ref=No)	Yes	-.01	.07	.96	-.51						
	Cumulative or Graduation GPA at Sending Institution	.21	.07	1.60	11.34	***					
Program Group (ref=Humanities & related)	Gen. Arts & Sci	-.03	.17	.53	-2.02	*	-.03	.16	.46	-2.18	*
	Educ'n/ Phys Ed	.00	.22	.99	-.03		.01	.30	1.14	.50	
	Fine Arts	.01	.32	1.25	.88		.02	.42	1.42	1.18	
	Social Sciences <sup>1</sup>	.03	.10	1.11	1.09		.05	.15	1.30	2.27	*
	Business	-.09	.08	.62	-3.57	***	-.02	.14	.88	-.82	
	Nat & Appl Sci <sup>2</sup>	-.09	.07	.60	-4.17	***	-.01	.14	.91	-.65	
Relevance (ref=Matched)	Related	-.04	.10	.83	-1.53		.00	.14	.98	-.16	
	Not Related	-.04	.09	.87	-1.33		.02	.14	1.13	.95	
	CED/Other	-.09	.08	.28	-4.36	***	-.03	.19	.54	-1.75	
Admission Basis (ref=High School)	CAAT	-.01	.20	.95	-.27		.02	.28	1.12	.46	
	Other Bases	-.03	.18	.84	-.80		-.03	.22	.83	-.72	
	Transfer Credits	.17	.00	1.02	9.45	***	.10	.00	1.01	6.30	***
Aspiration (ref=Employment)	Other	.00	.20	1.02	.08		.01	.30	1.24	.87	
	College	.00	.13	.97	-.21		.01	.19	1.16	.92	
	University	-.01	.07	.95	-.70		.03	.11	1.22	2.17	*
	Cumulative or Graduation GPA at Receiving Inst.						.67	.08	2.57	31.64	***
Total N		5367					5367				
Prob > LR chi2 (DF)		Prob > 637.00 (22) = .000					Prob > 2305.80 (21) = .000				
Pseudo R-square		.09					.32				
AIC		6554.00					4883.20				
BIC		6705.52					5028.14				
Correctly Classified		.67					.81				

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . <sup>1</sup>Excludes business. <sup>2</sup>Includes biology, chemistry, engineering, physics and mathematics; St. = Standardized; Std. = Standard; Appl = Applied; CED = Continuing Education (Seneca Only); CAAT = College of Applied Arts & Technology; Educ'n = Education; Eng = English; Gen. = General; geo. = geography GPA = Grade Point Average; Inst. = Institution; pct. = percentile; Perm = Permanent; Phys Ed = Physical education; Prob = probability; ref = reference group; Nat = Natural Sci = Sciences; sig. = significance level

**Table 12: Seneca College to York University transfer – Ordinary least squares regression models predicting the time spent at the receiving institution (York) minus the standard program length: Model I and Model II**

		Model I: Baseline					Model II: Baseline + Transition Feature				
Categories	Independent Variables	St. Beta	Coeff. (b)	RStd. Err	t	sig.	St. Beta	Coeff. (b)	RStd. Err	T	sig.
Gender (ref=male)	Female	-.08	-.18	.04	-4.26	***	-.08	-.19	.04	-4.91	***
Immigration Status (ref=Canadian Citizen)	Permanent Resident	-.03	-.10	.07	-1.46		-.02	-.06	.06	-1.08	
	Visa Student	.00	.00	.07	-.05		-.03	-.12	.07	-1.72	
	Age	-.14	-.04	.01	-7.04	***	-.05	-.01	.01	-2.38	*
Mother Tongue (ref=Eng)	Other Language	-.07	-.17	.05	-3.37	***	-.06	-.15	.05	-3.13	**
Had Credential from Sending Institution (ref=No)	Yes										
	Cumulative or Graduation GPA at Sending Institution										
Program Group (ref=Humanities & related)	General Arts and Science						.06	.85	.42	2.03	*
	Educ'n/ Phys Ed						.07	.63	.14	4.45	***
	Fine Arts						-.01	-.05	.14	-.39	
	Social Sciences <sup>1</sup>						-.07	-.15	.06	-2.78	**
	Business						-.01	-.01	.08	-.18	
	Natural & Applied Sci <sup>2</sup>						-.02	-.07	.08	-.84	
Credential Type (ref=Ordinary Degree)	Honour's Degree						-.29	-.65	.04	-18.00	***
	Transfer Credits Granted						-.27	-.02	.00	-14.26	***
Relevance (ref=Matched)	Related						-.01	-.02	.07	-.34	
	Not Related						.01	.02	.07	.36	
	CED / Other						.04	.38	.19	1.98	*
Admission Basis (ref=High School)	CAAT						-.06	-.21	.11	-1.93	
	Other Bases						-.06	-.21	.12	-1.78	
Aspiration (ref=Employment)	Other						.01	.10	.11	.93	
	College						.03	.14	.09	1.61	
	University						.04	.09	.05	1.86	
	Cumulative or Graduation GPA at Receiving Institution										
Intercept Constant			1.23	.12	10.28	***		1.65	.18	9.10	***
Total N					3305					3305	
F					F( 5, 3299) = 27.65					F( 21, 3283) = 42.58	
Prob > F					.00					.00	
R-squared					.04					.22	

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . <sup>1</sup>Excludes business. <sup>2</sup>Includes biology, chemistry, engineering, physics and mathematics; St. = Standardized; RStd. Err = Robust Standard Error; CED = Continuing Education (Seneca Only); Census-G. = Census geography; Eng = English; Gen. = General; GPA = Grade Point Average; Inst. = Institution; pct. = percentile; Prob = probability; ref = reference group; Sci = Sciences; sig. = significance level; Coeff (b) = Unstandardized Coefficient (b)

**Table 13: Seneca College to York University transfer – Ordinary least squares regression models predicting the time spent at the receiving institution (York) minus the standard program length: Model III and Model IV**

		Model III: Baseline +Transition Features + Sending Inst. Academic Performance					Model IV Baseline + Transition Features +Receiving Inst. Academic Performance				
		St. Beta	Coeff. (b)	RStd. Err	t	sig.	St. Beta	Coeff. (b)	RStd. Err	t	sig.
Categories	Independent Variables										
Gender (ref=male)	Female	-.07	-.17	.04	-4.40	***	-.08	-.19	.04	-5.03	***
Immigration Status (ref=Canadian Citizen)	Permanent Resident	-.02	-.06	.06	-.95		-.02	-.05	.06	-.89	
	Visa Student	-.03	-.13	.07	-1.81		-.03	-.12	.07	-1.67	
	Age	-.05	-.01	.01	-2.53		-.03	-.01	.01	-1.45	
Mother Tongue (ref=Eng)	Other Language	-.06	-.15	.05	-3.04	**	-.06	-.15	.05	-3.17	**
Had Credential from Sending Institution (ref=No)	Yes	-.03	-.07	.04	-1.62						
	Cumulative or Graduation GPA at Sending Institution	-.06	-.10	.03	-3.73	***					
Program Group (ref=Humanities & related)	General Arts and Science	.06	.85	.42	2.01	*	.06	.83	.42	1.96	*
	Educ'n/ Phys Ed	.07	.62	.14	4.36	***	.07	.57	.14	4.05	***
	Fine Arts	-.01	-.05	.14	-.38		-.01	-.12	.14	-.85	
	Social Sciences <sup>1</sup>	-.07	-.15	.06	-2.75	**	-.07	-.17	.06	-3.04	**
	Business	.00	-.01	.08	-.15		-.01	-.03	.08	-.36	
	Natural & Applied Sci <sup>2</sup>	-.02	-.07	.08	-.86		-.03	-.09	.08	-1.05	
Credential Type (ref=Ordinary Degree)	Honour's Degree	-.28	-.64	.04	-17.34	***	-.22	-.50	.04	-12.24	***
	Transfer Credits Granted	-.26	-.01	.00	-13.08	***	-.26	-.01	.00	-13.62	***
Relevance (ref=Matched)	Related	-.02	-.04	.07	-.59		-.01	-.04	.07	-.48	
	Not Related	.00	.00	.07	.01		.00	.01	.07	.17	
	CED/Other	.04	.48	.20	2.47	*	.04	.42	.19	2.25	*
Admission Basis (ref=High School)	CAAT	-.02	-.07	.11	-.67		-.06	-.19	.11	-1.82	
	Other Bases	-.04	-.13	.12	-1.11		-.06	-.20	.12	-1.68	
Aspiration (ref=Employment)	Other	.02	.11	.11	1.06		.01	.10	.11	.90	
	College	.03	.14	.09	1.65		.03	.14	.09	1.59	
	University	.04	.09	.05	1.88		.03	.06	.05	1.34	
	Cumulative or Graduation GPA at Receiving Institution						-.15	-.15	.02	-8.59	***
Intercept Constant			1.88	.19	9.90	***		2.38	.20	12.10	***
Total N				3305					3305		
F				F( 23, 3281) = 40.42					F( 22, 3282) = 44.81		
Prob > F				.000					.000		
R-squared				.22					.23		

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . <sup>1</sup>Excludes business. <sup>2</sup>Includes biology, chemistry, engineering, physics and mathematics; St. = Standardized; RStd. Err = Robust Standard Error; CED = Continuing Education (Seneca Only); Census-G. = Census geography; Eng = English; Gen. = General; GPA = Grade Point Average; Inst. = Institution; pct. = percentile; Prob = probability; ref = reference group; Sci = Sciences; sig. = significance level; Coeff (b)= Unstandardized Coefficient (b)

**Table 14: Number of individuals who earned between zero and three credentials at Seneca College after transferring from York University with zero to three credentials**

Number of credentials obtained from sending institution (York)	Number of credentials obtained from receiving institution (Seneca)					Total
	0	1	2	3	"In progress" <sup>1</sup>	
0	964	1,583	90	6	627	3,270
1	367	1,450	21	1	195	2,034
2	39	56	1	0	5	101
3	4	3	0	0	1	8
Total	1,374	3,092	112	7	828	5,413

Note. <sup>1</sup> No credential but still registered in 2012

**Table 14a: Number of individuals who earned between zero and three credentials at Seneca College after transferring from York University with zero to three credentials (column total = 100%)**

Number of credentials obtained from sending institution (York)	Number of credentials obtained from receiving institution (Seneca)					Total
	0	1	2	3	"In progress" <sup>1</sup>	
0	70.2%	51.2%	80.4%	85.7%	75.7%	60.4%
1	26.7%	46.9%	18.8%	14.3%	23.6%	37.6%
2	2.8%	1.8%	0.9%	0.0%	0.6%	1.9%
3	0.3%	0.1%	0.0%	0.0%	0.1%	0.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note. <sup>1</sup> No credential but still registered in 2012

**Table 14b: Number of individuals who earned between zero and three credentials at Seneca College after transferring from York University with zero to three credentials (row total = 100%)**

Number of credentials obtained from sending institution (York)	Number of credentials obtained from receiving institution (Seneca)					Total
	0	1	2	3	"In progress" <sup>1</sup>	
0	29.5%	48.4%	2.8%	0.2%	19.2%	100.0%
1	18.0%	71.3%	1.0%	0.0%	9.6%	100.0%
2	38.6%	55.4%	1.0%	0.0%	5.0%	100.0%
3	50.0%	37.5%	0.0%	0.0%	12.5%	100.0%
Total	25.4%	57.1%	2.1%	0.1%	15.3%	100.0%

Note. <sup>1</sup> No credential but still registered in 2012

**Table 15: Socio-demographic characteristics of York-to-Seneca transfer students who attained at least one credential, or are "in progress," or did not attain a credential from Seneca College, as well as average time to attain first Seneca credential**

Socio-demographic Characteristics								
	Obtained at least one credential from <b>receiving institution</b> (Seneca)							
	No		Yes		In progress		Total	
	count	col %	count	col %	count	col %	count	col %
<b>Gender</b>								
Male	644	46.87%	1,073	33.42%	386	46.62%	2,103	38.85%
Female	730	53.13%	2,138	66.58%	442	53.38%	3,310	61.15%
Total	1,374	100.00%	3,211	100.00%	828	100.00%	5,413	100.00%
<b>Immigration status</b>								
Canadian citizen	1,185	86.24%	2,970	92.49%	747	90.22%	4,902	90.56%
Permanent resident	114	8.30%	178	5.54%	57	6.88%	349	6.45%
Student visa	75	5.46%	63	1.96%	24	2.90%	162	2.99%
Total	1,374	100.00%	3,211	100.00%	828	100.00%	5,413	100.00%
<b>Age upon entering receiving institution</b>								
Less than 25	996	72.49%	2,338	72.81%	624	75.36%	3,958	73.12%
Equal or greater than 25	378	27.51%	873	27.19%	204	24.64%	1,455	26.88%
Total	1,374	100.00%	3,211	100.00%	828	100.00%	5,413	100.00%

Note. <sup>a</sup> If the dataset did not contain missing records, this number would be 5,413.



Table 15. <i>Continued....</i>	Obtained at least one credential from receiving institution (Seneca)								Time to completion (yrs)
	No		Yes		In progress		Total		Graduates only (at least 1 credential)
	count	col %	count	col %	count	col %	count	col %	
Mother tongue									
English or French	1,169	85.08%	2,836	88.32%	722	87.20%	4,727	87.33%	2.00
Other languages only	205	14.92%	374	11.65%	104	12.56%	683	12.62%	2.47
Not reported	0	.00%	1	.03%	2	.24%	3	.06%	NA
Total	1,374	100.00%	3,211	100.00%	828	100.00%	5,413	100.00%	2.06
Highest educational level of parents									
Elementary school	6	1.64%	12	1.65%	12	2.27%	30	1.85%	2.08
Some high school	30	8.22%	38	5.22%	25	4.73%	93	5.74%	2.29
Completed high school	54	14.79%	103	14.15%	62	11.74%	219	13.51%	2.43
Trade/vocational	21	5.75%	35	4.81%	22	4.17%	78	4.81%	2.17
Completed college/CEGEP	74	20.27%	177	24.31%	110	20.83%	361	22.27%	2.33
Some university	41	11.23%	61	8.38%	63	11.93%	165	10.18%	2.28
Bachelor's degree	74	20.27%	180	24.73%	150	28.41%	404	24.92%	2.35
Professional degree	30	8.22%	47	6.46%	32	6.06%	109	6.72%	2.21
Advanced/grad degree	35	9.59%	75	10.30%	52	9.85%	162	9.99%	2.39
Total	365	100.00%	728	100.00%	528	100.00%	1,621 <sup>a</sup>	100.00%	2.33
Parental education									
Neither parent had PSE	90	24.66%	153	21.02%	99	18.75%	342	21.10%	2.37
At least one parent had Some PSE	275	75.34%	575	78.98%	429	81.25%	1,279	78.90%	2.32
Total	365	100.00%	728	100.00%	528	100.00%	1,621 <sup>a</sup>	100.00%	2.33
Aspiration upon entering Seneca									
Other	51	5.60%	83	4.96%	31	4.92%	165	5.14%	2.70
Employment	561	61.58%	1,178	70.45%	378	60.00%	2,117	65.89%	2.40
College	50	5.49%	104	6.22%	58	9.21%	212	6.60%	2.22
University	249	27.33%	307	18.36%	163	25.87%	719	22.38%	2.69
Total	911	100.00%	1,672	100.00%	630	100.00%	3,213 <sup>a</sup>	100.00%	2.46

Note. <sup>a</sup> If the dataset did not contain missing records, this number would be 5,413.

**Table 16: Admission basis, program and program relevance of York-to-Seneca transfer students who attained at least one credential, or were still "in progress," or did not attain a credential from Seneca College, as well as average time to attain first Seneca credential**

Transition Features									
	Obtained at least one credential from <b>receiving institution</b> (Seneca)								Time to completion (yrs)
	No		Yes		In progress		Total		Graduates only (at least 1 credential)
	count	col %	count	col %	count	col %	count	col %	
Admission basis at receiving institution									
High school	672	48.91%	1,230	38.31%	485	58.57%	2,387	44.10%	2.38
University	331	24.09%	1,170	36.44%	106	12.80%	1,607	29.69%	1.54
Other bases	249	18.12%	449	13.98%	157	18.96%	855	15.80%	2.30
Not reported	122	8.88%	362	11.27%	80	9.66%	564	10.42%	2.30
Total	1,374	100.00%	3,211	100.00%	828	100.00%	5,413	100.00%	2.06
Program Group, 1st program at receiving institution									
Gen arts & Sci, Inter-dis	44	3.20%	25	0.78%	18	2.17%	87	1.61%	2.24
Education	52	3.78%	219	6.82%	57	6.88%	328	6.06%	2.44
Fine arts	50	3.64%	124	3.86%	46	5.56%	220	4.06%	2.18
Humanities & related	278	20.23%	765	23.82%	97	11.71%	1,140	21.06%	1.83
Social sciences (excl. business)	121	8.81%	798	24.85%	124	14.98%	1,043	19.27%	1.73
Business & commerce	353	25.69%	809	25.19%	217	26.21%	1,379	25.48%	2.01
Agriculture & bio	6	0.44%	32	1.00%	4	0.48%	42	0.78%	2.06
Engineering	75	5.46%	100	3.11%	62	7.49%	237	4.38%	2.75
Health	219	15.94%	192	5.98%	118	14.25%	529	9.77%	2.66
Math & physics	172	12.52%	147	4.58%	85	10.27%	404	7.46%	3.27
Other(CED)/Undecided major/Missing	4	0.29%	0	0.00%	0	0.00%	4	0.07%	NA
Total	1,374	100.00%	3,211	100.00%	828	100.00%	5,413	100.00%	2.06
Relevance of sending and receiving programs									
Match	118	8.59%	203	6.32%	75	9.06%	396	7.32%	2.60
Related	377	27.44%	1,347	41.95%	239	28.86%	1,963	36.26%	1.76
Not related	771	56.11%	1,518	47.27%	453	54.71%	2,742	50.66%	2.21
NA (CED/Missing/Other)	108	7.86%	143	4.45%	61	7.37%	312	5.76%	2.48
Total	1,374	100.00%	3,211	100.00%	828	100.00%	5,413	100.00%	2.06

**Table 17: Prior academic performance (including persistence) of York-to-Seneca transfer students who attained at least one credential, or were still "in progress," or did not attain a credential from Seneca College, as well as average time to attain first Seneca credential**

Academic Performance									
	Obtained at least one credential from <b>receiving institution</b> (Seneca)								Time to completion (yrs)
	No		Yes		In progress		Total		Graduates only (at least 1 credential)
	count	col %	count	col %	count	col %	count	col %	
Whether obtained at least one credentials from <b>sending institution</b> (York)									
No	964	70.16%	1,679	52.29%	627	75.72%	3,270	60.41%	2.51
Yes	410	29.84%	1,532	47.71%	201	24.28%	2,143	39.59%	1.56
Total	1,374	100.00%	3,211	100.00%	828	100.00%	5,413	100.00%	2.06
Grade 12 English stream									
College (C/G)	47	4.17%	51	1.91%	22	2.97%	120	2.64%	2.29
University (A/U)	1,081	95.83%	2,620	98.09%	718	97.03%	4,419	97.36%	2.03
Total	1,128	100.00%	2,671	100.00%	740	100.00%	4539 <sup>a</sup>	100.00%	2.04
Stop-out during study period (up to 1st credential) at receiving institution (Seneca)									
No stop-out	1,262	91.85%	3,109	96.82%	776	93.72%	5,147	95.09%	2.00
1 yr	58	4.22%	58	1.81%	29	3.50%	145	2.68%	3.66
>=2 yrs	54	3.93%	44	1.37%	23	2.78%	121	2.24%	3.70
Total	1,374	100.00%	3,211	100.00%	828	100.00%	5,413	100.00%	2.06

Note. <sup>a</sup> If the dataset did not contain missing records, this number would be 5,413.

**Table 18: Credential type earned by York-to-Seneca transfer students broken down by grade 12 English performance, sending institution GPA, receiving institution GPA and time of stop-out**

	Grade 12 English Grade (%)			Cumulative GPA (%) at <b>sending institution</b> (York)			Cumulative or graduation GPA at <b>receiving institution</b> (Seneca)			Stop-out (in years) during study period to obtain the first credential at <b>receiving institution</b> (Seneca)		
	Count	Mean	Std. Dev.	Count	Mean	Std. Dev.	Count	Mean	Std. Dev.	Count	Mean	Std. Dev.
Whether obtained a credential/Credential type at receiving institution (Seneca)												
No	1,119	71.29	11.24	1,183	61.15	20.61	1,344	63.89	26.15	1,374	.18	.83
Yes	2,661	73.28	9.60	2,706	67.27	13.73	3,211	82.61	7.75	3,211	.07	.56
Y to S – coll bachelor	44	70.18	12.25	51	57.50	16.55	53	79.97	6.78	53	.04	.19
Y to S – advanced dip.	287	71.94	9.31	265	58.95	15.86	325	79.81	7.21	325	.07	.39
Y to S – diploma	1,516	73.24	9.87	1,549	66.99	14.18	1,799	82.53	8.20	1,799	.07	.48
Y to S – grad. cert.	650	74.27	8.90	675	72.43	7.79	843	83.97	6.29	843	.05	.48
Y to S – certificate	139	73.46	8.67	142	65.23	14.72	160	83.29	8.46	160	.21	1.43
Y to S – other	25	69.04	10.29	24	65.23	15.60	31	80.80	10.30	31	.19	.75
In progress	739	74.12	9.75	785	57.44	20.93	821	72.33	18.65	828	.16	.92
Total	4519 <sup>a</sup>	72.92	10.10	4674 <sup>a</sup>	64.07	17.48	5376 <sup>a</sup>	76.36	18.01	5,413	.11	.70

Note. <sup>a</sup> If the dataset did not contain missing records, this number would be 5,413.

**Table 19: Transfer pattern of students moving from a York program to a Seneca program in terms of standard program length**

Standard program length of the first credential obtained at <b>sending institution</b> (York)	Standard program length of the first credential obtained at <b>receiving institution</b> (Seneca)								Total
	1 year	2 years	3 years	4 years	Other <sup>1</sup>	No credential <sup>2</sup>	"In progress" <sup>3</sup>	Total w/o "in progress"	
1 year	0	0	0	0	0	0	0	0	0
3 years	357	332	26	3	10	208	95	936	1,031
4 years	400	377	16	2	6	201	106	1,002	1,108
Other <sup>2</sup>	1	2	0	0	0	1	0	4	4
No credential <sup>2</sup>	245	1,088	283	48	15	964	627	2,643	3,270
Total	1,003	1,799	325	53	31	1,374	828	4,585	5,413

Note. <sup>1</sup> Concurrent Bachelor of Education, B.Ed., N/A; <sup>2</sup> No credential and not registered in 2012; <sup>3</sup> No credential but still registered in 2012

**Table 19a: Transfer pattern of students moving from a York program to a Seneca program in terms of standard program length (column total = 100%)**

Standard program length of the first credential obtained at <b>sending institution</b> (York)	Standard program length of the first credential obtained at <b>receiving institution</b> (Seneca)								Total
	1 year	2 years	3 years	4 years	Other <sup>1</sup>	No credential <sup>2</sup>	"In progress" <sup>3</sup>	Total w/o "in progress"	
1 year	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3 years	35.6%	18.5%	8.0%	5.7%	32.3%	15.1%	11.5%	20.4%	19.0%
4 years	39.9%	21.0%	4.9%	3.8%	19.4%	14.6%	12.8%	21.9%	20.5%
Other <sup>2</sup>	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.1%
No credential <sup>2</sup>	24.4%	60.5%	87.1%	90.6%	48.4%	70.2%	75.7%	57.6%	60.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note. <sup>1</sup> Concurrent Bachelor of Education, BEd, N/A; <sup>2</sup> No credential and not registered in 2012; <sup>3</sup> No credential but still registered in 2012

**Table 19b: Transfer pattern of students moving from a York program to a Seneca program in terms of standard program length (excludes "in progress"; row total = 100%)**

Standard program length of the first credential obtained at <b>receiving institution</b> (Seneca)	Standard program length of the first credential obtained at <b>receiving institution</b> (Seneca)						
	1 yr	2 yrs	3 yrs	4 yrs	Other <sup>1</sup>	No credential <sup>2</sup>	"In progress" <sup>3</sup>
Standard program length of the first credential obtained at <b>sending institution</b> (York)							
							Total w/o "in progress"
1 year	38.1%	35.5%	2.8%	0.3%	1.1%	22.2%	100.0%
	39.9%	37.6%	1.6%	0.2%	0.6%	20.1%	100.0%
3 years							
4 years	25.0%	50.0%	0.0%	0.0%	0.0%	25.0%	100.0%
Other <sup>2</sup>	9.3%	41.2%	10.7%	1.8%	0.6%	36.5%	100.0%
No credential <sup>2</sup>	21.9%	39.2%	7.1%	1.2%	0.7%	30.0%	100.0%
Total	38.1%	35.5%	2.8%	0.3%	1.1%	22.2%	100.0%

Note. <sup>1</sup> Concurrent Bachelor of Education, BEd, N/A; <sup>2</sup> No credential and not registered in 2012; <sup>3</sup> No credential but still registered in 2012

**Table 20: Number of York transfer students who spent between one and six or more years at Seneca College to receive their first Seneca credential as function of Seneca standard program length**

Years spent to obtain the 1st credential at <b>receiving institution</b> (Seneca)	Standard program length of the 1st credential obtained at <b>receiving institution</b> (Seneca)					
	1 yr	2 yrs	3 yrs	4 yrs	Other <sup>1</sup>	Total
1 year	821	271	0	1	6	1,099
2 years	130	1,112	21	7	13	1,283
3 years	39	269	204	10	6	528
4 years	9	87	79	29	5	209
5 years	2	35	17	4	1	59
>= 6 years	2	25	4	2	0	33
Total	1,003	1,799	325	53	31	3,211

Note. <sup>1</sup> Seneca Certificates, N/A, CED – Continuing Education (Seneca)

**Table 21: Average number of years York University transfer students spent at Seneca College as a function of whether a Seneca credential was attained or not, or “in progress,” as well as number of transfer credits granted**

		Time spent (no credential)/Time to completion (first credential) at <b>receiving institution</b> (Seneca)		
		Count	Mean	Std. Dev.
Whether obtained a credential/Credential type at <b>receiving institution</b> (Seneca)				
No		1,374	1.81	1.06
Yes		3,211	2.06	1.08
Y to S – coll bachelor		53	3.66	1.06
Y to S – advanced dip.		325	3.34	.82
Y to S – diploma		1,799	2.22	.96
Y to S – grad. cert.		843	1.21	.60
Y to S – certificate		160	1.48	.67
Y to S – other		31	2.42	1.09
In progress		828	1.81	1.17
Total		5,413	1.96	1.09



**Table 22: York University to Seneca College transfer – Logit models predicting the probability of students attaining at least one credential at the receiving institution (Seneca): Model and Model II**

		Model I: Baseline					Model II: Baseline + Transition Feature				
Categories	Independent Variables	St. Beta	Std. Err	Odds Ratio	Wald (z)	sig.	St. Beta	Std. Err	Odds Ratio	Wal d (z)	sig.
Gender (ref=male)	Female	.13	.14	1.67	6.08	***	.05	.11	1.25	2.45	*
Immigration Status (ref=Canadian Citizen)	Permanent Resident	-.06	.12	.61	-2.61	**	-.03	.16	.78	-1.23	
	Visa Student	-.05	.14	.32	-2.59	**	-.05	.16	.34	-2.29	*
	Age	.05	.02	1.04	2.17	*	.00	.02	1.00	.08	
Mother Tongue (ref=Eng)	Other Language	-.02	.12	.86	-1.10		.00	.15	1.02	.14	
Had Credential from Sending Institution (ref=No)	Yes										
	Cumulative or Graduation GPA at Sending Institution										
Program Group (ref=Humanities & related)	General Arts and Science						-.05	.14	.46	-2.54	*
	Educ'n/ Phys Ed						.09	.45	2.03	3.20	***
	Fine Arts						.05	.35	1.56	2.00	*
	Social Sciences <sup>1</sup>						.23	.47	3.01	7.03	***
	Business						.00	.12	.99	-.07	
	Natural & Applied Sci <sup>2</sup>						-.13	.07	.51	-5.18	***
Relevance (ref=Matched)	Related						.01	.20	1.05	.24	
	Not Related						-.02	.16	.91	-.51	
	CED/Other						-.04	.17	.67	-1.61	
Admission Basis (ref=High School)	University						.07	.14	1.31	2.60	**
	Other Bases						.01	.13	1.05	.42	
	Cumulative or Graduation GPA at Receiving Inst.										
Total N				2928					2928		
Prob > LR chi2 (DF)				Prob > 60.43 (5) = .000					Prob > 274.89 (16) = .000		
Pseudo R-square				.02					.08		
AIC				3495.30					3302.84		
BIC				3531.20					3404.53		
Correctly Classified				.71					.71		

Note. \*p < .05; \*\*p < .01; \*\*\*p < .001. 1 Excludes business. 2 Includes biology, chemistry, engineering, physics and mathematics; St. = Standardized; Std. = Standard; CED = Continuing Education (Seneca Only); Eng = English; Gen. = General; geo. = geography GPA = Grade Point Average; Inst. = Institution; pct. = percentile; Prob = probability; ref = reference group; Sci. = Sciences; sig. = significance level

**Table 23: York University to Seneca College transfer – Logit models predicting the probability of students attaining at least one credential at the receiving institution (Seneca): Model III and Model IV**

		Model III: Baseline +Transition Feature + Sending Inst. Academic Performance					Model IV: Baseline + Transition Feature + Receiving Inst. Academic Performance				
		St. Beta	Std. Err	Odds Ratio	Wald (z)	sig.	St. Beta	Std. Err	Odds Ratio	Wald (z)	sig.
Independent Variables											
Categories											
Gender (ref=male)	Female	.03	.11	1.14	1.37		-.04	.09	.82	-1.86	
Immigration Status (ref=Canadian Citizen)	Permanent Resident	-.02	.16	.79	-1.17		-.01	.22	.89	-.47	
	Visa Student	-.05	.17	.36	-2.15	*	-.05	.15	.27	-2.41	*
	Age	-.04	.02	.97	-1.54		-.06	.02	.94	-2.88	**
Mother Tongue (ref=Eng)	Other Language	.01	.16	1.10	.64		.03	.22	1.25	1.28	
Had Credential from Sending Institution (ref=No)	Yes	.06	.15	1.27	1.95						
	Cumulative or Graduation GPA at Sending Institution	.14	.03	1.15	5.20	***					
Program Group (ref=Humanities & related)	General Arts & Science	-.03	.19	.60	-1.63		.03	.73	1.76	1.36	
	Educ'n/ Phys Ed	.10	.53	2.36	3.82	***	.07	.51	2.02	2.76	**
	Fine Arts	.06	.39	1.72	2.40	*	.08	.67	2.45	3.30	***
	Social Sciences <sup>1</sup>	.24	.51	3.24	7.43	***	.28	.98	5.29	8.98	***
	Business	.04	.15	1.17	1.25		.11	.28	1.91	4.41	***
	Natural & Applied Sci <sup>2</sup>	-.11	.08	.57	-4.23	***	-.03	.13	.84	-1.13	
Relevance (ref=Matched)	Related	-.01	.19	.98	-.11		.01	.24	1.05	.20	
	Not Related	-.03	.16	.87	-.74		-.03	.18	.85	-.77	
	CED/Other	-.03	.19	.75	-1.14		-.03	.21	.73	-1.07	
Admission Basis (ref=High School)	University	.00	.12	.99	-.07		-.09	.08	.64	-3.60	***
	Other Bases	.01	.13	1.04	.31		.02	.17	1.14	.89	
	Cumulative or Graduation GPA at Receiving Inst.						.61	.31	4.44	21.28	***
Total N				2928					2928		
Prob > LR chi2 (DF)				Prob > 321.12 (18) = .000					Prob > 1003.28 (17) = .000		
Pseudo R-square				.09					.28		
AIC				3260.61					2576.45		
BIC				3374.27					2684.13		
Correctly Classified				.71					.81		

Note. \*p < .05; \*\*p < .01; \*\*\*p < .001. 1 Excludes business. 2 Includes biology, chemistry, engineering, physics and mathematics; St. = Standardized; Std. = Standard; CED = Continuing Education (Seneca Only); Eng = English; Gen. = General; geo. = geography GPA = Grade Point Average; Inst. = Institution; pct. = percentile; Prob = probability; ref = reference group; Sci. = Sciences; sig. = significance level

**Table 24: York University to Seneca College transfer – Ordinary least squares regression models predicting the time spent at the receiving institution (Seneca) minus the standard program length: Model I and Model II**

		Model I: Baseline					Model II: Baseline + Transition Feature				
		St. Beta	Coeff. (b)	RStd. Err	t	sig.	St. Beta	Coeff. (b)	RStd. Err	T	sig.
Categories	Independent Variables										
Gender (ref=male)	Female	-.14	-.22	.04	-6.18	***	-.07	-.11	.04	-3.19	***
Immigration Status (ref=Canadian Citizen)	Permanent Resident	.05	.19	.09	1.99	*	.02	.06	.09	.67	
	Visa Student	-.02	-.18	.28	-.66		-.04	-.40	.25	-1.57	
	Age	-.16	-.05	.01	-7.28	***	-.10	-.03	.01	-4.79	***
Mother Tongue (ref=English)	Other Language	.10	.27	.08	3.40	***	.06	.17	.07	2.29	*
Had Credential from Sending Institution (ref=No)	Yes										
	Cumulative or Graduation GPA at Sending Institution										
Program Group (ref=Humanities & related)	General Arts and Science						.04	.28	.14	1.99	*
	Educ'n/ Phys Ed						.11	.33	.08	4.29	***
	Fine Arts						.00	-.01	.09	-.15	
	Social Sciences <sup>2</sup>						-.14	-.24	.04	-6.54	***
	Business						.10	.17	.05	3.49	***
	Natural & Applied Sci <sup>3</sup>						.22	.47	.06	7.92	***
Credential Type (ref = Diploma)	Certificate						.05	.15	.08	1.76	
	Graduate Certificate						.08	.13	.04	3.07	**
	Advanced Diploma						-.06	-.15	.07	-2.29	*
	Coll. Bachelor's Degree						-.10	-.58	.15	-3.82	***
Relevance (ref=Matched)	Related						-.10	-.15	.09	-1.80	
	Not Related						-.08	-.12	.09	-1.41	
	CED/Other						-.02	-.06	.11	-.52	
Admission Basis (ref = High School)	University						-.20	-.30	.04	-7.90	***
	Other Bases						-.02	-.04	.05	-.81	
	Cumulative or Graduation GPA at Receiving Institution										
Intercept Constant			1.39	.16	8.54	***		1.09	.18	6.08	***
Total N				2051					2051		
F				F( 5, 2045) = 20.49					F( 20, 2030) = 22.42		
Prob > F				.000					.000		
R-squared				.06					.20		

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . <sup>1</sup> University stream only. <sup>2</sup> Excludes business. <sup>3</sup> Includes biology, chemistry, engineering, physics and mathematics; St. = Standardized; Std. = Standard; CED = Continuing Education (Seneca Only); Coeff (b) = Unstandardized Coefficient (b); Census-G. = Census geography; Coll. = College; Eng = English; Gen. = General; GPA = Grade Point Average; Inst. = Institution; pct. = percentile; Prob = probability; ref = reference group; Sci = Sciences; sig. = significance level

**Table 25: York University to Seneca College transfer – Ordinary least squares regression models predicting the time spent at the receiving institution (York) minus the standard program length: Model III and Model IV**

Categories	Independent Variables	Model III: Baseline + Transition Feature + Sending Inst. Academic Performance					Model IV: Baseline + Transition Feature + Receiving Inst. Academic Performance				
		St. Beta	Coeff. (b)	Std. Err	t	sig.	St. Beta	Coeff. (b)	Std. Err	t	sig.
Gender (ref=male)	Female	-.05	-.09	.03	-2.47	*	-.04	-.07	.03	-2.15	*
Immigration Status (ref=Canadian Citizen)	Permanent Resident	.01	.03	.08	.35		.00	.00	.08	.03	
	Visa Student	-.04	-.45	.25	-1.79		-.03	-.38	.28	-1.34	
	Age	-.05	-.01	.01	-2.12	*	-.06	-.02	.01	-3.01	**
Mother Tongue (ref=English)	Other Language	.05	.13	.08	1.72		.05	.12	.07	1.74	
Had Credential from Sending Inst. (ref=No)	Yes	<b>-.18</b>	<b>-.27</b>	<b>.04</b>	<b>-6.62</b>	<b>***</b>					
	Cumulative or Graduation GPA at Sending Inst.	<b>-.14</b>	<b>-.06</b>	<b>.01</b>	<b>-4.59</b>	<b>***</b>					
Program Group (ref=Humanities & related)	General Arts and Science	.03	.19	.14	1.37		.01	.05	.12	.43	
	Educ'n/ Phys Ed	.11	.32	.08	4.20	<b>***</b>	.14	.42	.08	5.56	<b>***</b>
	Fine Arts	.00	.01	.10	.09		-.02	-.07	.09	-.82	
	Social Sciences <sup>2</sup>	-.12	-.21	.04	-5.69	<b>***</b>	-.15	-.25	.03	-7.36	<b>***</b>
	Business	.05	.09	.05	1.89		.02	.03	.04	.73	
	Natural & Applied Sci <sup>3</sup>	.19	.42	.06	7.18	<b>***</b>	.16	.35	.06	6.00	<b>***</b>
Credential Type (ref = Diploma)	Certificate	.04	.13	.08	1.60		.07	.21	.08	2.71	<b>**</b>
	Graduate Certificate	.16	.27	.04	6.34	<b>***</b>	.13	.22	.04	5.36	<b>***</b>
	Advanced Diploma	-.08	-.20	.07	-3.04	<b>**</b>	-.04	-.08	.06	-1.39	
	Coll. Bachelor's Degree	-.12	-.66	.16	-4.25	<b>***</b>	-.09	-.51	.14	-3.56	<b>***</b>
Relevance (ref=Matched)	Related	-.08	-.12	.08	-1.44		-.09	-.13	.08	-1.55	
	Not Related	-.08	-.11	.08	-1.32		-.07	-.10	.08	-1.26	
	CED/Other	-.05	-.18	.11	-1.60		-.03	-.10	.11	-.98	
Admission Basis (ref = High School)	University	-.12	-.19	.04	-5.34	<b>***</b>	-.16	-.24	.04	-6.64	<b>***</b>
	Other Bases	-.01	-.02	.05	-.49		-.01	-.01	.04	-.26	
	Cumulative or Graduation GPA at Receiving Institution						<b>-.31</b>	<b>-.42</b>	<b>.04</b>	<b>-10.32</b>	<b>***</b>
Intercept Constant			1.03	.19	5.31	<b>***</b>		2.27	.22	10.07	<b>***</b>
Total N				2051					2051		
F				F( 22, 2028) = 26.92					F( 21, 2029) = 27.40		
Prob > F				.000					.00		
R-squared				.25					.28		

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . <sup>1</sup> University stream only. <sup>2</sup> Excludes business. <sup>3</sup> Includes biology, chemistry, engineering, physics and mathematics; St. = Standardized; Std. = Standard; CED = Continuing Education (Seneca Only); Coeff (b) = Unstandardized Coefficient (b); Census-G. = Census geography; Coll. = College; Eng = English; Gen. = General; GPA = Grade Point Average; Inst. = Institution; pct. = percentile; Prob = probability; ref = reference group; Sci = Sciences; sig. = significance level

**Table 26: Summary of logit and OLS regression analyses (college-to-university transfer): Variables associated with credential attainment and time to completion minus standard program length**

	Credential Attainment	Unique $R^2$	Time to Completion minus Standard Program Length	Unique $R^2$
Socio-demographics		.02		.04
Gender	X		X	
Immigration status	X		ns	
Age	X		X	
Mother tongue	X		X	
Transition features		.05		.18
Program group	X		X	
Program match	X		X	
Degree type	††		X	
Transfer credits	X		X	
Aspirations	†		ns	
Academic performance				
Sending institution GPA	X	.02	X	.00
Receiving institution GPA	X	.23	X	.01
Total $R^2$		.32		.23

Note. X – significant factor, x\* – significant factor under certain conditions;

† – unclear results; ns – non-significant; †† – not tested

**Table 27: Summary of logit and OLS regression analyses (university-to-college transfer): Variables associated with credential attainment and time to completion minus standard program length**

	Credential Attainment	Unique $R^2$	Time to Completion minus Standard Program Length	Unique $R^2$
Socio-demographics		.02		.06
Gender	x*		X	
Immigration status	X		ns	
Age	†		X	
Mother tongue	X		X	
Transition features		.06		.14
Program group	X		X	
Program match	ns		X	
Credential type	††		X	
Admission basis	†		X	
Academic performance				
Prior credential attainment	ns		X	
Sending institution GPA	X	.01	X	.05
Receiving institution GPA	X	.19	X	.03
Total $R^2$		.28		.28

Note. X – significant factor, x\* – significant factor under certain conditions;

† – unclear results; ns – non-significant; †† – not tested



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