Transfer Pathways among Ontario Colleges and Universities

Northern and Southern Differences in Students Who Transfer

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Overview of the Study

Youth from the northernmost parts of the provinces and territories often face significant proximity and socio-demographic barriers to attending postsecondary education, accessing various types of postsecondary education, and accessing many lucrative fields of study at the university level such as the STEM fields (Science, Technology, Engineering, and Mathematics) (Pizarro Milian, Seward, & Zarifa, 2020; Hango et al., 2019; Zarifa, Hango, & Pizarro Milian, 2018). Recent research reveals significant differences in the characteristics of Ontario students who transfer across and within university and college sectors and also points to the differences in the magnitude of various pathways across northern and southern institutions (Zarifa, Sano, & Hillier, 2020). However, to our knowledge, no existing academic or policy reports have shed light on the types of students who transfer in different regions of Ontario, both North and South. This research aims to fill this apparent knowledge gap using administrative data from Statistics Canada's Postsecondary Student Information System (PSIS) (2009 to 2016) linked to T1 Family File tax data.

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Key Findings

- Among Southern Ontario institutions, the most prominent postsecondary pathway is non-transfer university (76.06%), followed by non-transfer college (15.98%), university to college transfers (2.15%), college to university transfers (2.04%), university to university transfers (1.71%), college to college transfers (1.53%), and swirlers (0.54%). In Northern Ontario, the results are largely consistent. However, the overall level of transfer is slightly higher (8.41% vs. 7.96%), largely attributable to more university to university transfer and swirlers in northern institutions. Specifically, the most common route is non-transfer university (78.40%), followed by non-transfer college (13.19%), university to university transfers (2.31%), university to college transfers (2.10%), college to university transfers (1.84%), college to college transfers (1.42%), and swirlers (0.74%).

- In Southern Ontario schools, females show higher probabilities of taking four (university to university, college to university, college to college, and swirler) of the five transfer routes compared to males. The only transfer type where males show a higher probability is university to college transfer. In Northern Ontario, however, it is males who have higher probabilities of taking all five of the transfer pathways.
- Older students (age 22 and above) in both regions show higher probabilities of taking university to university and non-transfer university pathways and lower probabilities of taking college to college and non-transfer college pathways. However, in northern institutions, older students show higher chances of university to college transfer, lower chances of college to university transfer, and a higher probability of swirling. In southern institutions, the opposite is true, as younger students show higher chances of university to college transfer, lower chances of college to university transfer, and a higher probability of swirling.
- In both Southern and Northern Ontario, students from lower parental income backgrounds were significantly more likely to take many of the various postsecondary pathways, such as college to university, college to college, non-transfer college, and swirler, than take the non-transfer university route compared to those from higher parental income backgrounds.
- In both regions, arts/humanities students stand out as having higher chances of taking university to university, university to college, and swirler transfer routes, while social science students also show higher chances of university to college and college to university transfer. Health students show the highest probabilities of college to university and college to college transfer. In Southern Ontario, the natural sciences and social sciences stand out as having the highest probabilities of taking the non-transfer university pathway. In Northern Ontario, the arts/humanities show greater separation from the other fields in terms of their chances of university to university and university to college transfer, and the social sciences also show significantly higher chances of university to university transfer.

Introduction

A new and growing body of research points to the importance of examining regional differences in educational trajectories within Canada (Hillier et al., 2020; Zarifa et al., 2020; Hango et al., 2019; Zarifa et al., 2018). Youth from the northernmost parts of provinces and the territories, in particular, often face significant proximity and socio-demographic barriers to attending postsecondary education, accessing various types of postsecondary education, and accessing many lucrative fields of study at the university level such as the STEM fields (Pizarro Milian et al., 2020; Hango et al., 2019; Zarifa et al., 2018). Moreover, there is some evidence to suggest that students who reside in Canada's provincial north are more likely to enter a college program before heading to university (Zarifa et al., 2018).

At the same time, greater proportions of students are also balancing multiple life obligations (e.g., work, family, etc.) in tandem with pursuing higher education, leading to more complex postsecondary pathways (Deil-Amen, 2015; Kirst & Stevens, 2015; Davies & Mehta, 2018). These changes have prompted increases in student transfer across many colleges and universities (Decock, 2004), with some students showing higher chances of taking a transfer route during their postsecondary education (Finnie, Dubois, & Miyairi, 2020; Zarifa et al., 2020). Recent research reveals significant differences in the characteristics of Ontario students who transfer across and within university and college sectors and also points to the differences in the magnitude of various pathways across northern and southern institutions (Zarifa et al., 2020). However, to our knowledge, no existing academic or policy reports have zeroed in with regional analyses to shed light on the types of students who transfer within northern and southern institutions. As such, there is a need to understand more about the characteristics of students who transfer from different regions of Ontario, both North and South. This research aims to fill this apparent knowledge gap using administrative data from Statistics Canada's Postsecondary Student Information System (PSIS) (2009 to 2016) linked to T1 Family File tax data.

In step with our previous study (see Zarifa, Sano, and Hillier, 2020 for a lengthier discussion on transfer types), we explore five types of transfer in the postsecondary system with seven possible categories: 1) college to university transfers (CU); 2) university to college transfers (UC); 3) college to college transfers (CC); 4) university to university transfers (UU); 5) non-transfer college students (NTC); 6) non-transfer university students (NTU); and 7) swirlers (i.e., those students who changed their institutions more than once within two years).

First, we begin by comparing the relative percentages of students who take these various routes across northern and southern institutions. Second, we employ bivariate analyses to trace and compare the characteristics of students who transfer in Southern Ontario

and Northern Ontario institutions. Third, we draw upon multinomial logistic regressions and predicted probabilities to assess and compare the relative impact of students' characteristics on transfer types in the two regions. Finally, we conclude by highlighting some of the key areas of differences across the two locales and discuss the policy implications of these findings.

Transfer Types and Prevalence: Do the Pathways Differ Across Northern and Southern Institutions?

In this section, we examine the prevalence of the seven postsecondary pathways described above in both Northern Ontario and Southern Ontario institutions. As shown in Figure 1 (p. 25) (and Table 1, p. 26), the largest proportions of postsecondary students in southern institutions did not transfer within two years after their initial enrolment: NTU (76.06%) and NTC (15.98%). The same was true for northern institutions, where the majority of students in northern institutions did not transfer within two years: NTU (78.40%) and NTC (13.19%). It is important to note, however, that nearly 2.5% more students in northern institutions took the non-transfer university route, and nearly 3% more students in southern institutions took the non-transfer college route.

Among southern institutions, larger proportions of students transferred across postsecondary sectors, either from university to college (2.15%) or college to university (2.04%). Importantly, lateral transfers were less common, including students transferring from university to university (1.71%) and college to college (1.53%). Swirling was the least common pathway among students in southern institutions (0.54%). However, among northern institutions, the relative degree of transfer was slightly higher (8.41% vs. 7.96%), largely attributable to more university to university transfers and swirlers in northern institutions. Specifically, university to university transfers (2.31%) showed the highest proportion of students, followed by university to college transfers (2.10%), college to university transfers (1.84%), college to college transfers (1.42%), and swirlers (0.74%).

Additional characteristics of the PSIS-T1FF subsamples for southern and northern students respectively can be found in Table 1 (p. 26). In short, Northern Ontario institutions show greater relative proportions of older students (19.3% vs. 12.11%), female students (58.46% vs. 53.56%), more students from moderate income families, about 10% more health majors (21.77% vs. 11.61%), as well as smaller relative proportions of arts/humanities (11.36% vs. 19.52%) and social science majors (28.6% vs. 38.84%). These regional differences in student demographics are particularly important for policy makers and administrators when designing, revising, and evaluating articulation and transfer programs and student transition supports.

Northern and Southern Differences: Do the Characteristics of Youth Who Transfer Vary by Northern and Southern Institutions in Ontario?

Characteristics of Students Who Transfer in Southern Ontario Institutions

Most of what we know about the characteristics of students who transfer in Ontario is from studies in postsecondary institutions in Southwestern Ontario. While there are some studies that utilize provincial data sets (McCloy et al., 2017b; Decock et al., 2016; Usher & Jarvey, 2012; Finnie & Qiu, 2009), there are no distinctions made between northern and southern institutions to determine the unique characteristics of students who transfer in each region.

Studies in various institutions in Southern Ontario find that student demographics predict transfer rates from college to university. For student demographics, findings in the research are not clear. Some research finds older students (25+ years) are more likely to transfer to university (Acai & Newton, 2015; Blanchard et al., 2013; Gawley & McGowan, 2006) and other studies find students under the age of 25 more likely to transfer (McCloy et al., 2017a; Smith et al., 2016). Also, findings relating to sex are mixed, with some studies finding male students more likely to transfer (Acai & Newton, 2015; Gawley & McGowan, 2006) and others finding rates of transfer higher among female students (McCloy et al., 2017a; Smith et al., 2016).

Family background factors are influential predictors in college to university transfer. Research finds having at least one parent with postsecondary education is significantly related to transferring (McCloy et al., 2017a; Smith et al., 2016; Steffler, McCloy, & Decock, 2018). Steffler and colleagues (2018) find income has no significant effect on transfer rates. However, low-income students with university educated parents are more likely to plan on transferring from college to university than low-income students without university educated parents (Steffler et al., 2018).

Students' academics also relate to transfer. Program of study and/or students' career aspirations are key determinants of transfer. Acai and Newton (2015) find students aspiring to the teaching profession are more likely to transfer to university. And, according to Decock's (2004) examination of the Graduate Student Survey, general arts and science university programs receive more transfers from college than other programs (see also Stewart & Martinello, 2012). Other research finds social science programs in college receive more university transfers (Stewart & Martinello, 2012). Students with high GPAs in college have higher transfer rates to universities than those with low GPAs (Kennett & Mackie, 2014; Lang & Lopes, 2014; McCloy et al., 2017a; Smith et al., 2016; Steffler et al., 2018; Stewart & Martinello, 2012). Nevertheless, Smith and colleagues (2016) find that university students who transfer to college are also

strong academically (see also Stewart & Martinello, 2012). Many college students complete their two-year diploma before transferring to university (Lang & Lopes, 2014; Smith et al., 2016), except for foreign language students, who stay in college until they meet the language requirements to gain acceptance in a university program (Lang & Lopes, 2014). Finally, students' aspirations to attend university after college are associated with eventually transferring (McCloy et al., 2017a; Smith et al., 2016; Steffler et al., 2018).

Articulation agreements between institutions also influence students' decisions to transfer. That is, the amount of credits universities acknowledge from college programs had a significant positive relationship with choices to transfer (Gawley & McGowen, 2006). Additionally, other models of articulation are associated with transfer choice. The 'concurrent' college model—which has articulation agreements with local universities built into the program—is found to generate more college to university transfer students than the 'traditional' model (Lang & Lopes, 2014; Shook, Norman, & Guyatt, 2016). Moreover, those who intend to transfer to university when they enter college are more likely to choose the concurrent program (Lang, 2009).[1]

Characteristics of Students Who Transfer in Northern Ontario Institutions

For Northern Ontario, far less research exists. Using Graduate Satisfaction Survey data and administrative data from Confederation College and Lakehead University, Confederation College (2012) conducted research on student transfers in these two institutions located in Thunder Bay, Ontario. The descriptive findings from this study indicate that most students transferring into Confederation College are between the ages of 20 and 24 and female. Only 12% identified as Aboriginal and 6% identified as first-generation. Over half (57%) of students transferring to Confederation College already had a degree, diploma, or certificate from another postsecondary institution, and 70% of these were transfers from Lakehead University. Their descriptive results from student transfers into Lakehead University only included student transfers from Confederation College. In these findings, there was a higher percentage of transfers among female students and those ages 20 to 24. Twenty-two percent identified as Aboriginal and 24% identified as first-generation.

Apart from the study discussed above, there remains a dearth of research on the characteristics of students who transfer in postsecondary institutions in Northern Ontario. Therefore, this study intends to fill the gaps in our knowledge about the characteristics of transfer students in Northern Ontario institutions.

1. Unfortunately, our data did not allow us to account for articulation agreements, transfer credits, intentions to transfer, or future schooling aspirations. These remain important areas for further exploration, especially in Northern Ontario institutions.

Bivariate Analysis Between Characteristics and Transfer Types: Comparing Students at Northern and Southern Ontario Institutions

Tables 2 (p. 27) and 3 (p. 28) show the results from our bivariate analyses in Southern Ontario and Northern Ontario respectively. Overall, the bivariate analyses reveal that transfer types are significantly associated with several demographic, program, and family characteristics (p<0.01) in both regions. However, despite similar levels of significance across these characteristics, in this section, we graph the results to provide further insight into how various groups across these characteristics might be represented differently across the categories of our transfer type variables in Southern and Northern Ontario.

Sex

Figure 2 (p. 29) points to the importance of sex in understanding transfer types in Southern Ontario, while Figure 3 (p. 29) depicts the relationship for Northern Ontario. In Southern Ontario, we find that larger proportions of female students are either entering the university sector without transferring (NTU, 78.08% vs. 73.74%) or transferring into and across the university sector than males (CU, 2.23% vs. 1.82%; UU, 1.84% vs. 1.55%), whereas males have comparatively higher percentages of non-transfer college (NTC, 18.59% vs. 13.72%) and lateral transfer across colleges (CC, 1.57% vs. 1.50%) and transfer into colleges (UC, 2.19% vs. 2.11%). For swirlers, males and females share similar percentages (0.55% vs. 0.53%).

For Northern Ontario (see Figure 3), a similar picture emerges, with a few notable differences. As in Southern Ontario, we find that larger proportions of female students are either entering the university sector without transferring (NTU, 80.14% vs. 75.95%) or transferring across the university sector than males (UU, 2.52% vs. 2.03%), whereas males have comparatively higher percentages of non-transfer college (NTC, 15.70% vs. 11.41%) and lateral transfer across colleges (CC, 1.65% vs. 1.26%). Transfer *across sectors* appears to be the reverse of Southern Ontario, as females in the north show higher rates of transfer from university into colleges (UC, 2.16% vs. 2.03%) and lower rates of transfer from college to university (CU, 1.80% vs. 1.9%) compared to males. For swirlers, males and females again share similar percentages (0.76% vs. 0.72%).

Age

In terms of age effects in Southern Ontario, Figure 4 (p. 30) reveals that younger, traditionally aged students (those ages 21 or younger) share comparatively lower percentages across most transfer categories, with the exception of university-college transfers, as well as non-transfer university students. Specifically, smaller proportions of younger students, compared to older ones, are categorized as UU (1.69% vs. 1.80%), CU (1.79% vs. 3.82%), CC (1.42% vs. 2.29%), NTC (13.68% vs. 32.71%), and swirlers (0.52% vs. 0.69%). Conversely, younger students show

higher relative proportions making UC transfers (2.19% vs. 1.84%) and taking the NTU pathway (78.71% vs. 56.85%).

Among Northern Ontario schools (Figure 5, p. 30), many of our findings are reversed, as younger students had comparatively higher percentages across all transfer and non-transfer pathways, with the exception of the non-transfer university route. That is, larger relative proportions of younger students, compared to older ones, take the UU (2.35% vs. 2.17%), UC (2.35% vs. 1.09%), CU (1.89% vs. 1.63%), CC (1.50% vs. 1.09%), NTC (13.62% vs. 11.41%), and swirler pathways (0.78% vs. 0.54%).

Parental Income

Family socioeconomic status also emerges as an important predictor of postsecondary pathways in Southern Ontario (see Figure 6, p. 31). Specifically, students from the highest parental income category showed the highest percentages in terms of staying within the university sector (UU, 1.78%; NTU, 85.64%), but the lowest percentages in both the NTC (8.09%) pathway as well as nearly all of the transfer routes (UC, 1.82%; CC, 1.32%; CU, 0.88%; and swirlers, 0.48%).

In Northern Ontario, we also find that family socioeconomic status is an important predictor of postsecondary pathways (see Figure 7, p. 31). The pattern is largely consistent between northern and southern students, as students from higher income families are by and large transferring less than those from lower income families. In fact, among northern students, the largest proportions for UC (2.36%), CU (2.36%), and swirlers (1.18%) were shared by students whose parental income category was the lowest. Conversely, students with high income parents had the largest percentages for UU (2.54%), NTU (85.40%) but the smallest percentages for CC (0.95%) and NTC (6.98%).

Field of Study

An interesting story also emerges for field of study (Figure 8, p. 32). Southern students whose field of study is health-related had the highest percentages transferring college to university (3.84%), college to college (2.58%), and non-transfer college (20.20%). At the same time, students who major in arts/humanities had the largest percentages for university to university (2.38%), university to college (3.09%), and swirler (0.67%) pathways. The social sciences showed the second highest proportions for UU (1.69%), UC (2.28%), and CU (2.03%) transfers.

Among northern students (Figure 9, p. 32), the story looks quite similar. Students majoring in health-related subjects had the largest percentages for college to university (2.64%), college to college (2.64%), and non-transfer college routes (19.23%). In addition, students whose field of study is arts/humanities had the highest percentages taking university to university (4.59%)

and university to college (3.67%) pathways. Once again, social science students show the second highest percentages for UU (3.13%), UC (2.94%), and CU (2.21%), and the largest relative percentage for both the non-transfer university pathway (82.9%) and swirlers (0.99%). While arts/humanities and the social sciences stand out in both locales, the relative percentages of these students are significantly higher among Northern Ontario students—in some cases, the relative percentages are double those of their Southern Ontario counterparts.

Multinomial Logistic Regression Analysis of Transfer Types: Comparing Students at Northern and Southern Ontario Institutions

To estimate the net impact of each of the characteristics among students, we also perform separate multivariate analyses for Southern and Northern Ontario. These methods consist of multinomial logistic regressions as well as predicted probabilities and 95% confidence intervals to provide graphical displays of the relative differences across groups. While percentages were shown earlier in the bivariate analyses, predicted probabilities range from 0 to 1 and show the probability that a particular type of student (e.g., female) would take one of the various pathways, also taking into account the impact of all other variables in the model. The odds ratios from multinomial logistic regressions for Southern Ontario institutions are shown in Table 4 (p. 33), and the predicted probabilities derived from those models are shown in Table 5 (p. 34). The odds ratios from multinomial logistic regressions for Northern Ontario are shown in Table 6 (p. 35), and the predicted probabilities derived from those models are shown in Table 7 (p. 36). The predicted probabilities for both regions are graphed in Figures 10 to 17 (pp. 37–40). For ease of interpretation, and to make similarities and differences more apparent, we compare each of the effects of the background character- istics in northern and southern institutions in turn.

Sex

In Southern Ontario, female students show lower odds of taking many of the transfer pathways (e.g., UC, OR=0.85, p<0.01; CU, OR=0.93, p<0.01; CC, OR=0.79, p<0.01; swirlers, OR=0.84, p<0.01) as well as the non-transfer college route (OR=0.67, p<0.01) compared to taking the non-transfer university route. However, they are more likely to transfer from university to university than take the non-transfer university route (OR=1.11, p<0.01) compared to males. Interestingly, when looking at the predicted probabilities in Figure 10, we can see that females show higher probabilities of taking four (UU, CU, CC, and swirler) of the five transfer routes compared to males. The only transfer type that males have a higher probability of taking is the university to college route.

In Northern Ontario, however, there are some notable differences. Female students show lower odds of taking only two transfer pathways (CU, OR=0.74, p<0.01; CC, OR=0.63, p<0.01) and the non-transfer college route (OR=0.63, p<0.01) compared to taking the non-transfer university route. In fact, Figure 11 (p. 37) shows that in Northern Ontario institutions, it is male

students who have higher probabilities of taking all five of the transfer pathways (UU, UC, CU, CC, and swirler). Females show higher probabilities of not transferring in university, and males show higher probabilities of not transferring in college—a finding that was reversed among Southern Ontario institutions.

Age

For age, we find that older students (compared to younger students) are more likely to take many of the transfer pathways (e.g., UU, OR=1.50, p<0.01; UC, OR=1.17, p<0.01; CU, OR=2.46, p<0.01; CC, OR=1.96, p<0.01; swirlers, OR=1.79, p<0.01) and more likely to stay in the same college (OR=2.93, p<0.01) than take the non-transfer university route. Moreover, Figure 12 shows older students have higher probabilities of taking UU and CU, but younger students have higher probabilities of transferring UC, CC, and swirling. Among northern institutions, we find some differences. Older students are less likely than younger students to take many of the transfer pathways (e.g., UC, OR=0.48, p<0.01; CU, OR=0.70, p<0.05; CC, OR=0.51, p<0.01; swirlers, OR=0.55, p<0.05) as well as stay in the same college (OR=0.63, p<0.01) than take the non-transfer university route. In Figure 13 (p. 38), we can see that older students show higher probabilities of UU (same as Southern Ontario), higher probabilities of UC (opposite of Southern Ontario), lower probabilities of UC transfer (opposite), lower probabilities of CC (same), higher probabilities of NTU (same), lower probabilities of NTC (same), and a higher probability of swirling (opposite).

Parent Income

In Southern Ontario, students from lower parental income backgrounds were significantly more likely to take many of the various postsecondary pathways, such as CU, CC, NTC, and swirlers, than take the non-transfer university route compared to those from higher parental income backgrounds. For the UC transfers, however, the pattern is not necessarily consistent. Specifically, students whose parental income categories are lower (OR=1.12, p<0.01) and middle (OR=1.09, p<0.05) are more likely to take the university to college pathway than take the non-transfer university route; those whose parental income category is highest are less likely to do so (OR=0.75, p<0.01). Figure 14 (p. 39) sheds light on the predicted probabilities for each group across parental income quintiles. Overall, CU and CC and swirler transfer routes show negative relationships with parental income (lower income, higher probability of transfer), the NTU shows an increasing exponential relationship, and NTC shows a decreasing exponential relationship with higher parental income students.

In Northern Ontario, we find that the relationship between parental income and transfer types is largely consistent between northern and southern students. First, for northern students, the results reveal that higher income generally predicts lower odds of taking pathways such as UC, CU, CC, NTC, and swirlers over the NTU route. These findings can be observed in Figure 15 (p. 39). As in Southern Ontario, relationships between parental income

and the chance of taking particular pathways, for CU, CC and swirlers, are negative. That is, higher parental income decreases one's likelihood of taking one of these routes. Interestingly, while the relationships for NTU and NTC were non-linear (exponential), for Northern Ontario, the relationships are linear and the changes in probabilities are greater at lower parental income quintiles. Put differently, as parental income increases, the likelihood of not transferring university increases in an incremental fashion, whereas the likelihood of not transferring college decreases in an incremental fashion.

Field of Study

In step with previous research using the ELMLP and PSIS (see Zarifa et al., 2020; Finnie et al., 2020), our findings also reveal that field of study plays an important role in determining postsecondary pathways. Compared to those who major in arts/humanities, students who major in health-related subjects are less likely to take the UU (OR=0.43, p<0.01), UC (OR=0.44, p<0.01), and swirler (OR=0.82, p<0.01) pathways but are more likely to take the CU (OR=2.43, p<0.01), CC (OR=1.76, p<0.01), and NTC (OR=1.49, p<0.01) routes over the NTU route. Moreover, compared to those who major in arts/humanities, natural science students are less likely to take the UU (OR=0.63, p<0.1), UC (OR=0.54, p<0.01), CU (OR=0.36, p<0.01), CC (OR=0.64, p<0.01), NTC (OR=0.98, p<0.1), and swirler (OR=0.56, p<0.01) routes over the NTU route. In addition, social science students are less likely to take the UU (OR=0.70, p<0.01), UC (OR=0.71, p<0.01), CC (OR=0.72, p<0.01), NTC (OR=0.89, p<0.01), and swirler (OR=0.70, p<0.01) routes over the NTU route but are more likely to take CU route (OR=1.14, p<0.01).

In Figure 16 (p. 40), the predicted probabilities across all field categories are shown. Overall, arts/humanities students stand out as having higher chances of UU, UC, and swirler routes, while social science students also show higher chances of UC and CU transfer. Health students show the highest probability of CU and CC transfer. In terms of NTU, the natural sciences and social sciences stand out as having the highest probabilities.

In Northern Ontario, the results are similar. For example, compared to those majoring in arts/humanities, students majoring in health-related subjects are less likely to take the UU (OR=0.27, p<0.01), UC (0.22, p<0.01), and swirler (OR=0.42, p<0.05) pathways but are more likely to take the CU (OR=2.90, p<0.01), CC (OR=3.28, p<0.01), and NTC (OR=2.08, p<0.01) routes over the NTU route. In addition, natural science students are less likely to take the UU (OR=0.44, p<0.01) and UC (OR=0.47, p<0.01) routes but are more likely to take the NTC route (OR=1.43, p<0.01) than the NTU route. In addition, social science students are less likely to take the UU (OR=0.69, p<0.01), UC (OR=0.70, p<0.01), and NTC (OR=0.63, p<0.01) routes than the NTU route but more likely to take the CU route (OR=1.94, p<0.01). When looking at the predicted probabilities in Figure 17 (p. 40), however, we can see some interesting differences across the two regions. While the ordering stays similar, some of the gaps across probabilities are larger among Northern Ontario students. The arts/humanities students stand out further relative to the other fields in terms of their chances of UU and UC transfer. Unlike in Southern Ontario, social science students also show significantly higher chances of UU transfer but at the same time show the highest probability of NTU.

Conclusions and Policy Implications

This study is the first to provide a regional examination at the current levels of transfer at Northern and Southern Ontario colleges and universities. We employ Statistics Canada's PSIS data linked to family tax data to contribute in two key ways: 1) provide a comparison of the magnitude of multiple transfer and non-transfer pathways in each region; and 2) identify the characteristics of students in each region who are more prone to transfer.

Our analyses explore seven postsecondary pathways in this research, five of which are transfer pathways. Among southern students, the most prominent postsecondary pathway is non-transfer university (76.06%) followed by non-transfer college (15.98%). In Northern Ontario, the most common route is also non-transfer university (78.40%) followed by non-transfer college (13.19%). In the north, however, the percentages of non-transfer university (78.4%) are slightly higher and the percentages of non-transfer college (13.19%) are slightly lower than in the south. In terms of transfer, the remaining 7.96% of students are spread across the transfer pathways (UC, 2.15%; CU, 2.04%; UU, 1.71%; CC, 1.53%; swirlers, 0.54%). The overall level of transfer is slightly higher in northern institutions (8.41%) and is largely attributable to more UU transfer (2.31%) and swirlers (0.74%) in northern institutions. UC transfers (2.10%) occur at about the same rate, while CU (1.84%) and CC transfers (1.42%) are relatively less common in the north.

Overall, all characteristics in our bivariate analyses and models were highly statistically significant in both northern and southern institutions. In step with prior work (see Zarifa et al., 2020), student age, sex, parental income, field of study, family composition, and family size *all* show strong and significant effects on student mobility across and within universities and colleges. However, our separate north and south analyses reveal some important differences in the nature and direction of the effects.

In terms of sex, several important differences emerge. In Southern Ontario schools, female students show higher probabilities of taking four (UU, CU, CC, and swirler) of the five transfer routes compared to male students. The only transfer type where male students show a higher probability is university to college transfer. In Northern Ontario, however, it is male students who have higher probabilities of taking all five of the transfer pathways (UU, UC, CU, CC, and swirler). Another finding that differs in the north is that female students show higher probabilities of not transferring in university, and male students show higher probabilities of not transferring in college.

For age, we find that older students (age 22 or older) in both Southern and Northern Ontario alike show higher probabilities of taking UU and NTU pathways and lower probabilities of taking CC and NTC pathways. However, some key differences appear across regions. In northern institutions, older students show higher chances of UC transfer (similar to Confederation College, 2012), lower chances of CU transfer, and a higher probability of swirling. In southern institutions, the opposite is true, as younger students show higher chances of UC transfer, lower chances of CU transfer, and a higher probability of swirling.

In step with a long history of research in the sociology of education, parental socio-economic status matters. In both Southern and Northern Ontario, students from lower parental income backgrounds were significantly more likely to take many of the various postsecondary pathways, such as CU, CC, NTC, and swirling, than take the non-transfer university route compared to those from higher parental income backgrounds. Our findings show CU and CC and swirler transfer routes have negative relationships with parental income (lower income, higher probability of transfer). In Southern Ontario, however, the relationships between parental income and NTU and parental income and NTC are positive and negative non-linear, exponential relationships respectively. These findings mirror analyses of the province of Ontario as a whole (see Zarifa et al., 2020). However, in Northern Ontario, the relationships are linear and the changes in probabilities are greater at lower parental income quintiles. Put differently, the differences between lower parental income students are smaller in Southern Ontario, but the differences at higher parental income quintiles in Southern Ontario are greater. In Northern Ontario, the differences appear to increase equally across parental income quintiles. Unfortunately, we were unable to further consider how the effects of parental education (see McCloy et al., 2017a; Smith et al., 2016) might also explain student pathways nor could we explore the impact of various combinations of parental income and education (see Steffler et al. 2018). These remain important avenues for future research, in particular for northern institutions.

Finally, for field of study in southern schools, students from arts/humanities are taking many transfer routes (UU, UC and swirler routes) more so than students from other fields. At the same time, similar to other studies, we find social science students have higher chances of taking UC and CU pathways (Stewart & Martinello, 2012). Health students show the highest probability of CU and CC transfer. In terms of those who do not transfer and take the university route, natural science and social science students take this pathway the most. Among northern institutions, our findings show a similar story across fields. Interestingly, arts/humanities students stand out further in the north relative to the other fields in terms of their chances of UU and UC transfer. Also, unlike in southern institutions, the social sciences in the north show stronger roots in the university sector, as they stand out with the highest rates of lateral transfer across universities and non-transfer university. It is certainly possible that these differences may be attributable to differences in the availability of certain fields or even differences in the formal articulation agreements operating at institutions within the two regions. While Southern Ontario contains a myriad of undergraduate programs within their institutions, many of these programs are less prevalent in Northern Ontario (e.g., engineering).

Our comparisons across Southern and Northern Ontario institutions have two key implications for policymakers and education administrators. First, our summaries of the two subsamples for analysis revealed some notable differences across demographics in the two locales. Specifically, Northern Ontario institutions show greater relative proportions of older students (19.3% vs. 12.11%), female students (58.46% vs. 53.56%), more students from moderate income families, about 10% more health majors (21.77 vs. 11.61), as well as smaller relative proportions of arts/humanities (11.36% vs. 19.52%) and social science majors (28.6% vs. 38.84%). As mentioned earlier, it is important for policymakers to consider these regional differences in the academic and demographic compositions of the postsecondary landscapes in order to ensure efficient and effective program design, revision, and evaluation of existing transfer programs, articulation agreements, and student transition supports.

Second, our results shed light on the characteristics of students who are taking transfer pathways in colleges and universities in both Northern and Southern Ontario separately. This is particularly beneficial for education administrators, student services, and governments who are seeking knowledge on the types of students who are currently transferring, as well as the type of transfer they are engaging in. While age, sex, parental income, and field of study remain key predictors in both regions, our results revealed that the nature of their relationships is often different, with some of the effects even reversing across regions. Identifying who takes various pathways in each region separately sets the stage for location-specific targeted supports to stave off unsuccessful transitions leading to postsecondary stop out or drop out.

Appendix: Data Sources, Sample, Variables, and Analytical Approach

Data Sources

This study uses the Postsecondary Student Information System (PSIS) (for further details, see Statistics Canada, 2018). PSIS is administrative data collected on all public and not-for-profit postsecondary institutions funded by a provincial Ministry of Education. The data is particularly beneficial in that it provides a census of enrolments and graduates in all Canadian colleges and universities, collected annually since the 2005/2006 academic year, and yields approximately a 95% response rate. At the time of this writing, the 2016/2017 academic year is the most recent academic year available for analysis.

Another strength of the PSIS is that it includes variables about the educational institutions, student demographics, and information about the program in which the student is enrolled. They are optimal for use in this study to investigate the characteristics of students who pursue various PSE pathways in Northern and Southern Ontario. Additionally, we use the PSIS-T1FF linkage (tax years 2004 to 2015) to draw upon additional sociodemographic variables of relevance (e.g., parental income, family composition, family size, etc.).

Finally, the PSIS administrative data overcomes a number of limitations of using other nationally representative survey data to examine PSE pathways in Northern Ontario. First, small sample sizes prevent the use of Statistics Canada's Youth in Transition Survey (YITS) to parse out the Ontario case. Wave attrition further complicates analyses with YITS, and data on more recent cohorts are no longer collected. Most importantly, neither the YITS nor another nationally representative survey, the National Graduates Survey (NGS), contains institutional identifiers to create "Northern" and "Southern" groupings.

Subsample and Restrictions

We restrict our sample in this study in several important ways. For example, we limit our sample to undergraduate students from Ontario postsecondary institutions. Specifically, this study excludes students who are enrolled in professional, graduate, and postgraduate programs (see Finnie, Dubois, & Miyairi, 2017). In addition, there are two different ways of selecting students in the PSIS, namely the 'enrolment cohorts' and the 'graduate cohorts.' We rely on the enrolment cohorts in our analysis and track students' school and type of postsecondary education mobility over two years.

Admittedly, it would be ideal to track students' transfer types from their initial enrolment in postsecondary education until their graduation. To do so, we would need to draw our sample from the graduate cohorts that allow us to select those students who had attended a college or university program prior to graduating from a college or university program as well as those who did not attend a prior program but graduated with a college diploma or university degree. However, there are three limitations to this approach. First, our preliminary analyses revealed that the number of students included in the graduate cohorts is considerably smaller than those in the enrolment cohorts. Moreover, the PSIS has imputed information on several Ontario colleges (see Statistics Canada, 2019: 34). Unfortunately, respondents from these institutions are not available for longitudinal linkage due to a lack of record identification. Finally, coupled with these two limitations, considering our interest in students from postsecondary institutions in Northern Ontario, our sample sizes would be too small to perform the analyses presented here.

To overcome these limitations, this study uses the enrolment cohorts to understand students' transfer types.[2] Specifically, we select those students who were enrolled in a college or university program during the time of data collection and subsequently followed their institution and sector pathways for two years.[3] Ultimately, we capture the probability that students change their institution and/or institution type within their first two years of college or university.

This approach has several advantages. First, tracking students for two years after their initial enrolment is suitable for documenting their transfer types because transfers often happen during a relatively early stage of one's postsecondary educational career (see Hillman, Lum, & Hossler, 2008; Johnson & Muse, 2012).

Second, this approach allows us to keep a large-enough sample size to track students' transfer, especially among those students who had started their postsecondary education from two-year colleges. We adopt this approach and track six different cohorts of students (2009–11, 2010–12, 2011–13, 2012–14, 2013–15, and 2014–16) to understand their transfer types. For example, for 2009, we first compare differences between 2009 and 2010 institution IDs and institution types. We then compare 2010 to 2011 institution IDs and institution types. Third, we combine observed differences across both comparisons and then combine into the pathway variable below. Finally, we pool these students together, yielding analytical samples of 404,270 students in southern institutions and 19,020 students in northern institutions.

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2. An alternative approach was first explored by extracting and linking across the graduation cohorts in PSIS. Those who graduated in a particular year (e.g., 2016) were linked to their PSIS records in the previous four years (2012 to 2016). This approach provided a glimpse into graduates' last four years of postsecondary participation but revealed far less student mobility. As such, we opted to proceed with our current approach since a significant level of transfer occurs within their first few years of postsecondary education.

3. Additional analyses (not shown here) tracked students over four years of time and pool four cohorts of students (2009 to 2013; 2010 to 2014; 2011 to 2015; 2012 to 2016), but sample sizes diminished too much over time (due to graduation from college, attrition, drop out, or stop out). Unfortunately, once students leave or graduate from their institution, they are not captured in subsequent waves of PSIS.

Dependent Variable

The transfer-type variable that we create in this study includes the following seven pathways: (1) college to university transfers, (2) university to college transfers, (3) college to college transfers, (4) university to university transfers, (5) non-transfer college students, (6) non-transfer university students, and (7) swirlers (i.e., those students who changed their institutions more than once within two years).

Independent Variables

In step with prior research, we include demographic, program, and family characteristics in our analysis. First, demographic characteristics include age (0=younger, 21 or younger); (1=older, 22 or older), sex (0=males; 1=females), and the quintiles of gross parental income (0=lowest; 1=lower; 2=middle; 3=higher; 4=highest). Second, we include one program characteristic—major field of study (0=arts/humanities; 1=health; 2=natural sciences; 3=social sciences; 4=other).[4] Third, we add family characteristics such as the number of people in the family (0=smaller, 3 or fewer; 1=larger, 4 or more) and family type (0=two-parent; 1=lone-parent). As part of the limitation of the PSIS, we are not able to include students from imputed institutions. Considering that each year contains a different set of imputed institutions, we account for academic year of initial enrolment (0=2009; 1=2010; 2=2011-12; 3=2013; 4=2014).[5]

In addition, there are several other demographic variables, such as registration status, international student status, and immigration status; however, we do not include these variables due to their small sample sizes. Moreover, due to data quality issues, and under the advisement of Statistics Canada, we were also unable to make use of the following variables available in the PSIS files: total transfer credits; Aboriginal or visible minority status; mother tongue; program duration; program duration units; co-op program indicator; credits needed to graduate; program credit units; cumulative credits for program; second specialization; and end-date in program. The PSIS data also lack measures of GPA or student grades to account for academic performance as well as measures of parental aspirations or parent education to account for cultural capital effects. At the same time, we are unable to account for high school education and behavioural metrics (see Davies and Pizarro Milian, 2020).

4. Our field of study measure combines both 2-digit and 4-digit CIP (Classification of Instructional Program) codes (additional details available upon request).
5. The number of swirlers was too small for 2011 to permit Statistics Canada's disclosure of our bivariate results, so we combined 2011 and 2012 categories to examine the year of enrolment and transfer types.

Analytical Approach

To investigate the differences in the magnitude of pathways across regions, we use cross-tabulations and chi-square tests of the independent variables by our dependent variable of transfer pathway types (i.e., college to university, university to college, college to college, university to university, non-transfer college graduate, non-transfer university graduate, and swirlers) for each type of institution location: northern and southern. Second, for each of the institution locations (northern and southern), we utilize pooled multinomial logistic regression models (Long, 1997; Long and Freese, 2014) to map out the effects of the various independent variables (program characteristics, sociodemographic characteristics) on the seven types of transfer pathways. These models will enable us to map out the key characteristics of those who transfer from northern and southern institutions. To aid in the interpretation of our findings, we also produce and graph the predicted probabilities and 95% confidence intervals from these models.

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Figures and Tables
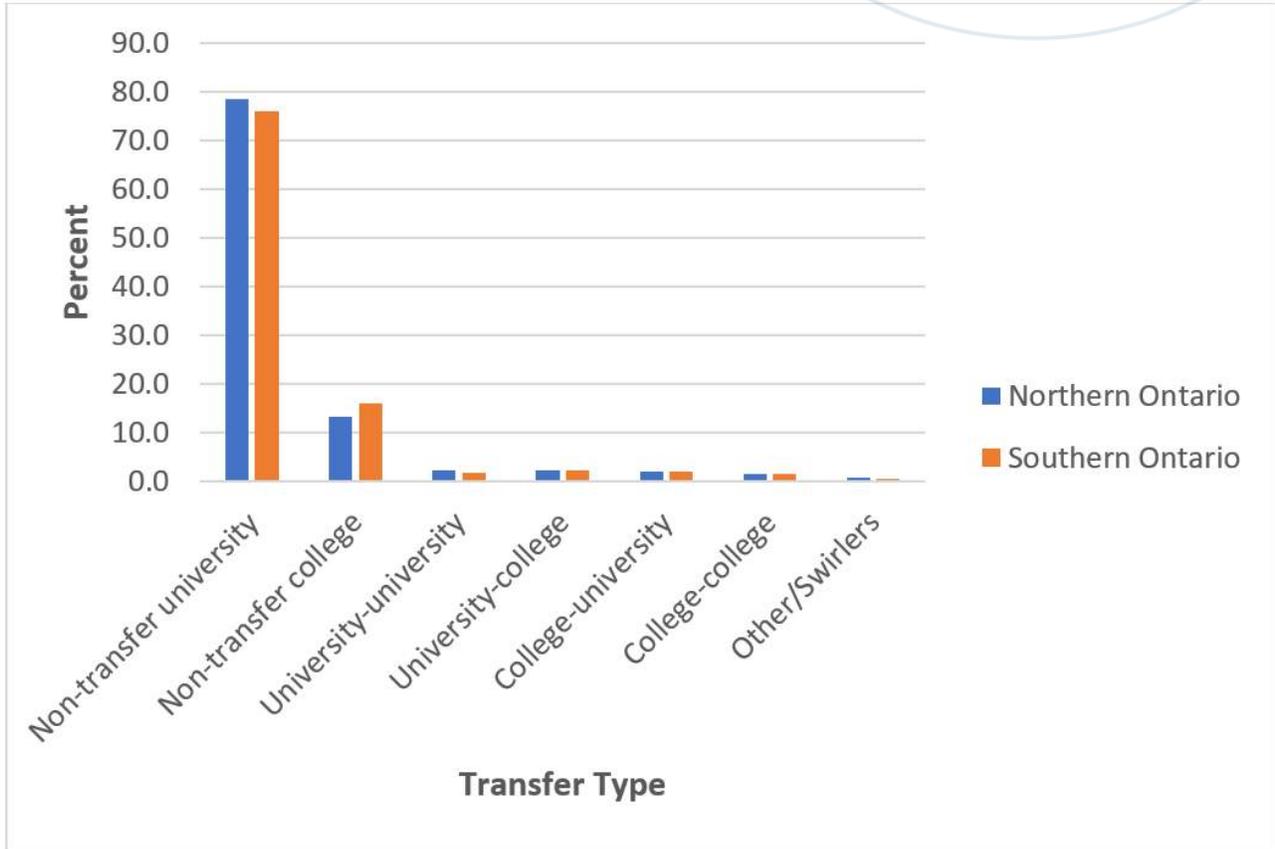
Figure 1. Pathways among Ontario Postsecondary Students: Northern and Southern Ontario

	Northern Ontario	Southern Ontario
Transfer types		
University to University (UU)	2.31	1.71
University to College (UC)	2.10	2.15
College to University (CU)	1.84	2.04
College to College (CC)	1.42	1.53
Non-Transfer University (NTU)	78.40	76.06
Non-Transfer College (NTC)	13.19	15.98
Swirlers	0.74	0.54
Age		
Younger (21 or younger)	80.7	87.89
Older (22 or older)	19.3	12.11
Sex		
Men	41.54	46.44
Women	58.46	53.56
Parental income		
Lowest	13.35	19.88
Lower	18.98	20.14
Middle	25.13	19.87
Higher	25.92	19.84
Highest	16.61	20.28
Field of study		
Arts/humanities	11.36	19.52
Health	21.77	11.61
Natural sciences	21.24	26.58
Social sciences	28.60	38.84
Other	17.03	3.45
Family composition		
Couple	86.65	88.12
Lone	13.31	11.88
Family size		
Smaller (3 or fewer)	33.86	29.75
Larger (4 or more)	66.14	70.25
Year		
2009	17.14	15.97
2010	17.50	16.82
2011/2012	32.60	33.54
2013	16.72	17.17
2014	16.09	16.49
Total	19,020	404,270

Table 1. Sample Characteristics by Region of Institution. PSIS-T1FF 2009-2016.

	UU	UC	CU	CC	NTU	NTC	Swirlers	
Sex								***
Men	1.55	2.19	1.82	1.57	73.74	18.59	0.55	
Women	1.84	2.11	2.23	1.50	78.08	13.72	0.53	
Age								***
Younger (21 or less)	1.69	2.19	1.79	1.42	78.71	13.68	0.52	
Older (22 or more)	1.80	1.84	3.82	2.29	56.85	32.71	0.69	
Parental income								***
Lowest	1.69	2.05	1.50	1.79	71.22	20.15	0.60	
Lower	1.66	2.30	2.36	1.82	71.65	19.67	0.55	
Middle	1.71	2.28	2.07	1.73	73.82	17.86	0.54	
Higher	1.68	2.29	1.95	1.45	77.84	14.25	0.54	
Highest	1.78	1.82	1.32	0.88	85.64	8.09	0.48	
Field of study								***
Arts/humanities	2.38	3.09	1.67	1.55	76.57	14.06	0.67	
Health	0.94	1.24	3.86	2.58	70.65	20.20	0.53	
Natural sciences	1.47	1.77	0.62	1.09	79.01	15.63	0.41	
Social sciences	1.69	2.28	2.03	1.20	78.39	13.90	0.51	
Other	2.44	1.36	9.03	5.01	42.41	38.68	1.07	
Family composition								***
Coupled	1.71	2.12	1.96	1.46	76.86	15.37	0.52	
Lone	1.67	2.39	2.58	2.06	70.10	20.53	0.67	
Family size								***
Smaller (3 or less)	1.64	2.05	2.38	1.76	72.03	19.58	0.57	
Larger (4 or more)	1.74	2.19	1.89	1.43	77.76	14.46	0.53	
Year								***
2009	2.06	2.32	2.49	1.75	72.70	18.20	0.48	
2010	1.99	2.09	2.56	1.71	74.15	17.10	0.50	
2011/2012	1.98	2.11	2.12	1.30	76.56	15.53	0.41	
2013	1.31	2.43	1.67	1.40	77.82	14.50	0.86	
2014	0.93	1.83	1.27	1.75	78.42	15.23	0.55	

***$p<0.01$ obtained from $X2$ test

Table 2. Bivariate analysis of the dependent and independent variables, Southern Ontario. PSIS-T1FF 2009-2016.

	UU	UC	CU	CC	NTU	NTC	Swirlers	
Sex								***
Men	2.03	2.03	1.90	1.65	75.95	15.70	0.76	
Women	2.52	2.16	1.80	1.26	80.14	11.41	0.72	
Age								***
Younger (21 or younger)	2.35	2.35	1.89	1.50	77.52	13.62	0.78	
Older (22 or older)	2.17	1.09	1.63	1.09	82.07	11.41	0.54	
Parental income								***
Lowest	2.36	2.36	2.36	1.57	72.05	18.11	1.18	
Lower	2.22	1.94	2.22	1.66	74.79	16.34	0.83	
Middle	2.30	2.09	1.88	1.46	78.29	13.36	0.63	
Higher	2.03	2.23	1.62	1.42	80.12	11.97	0.61	
Highest	2.54	2.22	1.27	0.95	85.40	6.98	0.63	
Field of study								***
Arts/humanities	4.59	3.67	1.38	0.92	77.06	11.47	0.92	
Health	1.20	0.96	2.64	2.64	72.84	19.23	0.48	
Natural sciences	1.73	1.98	1.48	1.48	75.80	16.54	0.99	
Social sciences	3.13	2.94	2.21	0.74	82.90	7.35	0.74	
Other	1.85	1.54	1.23	1.23	81.17	12.35	0.62	
Family composition								***
Coupled	2.24	2.12	1.76	1.39	78.96	12.80	0.73	
Lone	2.76	2.36	2.36	1.57	74.80	15.35	0.79	
Family size								***
Smaller (3 or fewer)	2.33	1.86	2.02	1.55	76.24	15.22	0.78	
Larger (4 or more)	2.30	2.30	1.75	1.35	79.44	12.14	0.71	
Year								***
2009	2.46	1.54	2.15	1.23	77.85	14.15	0.62	
2010	2.40	1.50	2.69	1.20	79.04	12.57	0.60	
2011/2012	2.58	1.78	1.78	0.97	79.64	12.76	0.48	
2013	1.58	3.15	1.26	1.26	78.23	13.25	1.26	
2014	1.96	2.94	1.63	2.94	76.14	13.73	0.65	

***$p<0.01$ obtained from $X2$ test

Table 3. Bivariate analysis of the dependent and independent variables, Northern Ontario, PSIS-T1FF 2009-2016.
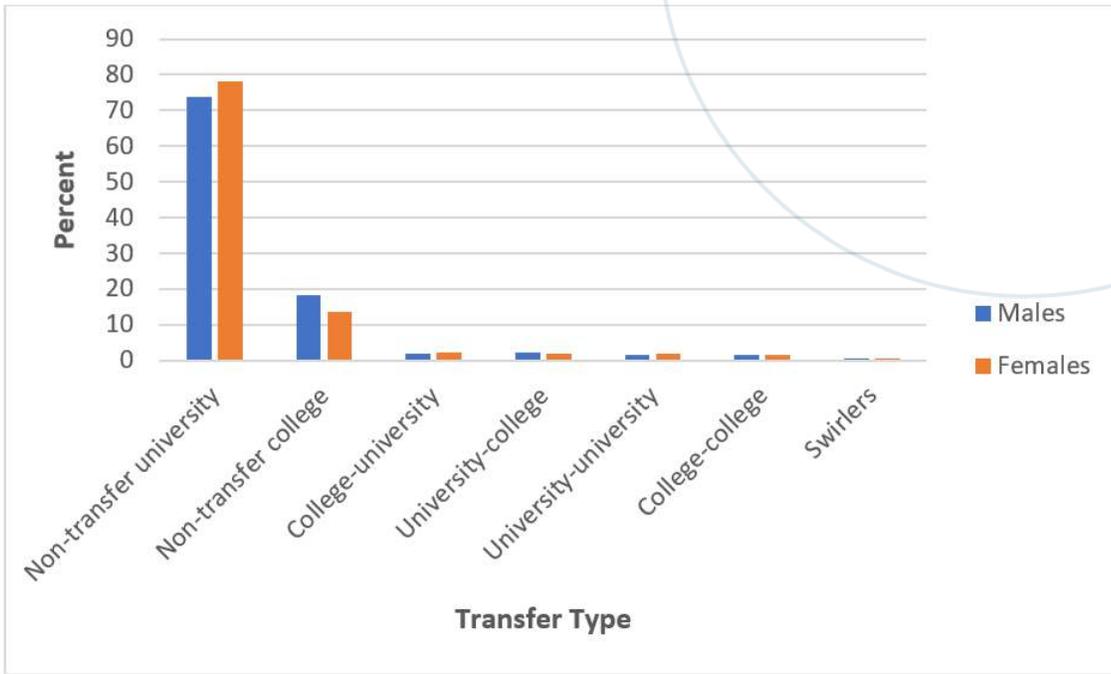
Figure 2. The Relationship between Sex and Transfer Pathways, Southern Ontario
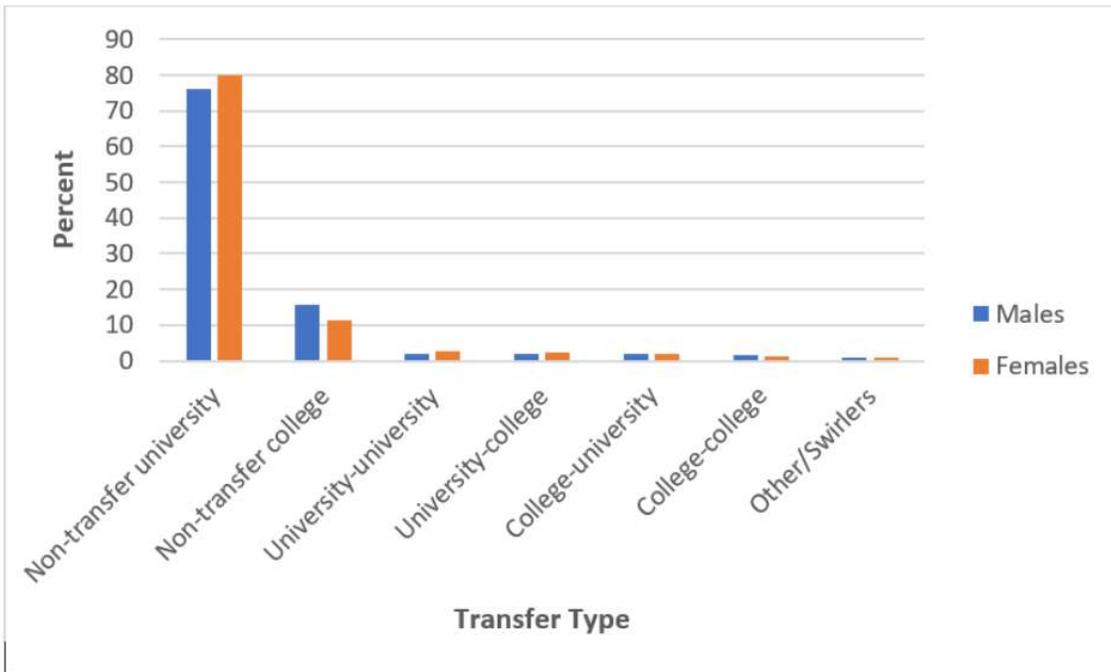
Figure 3. The Relationship between Sex and Transfer Pathways, Northern Ontario
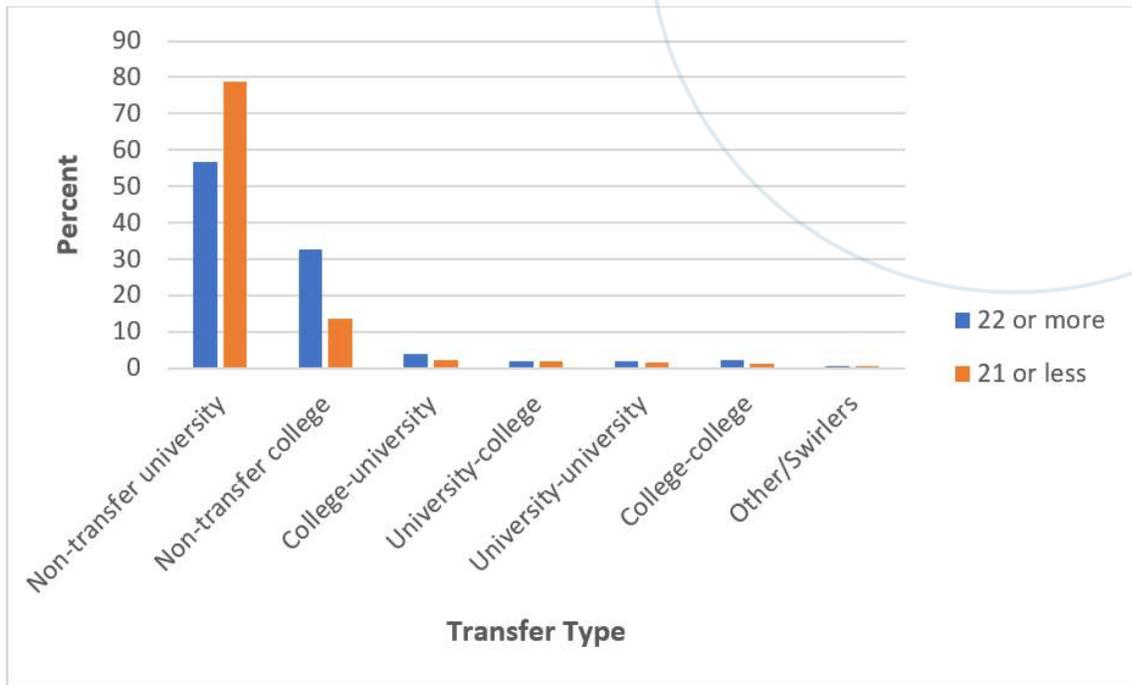
Figure 4. The Relationship between Age and Transfer Pathways, Southern Ontario
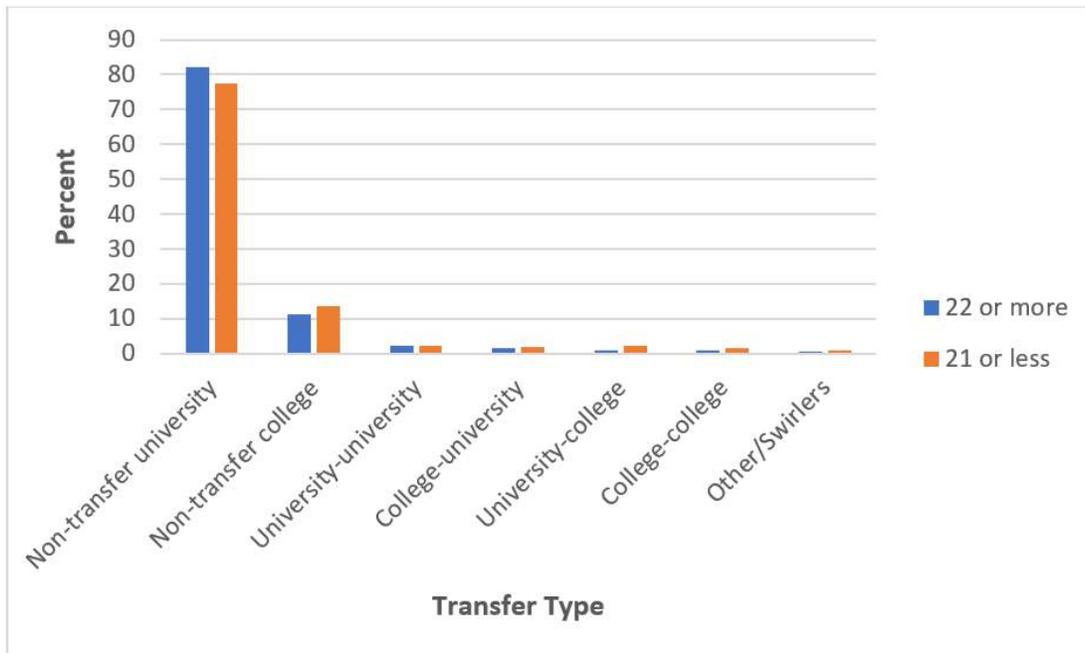
Figure 5. The Relationship between Age and Transfer Pathways, Northern Ontario
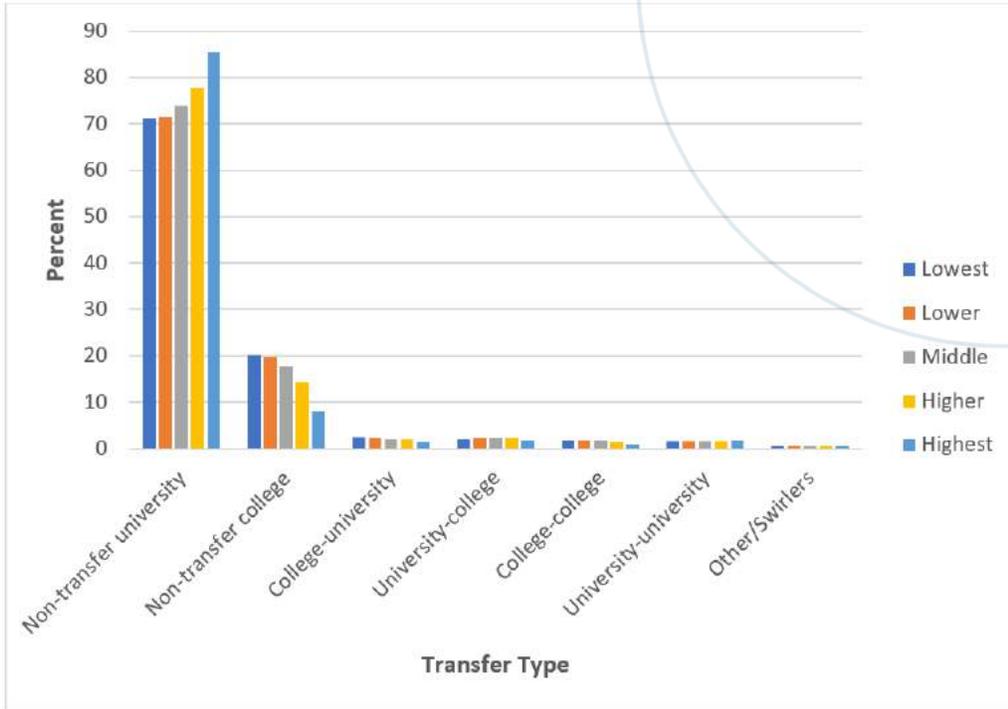
Figure 6. The Relationship between Parental Income and Transfer Pathways, Southern Ontario
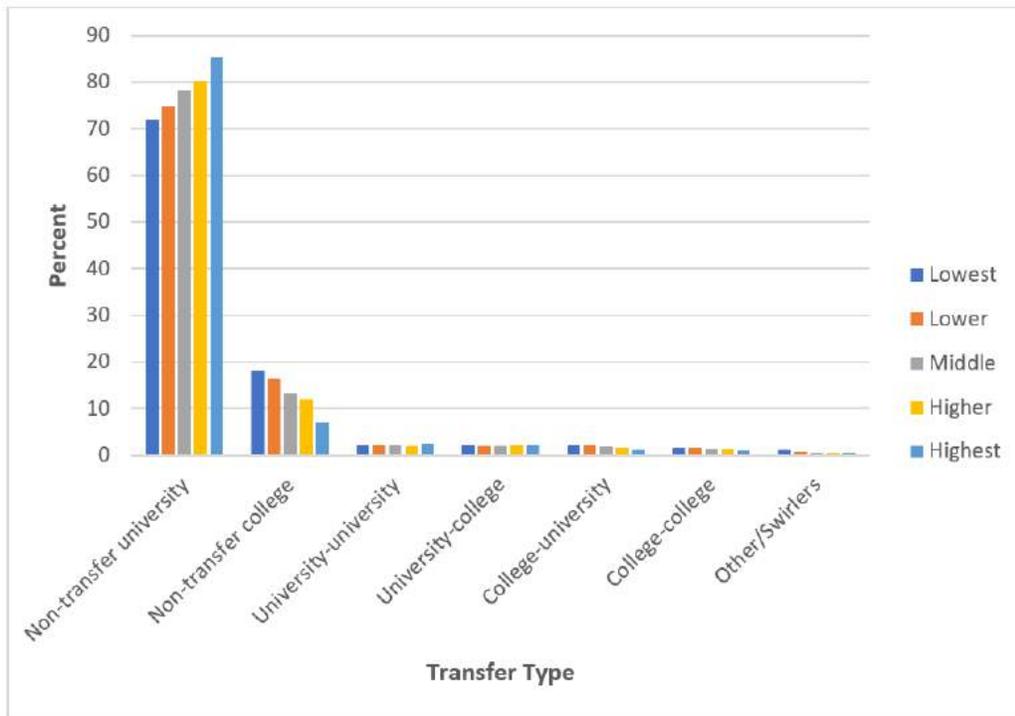
Figure 7. The Relationship between Parental Income and Transfer Pathways, Northern Ontario
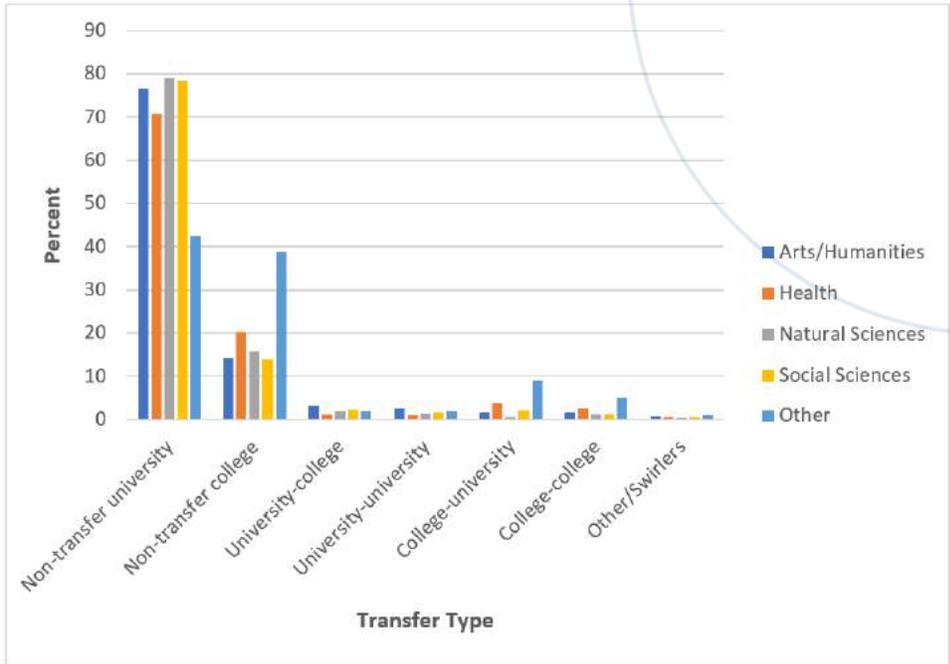
Figure 8. The Relationship between Field of Study and Transfer Pathways, Southern Ontario
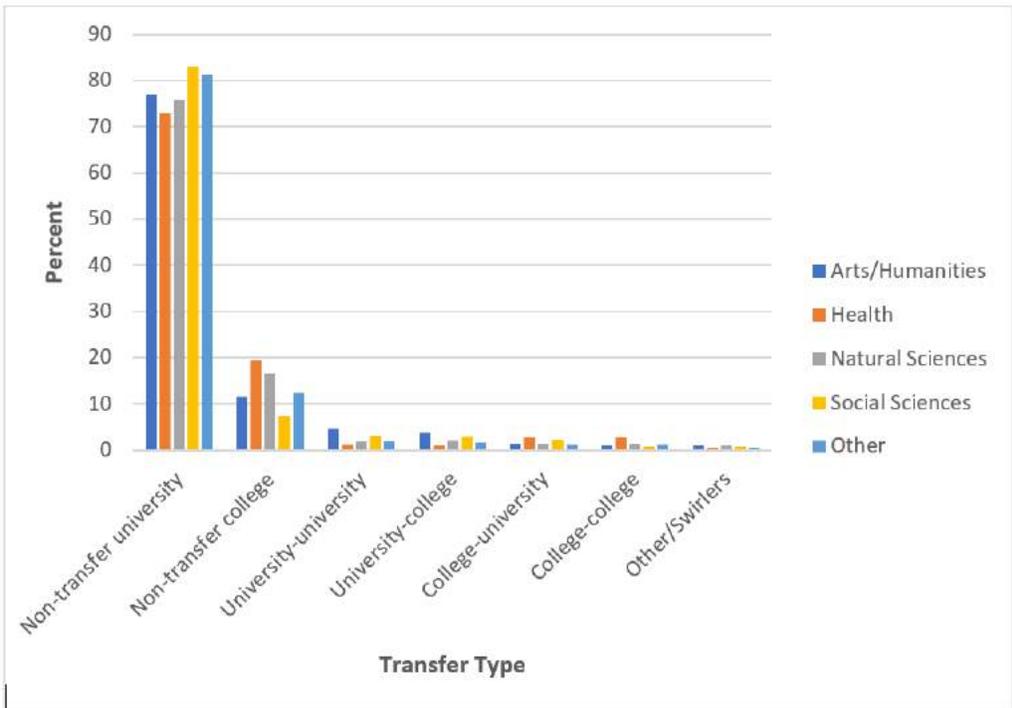
Figure 9. The Relationship between Field of Study and Transfer Pathways, Northern Ontario

|	UU	UC	CU	CC	NTC	Swirlers
Sex						
Men	-	-	-	-	-	-
Women	1.11***	0.85***	0.93***	0.79***	0.67***	0.84***
Age						
Younger (21 or younger)	-	-	-	-	-	-
Older (22 or older)	1.50***	1.17***	2.46***	1.96***	2.93***	1.79***
Parental income						
Lowest	-	-	-	-	-	-
Lower	0.97**	1.12***	0.95	1.03	1.03**	0.94
Middle	0.98***	1.09**	0.83***	0.98	0.94***	0.91
Higher	0.93***	1.05	0.78***	0.80***	0.74***	0.87*
Highest	0.92***	0.75***	0.51***	0.46***	0.39***	0.72***
Field of study						
Arts/humanities	-	-	-	-	-	-
Health	0.43***	0.44***	2.43***	1.76***	1.49***	0.82**
Natural sciences	0.63*	0.54***	0.36***	0.64***	0.98*	0.56***
Social sciences	0.70***	0.71***	1.14***	0.72***	0.89***	0.70***
Other	1.86***	0.75***	9.48***	5.46***	4.58***	2.77***
Family composition						
Coupled	-	-	-	-	-	-
Lone	1.04***	1.21***	1.15***	1.28***	1.15***	1.28***
Household size						
Smaller (3 or fewer)	-	-	-	-	-	-
Larger (4 or more)	1.07***	1.10***	0.96	0.96	0.91***	1.05
Year						
2009	-	-	-	-	-	-
2010	0.97***	0.91**	1.04	0.97	0.96**	1.04
2011/2012	0.94***	0.90***	0.85***	0.74***	0.87***	0.86**
2013	0.62***	1.04	0.66***	0.79***	0.81***	1.77***
2014	0.44***	0.79***	0.50***	0.98	0.85***	1.14*

*p<0.1, **p<0.05, ***p<0.01; NTU is the reference category for the dependent variable.

Table 4. Multinomial Logistic Regression Analysis of Transfer Types, Southern Ontario. PSIS-T1FF 2009–2016

	UU			UC			CU			CC			NTU			NTC			Swirlers		
	Margin	95% CI		Margin	95% CI		Margin	95% CI		Margin	95% CI		Margin	95% CI		Margin	95% CI		Margin	95% CI	
Sex																					
Men	1.68	1.64	1.73	2.18	2.13	2.23	1.84	1.80	1.89	1.45	1.41	1.49	78.39	78.26	78.52	13.93	13.82	14.04	0.52	0.49	0.54
Women	1.93	1.80	2.05	1.95	1.82	2.07	3.25	3.10	3.40	2.06	1.94	2.19	60.35	59.92	60.78	29.77	29.37	30.17	0.70	0.62	0.77
Age																					
Younger (21 or younger)	1.55	1.49	1.60	2.25	2.18	2.32	2.00	1.93	2.07	1.65	1.59	1.71	73.35	73.15	73.54	18.63	18.46	18.81	0.57	0.53	0.60
Older (22 or older)	1.84	1.78	1.90	2.06	2.00	2.12	2.06	2.00	2.12	1.43	1.38	1.48	78.40	78.23	78.57	13.69	13.55	13.83	0.51	0.48	0.54
Parental income																					
Lowest	1.70	1.61	1.79	2.08	1.97	2.18	2.37	2.27	2.48	1.72	1.63	1.81	72.92	72.61	73.22	18.63	18.37	18.90	0.58	0.53	0.63
Lower	1.64	1.56	1.73	2.31	2.20	2.41	2.25	2.15	2.35	1.77	1.68	1.85	72.48	72.18	72.78	19.02	18.75	19.28	0.54	0.49	0.59
Middle	1.69	1.60	1.78	2.29	2.19	2.39	2.02	1.92	2.11	1.71	1.62	1.80	73.89	73.59	74.18	17.87	17.61	18.13	0.54	0.49	0.59
Higher	1.69	1.60	1.78	2.31	2.20	2.41	2.00	1.90	2.10	1.47	1.39	1.56	77.11	76.82	77.40	14.88	14.63	15.13	0.54	0.49	0.59
Highest	1.83	1.74	1.93	1.80	1.71	1.89	1.50	1.41	1.59	0.96	0.89	1.03	84.45	84.20	84.71	8.96	8.76	9.16	0.50	0.45	0.54
Field of study																					
Arts/humanities	2.31	2.21	2.42	3.10	2.98	3.22	1.68	1.59	1.77	1.60	1.51	1.69	75.72	75.42	76.02	14.89	14.64	15.14	0.70	0.64	0.75
Health	0.92	0.83	1.00	1.26	1.16	1.36	3.75	3.57	3.92	2.59	2.44	2.73	70.79	70.39	71.20	20.16	19.80	20.52	0.53	0.47	0.60
Natural sciences	1.54	1.46	1.62	1.74	1.66	1.82	0.64	0.60	0.69	1.08	1.02	1.14	79.30	79.06	79.54	15.28	15.07	15.50	0.41	0.37	0.44
Social sciences	1.68	1.62	1.74	2.29	2.22	2.37	2.00	1.93	2.06	1.20	1.14	1.25	78.45	78.25	78.65	13.88	13.71	14.05	0.51	0.47	0.54
Other	2.50	2.23	2.76	1.35	1.16	1.55	8.76	8.30	9.23	4.82	4.47	5.17	44.89	44.08	45.70	36.57	35.79	37.34	1.10	0.93	1.28
Family composition																					
Coupled	1.71	1.66	1.75	2.11	2.06	2.16	2.01	1.96	2.06	1.49	1.45	1.53	76.39	76.25	76.53	15.77	15.65	15.89	0.52	0.50	0.55
Lone	1.70	1.57	1.83	2.46	2.30	2.62	2.20	2.07	2.33	1.81	1.69	1.94	73.85	73.44	74.25	17.33	16.99	17.67	0.65	0.57	0.72
Household size																					
Smaller (3 or fewer)	1.62	1.54	1.69	1.99	1.90	2.07	2.07	1.99	2.15	1.55	1.48	1.63	75.45	75.21	75.70	16.81	16.60	17.02	0.51	0.47	0.56
Larger (4 or more)	1.75	1.70	1.80	2.22	2.16	2.28	2.02	1.97	2.08	1.52	1.47	1.57	76.37	76.21	76.53	15.57	15.43	15.71	0.55	0.52	0.58
Year																					
2009	2.02	1.91	2.13	2.25	2.14	2.37	2.40	2.29	2.52	1.70	1.60	1.80	73.88	73.56	74.20	17.28	17.00	17.56	0.47	0.41	0.52
2010	1.99	1.88	2.09	2.08	1.97	2.18	2.52	2.40	2.63	1.67	1.58	1.77	74.50	74.18	74.81	16.76	16.49	17.03	0.49	0.44	0.54
2011/2012	1.98	1.91	2.05	2.11	2.04	2.19	2.14	2.06	2.21	1.31	1.25	1.37	76.40	76.18	76.62	15.65	15.46	15.84	0.42	0.38	0.45
2013	1.32	1.23	1.40	2.46	2.34	2.57	1.71	1.61	1.80	1.43	1.34	1.52	77.31	77.01	77.61	14.91	14.65	15.17	0.87	0.80	0.94
2014	0.95	0.87	1.02	1.87	1.77	1.98	1.29	1.20	1.37	1.78	1.68	1.88	77.89	77.59	78.20	15.66	15.39	15.93	0.56	0.51	0.62

Table 5. Predicted probabilities of transfer types, Southern Ontario. PSIS-T1FF 2009–2016

	UU	UC	CU	CC	NTC	Swirlers
Sex						
Men	-	-	-	-	-	-
Women	1.17	0.99	0.74***	0.60***	0.63***	1.07
Age						
Younger (21 or younger)	-	-	-	-	-	-
Older (22 or older)	0.88	0.48***	0.70**	0.51***	0.63***	0.55**
Parental income						
Lowest	-	-	-	-	-	-
Lower	0.89	0.76	0.97	1.02	0.84**	0.67
Middle	0.87	0.74*	0.87	0.77	0.63***	0.57**
Higher	0.83	0.73*	0.77	0.64**	0.53***	0.51**
Highest	1.02	0.71*	0.59**	0.44***	0.28***	0.38***
Field of study						
Arts/humanities	-	-	-	-	-	-
Health	0.27***	0.22***	2.90***	3.28***	2.08***	0.42**
Natural sciences	0.44***	0.47***	1.29	1.53	1.43***	1.05
Social sciences	0.69***	0.70**	1.94***	0.77	0.63***	0.80
Other	0.41***	0.36***	1.20	1.25	1.08	0.75
Family composition						
Coupled	-	-	-	-	-	-
Lone	1.22	1.06	1.24	0.74	0.82***	0.78
Household size						
Smaller (3 or fewer)	-	-	-	-	-	-
Larger (4 or more)	1.07	1.22	0.86	0.71**	0.76***	0.87
Year						
2009	-	-	-	-	-	-
2010	0.94	0.87	1.13	0.95	0.88*	0.67
2011/2012	1.06	1.18	0.78	0.85	0.91	0.75
2013	0.66**	2.26***	0.50***	1.14	0.97	2.07**
2014	0.87	2.17***	0.68**	2.37***	1.03	1.14

*p<0.1, **p<0.05, ***p<0.01; NTU is the reference category for the dependent variable.

Table 6. Multinomial logistic regression analysis of transfer types, Northern Ontario. PSIS-T1FF 2009–2016

	UU			UC			CU			CC			NTU			NTC			Swirlers		
	Margin	95% CI		Margin	95% CI		Margin	95% CI		Margin	95% CI		Margin	95% CI		Margin	95% CI		Margin	95% CI	
Sex																					
Men	2.31	2.07	2.55	2.32	2.08	2.56	1.93	1.71	2.16	1.56	1.36	1.76	77.02	76.36	77.69	14.06	13.51	14.62	0.78	0.64	0.93
Women	2.19	1.70	2.69	1.21	0.85	1.58	1.48	1.10	1.87	0.89	0.59	1.18	83.86	82.68	85.03	9.89	8.97	10.82	0.47	0.25	0.69
Age																					
Younger (21 or younger)	2.01	1.70	2.33	2.05	1.73	2.37	2.10	1.76	2.44	1.79	1.47	2.11	75.24	74.26	76.22	16.14	15.31	16.98	0.67	0.49	0.85
Older (22 or older)	2.49	2.20	2.79	2.16	1.88	2.43	1.67	1.44	1.91	1.18	0.98	1.38	80.61	79.87	81.34	11.12	10.54	11.71	0.76	0.59	0.93
Parental income																					
Lowest	2.32	1.72	2.92	2.51	1.84	3.19	2.00	1.44	2.56	1.71	1.15	2.27	71.26	69.38	73.14	19.08	17.44	20.72	1.12	0.66	1.57
Lower	2.15	1.68	2.62	2.01	1.53	2.48	2.03	1.57	2.49	1.83	1.37	2.28	74.35	72.90	75.79	16.87	15.63	18.10	0.78	0.48	1.08
Middle	2.21	1.79	2.62	2.02	1.62	2.42	1.93	1.54	2.31	1.48	1.14	1.83	78.19	77.02	79.35	13.47	12.52	14.43	0.70	0.46	0.94
Higher	2.16	1.74	2.58	2.07	1.68	2.47	1.75	1.37	2.13	1.27	0.96	1.58	80.42	79.31	81.54	11.68	10.79	12.58	0.65	0.42	0.87
Highest	2.79	2.18	3.40	2.12	1.62	2.61	1.44	1.00	1.87	0.94	0.62	1.26	85.53	84.30	86.76	6.68	5.83	7.53	0.51	0.26	0.75
Field of study																					
Arts/humanities	4.23	3.39	5.07	4.02	3.15	4.89	1.06	0.65	1.47	0.92	0.51	1.34	77.86	76.11	79.60	11.00	9.70	12.29	0.91	0.50	1.32
Health	1.05	0.74	1.36	0.82	0.55	1.09	2.78	2.26	3.31	2.73	2.21	3.25	71.72	70.32	73.11	20.55	19.28	21.82	0.35	0.17	0.53
Natural sciences	1.85	1.40	2.29	1.88	1.45	2.31	1.35	0.98	1.71	1.39	1.03	1.74	77.17	75.86	78.48	15.42	14.31	16.54	0.95	0.63	1.26
Social sciences	3.08	2.62	3.54	3.01	2.55	3.46	2.19	1.80	2.58	0.76	0.53	1.00	82.78	81.78	83.79	7.40	6.70	8.09	0.78	0.55	1.01
Other	1.79	1.34	2.24	1.50	1.08	1.91	1.32	0.93	1.70	1.20	0.82	1.59	81.15	79.81	82.49	12.34	11.20	13.47	0.71	0.42	1.00
Family composition																					
Coupled	2.22	2.00	2.45	2.09	1.87	2.31	1.77	1.56	1.97	1.47	1.28	1.66	78.17	77.53	78.82	13.53	12.99	14.06	0.75	0.61	0.88
Lone	2.74	1.99	3.49	2.24	1.57	2.91	2.24	1.61	2.87	1.13	0.73	1.52	79.61	77.96	81.26	11.44	10.24	12.64	0.60	0.31	0.89
Household size																					
Smaller (3 or fewer)	2.14	1.76	2.52	1.80	1.45	2.16	1.96	1.59	2.33	1.72	1.35	2.08	76.41	75.28	77.54	15.20	14.25	16.16	0.77	0.53	1.00
Larger (4 or more)	2.38	2.09	2.67	2.28	2.00	2.55	1.77	1.53	2.02	1.28	1.08	1.48	79.47	78.73	80.20	12.13	11.54	12.72	0.69	0.54	0.85
Year																					
2009	2.45	1.92	2.98	1.50	1.08	1.91	2.25	1.73	2.76	1.19	0.82	1.56	78.13	76.74	79.53	13.80	12.65	14.95	0.68	0.40	0.96
2010	2.35	1.85	2.86	1.32	0.94	1.70	2.60	2.05	3.14	1.15	0.79	1.52	79.67	78.32	81.02	12.44	11.34	13.54	0.46	0.24	0.69
2011/2012	2.62	2.23	3.02	1.79	1.46	2.12	1.78	1.45	2.11	1.04	0.79	1.29	79.43	78.44	80.43	12.81	11.99	13.63	0.52	0.34	0.70
2013	1.60	1.16	2.05	3.34	2.71	3.98	1.11	0.75	1.48	1.35	0.95	1.75	77.78	76.34	79.21	13.41	12.24	14.58	1.40	0.99	1.82
2014	2.06	1.54	2.58	3.15	2.52	3.79	1.50	1.07	1.92	2.73	2.16	3.31	76.04	74.54	77.55	13.76	12.55	14.96	0.75	0.44	1.07

Table 7. Predicted Probabilities of Transfer Types, Northern Ontario, PSIS-T1FF 2009-2016
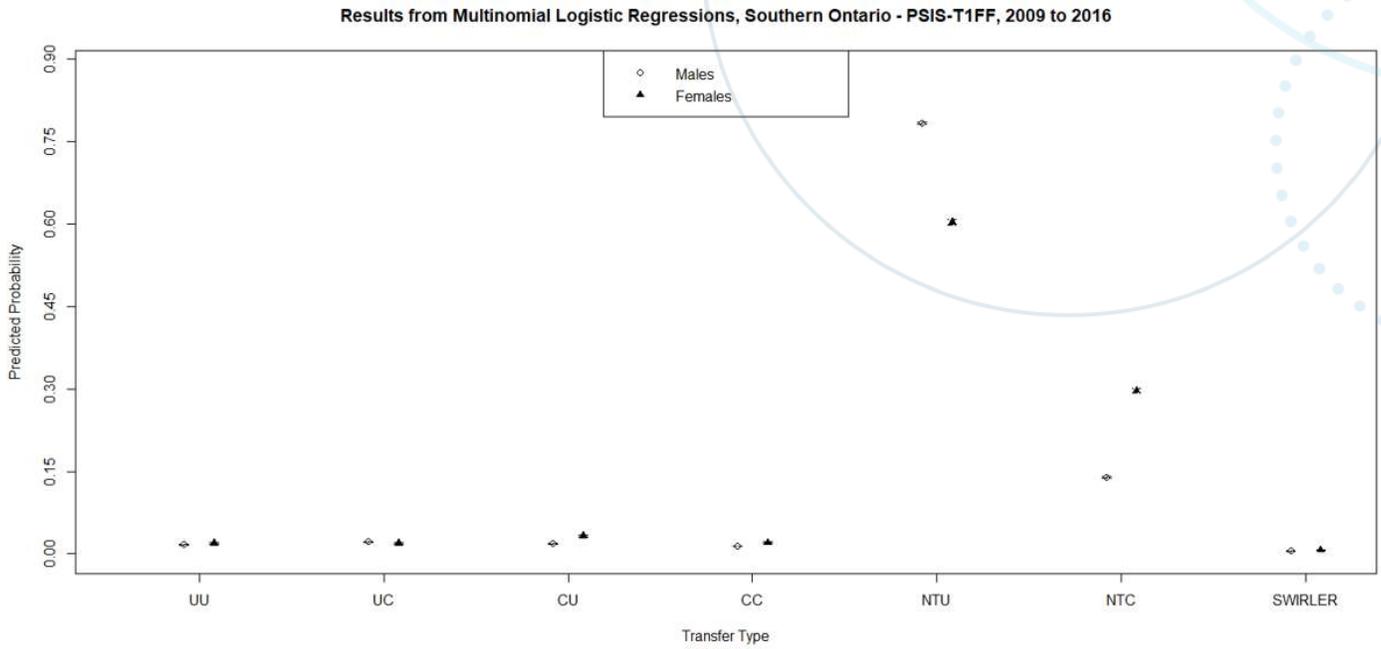
Figure 10. The Predicted Probabilities Across Sex and Transfer Type, Southern Ontario
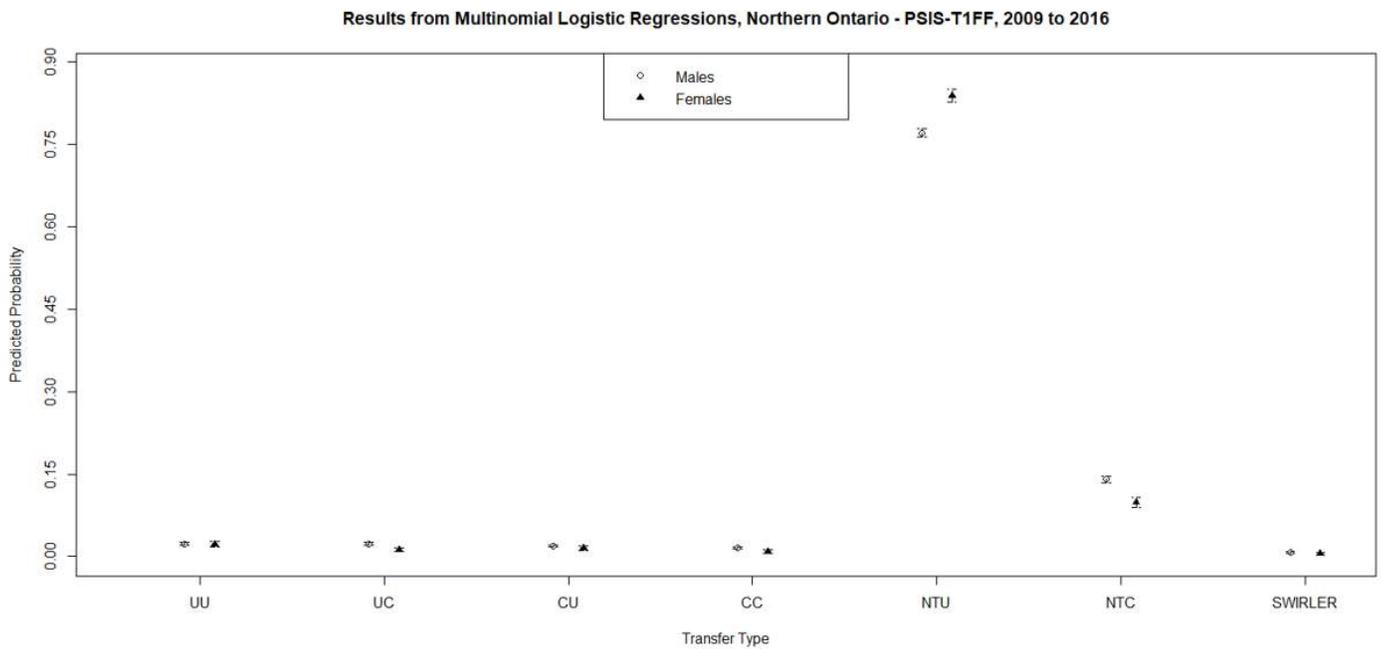
Figure 11. The Predicted Probabilities Across Sex and Transfer Type, Northern Ontario
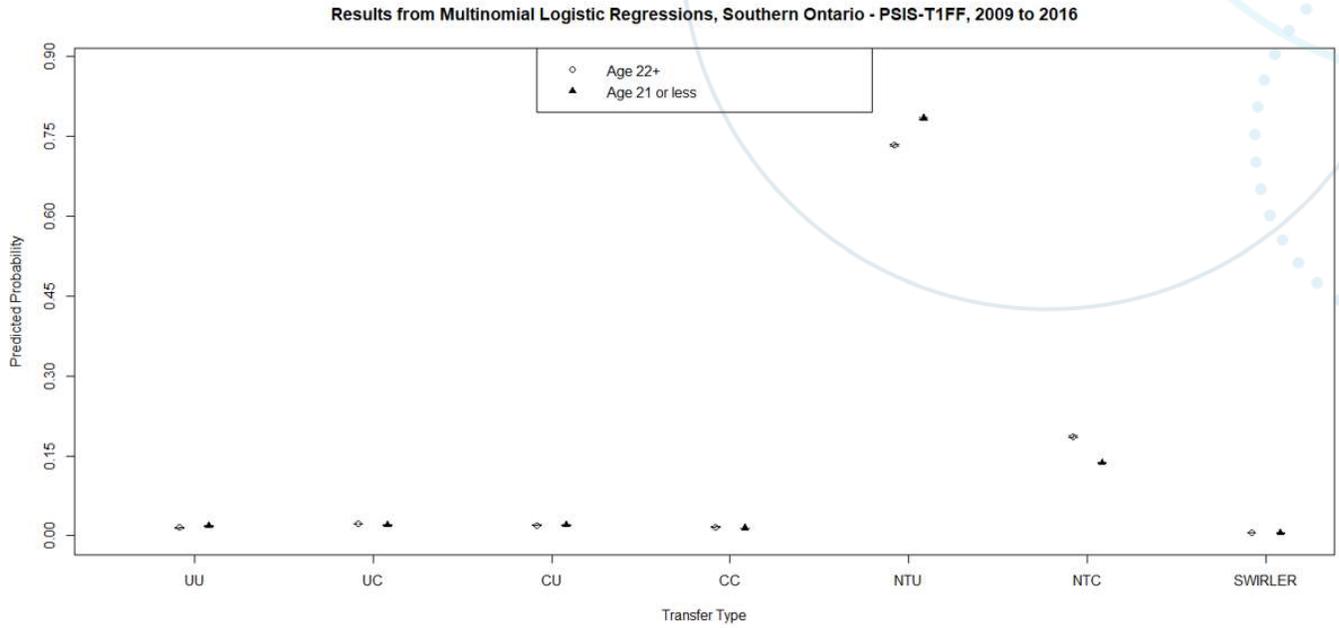
Figure 12. The Predicted Probabilities Across Age and Transfer Type, Southern Ontario
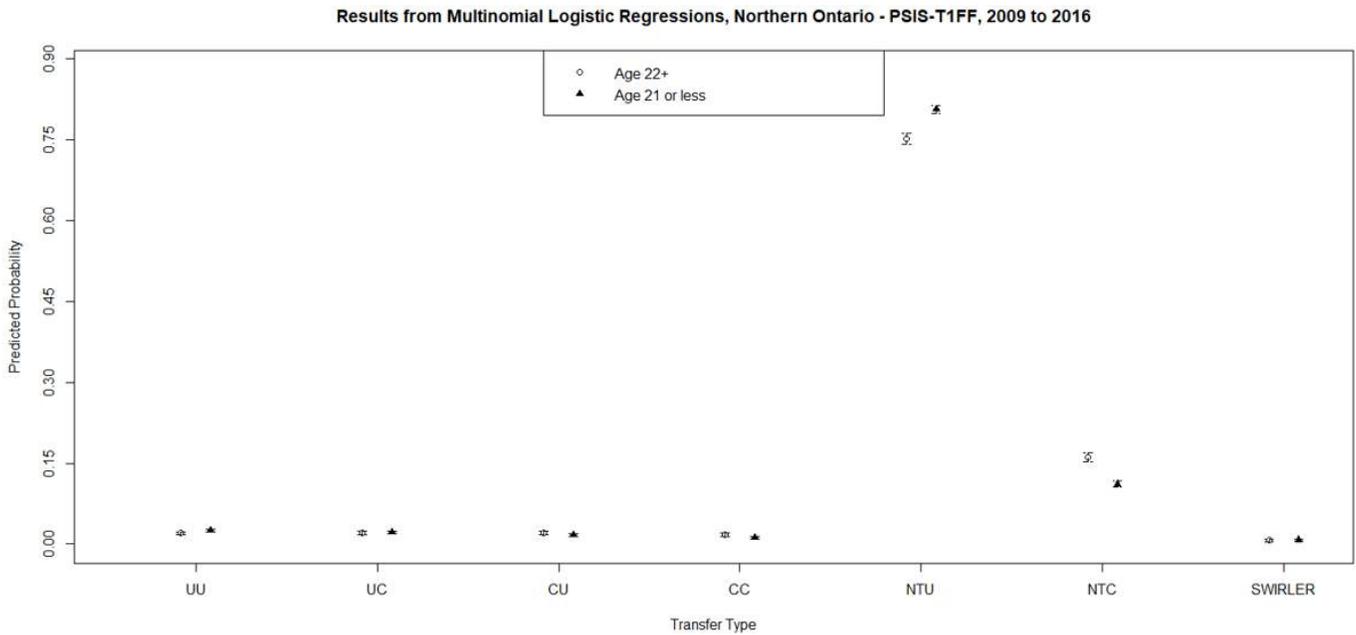
Figure 13. The Predicted Probabilities Across Age and Transfer Type, Northern Ontario
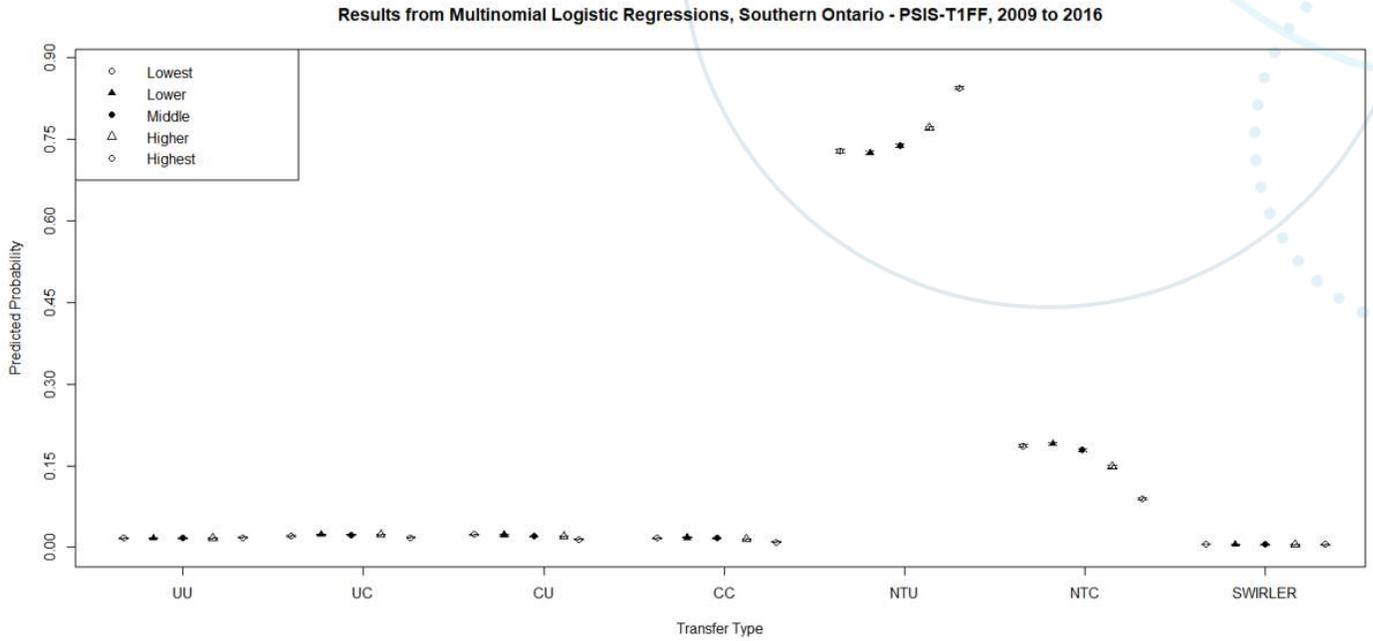
Figure 14. The Predicted Probabilities Across Parent Income and Transfer Type, Southern Ontario
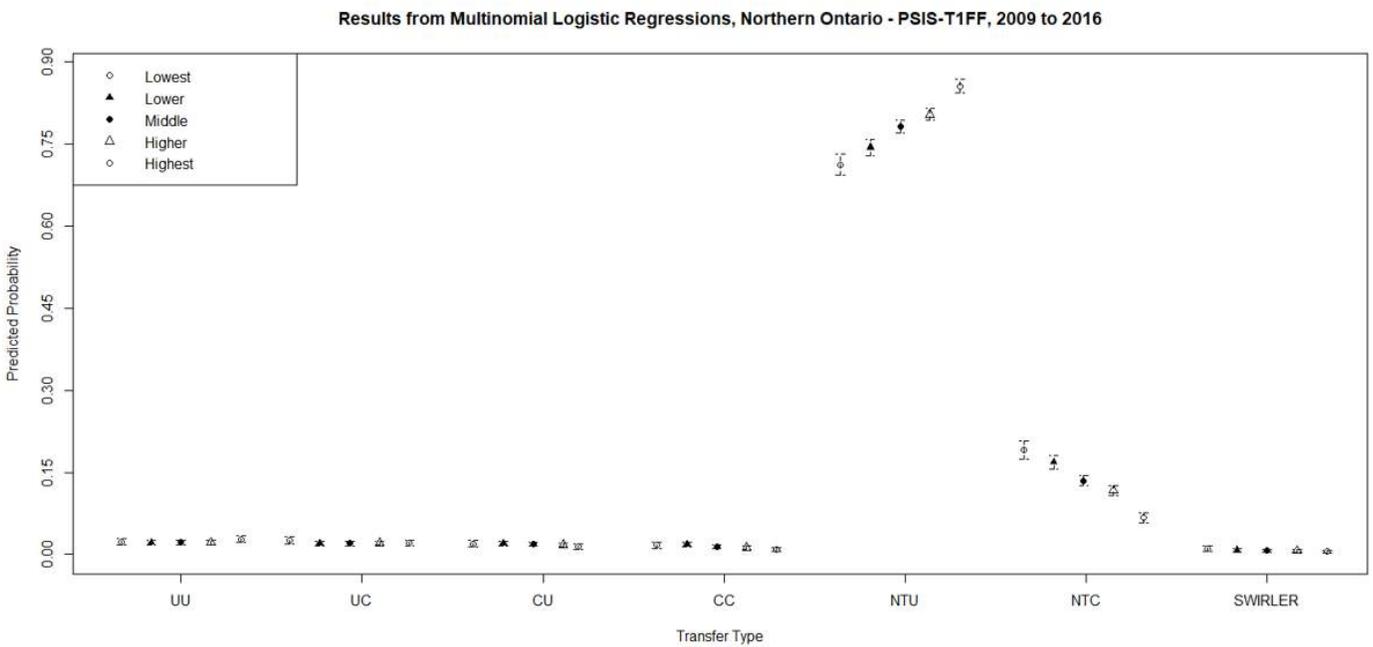
Figure 15. The Predicted Probabilities Across Parent Income and Transfer Type, Northern Ontario
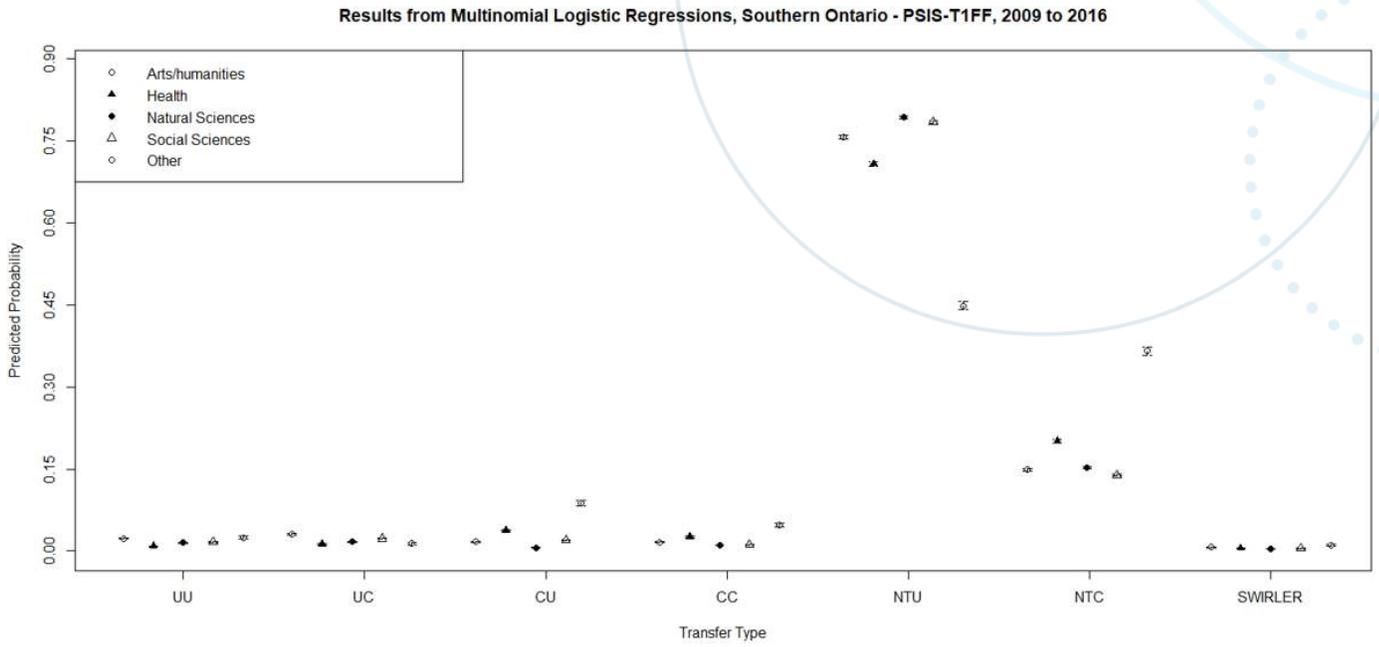
Figure 16. The Predicted Probabilities Across Field of Study and Transfer Type, Southern Ontario
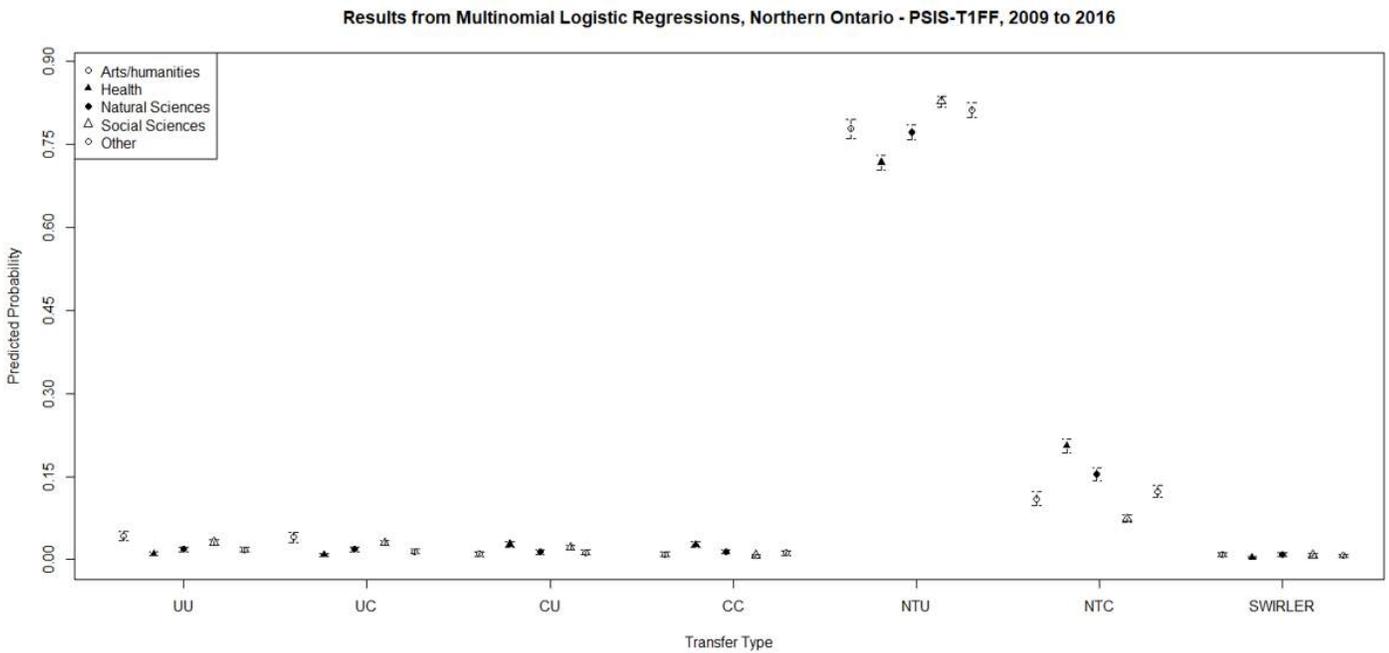

Figure 17. The Predicted Probabilities Across Field of Study and Transfer Type, Northern Ontario