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Transfer Pathways among Ontario Colleges and Universities

Characteristics of Students Who Transfer Across and Within Regions

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Table of Contents

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Overview of the Study

Research considering transfers between postsecondary institutions has largely focused on the types of transfers that students make across institutions and sectors (e.g., college to university, university to college, college to college, university to university). While some studies have explored regional elements of Ontario postsecondary recruitment efforts, with a focus on local catchment areas and community responsiveness (e.g., Kaufman, Jonker, & Hicks, 2018), there is little information on the regional flows of transfers across or within regions in Ontario: North to South, South to North, South to South, and North to North.

Research examining postsecondary education in Canada's provincial North points to various differences between southern and northern communities which would suggest that we might expect differences in the characteristics of youth who transfer across regions in Ontario (Hango et al., 2019; Pizarro Milian, Seward, & Zarifa, 2020; Zarifa, Hango, & Pizarro Milian, 2018; Zarifa, Seward, & Pizarro Milian, 2019). Moreover, northern economies continually struggle to maintain local human capital levels to promote economic development, and they commonly share high levels of skill and youth out-migration (FCM 2015a, 2015b; Labour Market Group, 2018; Newbold & Brown, 2015; Zarifa et al., 2018). With northern regions facing these significant challenges, with out-migration and 'brain drain' in particular—the loss of educated and skilled workers (Dowsley & Southcott, 2017; Hillier et al., 2020; Laflamme & Bagaoui, 2010)—it is important to assess empirically the magnitude and key determinants of student transfer behaviours not only within regions but across regions of Ontario.

Key Findings

- The prevalence of transfer across regions is much higher among northern students (4.89%) than southern students (0.29%). By contrast, a larger proportion of southern students (7.67%) are transferring within the region compared to northern students (3.47%).
- Older students have higher probabilities in both regions when it comes to not transferring and for transferring within the same region. However, older students in Southern Ontario show higher probabilities of transferring across the region, while in Northern Ontario, it is younger students who show higher probabilities of transferring across the region.
- In both regions, compared to university students, college students are significantly more likely to transfer within the region *and* across the region.
- In Southern Ontario, compared to full-time students, part-time students are significantly more likely to transfer both within the region *and* across the region. In Northern Ontario, however, part-time students are only significantly more likely to transfer across the region than their full-time counterparts.

- For Southern Ontario students, natural sciences majors show the highest probability of taking the non-transfer route; arts and humanities majors show the highest probability of transferring within the region; and health majors show the highest probability of transferring across the region. For Northern Ontario, health majors show the highest probability of not transferring, and arts and humanities and social science majors show the highest probabilities of transferring both within and across regions.

Introduction

With a growing number of students who transfer schools after completing college or university, or transferring before completion (Decock, 2004; Finnie, Dubois, & Miyairi, 2020), there is a need to understand more about the characteristics of students who transfer from different regions of Ontario, both North and South. Youth from the northernmost parts of provinces often face significant proximity and socio-demographic barriers to attending postsecondary institutions, 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) (Hango et al., 2019; Zarifa et al., 2018). Indeed, our two previous studies revealed that both the magnitude of transfer types as well as the socio-demographic and educational characteristics of students who transfer vary across Northern and Southern Ontario postsecondary institutions (Sano, Hillier, & Zarifa, 2020; Zarifa, Sano, & Hillier, 2020). At the same time, new research tracing the out-migration of young adults from Northern Canada to Southern Canada suggests that a considerable degree of out-migration occurs before students turn 30, and much of this out-migration is highly correlated with postsecondary education behaviours (Hillier et al., 2020).

Existing transfer research that considers regional pathways largely examines flows between two institutions that have articulation agreements in place (e.g., diploma to degree programs) and are located in close proximity to each other (Acai & Newton, 2015; Blanchard et al., 2013; Gawley & McGowan, 2006). That is, these pathways are primarily within city transfers between a college and a university. However, to our knowledge, no existing academic or policy reports have investigated the magnitude of regional transfer pathways both within and across regions in Ontario colleges and universities, nor have they taken a closer look to compare the characteristics of students who take these pathways at northern and southern institutions.

This research aims to fill this apparent gap in our understanding by using administrative data from Statistics Canada's Postsecondary Student Information System (PSIS) (2009 to 2016) linked to T1 Family File tax data (T1FF) to examine the regional flows of student transfers in Ontario's college and university sectors. Specifically, we explore the overall magnitude as well as the socio-demographic antecedents across three pathways for students at northern and southern institutions: 1) *no transfer*: students do not transfer within two years after their initial enrolment into postsecondary institution (i.e., college or university); 2) *transfer within region*: students transfer to another institution but stay within the same region; and 3) *transfer across region*: students leave their region to transfer to another institution (i.e., south to north or north to south).

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 these 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.

Regional Transfers and Prevalence: Does the Magnitude of Transfer Within and Across Regions Differ for Northern and Southern Ontario Institutions?

In this section, we examine the prevalence of the three postsecondary pathways described above in both Northern Ontario and Southern Ontario institutions. Table 1 shows the findings from our univariate analysis describing the characteristics of students in the PSIS-T1FF from northern and southern institutions. The results in Figure 1 show that two key differences emerge in the distributions of transfer types across the two locales. First, the prevalence of transferring *across* regions is considerably higher among students at northern institutions (4.89%) than among those at southern institutions (0.29%). Second, much larger proportions of southern students (7.67%) are transferring *within* their region than northern students (3.47%). Put differently, transfer among students at Southern Ontario institutions tends to stay in Southern Ontario, whereas the transfer pathways among students from Northern Ontario institutions transcend regional boundaries.

Additional characteristics of the 2009 to 2016 PSIS-T1FF subsamples for southern and northern students respectively can be found in Table 1. In short, there are more female students (58.46% vs. 53.56%) and older students (19.30% vs. 12.11%) in northern institutions than southern institutions, and fewer northern students (13.35%) have parents with income falling under the 'lowest' income category than southern students (19.88%). In terms of program characteristics, smaller proportions of northern students, compared to southern students, enroll in college (16.57% vs. 19.74%) and attend postsecondary institutions on a part-time basis (6.57% vs. 31.59%). Our analysis also reveals that more northern students major in health sciences (21.77% vs. 11.61%), but fewer northern students major in arts/humanities (11.36% vs. 19.52%), natural sciences (21.24% vs. 26.58%), and social sciences (28.60% vs. 38.84%) relative to southern students. In terms of family characteristics, the prevalence of single parenthood is slightly higher for northern students (13.35%) than southern students (11.88%), although this trend is reversed for having family size larger than four (66.14% and 70.25% for northern and southern students, respectively).

Northern and Southern Differences: Do the Characteristics of Students Who Transfer Within and Across Regions Differ at Northern and Southern Institutions in Ontario?

The Characteristics of Students Who Transfer Within Regions

For the characteristics of students who transfer within regions, we turn to the literature that examines transfer flows between Ontario postsecondary institutions that are located in close proximity to each other. In these studies, age is a key predictor of transfer within regions. Yet, some research finds older students (> 25 years) (Acai & Newton, 2015; Blanchard et al., 2013; Gawley & McGowan, 2006) are more likely to transfer to nearby institutions and others find younger students (< 25 years) more likely to transfer locally (McCloy et al., 2017; Smith et al., 2016). The sex of the student has also received mixed results, with some researchers discovering female students are more likely to transfer locally (McCloy et al., 2017; Smith et al., 2016) and others finding higher rates of transfer among male students (Acai & Newton, 2015; Gawley & McGowan, 2006). For family background characteristics, having one parent with postsecondary education is positively associated with transferring between institutions in the same region (McCloy et al., 2017; Smith et al., 2016; Steffler, McCloy, & Decock, 2018).

In relation to student academics, program of study, GPAs, and students' aspirations predict local transfers between postsecondary institutions. First, students aspiring to become teachers (Acai & Newton, 2015) and those seeking general arts and science university programs (Decock, 2004; Stewart & Martinello, 2012) are more likely to transfer from their college to a local university. Second, students with high GPAs in college have higher transfer rates to universities (Kennett & Mackie, 2014; Lang & Lopes, 2014; McCloy et al., 2017; Smith et al., 2016; Steffler et al., 2018; Stewart & Martinello, 2012). Yet, university students who transfer to college are also strong academically (Smith et al., 2016; Stewart & Martinello, 2012). Third, students' aspirations to attend university after college are associated with transfers to local universities (McCloy et al., 2017; Smith et al., 2016; Steffler et al., 2018).

The Characteristics of Students Who Transfer Across Regions

No literature currently exists that specifically examines transfers across regions. As such, we draw upon the small body of existing research that considers north to south migration f or considerations here. Using Canadian Census data (1996 to 2001), Southcott (2002) found all major cities in Northern Ontario experience significant out-migration, with the exception of Indigenous communities. In the rough time-frame when youth leave home to pursue

postsecondary studies, researchers found that the largest number of out-migrations are among youth aged 15 to 22 (Hillier et al., 2020; O'Hagan, 2014; Robichaud, 2013; Southcott, 2002). Additionally, once individuals leave northern cities for postsecondary education in the south, they are less likely to return (Girard & Laflamme, 2013; O'Hagan, 2014). Yet, those from smaller northern communities or from other areas in Northern Ontario often do return to their northern rural communities (O'Hagan, 2014).

In terms of examining the characteristics of individuals who leave their northern communities for the south, existing research in this area is even leaner. In Canada's territorial North (Dowsley & Southcott, 2017) as well as in Northern Ontario (Laflamme & Bagaoui, 2010), there is some evidence to suggest a 'female flight' from northern communities, and this out-migration is often attributed to their pursuits of postsecondary education. Most recently, across Canada's provincial North, Hillier and colleagues (2020) found Northern Canada respondents with higher education levels and higher PISA reading scores (measured at age 15 by the Programme for International Student Assessment) were likelier to migrate south. Additionally, parents' education was positively associated with the likelihood of migrating south (see also Laflamme & Bagaoui, 2010). These findings resonate with the aforementioned transfer research which finds students' education and skills and parents' education levels to be positively related to transfer rates (McCloy et al., 2017; Smith et al., 2016; Steffler et al., 2018).

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

Tables 2 and 3 show the results from our bivariate analyses in Southern Ontario and Northern Ontario respectively. Overall, the bivariate analyses reveal that transfer types are impacted by the interplay of demographic, program, and family characteristics among southern and northern students. We also graph these results in Figures 2 to 13 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

Figures 2 and 3 point to the importance of sex in understanding transfer types in Southern and Northern Ontario respectively. In Southern Ontario, the relationship between sex and transfer types is statistically significant ($p<0.01$), indicating that significantly larger proportions of female students are transferring within the region (7.88% vs. 7.41%) or across the region (0.32% vs. 0.26%) than males (see Figure 2). For Northern Ontario, compared to male students, fewer female students transfer within the region (3.42% vs. 3.54%), but more transfer across the region (5.04% vs. 4.81%) (see Figure 3). However, the relationship between sex and transfer type is not statistically significant among northern students.

Age

In terms of age, the relationships are statistically significant for both Northern and Southern Ontario ($p<0.01$). In Southern Ontario, Figure 4 shows that larger proportions of older students are transferring both within the region (9.91% vs. 7.36%) and across the region (0.51% vs. 0.26%). Interestingly, this pattern is reversed for students in northern institutions, where smaller proportions of older students transfer both within the region (2.72% vs. 3.65%) and across the region (3.81% vs. 5.21%) in comparison with younger students (see Figure 5).

Parental Income

Our bivariate analyses reveal that parental income also significantly impacts transfer types in Southern Ontario ($p<0.01$), suggesting that higher parental income generally leads to lower chances of transferring within the region. By contrast, southern students with the "lowest" parental income have the lowest percentage of transferring across the region while those with the "highest" parental income have the highest percentage of staying in the same institutions (see Figure 6). Although the relationship between parental income and transfer types is not statistically significant in Northern Ontario, the trend is somewhat similar to that of southern students. Specifically, the results in Figure 7 show that higher parental income generally predicts lower chances of transferring within the region, and students with the lowest parental income have the lowest percentage of staying in the same institutions.

Type of Institution

Figures 8 and 9 suggest that transfer pathways also vary by the type of institution in Southern and Northern Ontario ($p<0.01$). In Southern Ontario, more college students transfer within the region (18.31% vs. 5.05%) and across the region (0.74% vs. 0.18%), but fewer stay in the same institutions (80.95% vs. 94.77%) than university students (see Figure 8). In Figure 9, we can see this general pattern is similar in Northern Ontario, where significantly larger proportions of college students transfer within the region (10.76% vs. 2.08%) and across the region (9.81% vs. 3.91%) than university students.

Registration Status

In Figures 10 and 11, the bivariate results for registration status and transfer type are shown. In Southern Ontario, registration status has a statistically significant impact on transfer pathways ($p<0.01$). Specifically, more part-time southern students transfer within the region (13.65% vs. 7.39%) and across the region (0.39% vs. 0.29%), but fewer stay within the same institution (85.96% vs. 92.33%) compared to their full-time counterparts. Interestingly, slightly smaller proportions of northern part-time students stay in the same institutions (91.20% vs. 91.62%)

and transfer within the region (3.20% vs. 3.55%) than full-time students, but these differences are not statistically significant.

Field of Study

Finally, our results also point to field of study as being significantly associated with transfer pathways in Southern and Northern Ontario ($p<0.01$). Among southern students, students majoring in the natural sciences have the highest percentages of staying in the same institutions (94.63%) and the lowest percentage of transferring within the region (5.11%) (see Figure 12). By contrast, students majoring in arts and humanities have the lowest percentage of staying in the same institutions (90.65%), the highest percentage of transferring within the region (9.14%), and the lowest percentage of transferring across the region (0.22%). For Northern Ontario, Figure 13 shows students majoring in arts and humanities have the lowest percentage of staying in the same institutions (88.94%), the highest percentage of transferring within the region (4.61%), and the highest percentage of transferring across the region (6.45%).

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 Ontario 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., college) would take one of the various pathways, taking into account the impact that all other variables in the model have as well. The odds ratios from multinomial logistic regressions for Southern Ontario Institutions are shown in Table 4 and the predicted probabilities derived from those models are shown in Table 5. The odds ratios from multinomial logistic regressions for Northern Ontario are shown in Table 6, and the predicted probabilities derived from those models are shown in Table 7. The predicted probabilities for both regions are graphed in Figures 14 to 25. For ease of interpretation and to make similarities and differences more apparent, we compare each of the effects of the background characteristics in Northern and Southern institutions in turn.

Sex

In Southern Ontario, female students show higher odds of transferring within the region ($OR=1.07$, $p<0.01$) and across the region ($OR=1.42$, $p<0.01$) than their male counterparts when compared to the non-transfer route. Interestingly, when looking at the predicted probabilities

in Figure 14, we can see that female students show lower probabilities of not transferring and higher probabilities of transferring both within and across the region than male students. In Northern Ontario, however, the impact of sex on transfer types is not statistically significant. Figure 15 shows the same general pattern, yet the differences between male and female probabilities in the North are not large enough to yield statistical significance.

Age

In Southern Ontario, older students (compared to younger students) are less likely to transfer within the region (OR=0.88, $p<0.01$), but are more likely to transfer across the region than to stay in the same institutions (OR=1.43, $p<0.01$). Similarly, in Northern Ontario, significantly lower odds are observed for older students in terms of both transfer within the region (OR=0.79, $p<0.05$) and across the region (OR=0.65, $p<0.01$). In Figures 16 and 17, we can see that older students show higher probabilities in both regions when it comes to not transferring and for transferring within the same region. However, older students in Southern Ontario show higher probabilities of transferring across the region, while in Northern Ontario, it is younger students who show higher probabilities of transferring across the region.

Parental Income

The impact of parental income on transfer types seems to differ between Southern and Northern Ontario. In Southern Ontario, higher parental income is positively associated with a higher likelihood of transferring across the region, although students in the highest parental income category are significantly less likely to transfer within the region than their lowest-income counterparts (OR=0.93, $p<0.01$). Figure 18 shows the predicted probabilities across the transfer and parental income categories. Overall, only the transfers across the region category show a consistently positive relationship with parental income. By contrast, we do not observe any significant relationship between parental income and transfer types in Northern Ontario. This non-significant relationship can be seen in Figure 19, where the predicted probabilities for each transfer category appear to stay quite similar across all parental income quintiles.

Type of Institution

Our results show some interesting and sizeable differences across colleges and universities. In Southern Ontario, compared to university students, college students are significantly more likely to transfer within the region (OR=4.13, $p<0.01$) and across the region (OR=4.65, $p<0.01$). This pattern is similar in Northern Ontario—significantly higher odds are observed of transferring within the region (OR=7.12, $p<0.01$) and across the region (OR=3.30, $p<0.01$) among college students. Visually, the general pattern looks similar across locales, but two slight differences emerge in Figures 20 and 21. First, while college students show higher probabilities than university students

for transferring within and across the region, this gap between college and university students appears to be wider in Southern Ontario for within-region transfer and narrower than that of Northern Ontario for across-region transfer.

Registration Status

The role of registration status on transfer pathways is statistically significant in both Southern and Northern Ontario. In Southern Ontario, compared to full-time students, part-time students are significantly more likely to transfer both within the region (OR=2.05, $p<0.01$) and across the region (OR=1.26, $p<0.1$) than to take a non-transfer route. In Northern Ontario, however, part-time students in are only significantly more likely to transfer across the region than their full-time counterparts (OR=1.62, $p<0.01$). These differences across registration status can be seen in Figures 22 and 23. Moreover, part-time status shows higher probabilities for both within- and across-region transfer in the south, but only a higher probability than full-time status students in terms of across-region transfer in the north.

Field of Study

Finally, in terms of field of study, several key differences emerge across regions. In Southern Ontario, compared to students majoring in arts and humanities, those majoring in health (OR=0.82, $p<0.01$), natural sciences (OR=0.55, $p<0.01$), and social sciences (OR=0.80, $p<0.01$) have lower odds of transferring within the region over taking a non-transfer route. Interestingly, the trend is reversed for transferring across the region. That is, those majoring in health (OR=1.45, $p<0.01$), natural sciences (OR=1.25, $p<0.05$), and social sciences (OR=1.29, $p<0.01$) have higher odds of transferring across the region. In Northern Ontario, majoring in health and natural sciences is associated with lower odds of transferring within the region (OR=0.42, $p<0.01$; OR=0.57, $p<0.01$ for within the region and across the region respectively) or across the region (OR=0.56, $p<0.01$; OR=0.57, $p<0.01$). Figures 24 and 25 shed light on the absolute differences in probability of taking one of the three pathways. For Southern Ontario students, natural sciences majors show the highest probability of taking the non-transfer route; arts and humanities majors show the highest probability of transferring within the region; and health majors show the highest probability of transferring across the region. For Northern Ontario, it is health majors who show the highest probability of not-transferring, and it is arts and humanities and social science majors who show the highest probabilities of transferring both within and across regions.

Conclusions and Policy Implications

This study is the first to provide an empirical assessment of the current level of regional flows with respect to transfer at Northern and Southern Ontario colleges and universities. We employ Statistics Canada's PSIS and family tax data to contribute in two key ways: 1) to provide a comparison of the overall magnitude of within region and across region transfer types in each region; and 2) to identify the socio-demographic and educational characteristics of students in each region who are more prone to transferring to an institution that is situated inside or outside their region within two years of beginning their post-secondary education.

Our analyses explore three major pathways, two of which are transfer pathways (within-region transfer and across-region transfer). Overall, the prevalence of transferring *across* regions is considerably higher among students at northern institutions (4.89%) than among those at southern institutions (0.29%). Much larger proportions of southern students (7.67%) are transferring *within* their region than northern students (3.47%). Put differently, transfer among students at Southern Ontario institutions tends to stay in Southern Ontario, whereas the transfer pathways among students from Northern Ontario institutions transcend regional boundaries. These findings resonate with prior research that uncovered significant out-migration for young adults from northern areas of Canada (Dowsley & Southcott, 2017; Laflamme & Bagaoui, 2010), largely attributable to their pursuits of postsecondary education (Hillier et al., 2020; Girard & Laflamme, 2013). What is interesting to note from our findings here is that at least part of this out-migration appears to be happening *during* their pursuits of postsecondary schooling. While many students may leave northern regions after high school to begin their postsecondary education at southern institutions, some students do begin their studies at northern institutions before migrating to a southern institution.

Overall, all socio-demographic and educational characteristics in our analyses showed strong and statistically significant effects on transfer types for Southern Ontario institutions. These relationships emerged first in our bivariate analyses and remained strong even when controlling for all other factors in our multinomial logistic regression models. Resonating with our prior work that explored a myriad of possible transfer types in Ontario (see Sano et al., 2020; Zarifa et al., 2020), student age, sex, parental income, registration status, type of institution, field of study, family composition, and family size all had an impact on student mobility. For Northern Ontario, however, sex, parental income, and registration status were not statistically significant in our bivariate analyses, and sex and parental income remained non-significant in our multinomial logistic regression models. While many of the student characteristics showed significant effects on *within*- and *across*-region transfer pathways

in both regions, our results did uncover some notable differences across Northern and Southern Ontario institutions.

In terms of socio-demographic characteristics, several findings emerged. First, for sex, in Southern Ontario institutions, female students had lower probabilities of not transferring and higher probabilities of transferring both within and across the region than male students. But, in Northern Ontario, the impact of sex on transfer types was not strong enough to be statistically significant. Second, in terms of age, our results revealed that older students had higher probabilities in both regions when it comes to not transferring and for transferring within the same region. However, older students in Southern Ontario show higher probabilities of transferring across the region, while in Northern Ontario, it is younger students who show higher probabilities of transferring across the region. Certainly, for these younger students from northern regions, this finding resonates with the youth out-migration literature. It would be fruitful for future research to further disentangle what types of programs, supports, and opportunities are drawing these older students from Southern Ontario to relocate to northern institutions. Finally, the impact of parental income on transfer types also varies between Southern and Northern Ontario. In Southern Ontario, higher parental income is positively associated with a higher likelihood of transferring across the region. By contrast, our findings did not reveal any statistically significant relationship between parental income and transfer types in Northern Ontario.

Our results also point to some key education characteristics that have an impact on transfer behaviours. First, the analyses reveal notable differences across postsecondary sectors. In Southern Ontario, compared to university students, college students are significantly more likely to transfer within the region *and* across the region. This pattern is similar in Northern Ontario. While college students show higher probabilities than university students for transferring within and across the region, this gap between college and university students appears to be wider in Southern Ontario for within-region transfer and wider in Northern Ontario for across-region transfer. Second, the role of registration status on transfer pathways was statistically significant in both Southern and Northern Ontario. In Southern Ontario, compared to full-time students, part-time students are significantly more likely to transfer both within the region *and* across the region. In Northern Ontario, however, part-time students are only significantly more likely to transfer across the region than their full-time counterparts. Finally, several differences emerge across fields of study. For Southern Ontario students, natural sciences majors show the highest probability of taking the non-transfer route; arts and humanities majors show the highest probability of transferring within the region; and health majors show the highest probability of transferring across the region. For Northern Ontario, it is health majors who show the highest probability of not transferring, and it is arts and humanities and social science majors who show the highest probabilities of transferring both within and across regions.

Our comparisons across Southern and Northern Ontario institutions have three key implications for education administrators and policymakers. First, our foundational work on regional flows across Ontario colleges and universities in this study offers valuable

information to inform recruitment and retention strategies, strategic enrolment planning, and articulation agreements. While Ontario's public colleges in particular have long understood the importance of being responsive to their local environment and communities in order to foster local catchment efforts (Kaufman et al., 2018), our results show that college students are more prone to transfer across the province within two years of beginning their studies. This might suggest the need to monitor behaviours after entry and look for opportunities to promote local retention.

Second, by identifying who is most likely to transfer across or within regions, articulation agreements and transfer supports can be tailored to demands and unmet needs. It is clear from our results above that some characteristics influence the regional flow aspects of student mobility behaviours more than others, and at times, they influence transfer behaviours differently in Northern and Southern locations. For Northern Ontario education administrators in particular, it is important to note that students from Northern Ontario institutions are more likely to relocate across the province when transferring, suggesting higher levels of overall out-migration in the north. Among those who transfer in the north, older students are more likely to transfer within the north, while younger students and part-time students are more likely to out-migrate when transferring. Northern college students, as well as arts, humanities and social science majors (in both sectors), are more likely to transfer within the north *and* out of the north.

Finally, the regional flows and sectoral differences across college and universities shed light on the unique considerations that each region, as well as each type of institution, may need to consider in fostering successful transitions and articulation agreements. Unfortunately, small sample sizes prevented us from further distinguishing whether students who start in a southern college or southern university transfer to a northern university or a northern college and vice versa. As PSIS cohorts continue to mount, future pooled subsamples might be large enough to explore these additional refinements and would provide additional intra- and inter-regional pathway information for education officials, administrators, and policymakers.

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 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 to 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 is 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.[1] 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.[2] 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.

1. 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.

2. 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

In our previous reports (see Sano et al., 2020; Zarifa et al., 2020), we identify seven categories of students' transfer type (e.g., college to university transfers, university to college transfers, college to college transfers, university to university transfers, non-transfer college students, non-transfer university students, and swirlers). We initially adopted this coding strategy to explore the heterogeneity of transfer types within and across regions. Unfortunately, there is an analytical challenge with this approach because college students who transfer across regions are very small in number, making it difficult to explore regional types of student transfer such as 'northern college to southern college', 'northern college to southern university', 'southern college to northern college', and 'southern college to northern university.' To address this issue, we separately look at transfer types for northern and southern students. In particular, we track students' regional choice of postsecondary enrolment for two years (i.e., north to south and south to north). This allows us to explore three possible scenarios each for northern and southern students: 1) students do not transfer within two years after their initial enrolment into postsecondary institution (i.e., college or university); 2) students transfer to another institution but stay within the same region; and 3) students leave their region to transfer to another institution.

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 under); (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).[3] 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 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).[4] 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;

3. Our field of study measure combines both 2-digit and 4-digit CIP (Classification of Instructional Program) codes (additional details available upon request).
4. 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.

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 lacks 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).

Analytical Approach

There are four analytical steps. First, we use univariate analysis to describe the overall pattern of postsecondary transfer types across and within regions separately for Northern and Southern Ontario. Second, to uncover the characteristics of those who transfer via the various types of postsecondary pathways, we first use cross-tabulations and chi-square tests of the independent variables by our dependent variable of transfer pathway types in north and south (i.e., no transfer, transfer within the region, and transfer across the region). Third, 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 on transfer pathways. Multinomial logistic regression models serve to provide two important facets of information on the data: (1) to identify which predictors are significantly related to the dependent variable, and (2) to indicate how strong each predictor is relative to others (Denham, 2010). At the same time, these models enable us to map out the key characteristics of those who transfer, taking into consideration the effects all other characteristics simultaneously. To add further insights into the results, we also graph the predicted probabilities and 95% confidence intervals around those estimates.

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Figures and Tables

	South	North
Type of transfer		
No transfer	92.04	91.64
Within region	7.67	3.47
Across region	0.29	4.89
Sex		
Men	46.44	41.54
Women	53.56	58.46
Age		
Younger (21 or younger)	87.89	80.70
Older (22 or older)	12.11	19.30
Parental income		
Lowest	19.88	13.35
Lower	20.14	18.98
Middle	19.87	25.13
Higher	19.84	25.92
Highest	16.61	16.61
Type of institution		
University	80.26	83.43
College	19.74	16.57
Registration status		
Full-time	68.41	93.43
Part-time	31.59	6.57
Field of study		
Arts/humanities	19.52	11.36
Health	11.61	21.77
Natural sciences	26.58	21.24
Social sciences	38.84	28.60
Other	3.45	17.03
Family composition		
Couple	88.12	86.65
Lone	11.88	13.35
Family size		
Smaller (3 or fewer)	29.75	33.86
Larger (4 or more)	70.25	66.14
Year		
2009	15.97	17.13
2010	16.82	17.50
2011	16.89	16.45
2012	16.65	16.13
2013	17.17	16.71
2014	16.49	16.08
Total	404,270	19,020

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

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

	No transfer	Within region	Across region	
Sex				***
Men	92.33	7.41	0.26	
Women	91.79	7.88	0.32	
Age				***
Younger (21 or younger)	92.38	7.36	0.26	
Older (22 or older)	89.58	9.91	0.51	
Parental income				***
Lowest	91.37	8.40	0.22	
Lower	91.30	8.41	0.28	
Middle	91.68	7.99	0.32	
Higher	92.09	7.54	0.36	
Highest	93.73	5.99	0.28	
Type of institution				***
University	94.77	5.05	0.18	
College	80.95	18.31	0.74	
Registration status				***
Full-time	92.33	7.39	0.29	
Part-time	85.96	13.65	0.39	
Field of study				***
Arts/humanities	90.65	9.14	0.22	
Health	90.86	8.74	0.40	
Natural sciences	94.63	5.11	0.26	
Social sciences	92.30	7.42	0.28	
Other	81.16	18.12	0.72	
Family composition				***
Couple	91.61	8.06	0.32	
Lone	92.23	7.50	0.28	
Family size				***
Smaller (3 or fewer)	92.23	7.48	0.29	
Larger (4 or more)	90.65	9.02	0.33	
Year				***
2009	90.88	8.81	0.31	
2010	91.16	8.56	0.28	
2011	91.61	8.13	0.26	
2012	92.57	7.12	0.31	
2013	92.34	7.35	0.32	
2014	93.66	6.06	0.28	

*p<0.1, **p<0.05, ***p<0.01 obtained from X^2 test

Table 2. Bivariate Analysis of the Dependent and Independent Variables, Southern Ontario, PSIS-T1FF, 2009-2016

	No transfer	Within region	Across region	
Sex				n.s.
Men	91.65	3.54	4.81	
Women	91.55	3.42	5.04	
Age				***
Younger (21 or younger)	91.14	3.65	5.21	
Older (22 or older)	93.46	2.72	3.81	
Parental income				n.s.
Lowest	90.51	4.35	5.14	
Lower	91.14	3.60	5.26	
Middle	91.65	3.55	4.80	
Higher	92.09	3.45	4.46	
Highest	92.09	2.85	5.06	
Type of institution				***
University	94.01	2.08	3.91	
College	79.43	10.76	9.81	
Registration status				n.s.
Full-time	91.62	3.55	4.84	
Part-time	91.20	3.20	5.60	
Field of study				***
Arts/humanities	88.94	4.61	6.45	
Health	92.43	2.90	4.67	
Natural sciences	92.57	3.22	4.21	
Social sciences	90.26	4.23	5.51	
Other	93.23	2.77	4.00	
Family composition				**
Couple	91.46	3.73	4.81	
Lone	91.73	3.34	4.93	
Family size				**
Smaller (3 or fewer)	91.81	3.34	4.85	
Larger (4 or more)	90.51	4.35	5.14	
Year				**
2009	91.72	3.68	4.60	
2010	91.89	3.60	4.50	
2011	91.40	3.50	5.10	
2012	92.83	2.93	4.23	
2013	91.19	3.46	5.35	
2014	89.87	3.92	6.21	

*p<0.1, **p<0.05, ***p<0.01 obtained from X^2 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

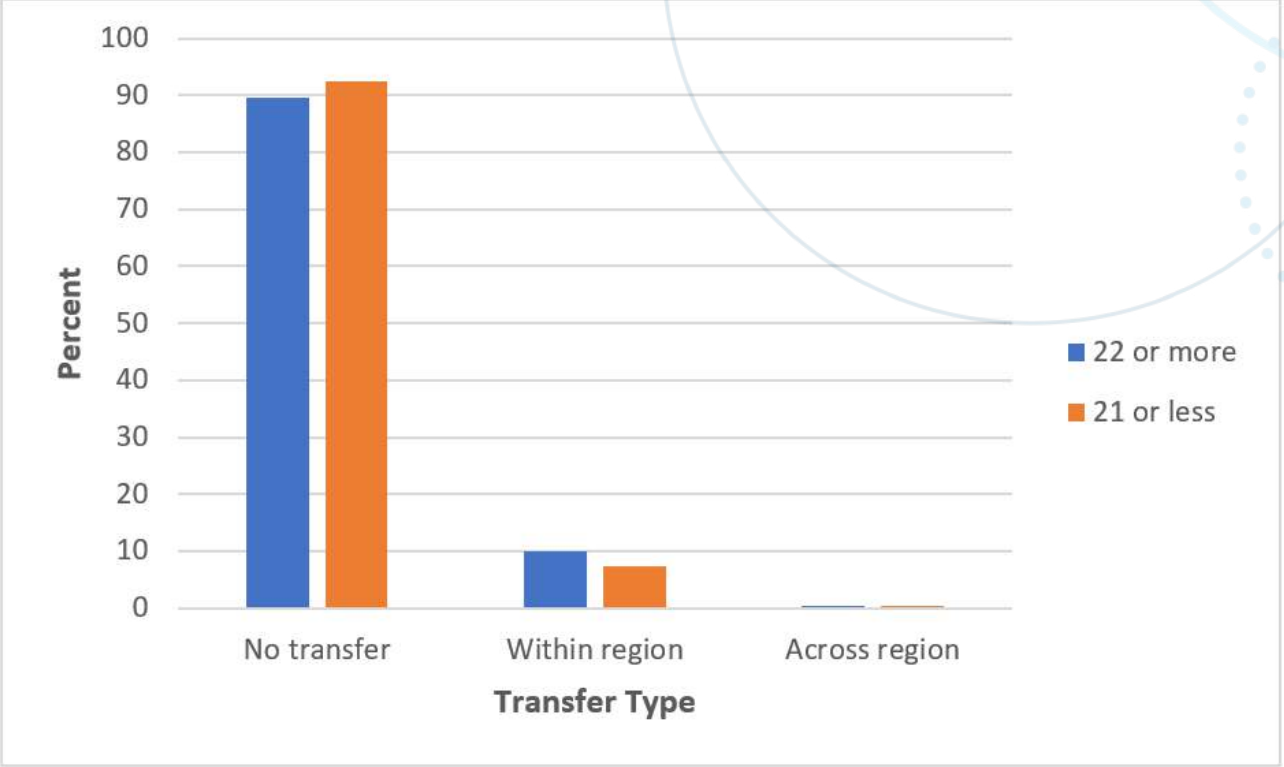

Figure 4. The Relationship between Age and Transfer Pathways, Southern Ontario

Figure 5. The Relationship between Age and Transfer Pathways, Northern Ontario

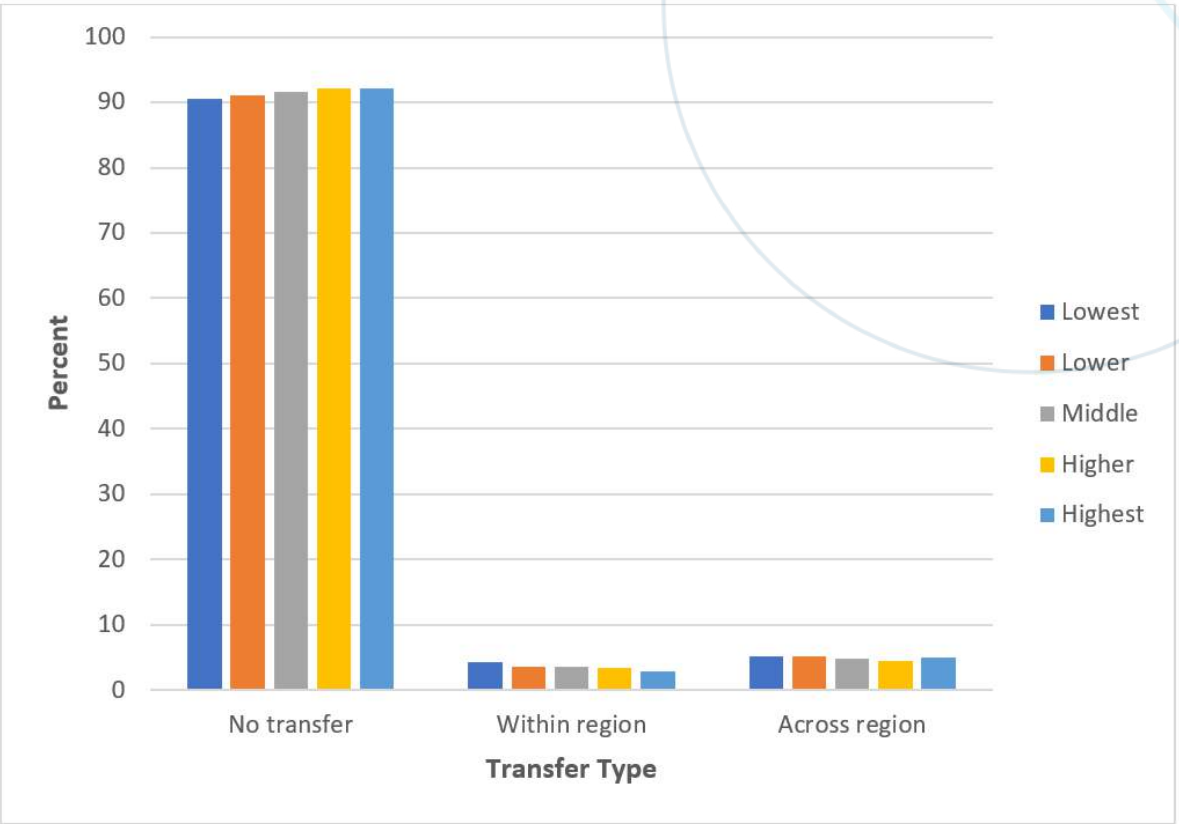

Figure 6. The Relationship between Parental Income and Transfer Pathways, Southern Ontario

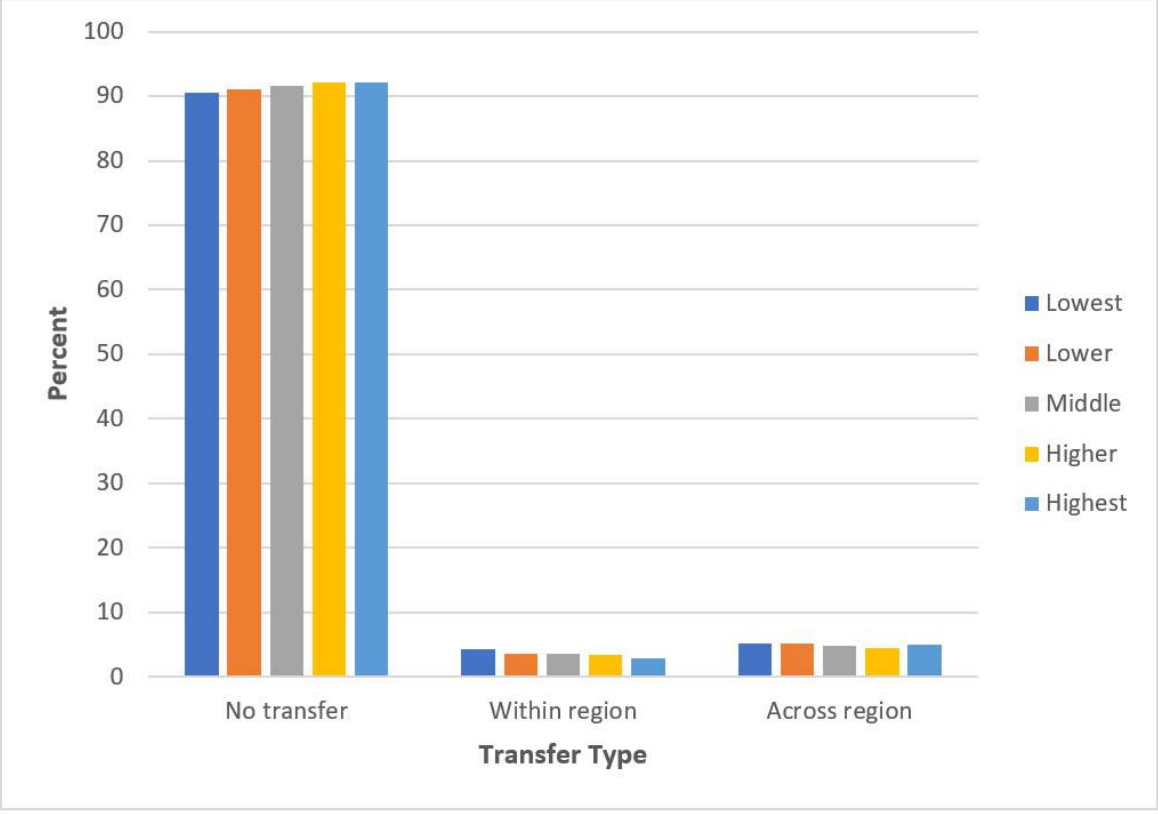

Figure 7. The Relationship between Parental Income and Transfer Pathways, Northern Ontario

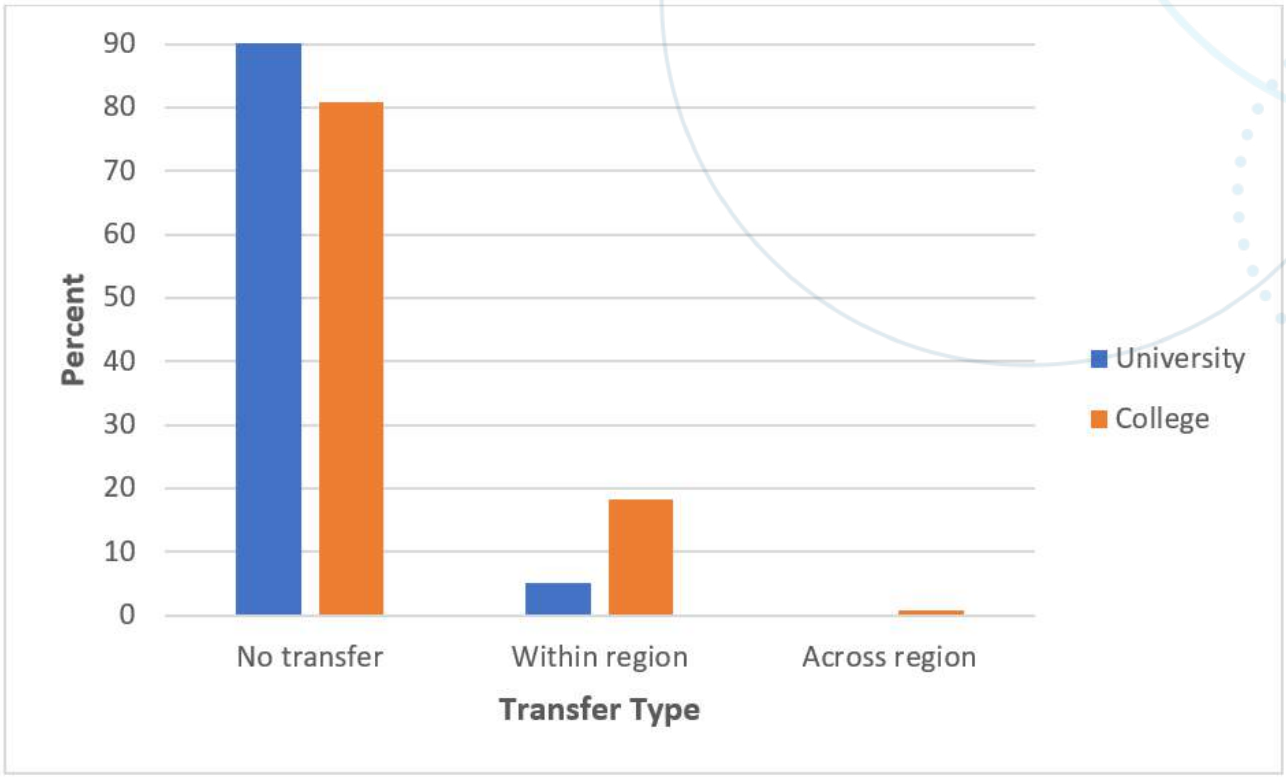

Figure 8. The Relationship between Field of Study and Transfer Pathways, Southern Ontario

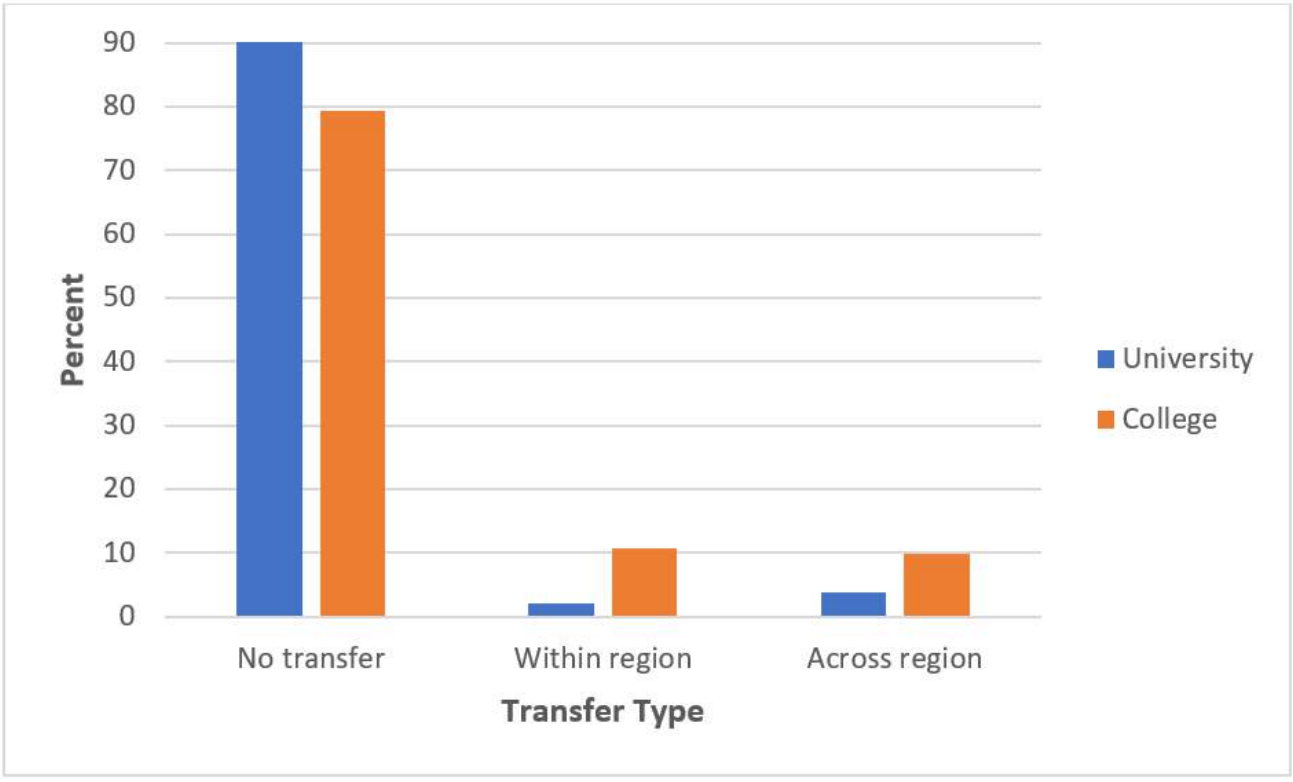

Figure 9. The Relationship between Field of Study and Transfer Pathways, Northern Ontario

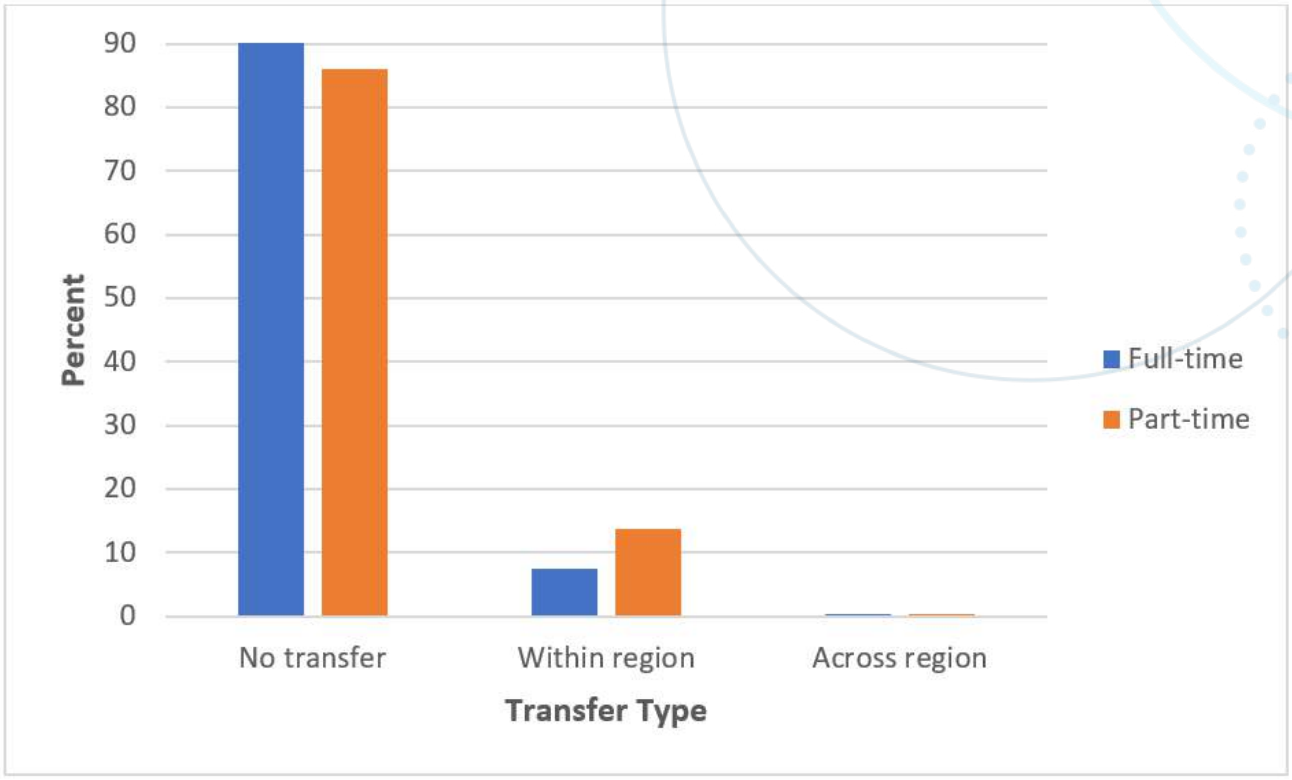

Figure 10. The Relationship between Registration Status and Transfer Pathways, Southern Ontario

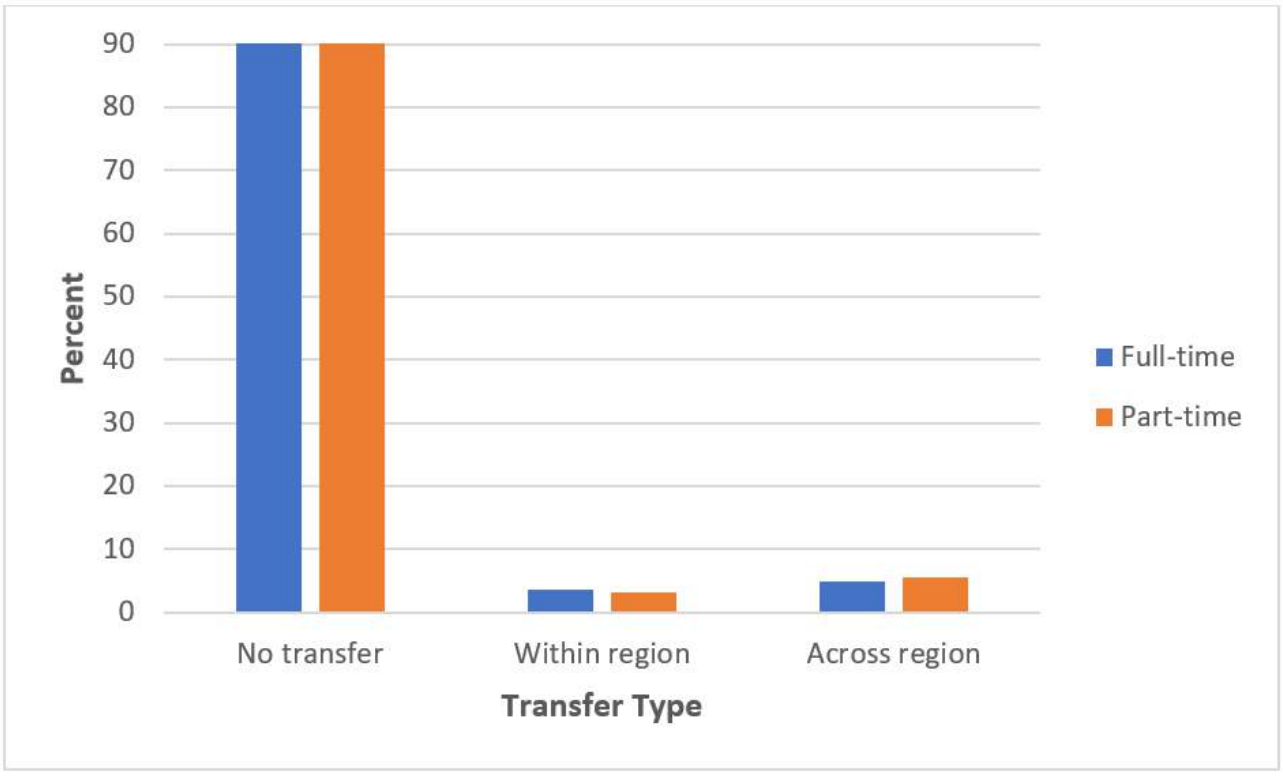

Figure 11. The Relationship between Registration Status and Transfer Pathways, Northern Ontario

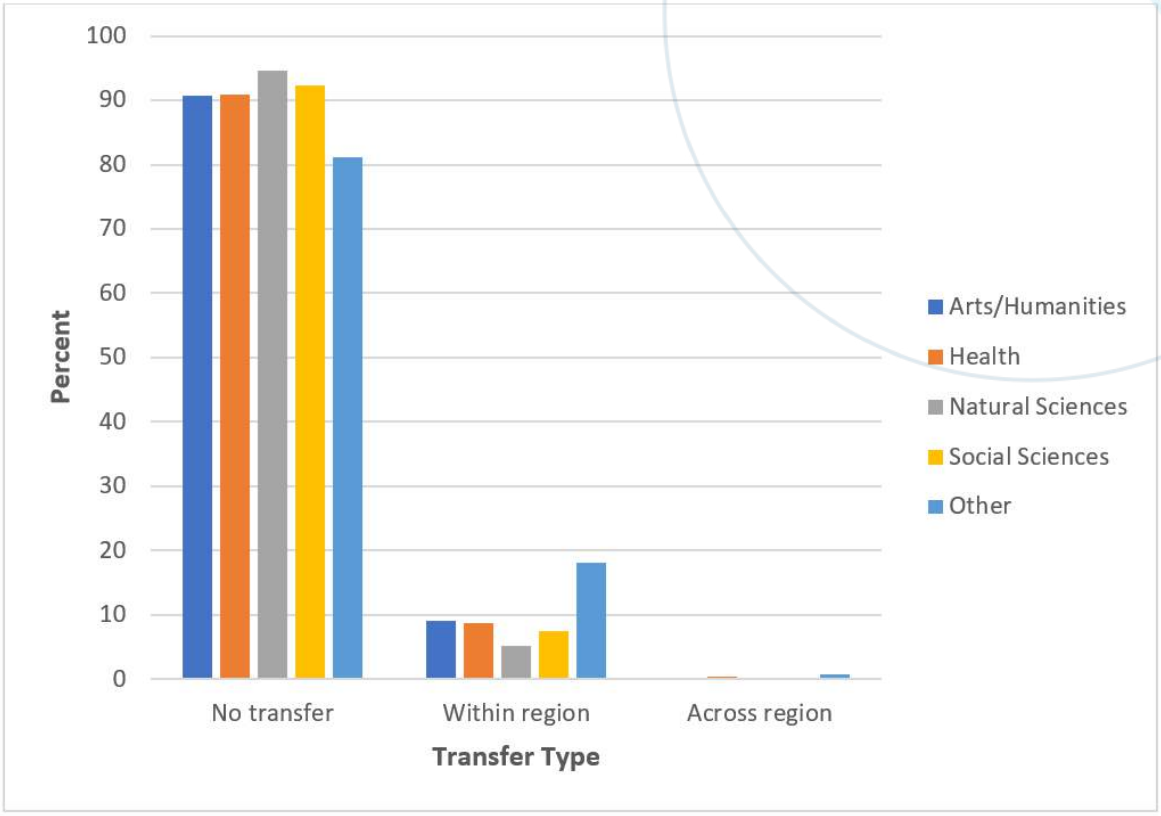

Figure 12. The Relationship between Field of Study and Transfer Pathways, Southern Ontario

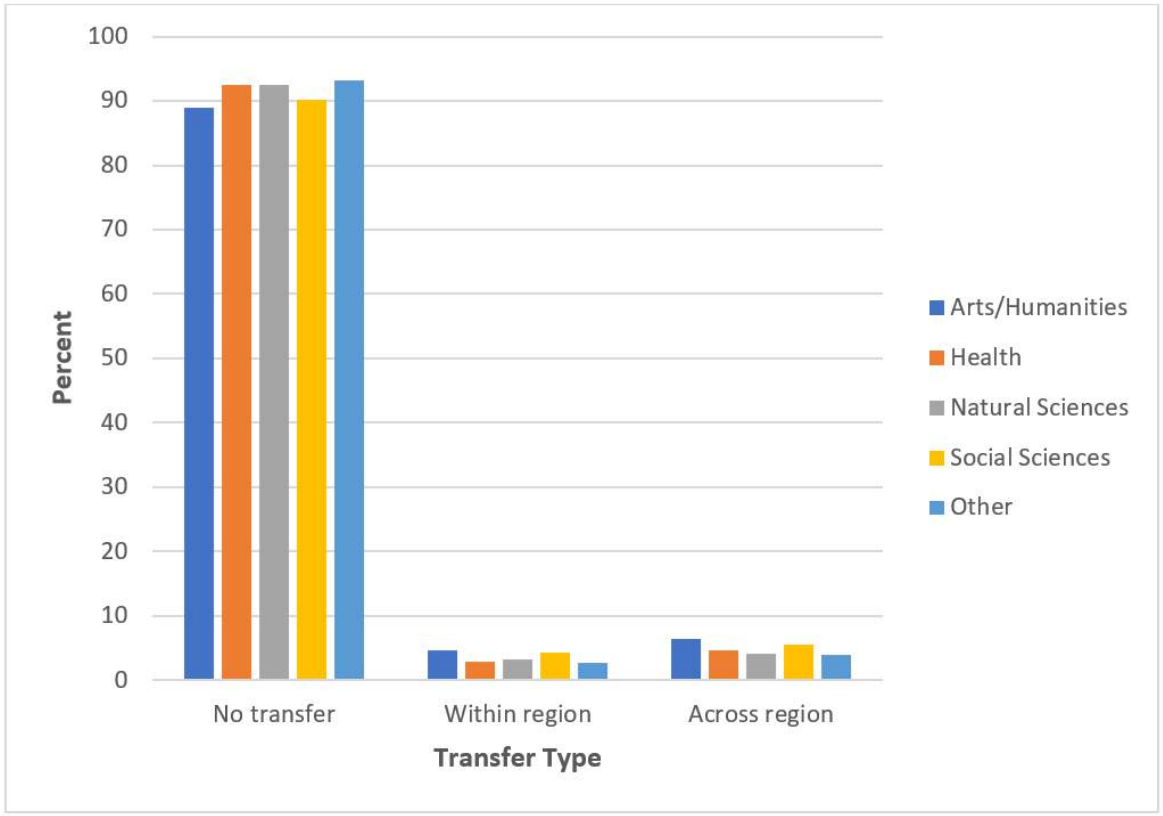

Figure 13. The Relationship between Field of Study and Transfer Pathways, Northern Ontario

	Within region		Across region	
	OR	*p*-value	OR	*p*-value
Sex				
Men	-		-	
Women	1.07	***	1.42	***
Age				
Younger (21 or younger)	-		-	
Older (22 or older)	0.88	***	1.43	***
Parental income				
Lowest	-		-	
Lower	1.01		1.29	**
Middle	0.99		1.66	***
Higher	1.02		2.06	***
Highest	0.93	***	1.90	***
Type of institution				
University	-		-	
College	4.13	***	4.65	***
Registration status				
Full-time	-		-	
Part-time	2.05	***	1.26	*
Field of study				
Arts/humanities	-		-	
Health	0.82	***	1.45	***
Natural sciences	0.55	***	1.25	**
Social sciences	0.80	***	1.29	***
Other	1.30	***	2.11	***
Family composition				
Couple	-		-	
Lone	1.10	***	0.97	
Family size				
Smaller (3 or fewer)	-		-	
Larger (4 or more)	1.11	***	1.30	***
Year				
2009	-		-	
2010	1.00		0.90	
2011	0.96	*	0.87	
2012	0.89	***	1.07	
2013	0.92	***	1.06	
2014	0.73	***	0.90	

*p<0.1, **p<0.05, ***p<0.01 ; No transfer is the reference category for the dependent variable

Table 4. Multinomial Logistic Regression Analysis of 'Type of Transfer' Among Students, Southern Ontario, PSIS-T1FF, 2009-2016

	No transfer			Within the region			Across the region		
	Margins	95% CI		Margins	95% CI		Margins	95% CI	
Sex									
Men	92.33	92.21	92.45	7.43	7.31	7.55	0.24	0.22	0.26
Women	91.79	91.68	91.91	7.87	7.76	7.98	0.34	0.31	0.37
Age									
Younger (21 or younger)	91.92	91.83	92.01	7.80	7.72	7.89	0.27	0.25	0.29
Older (22 or older)	92.64	92.44	92.85	6.96	6.76	7.16	0.39	0.34	0.45
Parental income									
Lowest	92.08	91.90	92.26	7.73	7.55	7.91	0.19	0.16	0.22
Lower	91.98	91.81	92.16	7.77	7.59	7.94	0.25	0.21	0.28
Middle	92.00	91.82	92.18	7.68	7.50	7.86	0.32	0.28	0.35
Higher	91.79	91.60	91.98	7.82	7.63	8.00	0.39	0.34	0.44
Highest	92.38	92.18	92.58	7.25	7.06	7.45	0.36	0.32	0.41
Type of institution									
University	94.73	94.65	94.81	5.09	5.01	5.17	0.18	0.17	0.20
College	81.45	81.16	81.73	17.83	17.55	18.10	0.73	0.66	0.79
Registration status									
Full-time	92.32	92.24	92.40	7.39	7.31	7.47	0.29	0.27	0.31
Part-time	86.13	85.63	86.63	13.54	13.04	14.04	0.33	0.25	0.41
Field of study									
Arts/humanities	90.45	90.25	90.65	9.33	9.13	9.53	0.22	0.19	0.25
Health	91.83	91.59	92.06	7.84	7.61	8.08	0.33	0.28	0.37
Natural sciences	94.25	94.11	94.40	5.45	5.31	5.59	0.29	0.26	0.33
Social sciences	92.01	91.87	92.14	7.70	7.57	7.83	0.29	0.27	0.32
Other	87.95	87.50	88.40	11.60	11.16	12.04	0.45	0.36	0.54
Family composition									
Couple	92.44	92.29	92.59	7.26	7.11	7.41	0.30	0.27	0.33
Lone	91.85	91.75	91.96	7.86	7.76	7.96	0.29	0.27	0.31
Family size									
Smaller (3 or fewer)	92.15	92.06	92.23	7.57	7.49	7.66	0.28	0.27	0.30
Larger (4 or more)	91.34	91.08	91.61	8.30	8.04	8.56	0.36	0.30	0.42
Year									
2009	91.45	91.24	91.65	8.25	8.05	8.45	0.30	0.26	0.34
2010	91.46	91.25	91.66	8.27	8.07	8.47	0.27	0.23	0.31
2011	91.76	91.56	91.96	7.98	7.78	8.18	0.26	0.22	0.30
2012	92.22	92.02	92.42	7.46	7.26	7.65	0.32	0.28	0.37
2013	92.02	91.82	92.22	7.66	7.47	7.86	0.32	0.28	0.36
2014	93.46	93.28	93.65	6.26	6.07	6.44	0.28	0.24	0.32

Table 5. Predicted Probabilities of 'Type of Transfer', Southern Ontario, PSIS-T1FF, 2009-2016

	Within region		Across region	
	OR	*p*-value	OR	*p*-value
Sex				
Men	-		-	
Women	1.06		1.06	
Age				
Younger (21 or younger)	-		-	
Older (22 or older)	0.79	**	0.65	***
Parental income				
Lowest	-		-	
Lower	0.86		0.97	
Middle	0.95		0.94	
Higher	1.00		0.88	
Highest	1.02		1.05	
Type of institution				
University	-		-	
College	7.12	***	3.30	***
Registration status				
Full-time	-		-	
Part-time	1.11		1.62	***
Field of study				
Arts/humanities	-		-	
Health	0.42	***	0.56	***
Natural sciences	0.57	***	0.57	***
Social sciences	0.98		0.89	
Other	0.50	***	0.55	***
Family composition				
Couple	-		-	
Lone	1.07		1.12	
Family size				
Smaller (3 or fewer)	-		-	
Larger (4 or more)	1.29	**	1.07	
Year				
2009	-		-	
2010	1.01		0.98	
2011	0.97		1.15	
2012	0.82		0.98	
2013	1.02		1.22	*
2014	1.12		1.42	***

*p<0.1, **p<0.05, ***p<0.01; No transfer is the reference category for the dependent variable

Table 6. Multinomial Logistic Regression Analysis of 'Type of Transfer' Among Students, Northern Ontario, PSIS-T1FF, 2009-2016

	No transfer			Within the region			Across the region		
	Margins	95% CI		Margins	95% CI		Margins	95% CI	
Sex									
Men	91.89	91.28	92.49	3.38	2.98	3.78	4.74	4.26	5.22
Women	91.42	90.89	91.95	3.56	3.20	3.92	5.02	4.60	5.43
Age									
Younger (21 or younger)	91.16	90.71	91.67	3.60	3.31	3.89	5.24	4.88	5.68
Older (22 or older)	93.50	92.65	94.34	2.96	2.37	3.55	3.54	2.91	4.18
Parental income									
Lowest	91.29	90.19	92.40	3.61	2.90	4.31	5.10	4.20	6.00
Lower	91.85	90.99	92.71	3.14	2.60	3.68	5.01	4.30	5.72
Middle	91.75	90.99	92.51	3.45	2.94	3.95	4.81	4.20	5.41
Higher	91.82	91.04	92.60	3.63	3.09	4.18	4.55	3.95	5.14
Highest	91.02	89.96	92.08	3.65	2.92	4.39	5.33	4.50	6.16
Type of institution									
University	94.12	93.76	94.49	2.01	1.79	2.24	3.87	3.57	4.13
College	78.01	76.48	79.53	11.61	10.39	12.86	10.38	9.26	11.58
Registration status									
Full-time	91.77	91.38	92.16	3.47	3.21	3.73	4.76	4.45	5.71
Part-time	88.94	86.94	90.95	3.66	2.46	4.85	7.40	5.66	9.14
Field of study									
Arts/humanities	88.30	86.95	89.65	4.96	4.03	5.89	6.74	5.66	7.81
Health	93.57	92.87	94.27	2.34	1.93	2.77	4.08	3.50	4.66
Natural sciences	92.82	92.02	93.62	3.08	2.55	3.62	4.09	3.47	4.72
Social sciences	89.00	88.14	89.86	4.95	4.32	5.57	6.05	5.39	6.72
Other	93.24	92.39	94.10	2.72	2.16	3.28	4.03	3.35	4.71
Family composition									
Couple	92.07	91.37	92.76	3.36	2.90	3.81	4.58	4.02	5.13
Lone	91.36	90.85	91.89	3.56	3.21	3.90	5.08	4.67	5.49
Family size									
Smaller (3 or fewer)	91.77	91.35	92.19	3.36	3.08	3.63	4.87	4.53	5.20
Larger (4 or more)	90.64	89.38	90.91	4.24	3.35	5.12	5.12	4.15	6.09
Year									
2009	92.06	91.16	92.97	3.54	2.92	4.15	4.40	3.70	5.10
2010	92.12	91.23	93.01	3.56	2.95	4.18	4.32	3.63	5.00
2011	91.56	90.61	92.51	3.41	2.78	4.03	5.03	4.27	5.79
2012	92.69	91.78	93.61	2.95	2.35	3.55	4.35	3.63	5.08
2013	91.14	90.17	92.12	3.55	2.92	4.19	5.30	4.52	6.08
2014	90.08	89.04	91.11	3.84	3.17	4.50	6.09	5.24	6.93

Table 7. Predicted Probabilities of 'Type of Transfer', Northern Ontario, PSIS-T1FF, 2009-2016

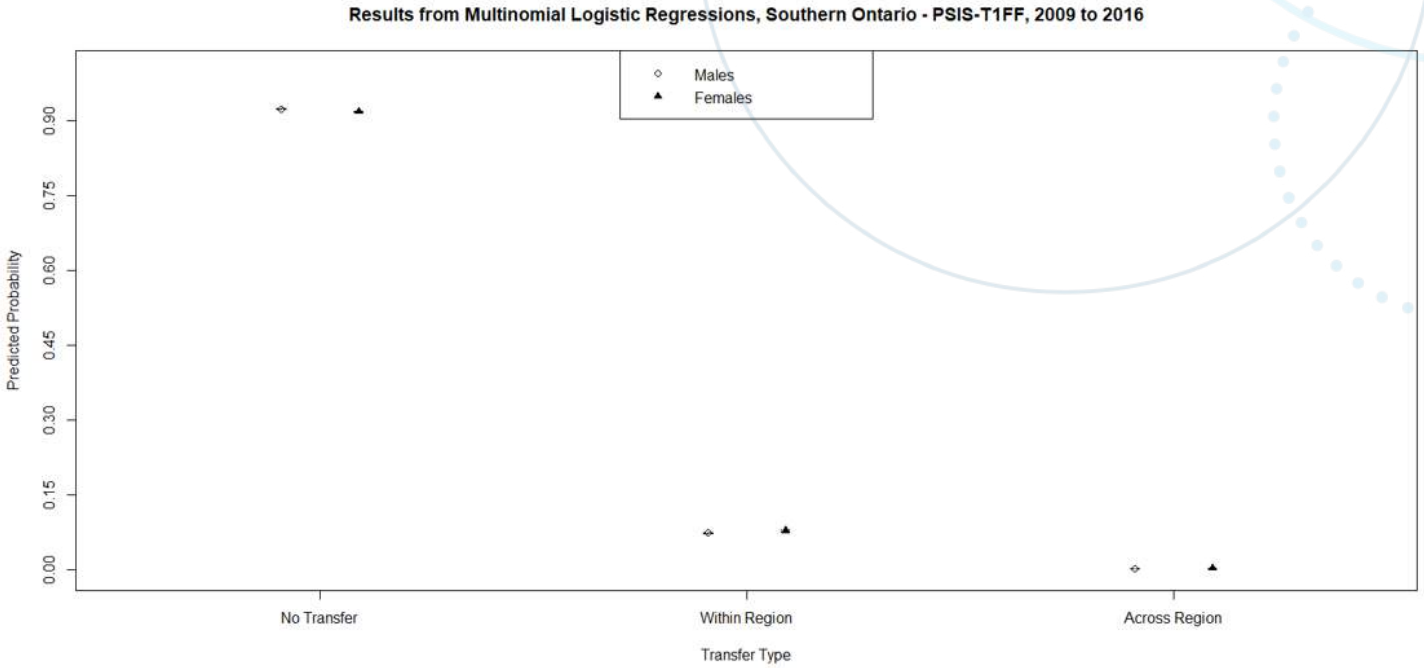

Figure 14. The Predicted Probabilities across Sex and Transfer Type, Southern Ontario

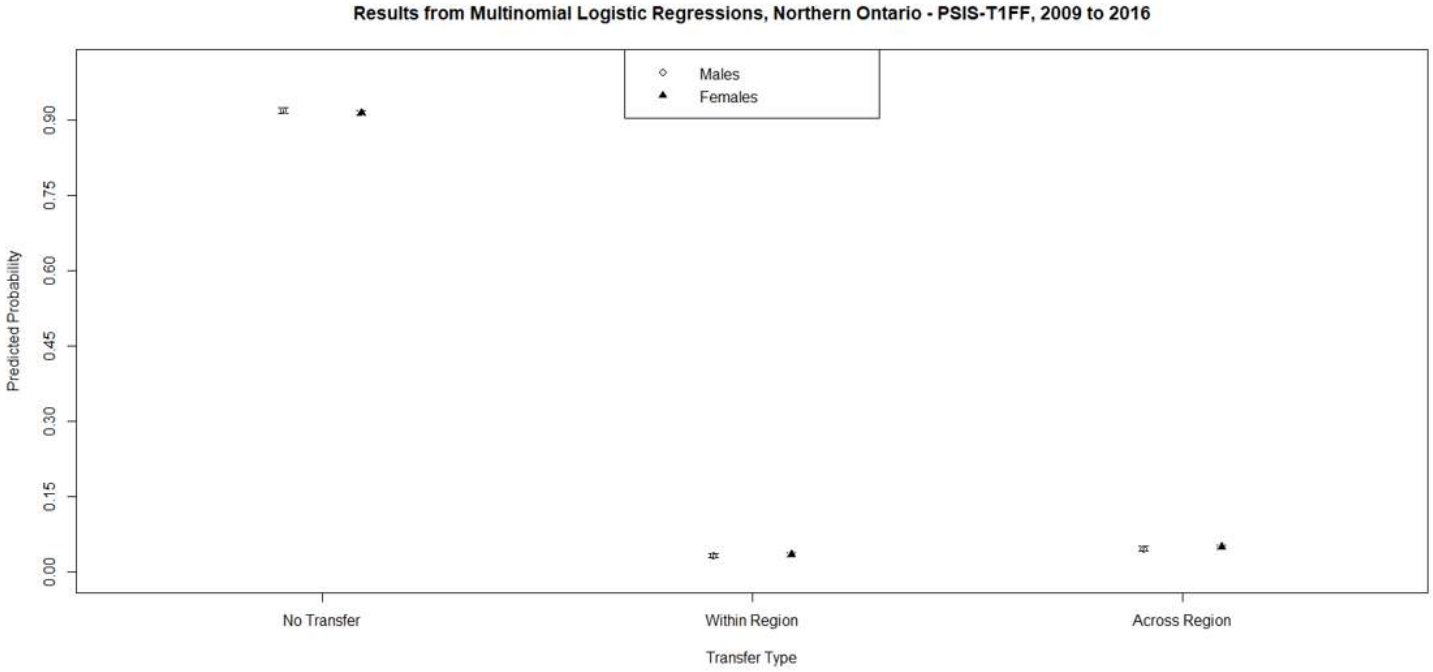

Figure 15. The Predicted Probabilities across Sex and Transfer Type, Northern Ontario

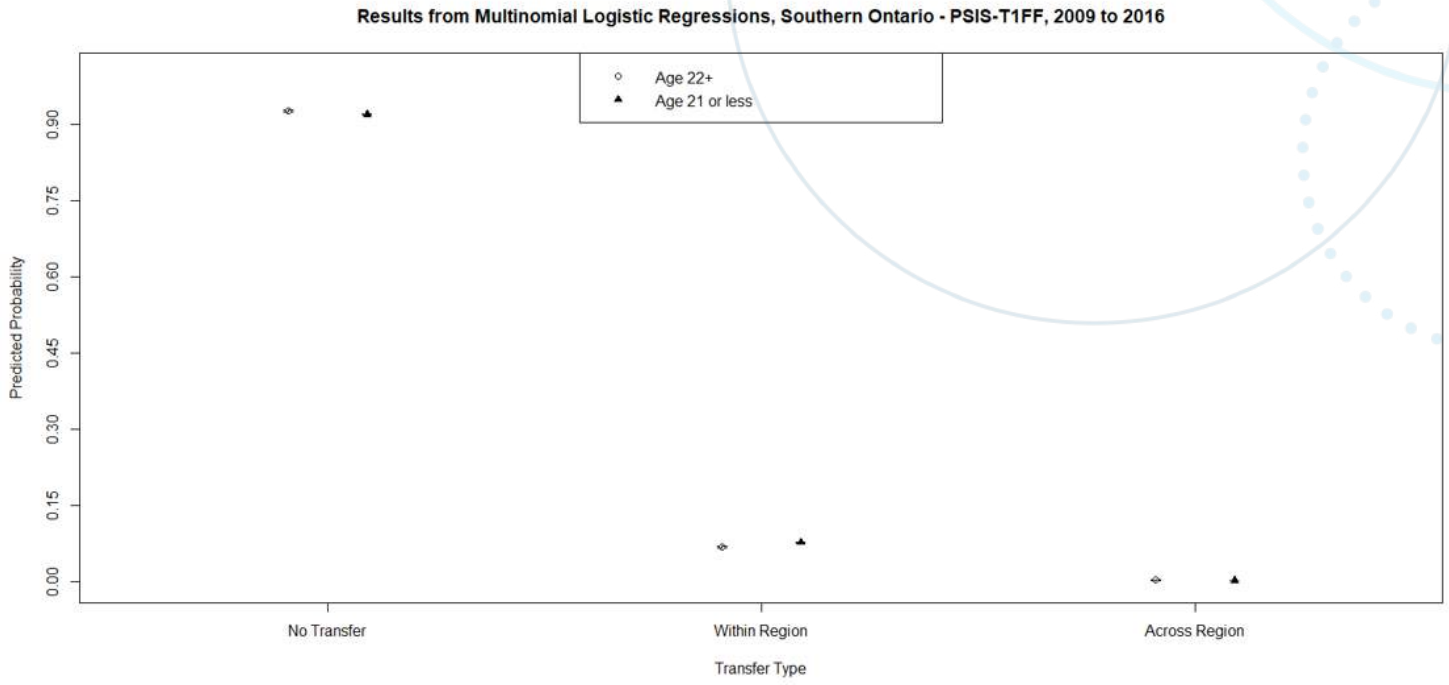

Figure 16. The Predicted Probabilities across Age and Transfer Type, Southern Ontario

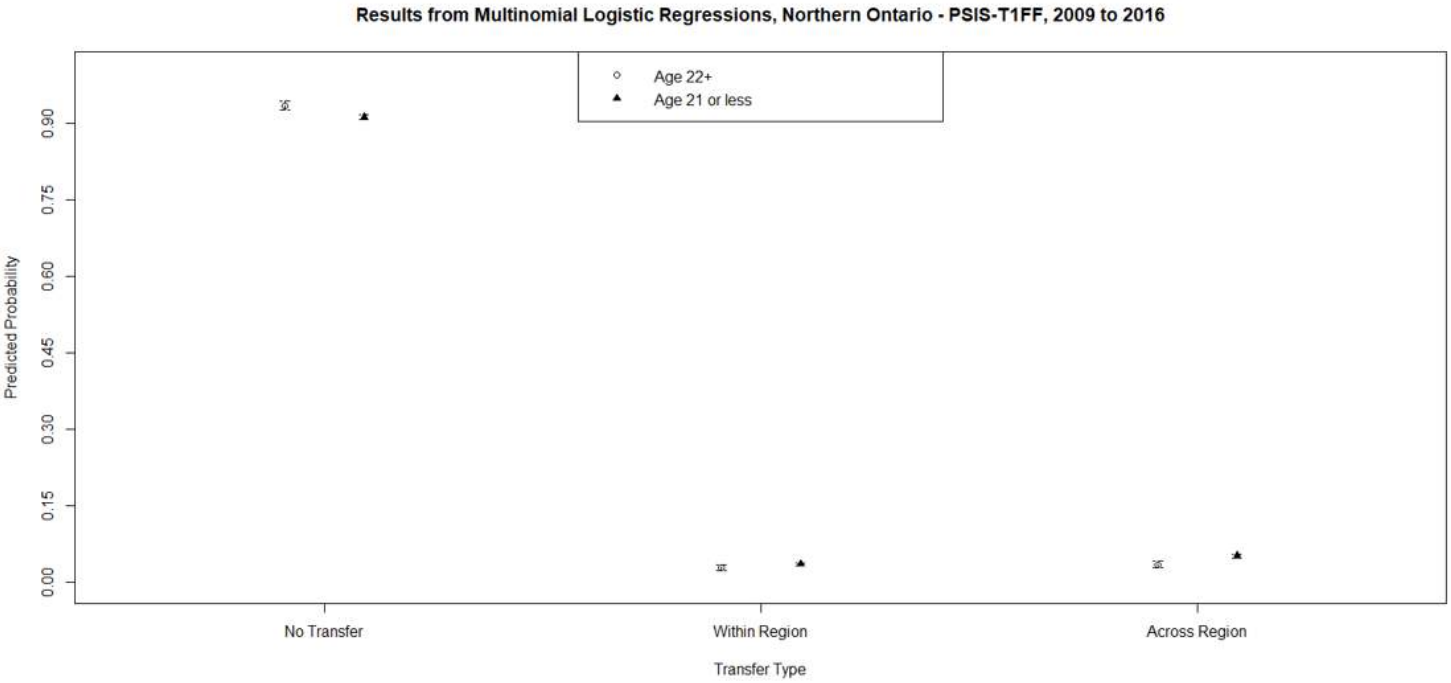

Figure 17. The Predicted Probabilities across Age and Transfer Type, Northern Ontario

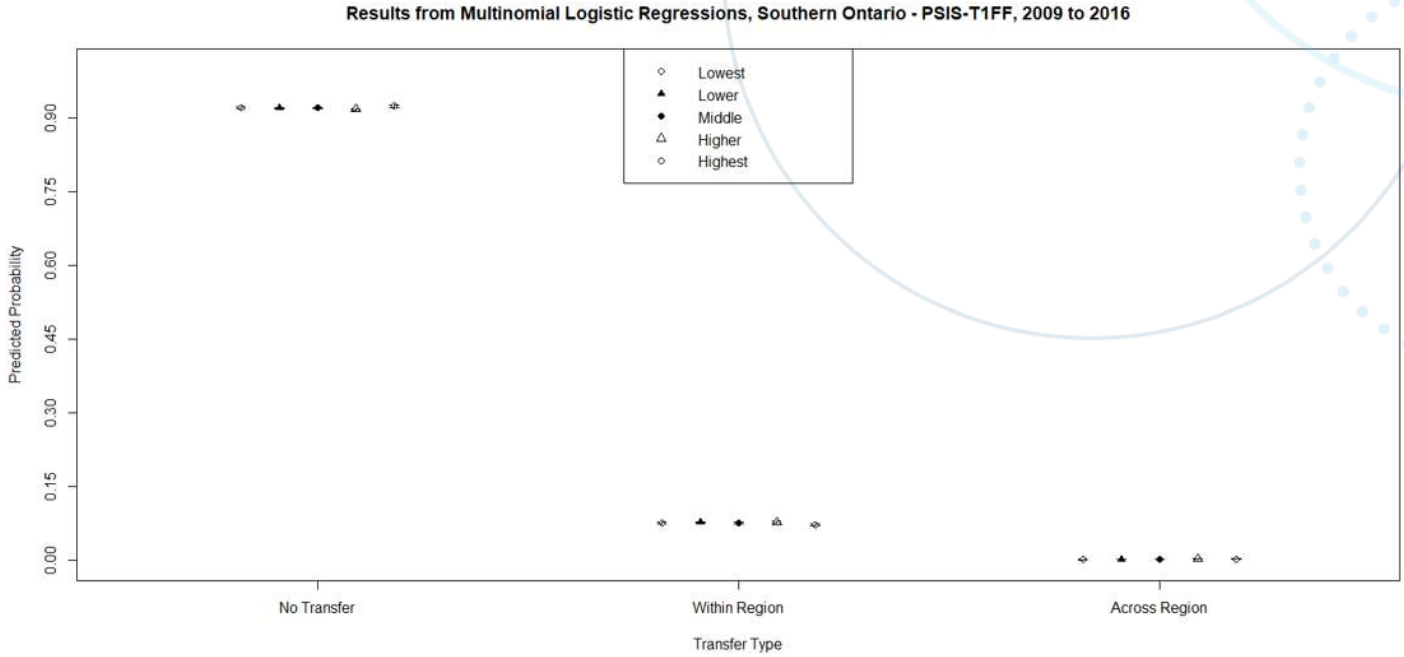

Figure 18. The Predicted Probabilities across Parent Income and Transfer Type, Southern Ontario

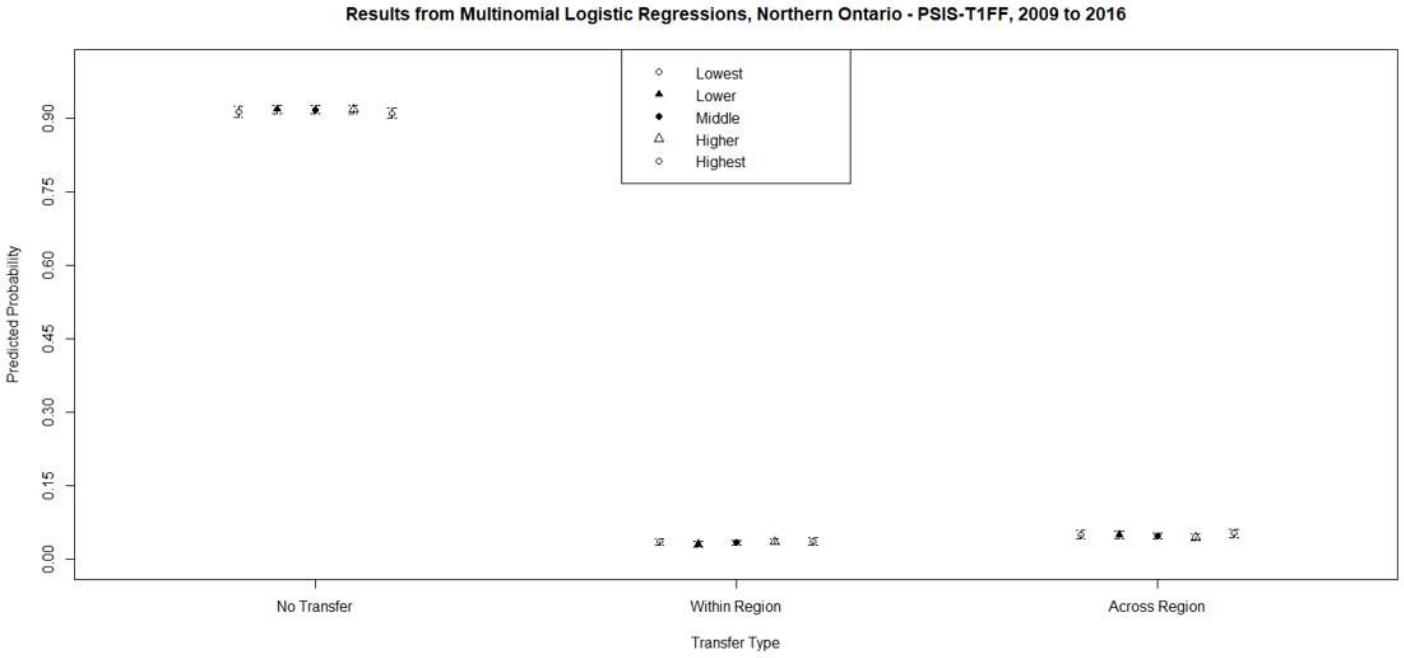

Figure 19. The Predicted Probabilities across Parent Income and Transfer Type, Northern Ontario

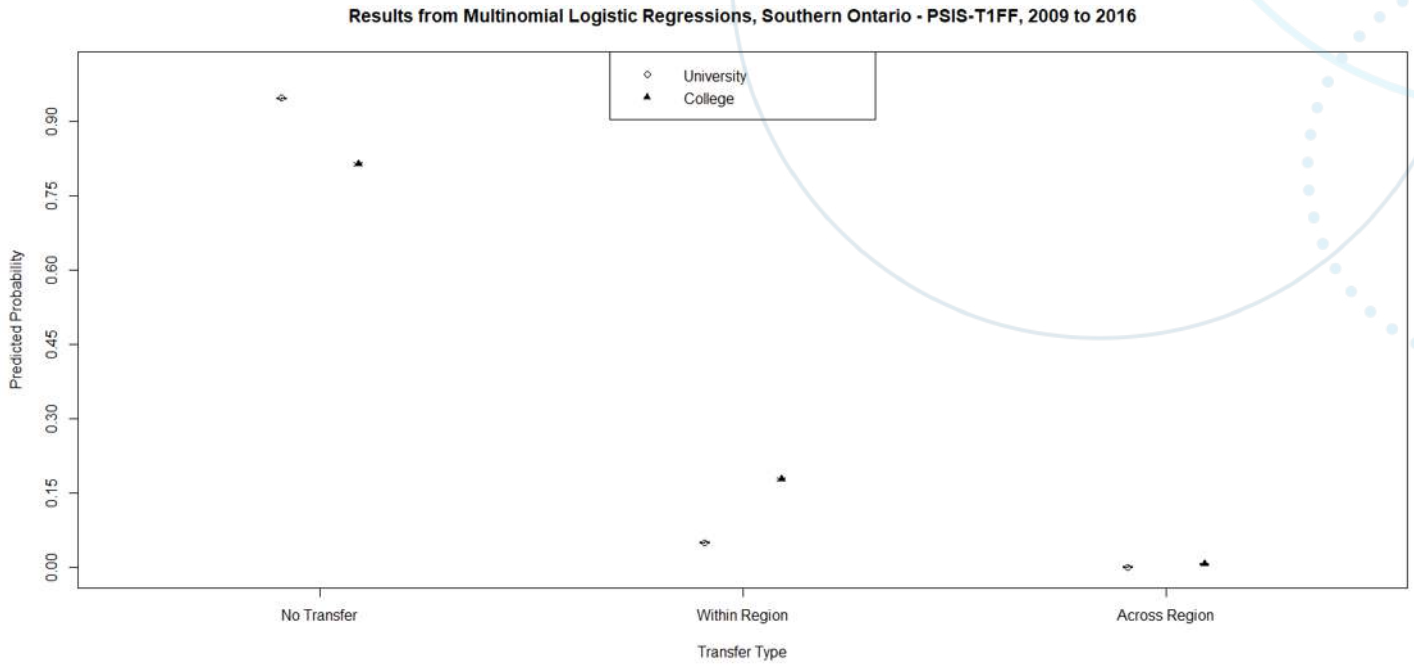

Figure 20. The Predicted Probabilities across Type of Institution and Transfer Type, Southern Ontario

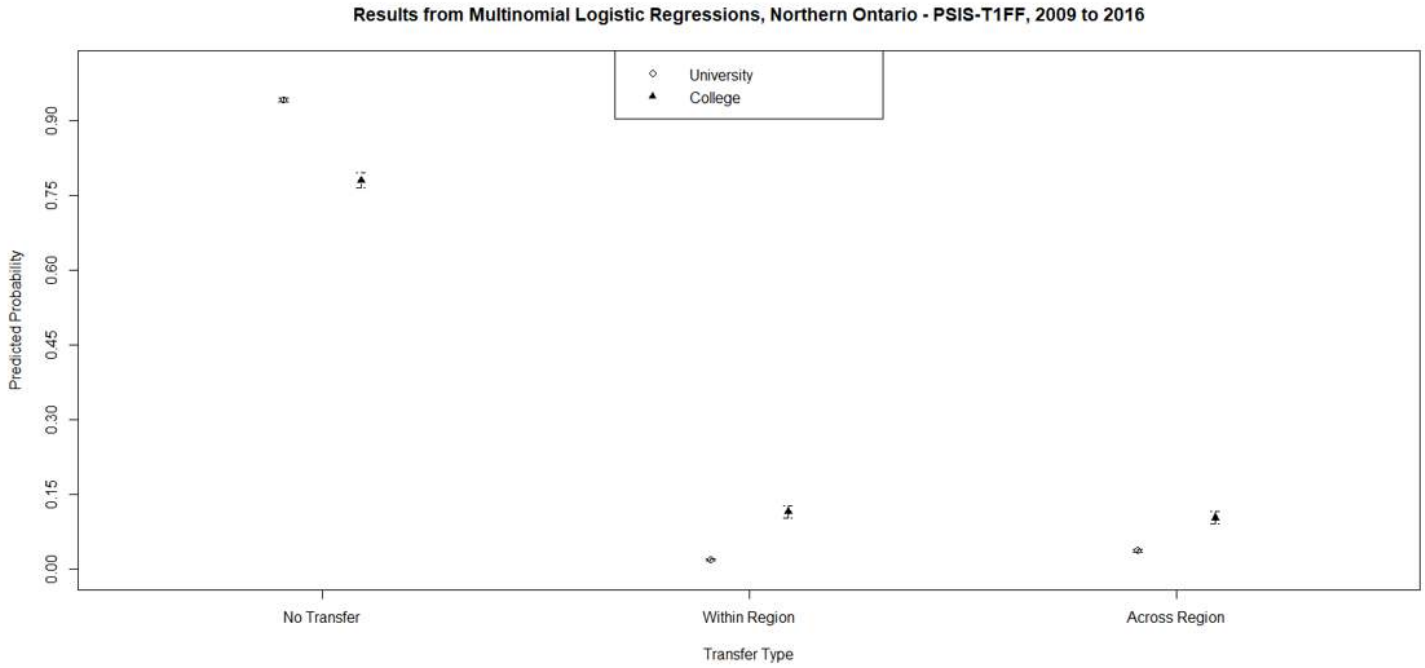

Figure 21. The Predicted Probabilities across Type of Institution and Transfer Type, Northern Ontario

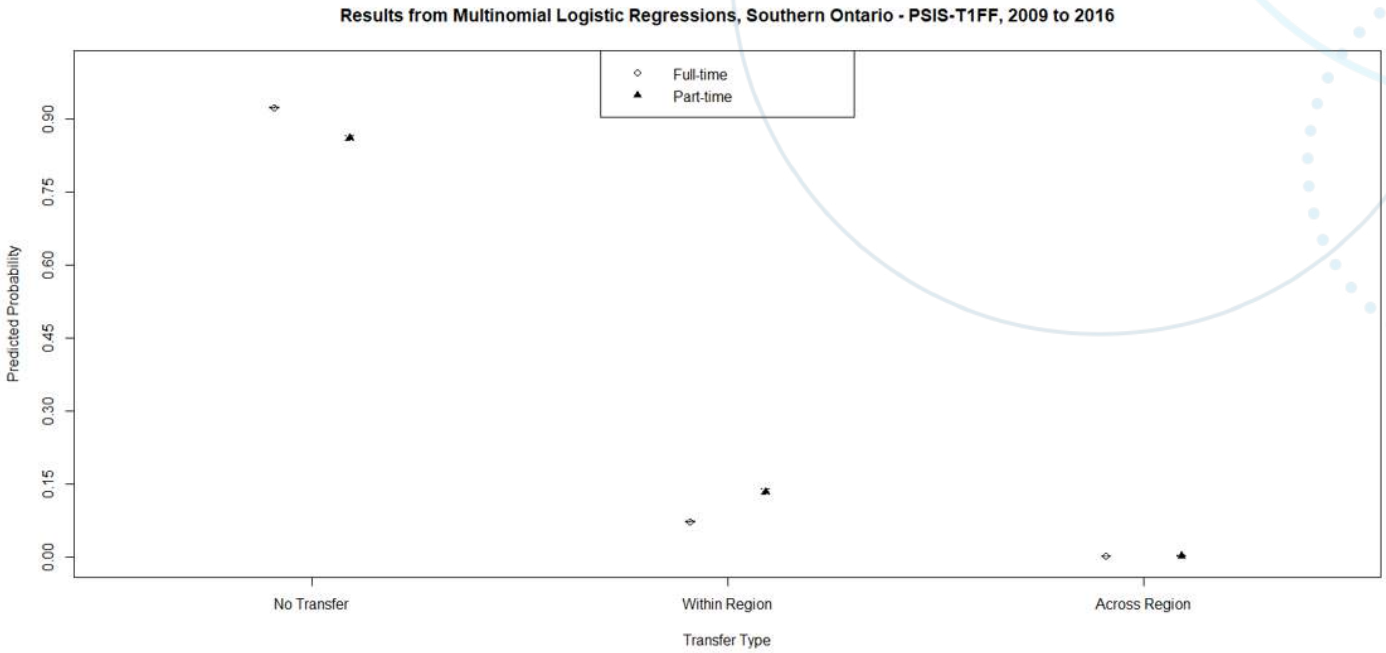

Figure 22. The Predicted Probabilities across Registration Status and Transfer Type, Southern Ontario

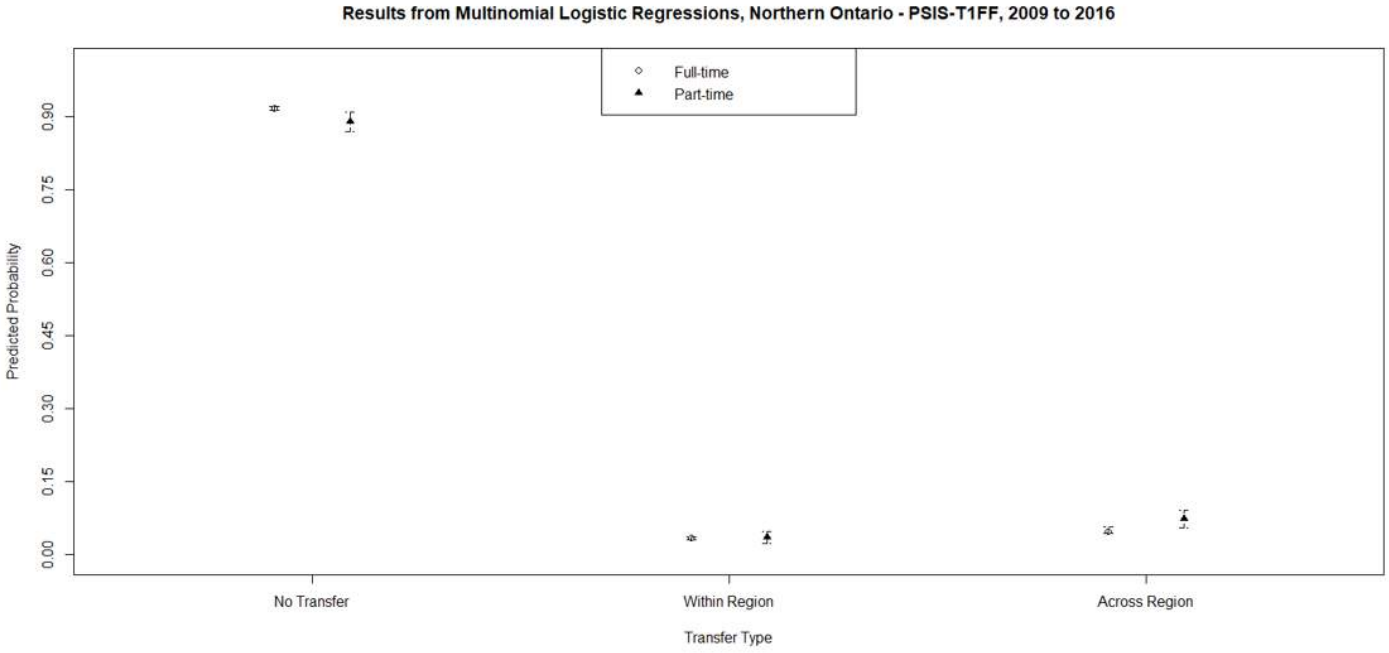

Figure 23. The Predicted Probabilities across Registration Status and Transfer Type, Northern Ontario

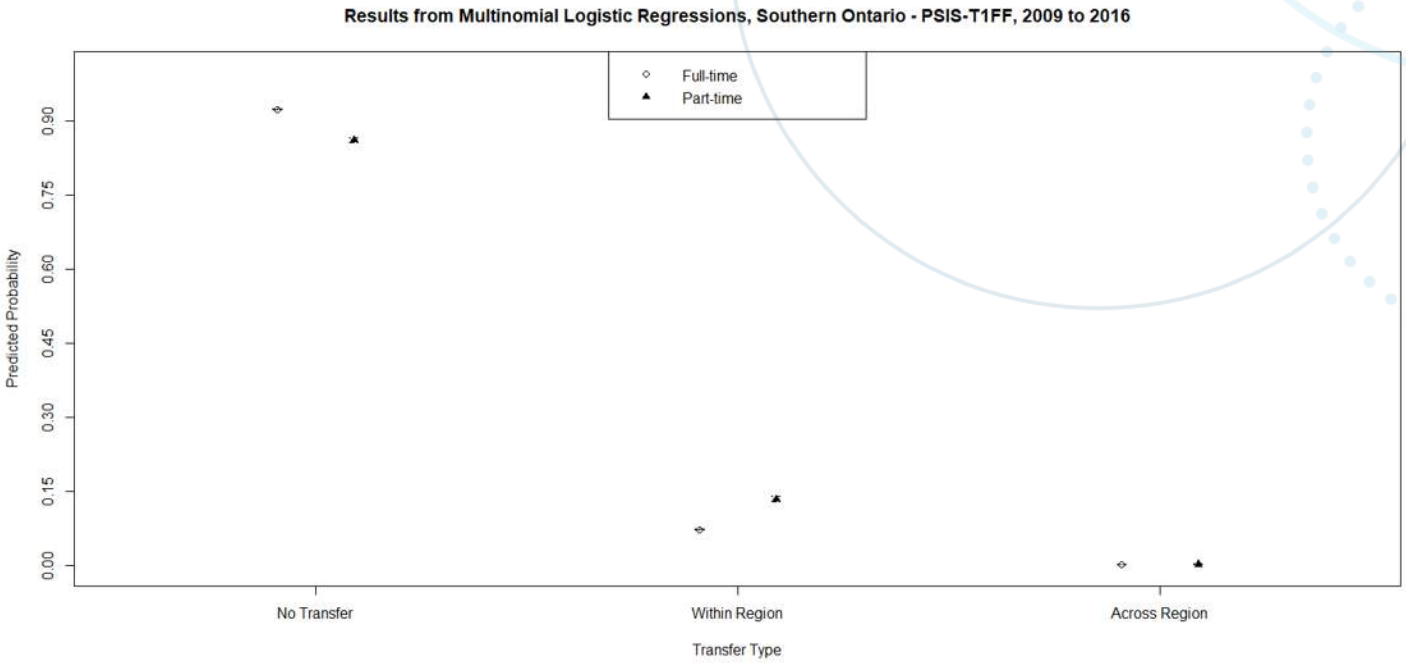

Figure 22. The Predicted Probabilities across Registration Status and Transfer Type, Southern Ontario

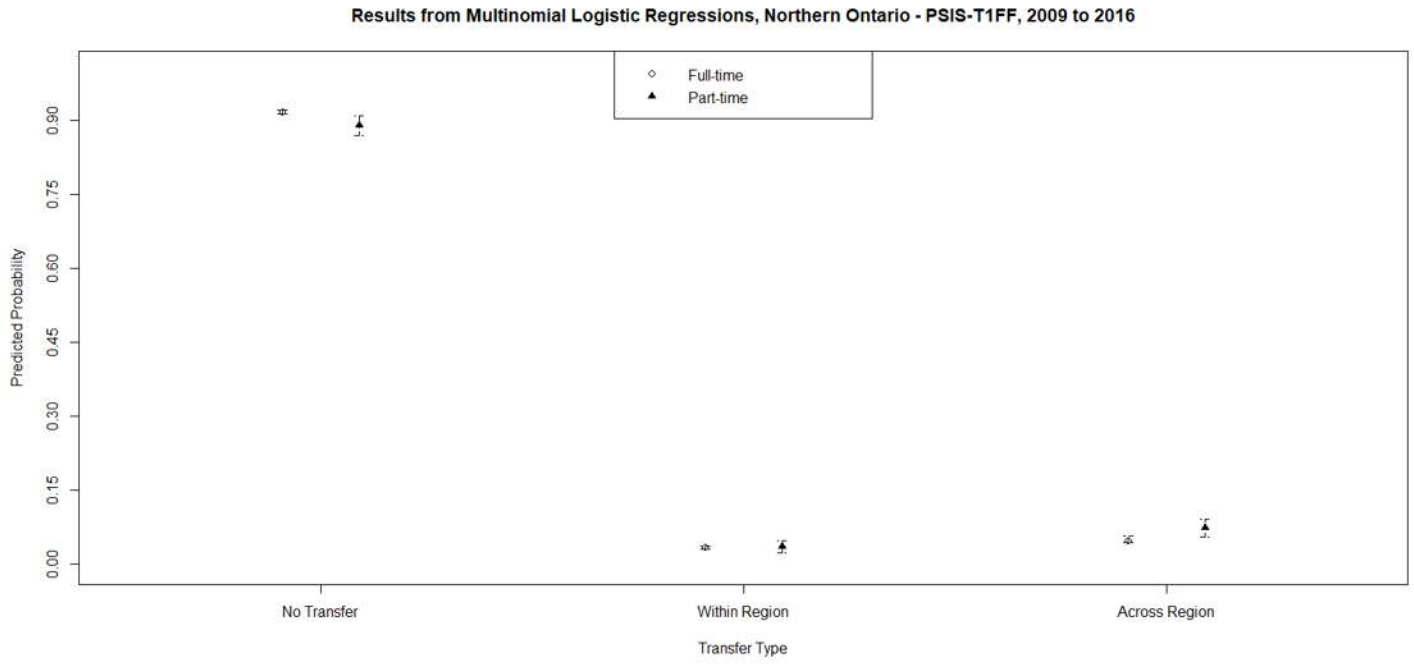

Figure 23. The Predicted Probabilities across Registration Status and Transfer Type, Northern Ontario

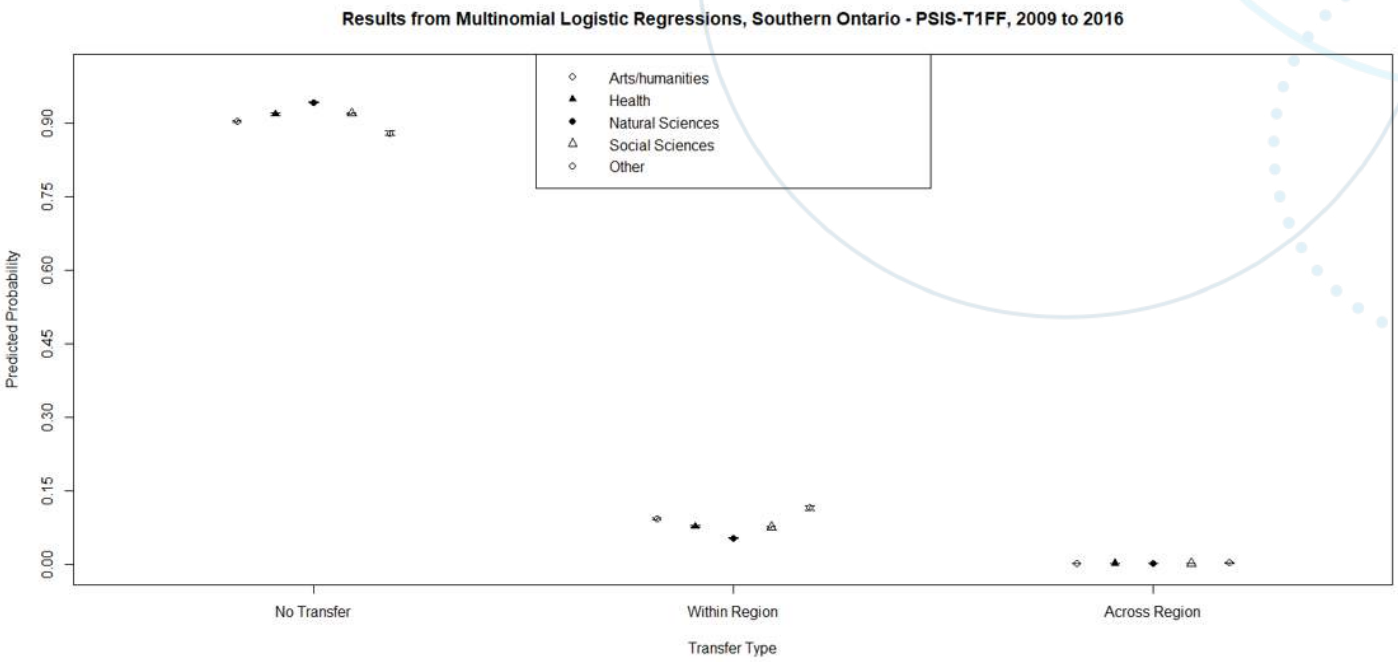

Figure 24. The Predicted Probabilities across Field of Study and Transfer Type, Southern Ontario

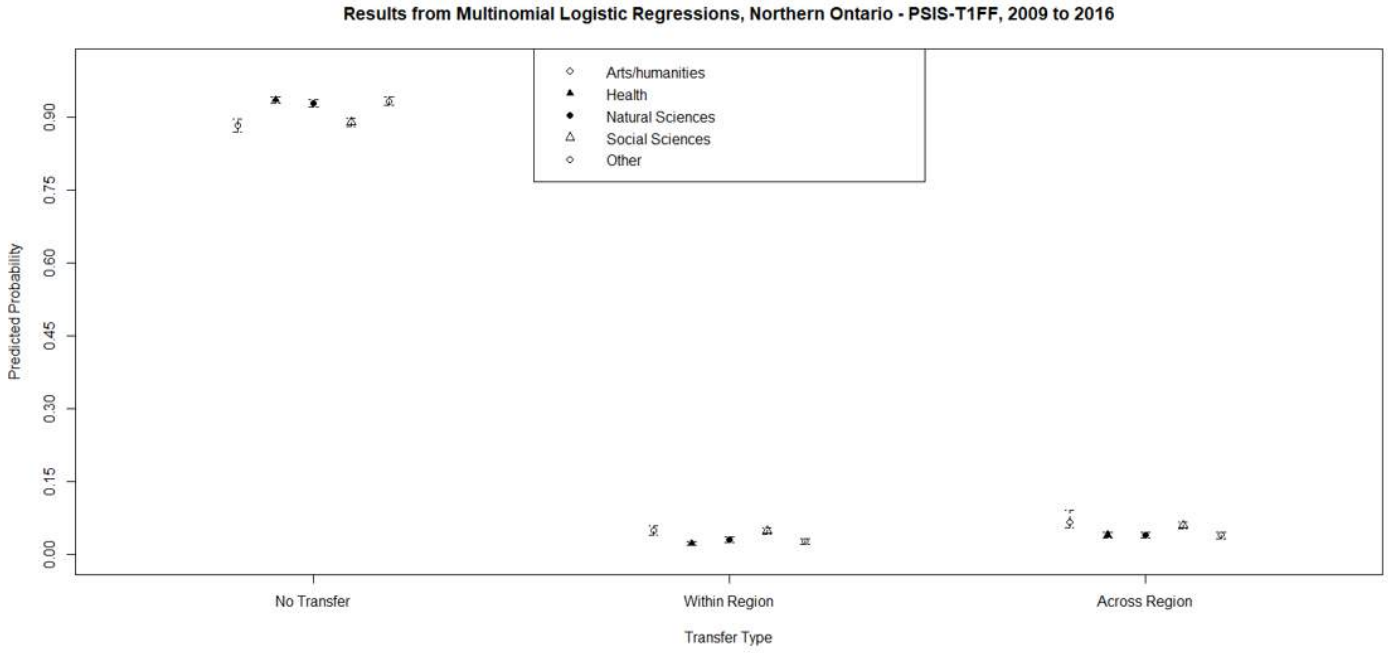

Figure 25. The Predicted Probabilities across Field of Study and Transfer Type, Northern Ontario