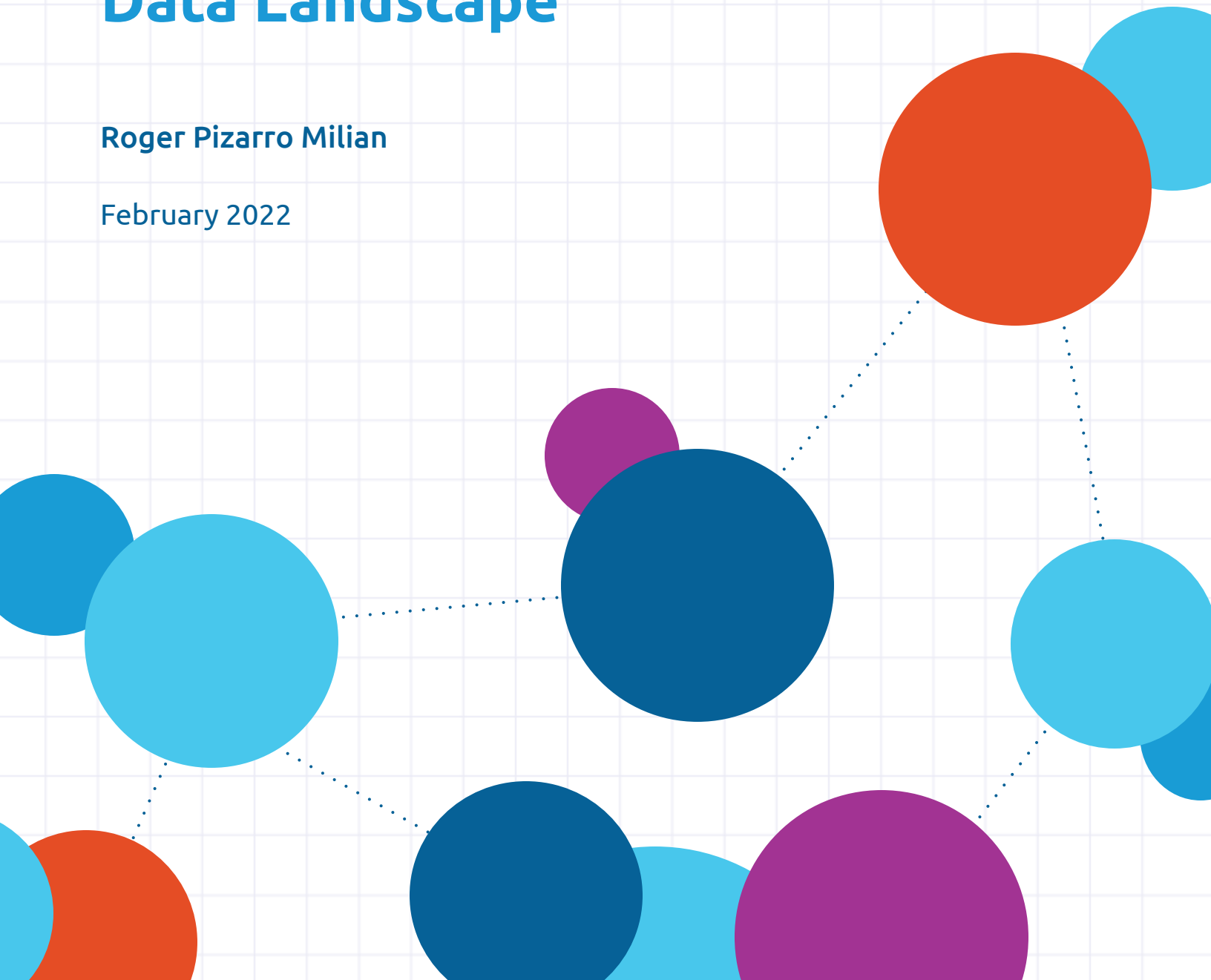


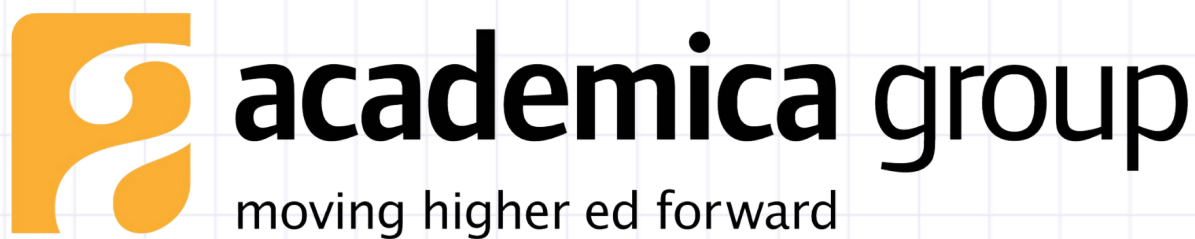
A Statistical Analysis of Transfer and Student Mobility
in Ontario: What the University/College Applicant Survey™ Tells Us

Situating the UCAS™ Dataset within the Ontario PSE Data Landscape

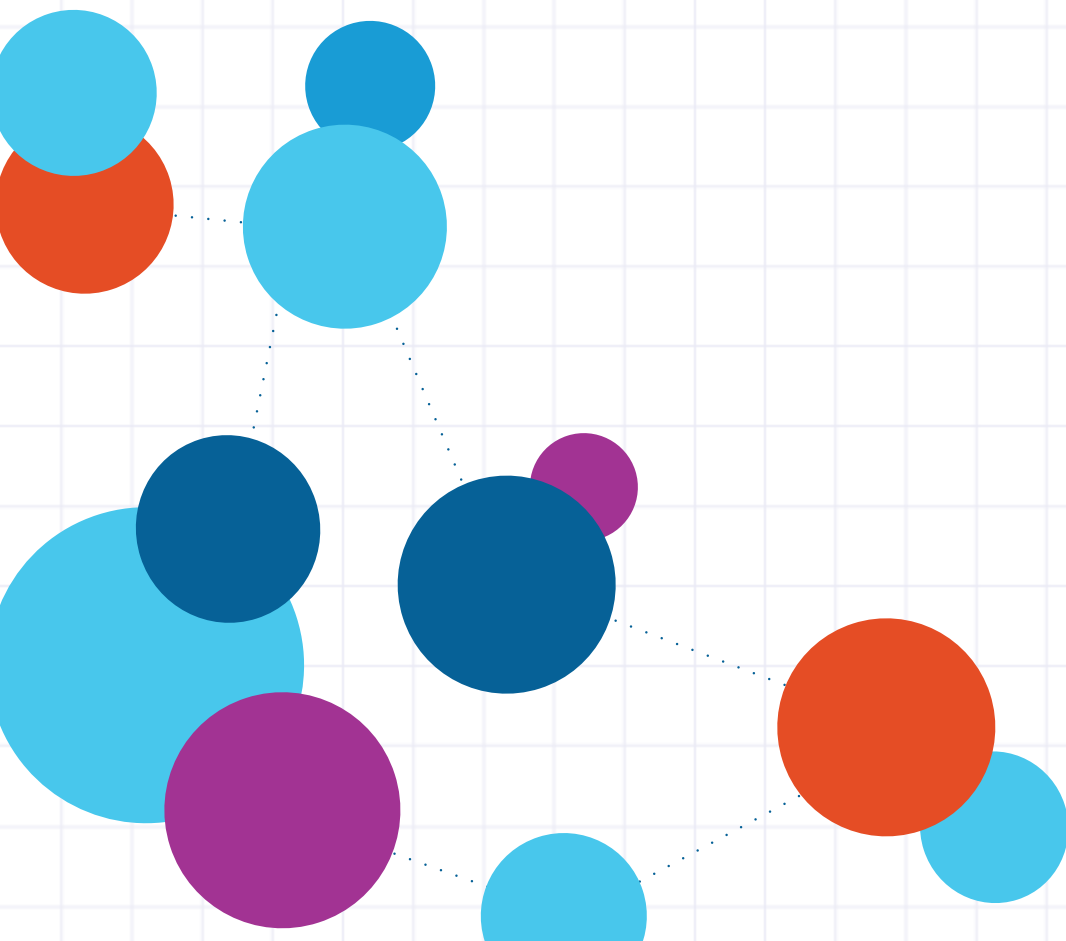
Roger Pizarro Milian

February 2022





The authors wish to thank the Academica Group for providing them with access to the UCAS™



Foreword

Rod Missaghian, ONCAT

Postsecondary transfer research in Ontario – despite making significant strides in recent decades – continues to suffer from a lack of data sources that systematically capture patterns in student mobility. For this reason, ONCAT has been diligently working to find innovative data sources, potential new data-linkages, and other opportunities that allow us to extend our understanding of transfer and student mobility in Ontario.

In the spring of 2020, Academica Group graciously provided ONCAT with access to one of the richest and largest educational datasets in Canadian postsecondary education (PSE): The University/College Applicant Survey™ (UCAS). This proprietary data source provides impressive coverage of hundreds of data fields capturing postsecondary applicants' demographic characteristics, educational background and aspirations, usage of various information sources, decision-making, and other relevant topics. The UCAS™ has been conducted annually by Academica since the mid-2000s and has been fine-tuned over the years in consultation with PSE stakeholders to capture emerging topics of interest. During this period, the UCAS™ has been completed by hundreds of thousands of applicants to 100+ Canadian colleges, polytechnics, and universities. To date, the UCAS™ remains one of the most trusted data sources for institutional decision-makers across Canada.

ONCAT is now releasing a series of briefs and papers that outline the initial statistical analysis of transfer and student mobility in Ontario based on this UCAS™ dataset. The analysis presented in this series was developed by the ONCAT research team in partnership with researchers from across the sector and a cross-sector panel of external reviewers. This work builds on previous ONCAT-funded research (Henderson & McCloy, 2017) that also used UCAS™ data. This series contains an introductory paper followed by three briefs:

- **Situating the UCAS™ Dataset within the Ontario PSE Data Landscape**
- **Brief 1: Regional Disparities in Transfer Intent Among Ontario College Applicants: Insights from Academica's University/College Applicant Survey™**
- **Brief 2: Does Socio-Economic Background Matter? A Look at Pathways into Ontario Colleges**
- **Brief 3: Applicant Pathways into University: Do High School Grades Matter?**

It is our hope that this statistical research will advance transfer research and instigate useful discussions at multiple levels within policy and administrative circles.

Introduction

Researchers routinely lament the barriers to empirically studying student mobility within Ontario postsecondary education (PSE) (e.g., Maier & Robson, 2020). In jurisdictions like British Columbia, the Student Transitions Project has long leveraged unique identifiers to merge records across K-12 and PSE and facilitate the longitudinal study of student pathways (e.g., Heslop, 2016). However, in Ontario, performing comparable analyses of student mobility typically requires privileged access to highly guarded data within provincial Ministries. Lacking access to such government records, we have seen Ontario researchers routinely use creative “workarounds” to study student mobility. Through this introductory brief, we aim to provide a (relatively) expedient overview of the data “landscape” in Ontario, as it pertains specifically to student mobility research.¹ We engage in this exercise to identify the relative merits and limitations of the UCAS™ data used in briefs within this series, which to our knowledge is the most comprehensive postsecondary applicant survey in Canada. We hope that this piece is both instructive for those wishing to understand existing data sources in this field, while also providing the necessary context to appreciate the potential uses of the UCAS™ dataset.

Administrative Data

If you wish to study student mobility within Ontario PSE, the “gold standard” would be a longitudinal data source that follows students across time, detecting their switching of postsecondary institutions, and containing details on both student demographics and program information. Presently, data with these qualities exist in two locations:

1. Linked enrollment files (e.g. CSER, USER)² gathered by the Ontario Ministry of Colleges and Universities (MCU) from each public college and university in the province. These files are submitted to MCU multiple times a year, providing census-level coverage of students in the province. They also contain data fields essential to the study of student mobility in Ontario, including the credit transfer flag (indicates whether transfer credit was indeed awarded to a student at a receiving institution) – which are not present in other data sources, including Statistics Canada datasets discussed later on. It is important to note that access to Ministry student records has and continues to be highly discretionary (Gallagher-Mackay, 2017). To our knowledge, these records have never been used by researchers external to the Ministry to study student mobility. However, they can be linked across years using unique identifiers (e.g., OEN) to provide the most complete and high-definition picture of student mobility possible.

¹For a broader discussion of this topic – published after the completion of this brief – see Robson (2021).

²A reporting guide for the College Statistical Enrollment Report (CSER) is available here. Unfortunately, we know of no publicly available documents discussing the contents of the University and Statistical Enrollment Reporting (USER) files.

2. Statistics Canada's Research Data Centers (RDCs) where researchers can obtain access to the relatively new Education and Labour Market Linkage Platform (ELMLP).³ This environment contains the Postsecondary Student Information System (PSIS)⁴ files, which are annual snapshots of student enrollments gathered from every public college and university in the country since the mid-2000s. These student-level records can be linked across years, allowing for student tracking and measurement of basic PSE outcomes (e.g., graduation). By linking PSIS and tax file information, both parental income and labor market outcomes can be included in statistical analyses. The main limitation of the ELMLP is that the PSIS files lack many fields available within Ministry enrollment files (e.g., credit transfer flag), as well as extensive demographic information. They also reflect a count date sometime within the Fall term, and thus, miss a sizable number of students that first enroll during other semesters. In addition, there are well-documented gaps in the earlier PSIS files within the Ontario the college sector.

Over the past two years, several ONCAT-funded studies have leveraged the ELMLP to study student mobility, and several future studies are planned. Discussions for ONCAT to gain access to Ministry enrollment records are also ongoing. However, the bulk of the existing literature on student mobility in Ontario draws from institutional-level administrative records.

Using institutional records that capture students' previous institution (e.g., high school, college, university), researchers have been able to categorize students enrolled at their institutions into direct entry and various transfer types. For example, at Trent University, one study (Drewes, Maki, Lew, Willson & Stringham, 2012) used administrative records to examine GPA and graduation rate differences between direct entry, college-to-university and university-to-university transfers. They were also able to differentiate among those that transferred in via articulated pathways from those that did not. ONCAT continues to support the analysis of administrative records at particular institutions as a source of intelligence for both recruitment or retention, and has most recently supported this work through funding available via our [DataPilot](#) stream.

Drawing on institutional administrative data has the advantage of providing greater depth in the coverage of data fields not contained in either the PSIS or Ministry enrollment files. For example, there are a host of relevant metrics captured by institutions, such as grade point average (GPA), transfer credits awarded, and available linkages to internal student and graduate surveys, which are not available elsewhere. However, relying on administrative records from single institutions necessarily restricts analyses to incoming transfer flows, and prevents the analysis of those who transfer out to other institutions.

³See <https://crdcn.org/datasets/elmlp-education-and-labour-market-longitudinal-linkage-platform>

⁴See <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5017>

Some have overcome this limitation by linking administrative data at two or more proximate institutions. Seneca College and York University are leaders in this space (McCloy, Steffler & Decock, 2017; Smith, Decock, Lin, Sidhu & McCloy, 2016), having conducted multiple studies of student flows and outcomes between their institutions. A primary disadvantage of such bilateral linkages is that estimates of the predictors of transfer and student outcomes are not generalizable across other institutional pairings, or the system at large.

Survey Data

Beyond administrative records, transfer research in Ontario has also drawn extensively from survey data. Most notably, we have seen the use of the college graduate satisfaction survey (GSS), which queries respondents about their educational and work status six months after graduation. A primary benefit of the GSS is that it contains a detailed transfer supplement. The GSS has been used extensively in reports published by Seneca's Centre for Research in Student Mobility (CRSM), as well as in several HEQCO reports. However, it has important limitations. First, it excludes those that transfer prior to graduating or after the six-month period. Second, and perhaps most importantly, it does not randomly sample the population, thus raising questions about response bias and representativeness. Nevertheless, the GSS serves as one of the best sources to study the post-graduation educational pathways of college graduates in the province.

A second survey which has been used to study student mobility in Ontario is Statistics Canada's National Graduate Survey. One older ONCAT-funded report used the 2013 NGS to examine student flows across program areas (Lennon et al., 2016). Meanwhile, more recent ONCAT-funded research (Dhuey, Seward & Walters, 2021) has explored the relationship between obtaining multiple credentials (e.g., college diploma + university degree) and labour market outcomes, including income and underemployment. This inclusion of labor market information is a primary strength of the NGS, as it allows for the linking of pathways to graduate outcomes. As with the GSS, one limitation of the NGS is that it only focuses on graduates, excluding non-completers. However, its sampling techniques are rigorous, thus providing a greater degree of representativeness for its target population (graduates).

There are several surveys which Ontario researchers have yet to tap specifically for work on student mobility. First, there is the National Survey of Student Engagement (NSSE), a survey which is held in high esteem by university administrators. The NSSE contains an extensive set of metrics on student life in and out of the classroom, measuring things like satisfaction with faculty and campus services.⁵

⁵A current ONCAT-funded pilot at Nipissing University is pooling data from multiple waves of the NSSE to study differences in engagement among students traveling diverging pathways into that university.

Student satisfaction surveys like these could one day be linked with Ministry enrollment or application records (OUAC/OCAS) to measure the likelihood of out-transfer for students differentially satisfied with their first-year experience. Second, there is the Ontario University Graduate Survey – a rough equivalent to the GSS in the university sector – which captures whether these graduates pursue further education (and what type). Unfortunately, neither of these surveys (consistently) use systematic sampling methods. Nevertheless, they contain information that can compliment existing student research in Ontario.

Cross-Sectoral Linkages

Over the last decade, we have also seen creative efforts to link student data across sectors. Such projects have greatly extended our understanding of student mobility. For example, Robson, Brown, Maier & Ranjbar (2016) connected TDSB student records with corresponding post-secondary application data provided by OCAS and OUAC to explore the PSE pathways traveled by TDSB students from 2010-14. Using such data, Robson and her team were able to estimate the number of students that traveled various pathways over that period.

More recently, Brown, Davies, & Chakraborty (2019) constructed a linkage between administrative records at the TDSB and the University of Toronto. Using the TDSB academic and demographic data fields, and the 'previous institution' field in the University of Toronto records in this dataset, Davies & Pizarro Milian (2020) were able to predict the likelihood of TDSB students traveling indirect pathways into the university. This included not just transfers from other Ontario institutions, but also, international colleges and universities.

In 2019, ONCAT also funded a linkage of TDSB student records with files in Statistic Canada's ELMLP. This allowed researchers to follow students as they made their way through Ontario PSE, and to estimate the relationship between pathways and student loan borrowing from the Canada Student Loans Program (CSLP) (Walters et al., 2021). The benefits of using TDSB records as a "base" for any linkage is that they contain detailed demographic and academic performance across their entire student population. The obvious disadvantage is that TDSB students are not representative of the Ontario population.

Generally, these custom linkages are not rendered accessible to the research community at large. Indeed, strict protocols typically restrict direct access only to a small project team, mainly driven by fears that even anonymized records may be misused to identify students or to portray institutions in a negative light.

The UCAS™

Considering the existence of the abovementioned data sources, readers may be curious about what new and exciting lines of inquiry the UCAS™ may enable, along with its relative strengths/weaknesses. Below, we highlight several noteworthy characteristics of the UCAS™, particularly as it pertains to the study of student mobility.

- 1. Detailed Pathway Information.** Perhaps most pertinent to the study of student mobility, the UCAS™ contains detailed information on the type of institutions to which an individual applied (e.g., college, university), their first/second-choice institutions, and the primary program area to which they applied. It also captures information on where the individual was enrolled during the past academic year (e.g., high school or another PSE), as well as their educational attainment. Using this combination of previous education and application/preference data, we can derive their intended pathways, and isolate populations of interest (e.g., college-to-university applicants with/without a completed credential). This is something which often is not feasible through institutional administrative records that only possess information about the previous institution an individual attended.
- 2. Extensive Demographic Coverage:** The UCAS™ contains demographic information that exceeds what is typically contained in institutional administrative, MCU or PSIS records. Indeed, it even rivals what is contained in linkages drawing on rich TDSB data (e.g., Davies & Pizarro Milian, 2020). This includes not just common variables like age, gender, primary language, and citizenship status, but also, detailed ethno-racial groupings, disability types, country of birth, marital status, whether the applicant had dependents, parental education, household income, their forward sortation area and other fields. This information not only allows for the isolation of specific populations, but also offers a diverse set of controls when modeling pathways.
- 3. Essential K-12 Information:** It would make little sense for the UCAS™ to re-gather academic information already supplied by respondents to institutions through their applications (e.g., via high school transcripts). But it does capture some key pieces about their early academic history. This includes their (self-reported) average marks during Grade 12 and the type of high school they attended, be it public, private, or religious. The former has been found as a key predictor of postsecondary pathways, yet it is entirely missing from the PSIS and most studies drawing on administrative records from single institutions.
- 4. Information Sources:** Where the UCAS™ really separates itself from other data sources is in its in-depth coverage of the information sources used by applicants during their search process. This includes an array of web portals (e.g., ontariocolleges.ca, cicic.ca), social media (e.g., Facebook, Instagram) and more traditional sources, such as campus tours, university/college fairs, and viewbooks or brochures. Perhaps most importantly, it asks questions about how influential these sources were to their decision. This information is absent from traditional administrative records and could be leveraged to inform the strategic recruitment of transfer students.
- 5. Sample Sizes:** The UCAS™ gathered data from approximately 460,000 individuals during the 2005 to 2019 period. More than 280,000 of those responses are from applicants in Ontario. Such sample sizes overshadow the size of most datasets used in studies of student mobility in Ontario. This allows us to explore the characteristics and pathways of structurally small groups (e.g., mature students), and to focus on very homogenous sub-samples when performing statistical analyses.

The above-mentioned characteristics illustrate the many exciting lines of inquiry that can be pursued through the UCAS™, despite some of the limitations that we identify below. First, given that it is a proprietary survey, the UCAS™ is fielded only to applicants of colleges and universities that subscribe to the survey within a given year, with varying institutional participation across years. As such, though certainly more potentially representative than data from a single institution, research findings produced through the analysis of the UCAS™ are not as generalizable as those produced using PSIS records – given that the latter includes *all* postsecondary institutions in the province.⁶

Second, the UCAS™ is sent to all applicants at participating institutions, rather than a random sub-sample. As such, it is a voluntary census that may not be representative of the population of applicants to each institution. In addition, though survey weights are produced to render the obtained sample more representative of the pool of applicants at each institution, no system level weights are produced. This is to be expected given that the UCAS™ is strategically designed to generate insights at the institutional rather than system level.

Third, and perhaps most obvious, the UCAS™ allows us to examine applications, but cannot follow students across time as they make their way through postsecondary education. As such, there may be key differences between application and enrollment pathways that need to be further explored.

Given these limitations, and as with any other data source, care needs to be taken when interpreting the findings produced with the UCAS™. Through the briefs we have produced in this series, attempts are repeatedly made to cross-reference findings with existing research, and where substantial deviations exist in findings, a critical eye is directed towards them. We find the UCAS™ an incredibly useful source to both i) explore the relationship between applicant pathways and topics which have received limited attention in Ontario due to data limitations, and ii) to attempt to replicate findings produced through the use of other data sources.

It is our hope that the analyses presented through this report advance our collective understanding of student mobility, providing thoughtful direction for future researchers and actionable insights for both policymakers and institutional leaders.

⁶Nevertheless, it is important to note that the UCAS™ is particularly strong in its coverage of particular sectors of Ontario PSE during specific periods. In Ontario, applicants of all 24 Ontario colleges were surveyed from 2008-2017 when Colleges Ontario was the client. On the university side, it is also worth pointing out that a majority of Ontario universities have participated in the survey at some point during the last ten years.

Bibliography

- Brown, R. S., Davies, S., & Chakraborty, N. (2019). *The University of Toronto-Toronto District School Board Cohort Analysis Report 1: Introductory Findings*. Toronto: University of Toronto/Toronto District School Board.
- Davies, S. & Pizarro Milian, R. (2020). *An overview of the TDSB-UT linkage and transfer project*. Ontario Council on Articulation and Transfer: Toronto, ON.
- Dhuey, E., Seward, B., & Walters, D. (2021). *Multi-Credentialed Graduates in Canada: Employment, Earnings, and Student Loan Holding*. Toronto: Ontario Council on Articulation and Transfer.
- Drewes, T., Maki, K., Lew, K., Willson, M., & Stringham K., (2012). *An analysis of CAAT transfer students' academic performance at Trent University*. Ontario Council on Articulation and Transfer: Toronto, ON.
- Gallagher-Mackay, K. (2017). *Data infrastructure for studying equity of access to postsecondary education in Ontario*. Higher Education Quality Council of Ontario.
- Heslop, J. (2016). Education Pathways of High School Graduates and Non-Graduates: A Longitudinal Study from the Student Transitions Project. *Student Transitions Project*.
- Lennon, M. C., Brijmohan, A., Lavigne, E., Yang, J., Moodie, G., & Wheelahan, L. (2016). *Ontario student mobility: carving paths of desire*. Toronto: Centre for the Study of Canadian and International Higher Education, OISE, University of Toronto.
- Maier, R., & Robson, K. (2020). Exploring university-to-college transfer in Ontario: A qualitative study of non-linear post-secondary mobility. *Canadian Journal of Higher Education/Revue canadienne d'enseignement supérieur*, 50(1), 82-94.
- McCloy, U., Steffler, M., & Decock, H. (2017). *Pathways from Seneca College's Liberal Arts Transfer program: From college entrance to university graduation*. Toronto: Ontario Council on Articulation and Transfer.
- Robson, K. (2021). An Essay on the Challenges of Doing Education Research in Canada. *Journal of Applied Social Science*, 19367244211003471
- Robson, K., Brown, R., Maier, R., & Ranjbar, M. (2016). *Unraveling the knot: Understanding the diverse postsecondary pathways of Toronto high school students*.
- Smith, R., Decock, H., Lin, S., Sidhu, R., & McCloy, U. (2016). *Transfer pathways in postsecondary education: York University and Seneca College as a case study*. Toronto: Higher Education Quality Council of Ontario.
- Walters, D., Brown, R., Parekh, G., Reynolds, D., & Einmann, T. (2021). *Postsecondary Borrowing Patterns and Graduation among Transfer Students in Ontario: The Role of High School Academic Performance*. Toronto: Ontario Council on Articulation and Transfer.



oncat.ca/statistical-analysis-transfer-and-student-mobility-ontario



Established in 2011, the Ontario Council on Articulation and Transfer (ONCAT) was created to enhance academic pathways and reduce barriers for students looking to transfer among Ontario's public colleges, universities, and Indigenous Institutes.