

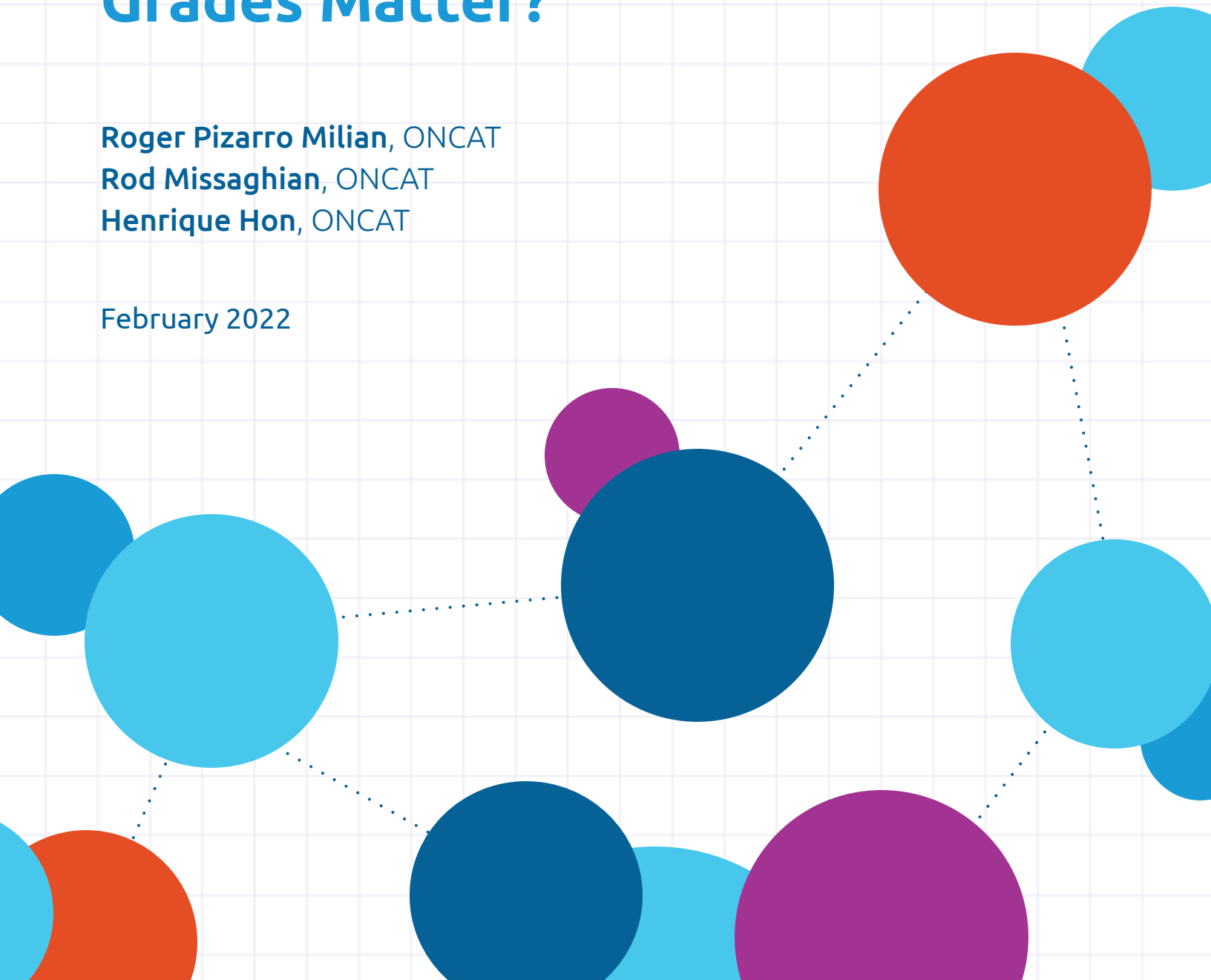
Brief 3: Applicant Pathways into University: Do High School Grades Matter?

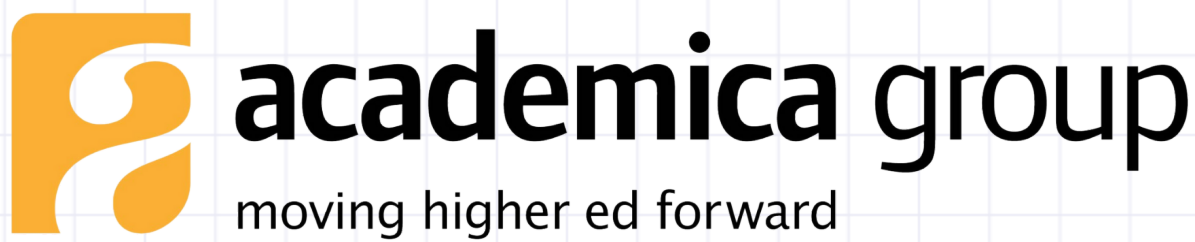
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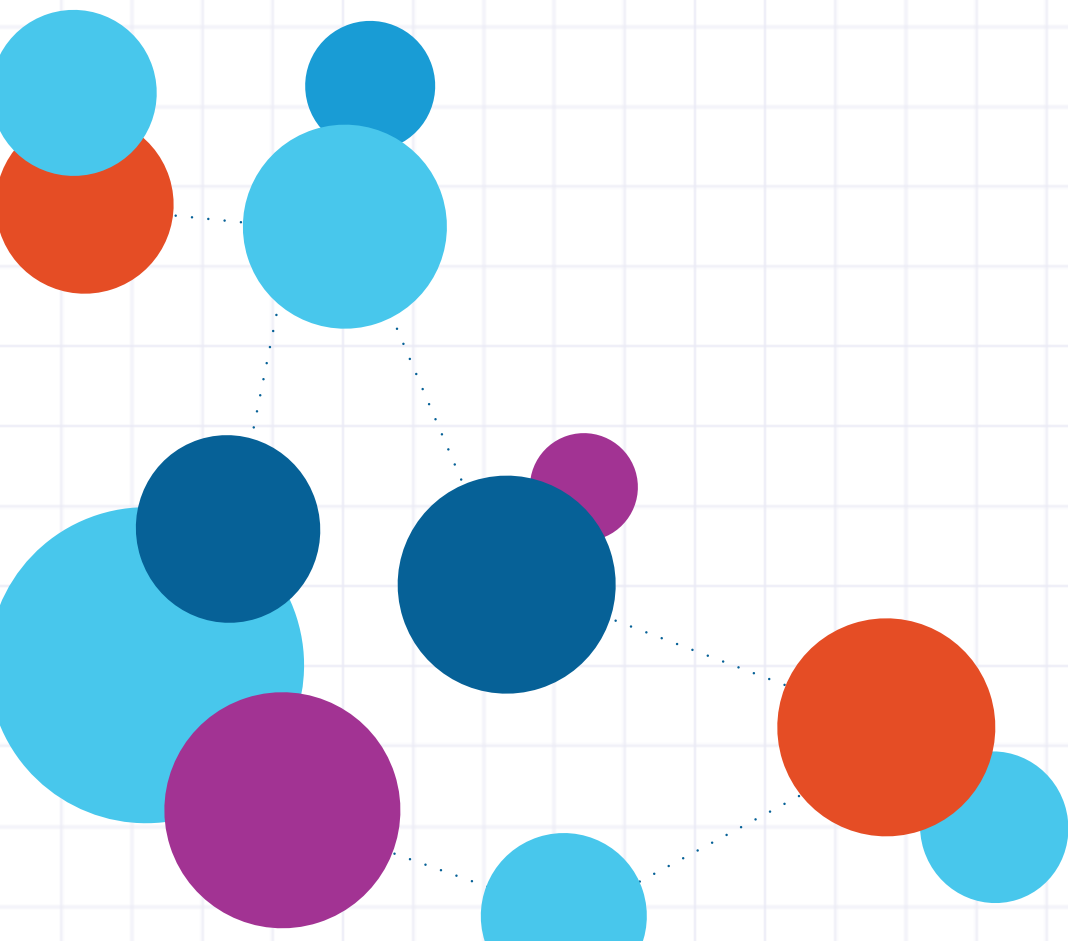




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The authors wish to thank the Academica Group for providing them with access to the UCAS™



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.

Introduction¹

Canadian research has consistently found that university graduates outperform college counterparts across a range of labor market metrics (e.g., Dhuey, Seward & Walters, 2021; Ferrer and Riddell 2002; Finnie, Dubois & Miyairi, 2020; Boothby & Drewes, 2006; St-Denis, Boujija & Sartor 2021).² It is thus perhaps not surprising that access to university is highly coveted in Canada and internationally (Davies & Pizarro Milian, 2016). This has led many Canadian social scientists to empirically examine the factors associated with university access (e.g., Finnie, Wismer & Mueller, 2015; Frenette, 2007; 2017; Robson, Anisef, Brown & George, 2018). However, research exploring the uptake of disaggregated transfer pathways into universities within Ontario is limited, in large part due to the absence of longitudinal data sources capturing K-12 to postsecondary transitions (Robson, 2021). In the absence of robust longitudinal data sources, Ontario research analyzing pathways into universities has been dominated by studies drawing on (i) the college Graduate Satisfaction Survey (GSS) (McCloy, Steffler & Decock, 2017; Steffler, McCloy & Decock, 2018), (ii) an assortment of custom linkages (e.g., Davies & Pizarro Milian, 2020; Robson et al., 2018; Walters, Brown, Parekh, Reynolds & Einmann, 2021), and (iii) Statistics Canada's Post-secondary Student Information System (PSIS) (e.g., Finnie et al., 2020; Zarifa, Sano & Hillier., 2020). All these sources have notable deficiencies.³

One area of ongoing debate in this literature centres on the influence of high school grades on postsecondary pathways. Analyzing an administrative linkage between the Toronto District School Board and the University of Toronto, Davies & Pizarro Milian (2020) found that TDSB graduates with lower high school grades were more likely to enter the university by way of a community college, but university transfers had similar high school performance as direct entries. Descriptive statistics presented by Walters et al. (2021) for a TDSB-PSIS linkage also showed that students traveling direct entry pathways into Ontario universities had higher marks (79%) in Grade 12 than lateral transfer (76%) or college-to-university (65%) counterparts. On the other hand, work by Steffler et al. (2018) with a custom linkage between Seneca and York found that high school grades were negatively correlated with the desire among college entrants

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²For an alternative set of findings, see Frenette (2019).

³The GSS captures only the transitions of graduates that go on to university within the six months following college graduation, missing those that transfer prior to graduation or later in the life course. The latter is a particularly notable limitation, given that credential accumulation plays out over long stretches of time (St. Denis, Boujija & Sartor, 2021). On the other hand, available custom K-12 to PSE linkages in Ontario capture only Toronto District School Board (TDSB) students and are thus not provincially representative. Meanwhile, the PSIS lacks extensive coverage of student demographics.

to eventually transfer to a university (e.g., transfer intent), but that their Seneca GPA was positively correlated with eventual transfer. The findings of these studies contrast those of earlier Canadian research with the Youth in Transition Survey (YITS), which did not identify any high school grade or reading proficiency effects on the likelihood of program switching (Childs, Finnie, & Martinello, 2017).⁴ Unfortunately, this topic is not one that has been explored through recent ONCAT-funded work (e.g., Zarifa et al., 2020) with Statistics Canada's Post-Secondary Student Information System (PSIS), given that such data currently lacks proxies of academic performance – such as grades and standardized tests scores – at either the K-12 or PSE levels in Ontario. As such, making progress on this front will require the continued use of creative “workarounds.”

Through this brief, we explore the relationship between high school grades (academic achievement) and the pathways travelled by applicants into Ontario universities using Academica's University/College Applicant Survey (UCAS™). This is a dataset that contains impressive coverage of not only high school grades, but also, a host of demographic characteristics that could serve as confounding variables. Our analysis finds that the probability of traveling a college-to-university pathway decrease as H.S. grades rise. Meanwhile, the opposite is true for direct entry and university-to-university transfer, with the odds of traveling those pathways increasing as H.S. grades increase. We consider the implications of these findings for both future research and policy in Ontario.

Plan for Analysis

This brief empirically explores two main questions:

- 1) Do applicants taking various routes (direct entry, college/university transfer) into university differ with respects to their high school grades?
- 2) Does the relationship between high school grades and pathways into university survive controls for other applicant characteristics?

Two waves of analyses are performed. First, we provide a descriptive overview of H.S. grades among the roughly 46,000 UCAS respondents who resided in Ontario and applied to university during the 2013-2019 period. This first analytical sample includes only those applicants who would be aged 40 or younger by September 1st of the forthcoming academic year, and who did not contain missing data on either their age or postsecondary history (e.g., most recent institution enrolled in).

⁴We do not discuss American research at length, but it too has found that those engaging in upward transfer tend to have lower high school performance than direct entry counterparts (e.g., Dietrich & Lichtenberger, 2015; Grubbs, 2020).

Second, multinomial logistic regression was used to regress applicant pathways on H.S. grades among the sub-sample of 28,300 applicants with complete data across a broader set of controls, including: age, gender, ethno-racial groupings, disability, marital status, dependents, parental education, household income, place of birth, region of residence, primary language, type of high school attended, primary program area applied to, and year applied.

To produce a disaggregated applicant pathways category, we utilize a variable identifying the type of institution that the individual was enrolled in during the last calendar year, including (1) high school, (2) college or polytechnic, and (3) university. Such variables allow us to focus on student mobility, and those applicants most likely (but not guaranteed) to be seeking transfer credit at the receiving institution. Our focal predictor is self-reported grades in the final year of high school, a continuous measure that ranges from 50 to 100% in our analytic sample.⁵

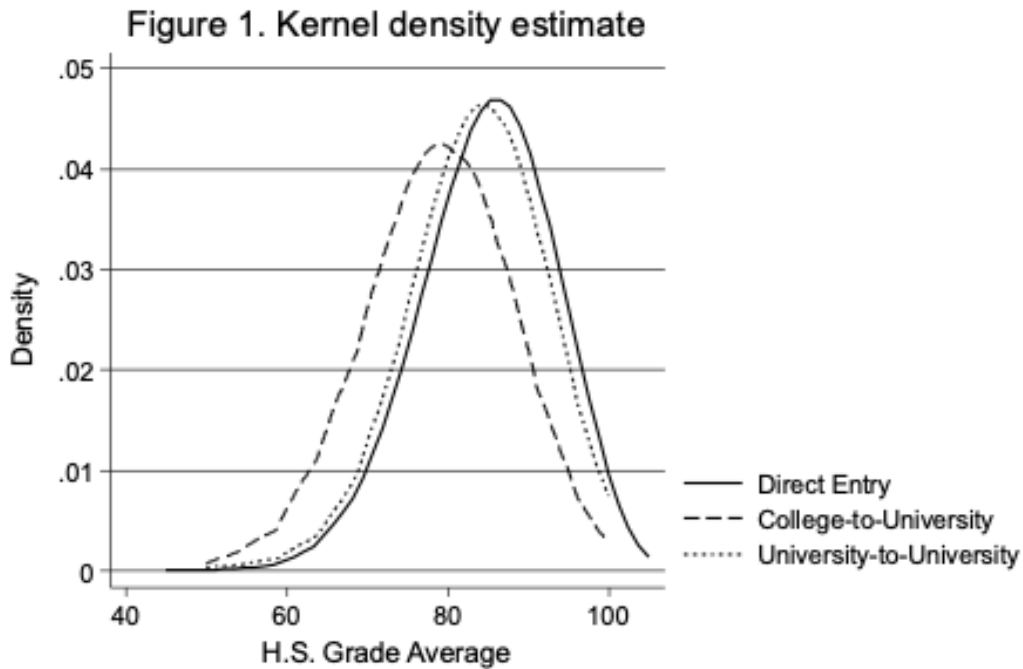
Findings

Descriptive Statistics

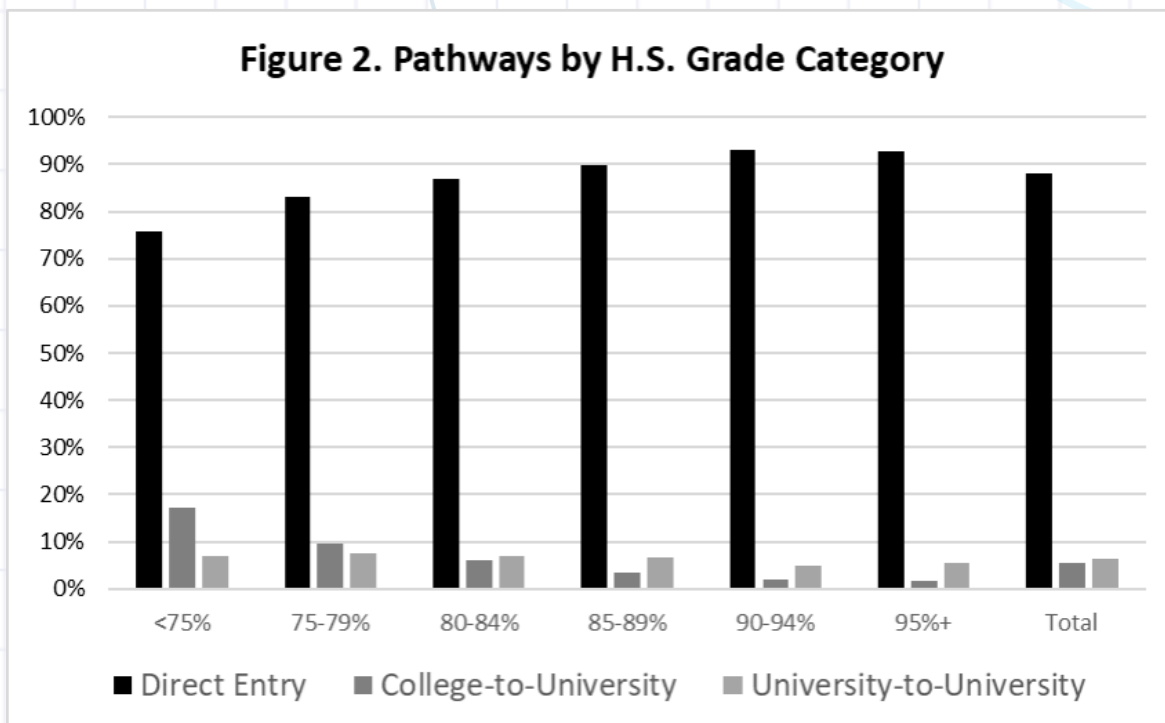
Descriptive statistics reveal mean differences in the H.S. grades of applicants traveling different pathways into universities. Those applying directly from high school tend to have the highest average (84.9%), followed by those applying from another university (83.5%), and then those applying from a college (78.7%). This general ordering of categories closely mirrors those observed by both Davies & Pizarro Milian (2020) and Walters et al. (2021) despite the vastly different sampling frames used.

Visualizing the grade distribution by group also reveals important differences. We see that the distributions for direct entry and university-to-university applicants are quite similar in shape, with the average simply differing by less than 2 percentage points. However, the grades of college-to-university transfers are not only lower, but the distribution is more “spread out.” It is important to emphasize that, despite the noted differences, there is considerable overlap in the grade distributions across applicant categories. Hence, there are many applicants with comparable grades within each group.

⁵We experimented with various ways of coding grades, including both the natural log and quintiles of grades. All of these rendered the same general results, serving as additional evidence that observed relationships weren't an artifact of any given coding of the predictor.

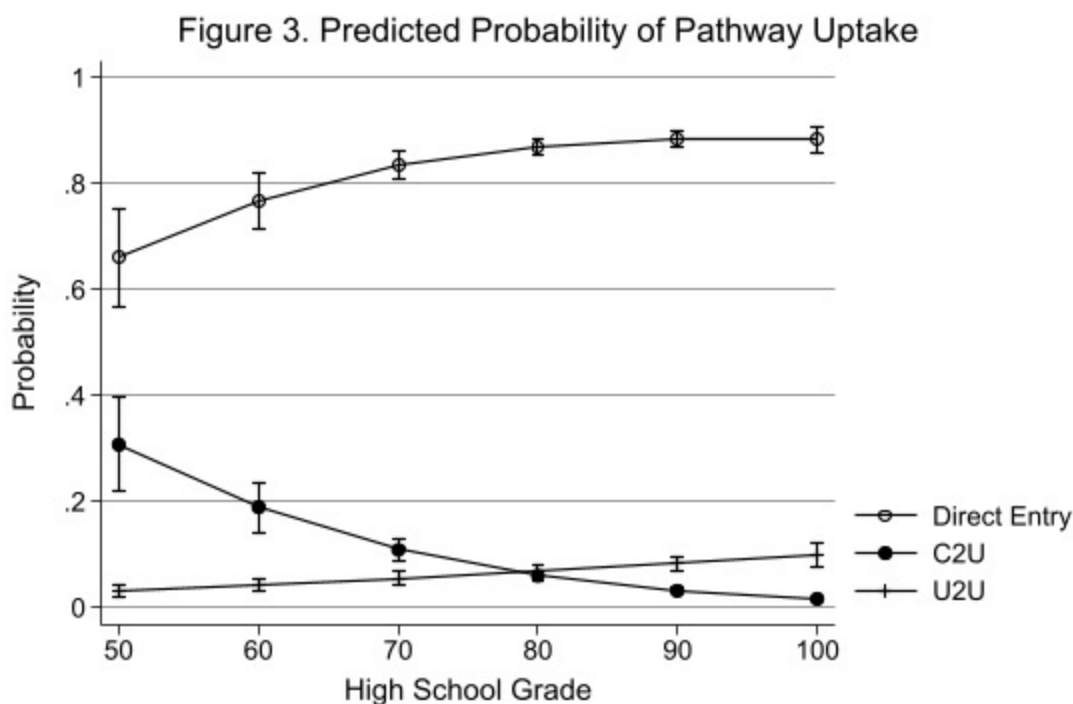


Another useful way to display the relationship between applicant pathways and H.S. grades is to plot the percentage of students applying through the various pathways across segments of the H.S. grade distribution (Figure 2). Again, we see that the percentage of direct entry students tends to increase with grades. Meanwhile, the percentage of college transfers decreases with grades. The same pattern is also true for university transfers, but the drop is less pronounced.



Regression Analyses

To assess whether the above-mentioned differences would persist after controlling other applicant characteristics, such as age and gender, we ran regression models to estimate the net relationship between reported H.S. grades and applicant pathways into university. In Figure 3, we plot the results of this modeling: the predicted probability that an applicant will travel each pathway into university across various points of the grade distribution.⁶ As with our descriptive analyses, we find that the predicted probability of applying via the C2U pathway decreases markedly as grades improve, while the likelihood of applying via direct entry or U2U pathways increases with grades.⁷



⁶These predicted probabilities assume the applicant would be aged 19 at the start of the next academic year, and sample means across all other variables in our regression model. The age specification here is important, as our pathway variable does not meaningfully vary at the lower age ranges (since those students have not yet had the opportunity to transfer).

⁷A final set of robustness checks were conducted to test for independence of observations. We re-ran the saturated models for single application years to assess whether observed trends would remain consistent to model that included all years. We observed little change from full model when looking at specific years, although some years slightly modified results given their smaller sample sizes.

Discussion

Our analyses suggest that individuals applying to Ontario universities through the various available pathways differ with respects to their H.S. grades. Direct entry and university transfer applicants tend to report higher grades than transfers originating from college. One potential interpretation of the observed trends is that those traveling the college-to-university pathway are comparatively lower-achieving students in high school. They may have been unable to gain admission to their preferred university programs directly after high school, and thus, traveled “roundabout” pathways to their university program of choice. The reason why university transfers do not differ markedly from direct entry applicants with respects to HS academic performance may be that their lateral movement to another university is perhaps motivated by factors other than academics. Perhaps it is the function of a poor social fit at their initial university, or to access a field of study not offered at their current institution. Of course, further research is required to better understand the dynamics behind these observed trends.

What are the practical implications of these findings? For starters, we need to acknowledge that college-to-university transfers may need more academic support once they arrive at university than their counterparts traveling other routes. As such, universities need to invest not only in the recruitment and admission of these students, but also, establishing protocols to ensure they receive the timely academic support and guidance that they need. In the absence of such efforts, college-to-university students may struggle academically. Our interpretations of these findings are supported by recent ONCAT-funded research (Davies & Pizarro Milian, 2020; Walters et al., 2021) drawing on various custom linkages, which finds that college-to-university transfers have lower university graduation rates than their direct entry and university transfer counterparts.

A key limitation of this analysis is that we cannot distinguish the extent to which grades in the final year of H.S. are from either university or college stream preparatory courses. As such, there are likely further qualitative differences between the grades of college-to-university and other applicants that we cannot control for. Future research, drawing on administrative data from school boards, should be able to control for the academic stream that students were on during their final year of high school. Lastly, while self-reported GPA's have been found to closely approximate actual grades (Kuncel, Credé, Thomas, Klieger, Seiler & Woo, 2005), there is always the possibility that there is some reporting bias, particularly among lower achieving students. This further emphasizes the need for further work on this topic with administrative records.

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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.