

QUANTITATIVE TRANSFER RESEARCH IN CANADA: PAST ACHIEVEMENTS, CURRENT CHALLENGES, AND FUTURE DIRECTIONS

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Abstract

The study of transfer in Canadian post-secondary education is a fractured terrain, with vast inter-provincial differences and deep schisms between participating communities. At the time of writing, there exists no comprehensive review that maps the predictors and associated outcomes of transfer in Canada, thus complicating the advancement of this sub-field. Drawing on a review of over 100 academic articles, policy reports, and institutional research documents produced from 1968 to 2020, we discuss the major findings of, methodological approaches to, and gaps within the existing quantitative transfer literature. Further, we outline challenges that Canadian researchers face as they attempt to emulate “best practices” used by international counterparts. In particular, we emphasize the need for the use of more robust administrative data linkages and enhanced methodological sophistication in Canadian quantitative transfer research.

Keywords: transfer, student mobility, quantitative methods

Résumé

L'étude du transfert dans l'enseignement postsecondaire canadien est un terrain fracturé, avec de vastes différences interprovinciales et de profonds schismes entre les communautés. Au moment de la rédaction du présent article, il n'existe pas d'étude exhaustive des prédicteurs et des conséquences du transfert au Canada, ce qui limite les avancées dans ce sous-domaine. Par le biais d'un examen de plus de 100 articles universitaires, rapports et documents de recherche institutionnels produits entre 1968 et 2020, nous discutons des principales découvertes et des approches méthodologiques, et nous faisons ressortir les lacunes de la littérature quantitative existante sur le transfert. En outre, nous décrivons les défis auxquels les chercheurs canadiens sont confrontés lorsqu'ils tentent d'imiter les meilleures pratiques utilisées par leurs homologues internationaux. En particulier, nous soulignons la nécessité d'un meilleur couplage des données administratives et d'une méthodologie améliorée dans les recherches quantitatives sur le transfert au Canada.

Mots-clés : transfert, mobilité étudiante, méthodes quantitatives

Introduction

The empirical study of student mobility within North American post-secondary education (PSE)—though certainly not as popular as mainstream access or achievement research—has preoccupied many scholars across the social sciences. For example, analyses of *vertical transfer*—referring to flows of students from community colleges to universities—featured prominently in late 20th century sociological theorizing about stratification

(e.g., Brint & Karabel, 1991; Clark, 1960; Karabel, 1972, 1986; Dougherty, 1994). Vertical transfer also continues to preoccupy American scholars using increasingly complex techniques to estimate the community college “penalty” on baccalaureate attainment and labour market outcomes (e.g., Brand et al., 2014; Long & Kurlaender, 2009; Witteveen & Attewell, 2020). And, perhaps most importantly, North American policy analysts have repeatedly contemplated the utility of transfer policy frameworks for expanding access to PSE and promoting more

efficient human capital production (Handel & Williams, 2012; Junor & Usher, 2008; Missaghian, 2020; Pizarro Milian & Munro, 2020; Trick, 2013; Young et al., 2017). Most recently, scholars have also expanded the horizons of student mobility research, acknowledging the fact that contemporary students travel through PSE via non-linear trajectories (e.g., “reverse”/horizontal transfer) (St-Denis et al., 2021) while also stopping out, and co-enrolling, among other non-traditional patterns (Taylor & Jain, 2017).¹ It would thus be fair to say that the study of PSE student mobility is implicated in various strands of social research and theorizing.

Despite the importance of this topic, there has been no systematic accounting of the antecedents and consequences of student mobility in Canadian quantitative social research. By mobility, it is important to note that we refer to student flows within PSE, rather than upward flows between K–12 and PSE. The absence of such review in Canada is likely attributable to several factors. First, while the Council of Ministers of Education, Canada (CMEC) provides a national forum for discussing education policy issues, there is no truly national PSE system in Canada, as each province governs PSE differently (Jones, 2014). This structural differentiation has implications for how students move within each system, and the repercussions of such movements. Second, the capacity to track PSE student mobility across provinces has been historically uneven. While British Columbia has long been a leader in this space, similar capacity has lagged elsewhere.² This provincialization of student data has meant that “no one data source” has been able to “tell the full story of student mobility” in Canada (Lawrance, 2009, p. 2). The evolution of Statistics Canada’s Education and Labour Market Longitudinal Linkage Platform (ELMLP) is slowly changing this situation, but the platform lacks vital variables (e.g., transfer credit awarded) across certain provinces, which limits its utility. Third, diverse communities carry out student mobility research, using contrasting data sources and methodological approaches for different purposes, leading to a literature with deep fractures. Combined, these factors complicate efforts to develop a national understanding of transfer in Canada.

Through this piece, we provide an overview of quantitative student mobility research in Canada, informed by an extensive review of over 100 academic articles, policy documents, and institutional research reports. We also tap into our professional experiences conducting

transfer research within the policy spheres to elucidate features of the non-academic landscape that may not be readily apparent to academics. Throughout this article, we focus on studies specifically analyzing the predictors and outcomes associated with travelling transfer pathways. Such parameters render the proposed review feasible within the confines of an article length piece but force us to neglect important qualitative and quantitative research focusing on other pertinent topics, such as the transfer student experience (e.g., Cameron, 2005; Gerhardt & Ackerman, 2014; Smith & Frank, 2020; Vaala, 1989), as well as more conventional historical or policy analysis (e.g., Carter et al., 2011; Kennepohl, 2016; Missaghian, 2020; Skolnik, 2010). As with any national overview, the goal is not to provide a high-definition image of trends within any province, but to paint the current situation with broad strokes. We use this review exercise to chart a potential future for quantitative student mobility research in Canada, illustrating the need for more robust data infrastructure, and the adoption of more rigorous methods.

Methods

The review informing this manuscript was performed primarily by the first author in part to inform the development of an organizational research plan for a provincial council, and in part to develop an independent academic research program on student mobility. This review was carried out between March 2019 and December 2020,³ and drew on four main sources. First, the websites of the Pan-Canadian Consortium on Admissions & Transfer (PCCAT) and its provincial counterparts⁴ were mined for available transfer research reports, irrespective of their methodological orientation or substantive focus. Second, a similar scan of the websites of other PSE sector or sector-adjacent organizations was executed, including the Council of Ministers of Education, Canada (CMEC), the Higher Education Quality Council of Ontario (HEQCO), Maritime Provinces Higher Education Commission (MPHEC), Seneca’s Centre for Research in Student Mobility (CRSM), Statistics Canada, and similar entities. Third, keyword⁵ searches within the *Canadian Journal of Higher Education* website were performed, netting a number of peer-reviewed articles focusing on transfer. And, lastly, a similar and complementary keyword search of major American and international journals⁶ that focus on PSE research was executed. This last source was in-

strumental to developing an understanding, via comparison, of the unique characteristics of Canadian transfer research and plausible future steps it could take in its evolution.

The initial group of documents gathered from these varied sources were read, allowing us to produce hundreds of pages of notes pertaining to—where applicable—available data sources, research methods, theoretical frameworks, and findings. In turn, for the sub-set of Canadian documents, as done in Davies and Rizk (2018), we mined their literature reviews to identify additional sources not captured through our initial search. We followed citation patterns back through time, acquiring and reading a smaller subset of earlier studies of student mobility in Canada. We extend Davies and Rizk’s (2018) tactics by also looking forward and, for those documents indexed within Google Scholar, exploring the articles and reports that had cited them post-publication. This netted us a smaller third and last wave of documents for review.

The documents gathered through our review include contributions from various sections of the transfer research community in Canada. This includes work by institutional researchers (e.g., Brown & McAlear, 2014; Gorman et al., 2012), academics (e.g., Acai & Newton, 2015; Gerhardt & Masakure, 2016; Martinello & Stewart,

2015; Percival et al., 2016; Robson et al., 2016; Stewart & Martinello, 2012) and policy analysts (e.g., CMEC, 2012; Constantineau, 2009; Heath, 2012; Heslop, 2009, 2017, 2019; Kerr et al., 2010; Missaghian, 2020; Smith et al., 2016)—each of which tend to produce distinct flavours of transfer research (for an overview, see Table 1). It also captures contributions from diverse intellectual groups scattered across various regions, including major hubs in British Columbia (Andres, 1998, 2001; Andres & Dawson, 1998; Andres et al., 1997; Dennison, 1978, 2002; Dennison & Jones, 1968, 1970) and Ontario (e.g., Arnold et al., 2018; Lang, 2007, 2009, 2018; Lang & Lopes, 2014; Lennon et al., 2016; Skolnik, 2004, 2010, 2016; Skolnik et al., 2018; Wheelahan et al., 2016). Through our search, we also netted various commissioned projects carried out by consultants, typically at the behest of various sector organizations (e.g., Drinkwater et al. 2018a; Duklas, 2019; Heath, 2012; Junor & Usher, 2008; Trick, 2016).

Our review is extensive, but certainly not exhaustive. It sports several limitations worth flagging. First, and perhaps most obvious, we miss any analyses deemed sensitive and not published by either colleges, universities, government entities, or other agencies.⁷ Second, our scope excludes transfer research published in French and, as such, neglects research published by

Table 1

Typology of Student Mobility Researchers in Canada

	Academic	Institutional	Policy
Audiences	• Primarily other academics, but also government	• Primarily leadership in colleges and universities	• Policy makers and leaders in colleges and universities
Visibility	• High	• Low	• Medium
Prevalence	• Low	• High	• Low
Location	• Academic departments	• Research or reporting office	• Government-funded entity (e.g., HEQCO)
Data	• PSIS, survey data, custom datasets	• Rich, in-house, and confidential administrative data.	• Mixed
Methods	• Multivariate	• Primarily descriptive	• Mixed
Orientation	• Theoretical	• Practical	• Policy

francophone scholars focusing on trends within Quebec. Despite these limitations, our work remains what is, to our knowledge, the most thorough review of quantitative student mobility research in Canada.

Findings

Below, we identify the major trends observed through our review. We begin by examining research on the predictors of transfer pathways, and subsequently, we explore a second strand of inquiry focusing on associated outcomes.

Predictors of Transfer Pathways

The predictors of transfer have preoccupied researchers for various reasons. For academics, there has long been interest in determining if certain transfer-aspiring groups are effectively cooled out during the course of their trajectories (Bahr, 2008; Clark, 1960, 1980; Grubbs, 2020; Simon, 1967). Meanwhile, for both administrators and policy makers, intelligence pertaining to how—and which—students travel non-linear pathways has always been useful from a planning, recruitment, and retention standpoint.

Resulting analyses of the predictors of transfer have come in several flavours. Institutional researchers typically contrast the profiles of direct entry and transfer students using administrative records at their home institutions and conclude that differences are likely drivers of transfer. Such work has found variation with respect to age, sex, place of birth, ethnicity, parental education, and several other characteristics (e.g., Lee et al., 2009; Martell & Wilson, 2009; Okanagan Planning and Institutional Research, 2017). Profiles of transfer students produced via this work are not generalizable given the vast differences in student demographics both across and within provinces. Aside from the basic finding that transfer students tend to be older, there appears to be little consistency in the transfer student profiles produced by analysts across Canadian institutions.

Reports produced by policy researchers typically generate a broader and more generalizable picture of who transfer students are, and the pathways they travel. The British Columbia Council on Admission & Transfer (BCCAT) has long been a national leader in the publication of aggregate transfer student data (e.g., Heslop, 2001; Lambert-Maberly, 2010; Tikina, 2015; Plaid Con-

sulting, 2020). But, outside of British Columbia, similar reporting capacity has lagged. In Ontario, for example, data limitations have forced researchers of all types to use creative workarounds with survey data which have provided insights into dynamics within certain transfer pathways (e.g., college-to-university) (Decock et al., 2011; Dhuey et al., 2021; Kerr et al., 2010; Lennon et al., 2016), as well as the traits of prospective transfers applicants (e.g., Durham College, 2016; Henderson & McCloy, 2019). Though useful, work by policy-oriented researchers has a tendency—with notable exceptions (e.g., McCloy et al., 2017)—to rely on descriptive methods, limiting its ability to effectively identify net predictors of transfer.

To date, the most advanced multivariate exploration of the predictors of transfer pathways at a provincial level comes from recent work by academic researchers using Statistics Canada's Postsecondary Students Information System (PSIS) (Finnie et al., 2020; Hillier et al., 2020; Sano et al., 2020; Zarifa et al., 2020). Using the PSIS, along with available linkages to T1 Family File (T1FF) tax data, Zarifa et al. (2020) analyzed the pathways travelled by over 420,000 college and university students in Ontario within their first two years of study. Using multinomial logistic regressions, they predicted uptake of various pathways, including both inter- and intra-sectoral movements, and swirl. They estimated a laundry list of statistically significant predictors of transfer pathways, including gender, parental income, and geographical region. Extensions of this work by Sano et al. (2020) have examined the specific predictors of transfer among sub-samples of northern and southern Ontario students; and Hillier et al. (2020) have also explored the predictors of transferring out of and within regions of Ontario.

Efforts to examine transfer students at a supra-provincial level have been limited. Heath's (2012) early and ambitious attempt to collect data from across Canadian universities—backed by ARUCC, CMEC, HEQCO, and others—was hampered by response bias. The most rigorous supra-provincial examination of the predictors of transfer we are aware of is Finnie and Qiu's (2009) early work with PSIS data from the Atlantic provinces, which found significant age, gender, and institutional type effects. Perhaps the most surprising finding of this study was that switching rates did not vary greatly across the Atlantic provinces (Finnie & Qiu, 2009, p. 37). Further pan-Canadian work has not been pursued with the PSIS,⁸ likely due to the complexities of such work and

historical quality issues with the PSIS across various provinces.

It is difficult to derive generalizable trends from the collection of studies cited above, given the inconsistencies across data sources—with respect to their representativeness and possession of specific controls—the time periods studied, and methodological approaches used. Though we have a general sense of who transfer students are within particular institutions, pathways, or regions, it is fair to say that we lack a more macro-level understanding of the predictors of transfer. Moreover, much work remains to be done to evaluate the robustness of findings derived from the PSIS given ongoing data quality issues (Statistics Canada, 2020), and the absence of linkages to both K–12 records and rich demographic data in most provinces. The latter have been found to be influential predictors of transfer pathway uptake in recent research drawing on a custom linkage of Toronto District School Board (TDSB) and University of Toronto records (Davies & Pizarro Milian, 2020).⁹ Later on, we return to the topic of data infrastructure, and strategies that can be undertaken to ameliorate these present gaps.

Consequences of Transfer

The analysis of transfer student outcomes (mainly academic, but also labour market-related) is of interest for varied reasons. For both academic and policy researchers, the focus is often spurred by a desire to inform system improvements. Institutional researchers are also lured to study these outcomes to evaluate the prospective impact of transfer student intake on key performance indicators, such as graduation and employment rates.

Grade Point Average

Research on transfer student academic performance dates to the late 1960s (Burford, 1972; Dennison & Jones, 1968; Sheehan & Reti, 1974), and initially focused on administrative datasets representing particular institutions. Since these early analyses, there has been a proliferation of Canadian studies examining the grades (e.g., GPA) of transfers, especially those travelling the college-to-university route. Such work varies widely with respect to its findings and methodological rigor. Descriptive approaches, and basic statistical tests (e.g., t-tests), remain the primary tools used by the institutional re-

search (e.g., Lakehead University, 2012; Percival et al., 2015) and policy communities (Heslop, 2017, 2019), despite being far less frequently used in academic studies (e.g., Hurley & Mitchell, 2021). However, a recent flurry of reports funded by the Alberta Council on Articulation and Transfer (ACAT) (e.g., Drinkwater et al., 2018a, 2018b, 2018c, 2018d) have employed multivariate modelling to examine student performance using institutional data, and in the process elevated the methodological bar within non-academic segments of this field.¹⁰ Such work has found that transfer student performance differs markedly across universities. At Mount Royal University, college transfers achieved higher GPAs, net of available controls. However, at the University of Alberta, this trend was reversed.

Multivariate analysis of this sort is the norm across academic studies, and within work performed in specific policy-oriented research centres (e.g., McCloy et al., 2017). However, it has still produced very mixed findings. For example, Martinello and Stewart (2015), using administrative data from Brock University, found that incoming college transfers no longer underperformed once other controls (e.g., gender, field of study) were introduced into their models. Meanwhile, Gerhardt and Masakure (2016), using administrative records from Wilfrid Laurier University, found that incoming transfers had a higher first term GPA than their direct entry counterparts, net of available controls. Unfortunately, neither of these two studies had access to extensive demographic controls. This has been remedied by recent work with custom administrative linkages (e.g., Davies & Pizarro Milian, 2020). Such work found that direct entry university students outperform incoming college transfer counterparts with respect to cumulative GPA, even after taking into consideration demographics and academic performance in high school, as well as field of study.

One key influencer of the mixed outcomes of these studies is the academic quality of the reference (e.g., direct entry) and transfer students being compared. As astutely noted in Church (2005), the relative academic performance of transfer students in British Columbia varies greatly. At university colleges, transfers tend to graduate with higher GPAs than their direct entry counterparts, but the reverse is true at research universities. Church explains that this difference is likely the function of research universities being able to recruit higher caliber direct entries.

Graduation Rates

A second strand of studies has measured transfer students' graduation rates, and again, focused primarily on college-to-university transfers. Descriptive work on this topic by institutional researchers has once again found that transfer students graduate at comparable, if not higher, rates.¹¹ Some academic work using regression modelling has estimated similar trends within certain institutions (Stewart & Martinello, 2012). However, using PSIS data for all Ontario universities, Finnie et al. (2020) estimated a graduation rate deficit for university-to-university transfers shrunk from 18–27% at the four-year mark to 6–7% at the six-year mark, reflecting the longer time-to-completion of transfers. Other work in Ontario has brought attention to the heterogeneity in graduation rates across transfer types. Drewes et al. (2012) observed that transfers into Trent University that came through articulated pathways with colleges, as well as from other universities, had lower graduation rates than high school entrants, net of controls. Meanwhile, Davies and Pizarro Milian (2020) found that while transfers from another university performed just as well as direct entries, college-to-university transfers had far lower likelihoods of graduating (13% to 34% lower, depending on the model specification). Preliminary analyses performed with a similar linkage between TDSB and York University records are yielding consistent results (Brown, 2021). Perhaps the most holistic analysis of graduation patterns among transfers comes from Walters et al. (2021), using a linkage between TDSB and PSIS records, which demonstrated that transfers into both college and university graduate at lower rates than direct entry counterparts.

Labour Market Outcomes

A third strand of research on Canadian transfer students' labour market outcomes has been hindered by the historical absence of linkages between PSE enrollment records and income data (Gallagher-Mackay, 2017). Prior to the advent of Statistics Canada's ELMLP, even leading provinces struggled to evaluate transfer students' labour market experiences, having to perform expensive surveying to carry such projects out (e.g., Dumaresq et al., 2003; Karlinski, 2007). This forced researchers to extrapolate from studies that examined economic returns to individuals with multiple credentials at the degree level or below (e.g., Boothby & Drewes, 2006; Dhuey et al.,

2021; Dubois, 2007; Ferrer & Ridell, 2002; Hango, 2010; Walters, 2003). More recent work by Finnie et al. (2017) used a custom linkage between administrative records at two Canadian colleges and three universities and tax data. These data allowed for direct analyses of transfer students but failed to identify any income differences. Recent analyses with PSIS-T1FF linkages in the ELMLP have proven such findings to be robust (Finnie et al., 2020).

Summary

The lackluster result of a review of this mixture of findings, once again, is that overarching trends are difficult to synthesize. Findings with respect to various types of academic performance in particular are mixed, at best. Indeed, it appears that the relative performance of transfer students hinges on the quality of the direct entry counterparts to which they are compared. However, this is not unique to Canadian research. American work on this topic is also marred with contradictory findings about the academic performance of transfer students (e.g., Asarta et al., 2013; Branson & Green, 2007; Carlan & Byxbe, 2000; Regier, 2016; Stratton, 2015; Whitfield, 2005). More work is required to identify robust macro-level trends, along with heterogeneities in transfer outcomes across important dimensions.

Barriers to the Advancement of Quantitative Transfer Research

Though much ground has been covered since the late 1960s, several barriers promise to impede the advancement of quantitative transfer research in Canada. Significant effort, resources and collaboration will be required to overcome deficiencies in the existing data infrastructure (Robson, 2021), and to disrupt the ongoing use of less-than-optimal methods. Below, we outline these problems, and sketch out prospective strategies to overcome them inspired by existing structures and best practices in Europe and the United States.

Data Limitations

One problem with most of the Canadian transfer research cited above is that it draws on datasets that are left-censored, failing to capture the early life course.

By contrast, American research has long examined the shadows cast by children's primary schools, neighbourhood contexts, and family backgrounds (e.g., Alexander et al., 2014; Chetty et al., 2011; Magnuson et al., 2017). This truncation means that many findings in Canadian transfer research may be explained by earlier life course metrics. For example, the correlation identified between college grades and propensity to transfer to university (Steffler et al., 2018) may fully attenuate once we account for K–12 academic preparation. Further, currently state-of-the-art examinations of the labour market outcomes of transfers drawing on the ELMLP may also be biased by the absence of controls for parental education and K–12 grades.

The good news is that much of the data required to build up our infrastructure in Canada currently exists (albeit in silos), and simply needs to be linked. For example, each province already carries out a series of standardized tests that many students take as they progress through K–12 education (see CMEC, 2020; Jonker & Ephrem, 2020). A slew of course grade data are also kept by school boards, Ministries of Education, colleges, and universities. Efforts should be made by said organizations to render this data available within the ELMLP. British Columbia has already introduced K–12 records into the ELMLP, and similar developments are taking place in Ontario. But more needs to be done to streamline the creation, augmentation, and availability of academic performance data at multiple levels.

On the demographic side, useful bits of information are scattered across various organizations, which could complement existing proxies of socio-economic status (e.g., parental income) available in the ELMLP. Ideally, individual-level data, for both students and parents, could be mined from relevant provincial ministries of community and social services, health, municipal affairs and housing, and other entities. However, as we await such data, researchers may have to make do with socio-economic information derived from the census tract where students resided during their elementary/secondary school years. This strategy is common in neighbourhood effects research in both the American (Levy et al., 2019) and European context (Lund, 2020). It has also been pioneered by McCloy et al. (2017) in Ontario transfer research.

Beyond the abovementioned early predictors, it is also essential to gather more reliable and detailed stu-

dent-level data from PSE organizations. This includes not only rudimentary transfer flags, but also, the actual number and type of transfer credit awarded at receiving institutions. Lastly, in the provinces where they exist, college and university application centres (e.g., Apply Alberta, OCAS, OUAC) could be key contributors to prospective linkage initiatives. These centres serve as centralized sources of information on transfer intent and true program demand, by virtue of capturing application activity.

At first sight, the consolidation of these data sources may sound utopian to the Canadian reader accustomed to no-frills datasets. However, there is clear precedent for this agglomeration in numerous American states. There are also many impressive examples of national or regional administrative registers in Europe that contain extensive demographic and academic data from various life stages (e.g., high school, university) (Borgen & Borgen, 2016; Hovdhaugen, 2011; Lorentzen et al., 2019).¹² Moving closer to the capability of these more advanced systems will be key to improving Canadian transfer research, and quantitative social science more broadly.

Methodological Limitations

As discussed earlier, there is variation in the methodological rigor adopted by Canadian transfer researchers. However, even our most advanced quantitative work falls short of that performed by international counterparts. Though there is every indication that students self-select, or are streamed, into transfer pathways based on demographics and ability, we are not aware of any Canadian transfer studies that try to model self-selection. Standard regression techniques used to evaluate transfer student outcomes, though they can certainly control for predictors of transfer, will nevertheless produce biased estimates. This is a commonly acknowledged problem in econometric texts (Liu & Borden, 2019), and is routinely addressed in American research (Dietrich & Leichtenberger, 2015; Leichtenberger & Dietrich, 2017; Melguizo & Dowd, 2009; Melguizo et al., 2011; Xu et al., 2018) via matching or other common techniques used for causal inference with observational data (e.g., Guo & Fraser, 2014). Of course, the application of these techniques is contingent on us possessing access to requisite longitudinal linkages. Second, transfer research in Canada—including our own work—has yet to fully real-

ize the potential of mixed-effects models. These models offer researchers the ability to simultaneously examine the effects of individual-level and school-level variables (Snijders & Bosker, 2012; Raudenbush & Bryk, 2002). Variance at the organizational level goes entirely unexplained in the traditional regression models used in Canadian transfer research, despite the American evidence demonstrating its importance (e.g., Hilmer, 2000). Traditionally, an evaluation of these factors was hindered by the suppression of institutional names in Canadian national datasets. But, with the PSIS, this is no longer a barrier.

As we move toward greater complexity on the statistical modelling of the antecedents and consequences of transfer, it is also important to acknowledge the limitations of these methods. Numbers alone cannot capture the full complexity of how social processes play out in everyday life (Collins, 2000), and we will need to be proactive in bringing advanced quantitative methods into conversation with research using complementary qualitative approaches, such as interviews, focus groups, and ethnographic work. The push for quantitative sophistication cannot come at the expense of further detachment from other mainstream research.

Conclusion

Transfer in Canada has attracted the attention of scholars across many social sciences in recent decades. Yet, relative to other jurisdictions, we lag behind, both with respect to the breadth of data sources and the rigor with which we have examined these processes. This state of affairs is attributable to various institutional and technical features of the environment in which transfer research takes place in Canada. Through this article, we have endeavoured to provide a bird's eye view of quantitative research on the antecedents and outcomes of transfer, including major findings and methodological approaches. We have also identified some major challenges, and strategies that could help us overcome them. It is our hope that this piece will serve as a reference point, providing a useful narrative review of this field, while also pointing the way forward for the Canadian transfer research community. The challenges ahead are formidable, and we believe there is little hope of overcoming them in the absence of extensive, cross-sector collaboration. On the data side, heavy and risk-averse bureaucracies will need to be enticed to move, adapt, and operate in novel

ways. It has been our experience that securing their buy-in requires persistence and persuasion—a carrot rather than a stick. Fortunately, it is not only transfer scholars that will benefit from the creation of more robust data infrastructure as described earlier, and finding allies will thus not be difficult. Building a diverse coalition, including leading academic and policy researchers, advocacy groups, government representatives, and other stakeholders in the field of transfer, will be key to the success of this enterprise. Similarly, as we aim to elevate the rigor of transfer research, this too will require that our community opens itself up to new ways of thinking. Techniques required to address self-selection in transfer research are not the norm either in the Canadian schools of education or institutional research offices that perform the bulk of the work in this field. Elevating the methodological rigor across our community will thus require a conscious and respectful effort to upskill.

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References

- Acai, A., & Newton, G. (2015). A comparison of factors related to university students' learning: College-transfer and direct-entry from high school students. *Canadian Journal of Higher Education*, 45(2), 168–192. <https://eric.ed.gov/?id=EJ1073604>
- Alexander, K., Entwisle, D., & Olson, L. (2014). *The long shadow family: Background, disadvantaged urban youth, and the transition to adulthood*. Russell Sage Foundation.
- Andres, L. (1998). *Investigating Transfer Project, Phase II: Community college students' perceptions of transfer: The case of Douglas College*. British Columbia Council on Admissions and Transfer.
- Andres, L. (2001). Transfer from community college to university: Perspectives and experiences of British Columbia students. *Canadian Journal of*

- Higher Education*, 31(1), 35–74. <https://eric.ed.gov/?id=EJ629720>
- Andres, L., & Dawson, J. (1998). *Investigating Transfer Project - Phase III: A history of transfer policy and practice in British Columbia*. British Columbia Council on Admissions and Transfer.
- Andres, L., Qayyum, A., & Dawson, J. (1997). *Investigating Transfer Project, Phase I: Transfer experiences of students from community college to university*. British Columbia Council on Admission and Transfer.
- Aparicio-Chueca, P., Domínguez-Amorós, M., & Maestro-Yarza, I. (2019). Beyond university dropout. An approach to university transfer. *Studies in Higher Education*, 46(3), 473–484. <https://doi.org/10.1080/03075079.2019.1640671>
- Arnold, C. H., Wheelahan, L., Moodie, G., Beaulieu, J., & Taylor-Cline, J.-C. (2018). Mapping the typology of transition systems in a liberal market economy: The case of Canada. *Journal of Education and Work*, 31(2), 125–143. <https://doi.org/10.1080/13639080.2017.1414941>
- Asarta, C. J., Fuess Jr, S. M., & Perumal, A. (2013). How do transfer students perform in economics? Evidence from intermediate macroeconomics. *The Journal of Economic Education*, 44(2), 110–128.
- Backes, B., & Dunlop Velez, E. (2015). *Who transfers and where do they go? Community college students in Florida*. National Center for Analysis of Longitudinal Data in Education Research. https://calder-center.org/sites/default/files/WP_126.pdf
- Bahr, P. R. (2008). Cooling out in the community college: What is the effect of academic advising on students' chances of success? *Research in Higher Education*, 49(8), 704–732. <https://www.springer.com/journal/11162>
- Bell, S. (1998). College transfer students: A Canadian case. *Community College Journal of Research and Practice*, 22(1), 21–37.
- Belloc, F., Maruotti, A., & Petrella, L. (2011). How individual characteristics affect university students drop-out: A semiparametric mixed-effects model for an Italian case study. *Journal of Applied Statistics*, 38(10), 2225–2239. <https://doi.org/10.1080/02664763.2010.545373>
- Borgen, S. T., & Borgen, N. T. (2016). Student retention in higher education: Folk high schools and educational decisions. *Higher Education*, 71(4), 505–523. <https://www.springer.com/journal/10734>
- Brand, J., Pfeffer, F., & Goldrick-Rab, S. (2014). The community college effect revisited: The importance of attending to heterogeneity and complex counterfactuals. *Sociological Science*, 1, 448–465. https://www.sociologicalscience.com/download/volume%201/october/SocSci_v1_448to465.pdf
- Branson, J., & Green, B. (2007). Academic performance of transfer and non-transfer students in introductory agriculture courses. *NACTA Journal*, 51(2), 5–10.
- Brint, S., & Karabel, J. (1991). *The diverted dream: Community colleges and the promise of educational opportunity in America, 1900-1985*. Oxford University Press.
- Brown, R. (2021). *First (freshmen) year at-risk at York: Findings from the York University-Toronto District School Board cohort study* [Unpublished manuscript].
- Brown, N., & McAlear, L. (2014). *An examination of the academic and professional success of Nipissing University's Bachelor of Commerce College Partnership Program*. Council on Articulation and Transfer.
- Boothby, D., & Drewes, T. (2006). Postsecondary education in Canada: Returns to university, college and trades education. *Canadian Public Policy/Analyse de Politiques*, 32(1), 1–21.
- Burford, C. T. (1972). *Academic achievement of Red Deer College students at Alberta universities* [Master's thesis, University of Calgary]. ERIC. <https://files.eric.ed.gov/fulltext/ED095763.pdf>
- Cameron, C. (2005). Experiences of transfer students in a collaborative baccalaureate nursing program. *Community College Review*, 33(2), 22–44. <https://doi.org/10.1177%2F009155210503300202>
- Carlan, P. E., & Byxbe, F. R. (2000). Community colleges under the microscope: An analysis of perfor-

- mance predictors for Native and transfer students. *Community College Review*, 28(2), 27–42.
- Carter, I., Coyle, J., & Leslie, D. (2011). Easing the transfer of students from college to university programs: How can learning outcomes help? *Canadian Journal of Higher Education*, 41(2), 10–27. <https://files.eric.ed.gov/fulltext/EJ959449.pdf>
- Chetty, R., Friedman, J. N., Hilger, N., Saez, E., Schanzenbach, D. W., & Yagan, D. (2011). How does your kindergarten classroom affect your earnings? Evidence from Project Star. *The Quarterly Journal of Economics*, 126(4), 1593–1660. <https://doi.org/10.1093/qje/qjr041>
- Childs, S. E., Finnie, R., & Martinello, F. (2017). Postsecondary student persistence and pathways: Evidence from the YITS-A in Canada. *Research in Higher Education*, 58(3), 270–294. <https://www.springer.com/journal/11162>
- Church, R. (2005). *Transfer credits and transfer students at the University Colleges of British Columbia: A study of the baccalaureate graduates of 1998-2001*. British Columbia Council on Admissions and Transfer.
- Clark, B. R. (1960). The “cooling-out” function in higher education. *American Journal of Sociology*, 65(6), 569–576. <https://psycnet.apa.org/doi/10.1037/11302-021>
- Clark, B. R. (1980). The “cooling out” function revisited. *New Directions for Community Colleges*, 1980(32), 15–31. <https://files.eric.ed.gov/fulltext/ED195318.pdf#page=24>
- Collins, R. (2000). Situational stratification: A micro-macro theory of inequality. *Sociological Theory*, 18(1), 17–43.
- Confederation College of Applied Arts and Technology. (2012). *Measures of student success and student experience following university/college transfers in Northwestern Ontario*. <https://www.oncat.ca/en/projects/measures-student-success-and-student-experience-following-universitycollege-transfers>
- Constantineau, P. (2009). *The Ontario Transfer Credit System: A situation report*. Council of Ontario Universities.
- Council of Ministers of Education, Canada. (2012). *Report of the CMEC credit transfer working group*. https://www.cmec.ca/Publications/Lists/Publications/Attachments/311/CTWG_Report_2012_EN.PDF
- Council of Ministers of Education, Canada. (2020). Over 50 years of pan-Canadian leadership in education. <https://www.cmec.ca/131/Overview.html>
- Davies, S., & Pizarro Milian, R. (2020). *Transfer student outcomes at the University of Toronto: GPA, access to STEM, and graduation*. Ontario Council of Articulation and Transfer (ONCAT). <https://oncat.ca/sites/default/files/media-files/2020-05-transfer-student-outcomes-at-the-university-of-toronto.pdf>
- Davies, S., & Rizk, J. (2018). The three generations of cultural capital research: A narrative review. *Review of Educational Research*, 88(3), 331–365. <https://doi.org/10.3102%2F0034654317748423>
- Decock, H., McCloy, U., Liu, S., & Hu, B. (2011). *The transfer experience of Ontario college graduates who further their education: An analysis of Ontario's College Graduate Satisfaction Survey*. Higher Education Quality Council of Ontario. <https://heqco.ca/wp-content/uploads/2020/03/TransferExperienceofOntarioCollegeGraduates.pdf>
- Dennison, J. D. (1978). University transfer programs in the community college. *Canadian Journal of Higher Education*, 8(2), 27–38. <https://files.eric.ed.gov/fulltext/EJ185059.pdf>
- Dennison, J. D. (2002). *Significant factors in the development of transfer and articulation policies among post-secondary institutions in British Columbia*. British Columbia Council on Admissions and Transfer. <https://www.bccat.ca/pubs/Reports/TAPolicies2002.pdf>
- Dennison, J. D., Forrester, G., & Jones, G. (1982). Degree completion at British Columbia's universities. *Canadian Journal of Higher Education*, 12(2), 43–57. <https://files.eric.ed.gov/fulltext/EJ271444.pdf>
- Dennison, J. D., & Jones, G. (1968). *A study of the characteristics and subsequent performance of Vancouver City College students who transferred to the University of British Columbia in September*,

1967. <https://files.eric.ed.gov/fulltext/ED026061.pdf>
- Dennison, J. D., & Jones, G. (1970). *A long range study of the subsequent performance and degree attainment of students who transferred from Vancouver City College to the University of British Columbia from 1966-1969*. <https://files.eric.ed.gov/fulltext/ED037217.pdf>
- Dietrich, C. C., & Lichtenberger, E. J. (2015). Using propensity score matching to test the community college penalty assumption. *The Review of Higher Education*, 38(2), 193–219.
- Dhuey, E., Seward, B., & Walters, D. (2021). *Multi-credentialed graduates in Canada: Employment, earnings and student loan holding*. Ontario Council on Articulation and Transfer. <https://www.oncat.ca/sites/default/files/media-files/multi-credentialed-graduates-in-canda-elizabeth-dhuey.pdf>
- Dougherty, K. (1994). *The contradictory college: The conflicting origins, impacts, and futures of the community college*. State University of New York Press.
- Drewes, T., Maki, K., Lew, K., Willson, M., & Stringham, K. (2012, February 27–March 1). *An analysis of CAAT transfer students' academic performance at Trent University* [PowerPoint presentation]. 2nd Annual Student Pathways in Higher Education Conference, Toronto, Canada. https://oncat.ca/sites/default/files/inline-images/d3_2013_drewes_maki_fri.pdf
- Drinkwater, A., Lougheed, P., & Jamieson, L. (2018a). *Transfer student success in Alberta case study: Mount Royal University*. <https://acat.alberta.ca/media/1752/20180614-case-study-mount-royal-university.pdf>
- Drinkwater, A., Lougheed, P., & Jamieson, L. (2018b). *Transfer student success in Alberta case study: University of Lethbridge*. <https://acat.alberta.ca/media/1754/20180614-case-study-university-of-lethbridge.pdf>
- Drinkwater, A., Lougheed, P., & Jamieson, L. (2018c). *Transfer student success in Alberta case study: University of Alberta*. <https://acat.alberta.ca/media/1753/20180614-case-study-university-of-alberta.pdf>
- Drinkwater, A., Lougheed, P., & Jamieson, L. (2018d). *Transfer student success in Alberta case study: MacEwan University*. <https://acat.alberta.ca/media/1751/20180614-case-study-macewan-university.pdf>
- Dubois, J. (2007). *Outcomes for alternate pathways*. Strategic Policy and Research. https://publications.gc.ca/collection_2007/hrsdc-rhdsc/HS28-114-2007E.pdf
- Duklas, J. (2019). *International transfer credit practices*. British Columbia Council on Admissions and Transfer. <https://files.eric.ed.gov/fulltext/ED596516.pdf>
- Duklas, J., & Massey, K. (2018a). *A profile of transfer student success at the Northern Alberta Institute of Technology*. Alberta Council on Admissions and Transfer. <https://acat.alberta.ca/media/1659/over-all-nait-report-submitted-april-30-2018.pdf>
- Duklas, J., & Massey, K. (2018b). *Transfer student success: A profile of transfer student success at the University of Calgary*. Alberta Council on Admissions and Transfer. <https://duklascornerstone.ca/wp-content/uploads/2021/05/An-Alberta-study-on-transfer-student-success-at-the-University-of-Calgary.pdf>
- Dumaresq, C., Lambert-Maberly, A., & Sudmant, W. (2003). *The class of 1996 five years after graduation: Comparing BC university outcomes for direct entry and transfer students*. British Columbia Council on Admissions and Transfer.
- Durham College. (2016). *Credit where credit is due: Understanding the credit transfer experience at Ontario colleges*. Ontario Council on Articulation and Transfer. <https://oncat.ca/sites/default/files/research/2014-31-Final-Report-Credit-where-credit-is-due-understanding-credit-transfer-in-Ontario-Colleges.pdf>
- Ferrer, A. M., & Riddell, W. C. (2002). The role of credentials in the Canadian labour market. *Canadian Journal of Economics/Revue Canadienne D'Economique*, 35(4), 879–905. <https://doi.org/10.1111/0008-4085.00158>
- Finnie, R., Childs, S., & Qiu, T. (2012). *Patterns of persistence in postsecondary education: New evidence for Ontario*. Higher Education Quality

- Council of Ontario. <https://heqco.ca/wp-content/uploads/2020/03/Persistence-ENG.pdf>
- Finnie, R., Dubois, M., & Miyairi, M. (2017). *How student pathways affect labour market outcomes: Evidence from tax-linked administrative data*. Ontario Council on Articulation and Transfer. <https://www.oncat.ca/sites/default/files/research-project-attachments/2016-08-final-report-university-of-ottawa-how-student-pathways-affect-labour-market-outcomes.pdf>
- Finnie, R., Dubois, M., & Miyairi, M. (2020). *Schooling and labour market outcomes of Ontario transfer students: Evidence from PSE-Tax linked data*. Ontario Council on Articulation and Transfer. https://oncat.ca/sites/default/files/media-files/epri-oncat_2020-02-28_1.pdf
- Finnie, R., & Qiu, T. (2009). *Moving through, moving on: Persistence in postsecondary education in Atlantic Canada, evidence from the PSIS*. Statistics Canada.
- Gallagher-Mackay, K. (2017). *Data infrastructure for studying equity of access to postsecondary education in Ontario*. Higher Education Quality Council of Ontario. <https://heqco.ca/wp-content/uploads/2020/03/FINAL-Data-Infrastructure.pdf>
- Gerhardt, K., & Ackerman, M. (2014). Postsecondary student mobility from college to university: Student expectations and experience. *College Quarterly*, 17(1), (no page numbers). <https://files.eric.ed.gov/fulltext/EJ1032196.pdf>
- Gerhardt, K., & Masakure, O. (2016). Postsecondary student mobility from college to university: Academic performance of students. *Canadian Journal of Higher Education*, 46(2), 78–91. <https://files.eric.ed.gov/fulltext/EJ1113457.pdf>
- Gorman, G., Phelps, C., & Carley, R. (2012). *Exploring the success and challenges of diploma to degree transfer students*. Ontario Council on Articulation and Transfer.
- Grubbs, S. J. (2020). Does cooling out still apply? Community colleges and educational expectations. *Community College Journal of Research and Practice*, 44(10–12), 819–834. <https://doi.org/10.1080/10668926.2020.1724573>
- Guo, S., & Fraser, M. (2014). *Propensity score analysis: Statistical methods and applications*. Sage Publications.
- Handel, S., & Williams, R. (2012). *The promise of the transfer pathway - Opportunity and challenge for community college students seeking the baccalaureate degree*. College Board.
- Hango, D. (2010). *Labour market experiences of youth after leaving school: Exploring the effect of educational pathways over time*. Statistics Canada. <https://www150.statcan.gc.ca/n1/en/pub/81-595-m/81-595-m2010087-eng.pdf?st=quUjJnJg>
- Heath, N. (2012). *Student mobility in Canada across Canadian jurisdictions*. Pan-Canadian Consortium on Admission & Transfer. https://pccatweb.org/media/1244/pccat_mainreport_final-en-full-document-with-logos.pdf
- Henderson, C., & McCloy, U. (2019). *From application and beyond: Tracking aspirations, motivations, experiences, and outcomes of Ontario's transfer students*. Ontario Council on Articulation and Transfer. https://www.oncat.ca/sites/default/files/media-files/oncat_-_from_application_and_beyond_2016-10_2019v2.pdf
- Heslop, J. (2001). *Profile of BC college transfer students admitted to BC universities 1994/95 to 1998/99*. British Columbia Council on Admissions and Transfer.
- Heslop, J. (2009). *Mobility of BC transfer students – Fall 2007 to calendar year 2008*. British Columbia Council on Admissions and Transfer.
- Heslop, J. (2017). *Highlights from the student transitions project: Post-secondary student mobility*. British Columbia Council on Admissions and Transfer. <https://files.eric.ed.gov/fulltext/ED583054.pdf>
- Heslop, J. (2019). *Student mobility in the B.C. public post-secondary system*. British Columbia Council on Admissions and Transfer.
- Hillier, C., Sano, Y., Zarifa, D. (2020). *Transfer pathways among Ontario colleges and universities: Characteristics of students who transfer across*

- and within regions. Ontario Council on Articulation and Transfer. https://oncat.ca/sites/default/files/media-files/characteristics_of_students_who_transfer_across_and_within_regions.pdf
- Hilmer, M. J. (2000). Does the return to university quality differ for transfer students and direct attendees? *Economics of Education Review*, 19(1), 47–61. [https://doi.org/10.1016/S0272-7757\(99\)00021-7](https://doi.org/10.1016/S0272-7757(99)00021-7)
- Hovdhaugen, E. (2009). Transfer and dropout: Different forms of student departure in Norway. *Studies in Higher Education*, 34(1), 1–17. <https://doi.org/10.1080/03075070802457009>
- Hovdhaugen, E. (2011). Do structured study programmes lead to lower rates of dropout and student transfer from university? *Irish Educational Studies*, 30(2), 237–251. <https://doi.org/10.1080/03323315.2011.569143>
- Hovdhaugen, E., & Aamodt, P. O. (2009). Learning environment: Relevant or not to students' decision to leave university? *Quality in Higher Education*, 15(2), 177–189. <https://doi.org/10.1080/13538320902995808>
- Hurley, R., & Mitchell, J. (2021). Investigation of the academic performance of college-to-university transfer students. *Journal of Software Engineering and Applications*, 14(02), 67–81. <https://doi.org/10.4236/jsea.2021.142005>
- Jenkins, P., & Fink, J. (2015). *What we know about transfer*. Columbia University, Teachers' College, Community College Research Center. <https://ccrc.tc.columbia.edu/media/k2/attachments/what-we-know-about-transfer.pdf>
- Jones, G. (2014). An introduction to higher education in Canada. In K. M. Joshi & S. Paivandi (Eds.), *Higher education across nations* (pp. 1–38). B.R. Publishing.
- Jonker, L., & Ephrem, G. (2020). *Got skills? Summary of Ontario's performance on standardized skills assessments*. Economics Community of Practice. Ontario Ministry of Finance.
- Junor, S., & Usher, A. (2008). *Student mobility & credit transfer: A national and global survey*. Educational Policy Institute.
- Karabel, J. (1972). Community colleges and social stratification. *Harvard Educational Review*, 42(4), 521–562. <https://doi.org/10.17763/haer.42.4.46m282672517k642>
- Karabel, J. (1986). Community colleges and social stratification in the 1980s. *New Directions for Community Colleges*, 1986(54), 13–30. <https://files.eric.ed.gov/fulltext/ED271169.pdf#page=22>
- Karlinski, J. (2007). *BC university outcomes for direct entry and transfer students: Comparison of the class of 2000 and class of 1996 five years after graduation*. British Columbia Council on Admissions and Transfer. <https://files.eric.ed.gov/fulltext/ED505108.pdf>
- Kennepohl, D. K. (2016). Incorporating learning outcomes in transfer credit: The way forward for Campus Alberta? *Canadian Journal of Higher Education*, 46(2), 148–164. <https://files.eric.ed.gov/fulltext/EJ1113455.pdf>
- Kerr, A., McCloy, U., & Liu, S. (2010). *Forging pathways: Students who transfer between Ontario colleges and universities*. Higher Education Quality Council of Ontario. <https://heqco.ca/wp-content/uploads/2020/03/ForgingPathwaysENG.pdf>
- Lakehead University (2012). *Student success after transfer from college to Lakehead University*. Ontario Council on Articulation and Transfer. https://www.lakeheadu.ca/sites/default/files/uploads/66/Lakehead_University_Student_Success_After_Transfer_FINAL.pdf
- Lambert-Maberly, A. (2010). *Profile of BC college transfer students 2003/04 to 2007/08*. British Columbia Council on Admission and Transfer. <https://www.bccat.ca/pubs/Reports/ProfileBCCollege2010.pdf>
- Lang, D. W. (2007). The effects of articulation on college choice. *College Quarterly*, 10(4), (no page numbers).
- Lang, D. W. (2009). Articulation, transfer, and student choice in a binary post-secondary system. *Higher Education*, 57(3), 355–371. <https://www.springer.com/journal/10734>
- Lang, D. W. (2018). *Deciding to transfer: A study of college to university choice updated for internal*

- transfer. *College Quarterly*, 21(3), (no page numbers).
- Lang, D. W., & Lopes, V. (2014). Deciding to transfer: A study of college to university choice. *College Quarterly*, 17(3), (no page numbers).
- Lawrance, J. (2009). *Inter-provincial post-secondary student mobility: A review of data sources from a British Columbia perspective*. British Columbia Council on Admission and Transfer. <https://www.bccat.ca/pubs/Reports/InterProvincialStudentMobility2009.pdf>
- Lee, J., Chan, L., & Chuang, R. (2009). *Profile of BC college transfer students admitted to Simon Fraser University 2003/04 to 2007/08*. British Columbia Council on Admissions and Transfer.
- Lennon, M. C., Brijmohan, A., Lavigne, E., Yang, J., Moodie, G., & Wheelahan, L. (2016). *Ontario student mobility: Carving paths of desire*. Centre for the Study of Canadian and International Higher Education. <https://oncat.ca/sites/default/files/media-files/2015-05-final-report-governing-council-of-uoft-a-decision-making-tool-and-guidelines-for-optimizing-ontario-credit-transfer-system.pdf>
- Levy, B. L., Owens, A., & Sampson, R. J. (2019). The varying effects of neighborhood disadvantage on college graduation: Moderating and mediating mechanisms. *Sociology of Education*, 92(3), 269–292. <https://doi.org/10.1177%2F0038040719850146>
- Lichtenberger, E., & Dietrich, C. (2017). The community college penalty? Examining the bachelor's completion rates of community college transfer students as a function of time. *Community College Review*, 45(1), 3–32.
- Liu, X., & Borden, V. (2019). Addressing self-selection and endogeneity in higher education research. In J. Huisman & M. Tight (Eds.), *Theory and method in higher education research* (pp. 129–151). Emerald.
- Long, B. T., & Kurlaender, M. (2009). Do community colleges provide a viable pathway to a baccalaureate degree? *Educational Evaluation and Policy Analysis*, 31(1), 30–53. <https://doi.org/10.3102%2F0162373708327756>
- Lorentzen, T., Bäckman, O., Ilmakunnas, I., & Kauppinen, T. (2019). Pathways to adulthood: Sequences in the school-to-work transition in Finland, Norway and Sweden. *Social Indicators Research*, 141(3), 1285–1305. https://www.springer.com/journal/11205?gclid=CjwKCAiA7dKMBhBCEiwAO_crFH1ky8muZL-GVoZV_OmYFkFTdub-bClAae1pqqCV-vmUil4Mlf4UgnhoCg_wQAvD_BwE
- Lund, R. L. (2020). Moving to prosperity? The effect of prolonged exposure to neighborhood deprivation. *Scandinavian Journal of Educational Research*, 64(4), 471–487. <https://doi.org/10.1080/00313831.2019.1577753>
- Magnuson, K., Duncan, G. J., Lee, K. T. H., & Metzger, M. W. (2016). Early school adjustment and educational attainment. *American Educational Research Journal*, 53(4), 1198–1228. <https://doi.org/10.3102%2F0002831216634658>
- Martell, J., & Wilson, A. (2009). *Profile of BC college transfer students admitted to the University of Victoria 2003/04 to 2007/08*. British Columbia Council on Admission and Transfer. <https://files.eric.ed.gov/fulltext/ED505015.pdf>
- Martinello, F., & Stewart, J. (2015). Transfers from college to one Ontario university: A four-year outcome study. *Canadian Journal of Higher Education*, 45(1), 18–36. <https://files.eric.ed.gov/fulltext/EJ1061055.pdf>
- McCloy, U., Steffler, M., & Decock, H. (2017). *The changing patterns of college-to-university transfer: Examination of Ontario's Graduate Satisfaction Survey 2007–2015*. Ontario Council on Articulation and Transfer. https://www.senecacollege.ca/mobilityresearch/reports/The_Changing_Patterns_of_College-to-University_Transfer_-_websummary.pdf
- Melguizo, T., Kienzl, G. S., & Alfonso, M. (2011). Comparing the educational attainment of community college transfer students and four-year college rising juniors using propensity score matching methods. *The Journal of Higher Education*, 82(3), 265–291.
- Melguizo, T., & Dowd, A. (2009). Baccalaureate success of transfers and rising 4-year college juniors. *Teachers College Record*, 111(1), 55–89.

- Missaghian, R. (2020). *Policy innovations in transfer: A look across the United States*. Ontario Council on Articulation and Transfer.
- Okanagan Planning and Institutional Research. (2017). *New to UBC Okanagan Undergraduate Student Survey 2017: Transfer students*. British Columbia Council on Admission and Transfer. <https://opair.ok.ubc.ca/wp-content/uploads/sites/39/2018/01/2017-Transfer.pdf>
- Percival, J., DiGiuseppe, M., Goodman, B., LeSage, A., Hinch, R., Samis, J., Sanchez, O., Rodrigues, A., Raby, P., Longo, F., De La Rocha, A. (2015). Exploring student and advisor experiences in a college-university pathway program: A study of the Bachelor of Commerce pathway. *Canadian Journal of Higher Education*, 45(4), 400–422. <https://files.eric.ed.gov/fulltext/EJ1086860.pdf>
- Percival, J., DiGiuseppe, M., Goodman, B., LeSage, A., Longo, F., De La Rocha, A., Hinch, R., Samis, J., Sanchez, O., Rodrigues, A. A., Raby, P. (2016). Exploring factors facilitating and hindering college-university pathway program completion. *International Journal of Educational Management*, 30(1), 20–42. <https://www.emerald.com/insight/content/doi/10.1108/IJEM-04-2014-0051/full/html>
- Pizarro Milian, R., & Munro, Y. (2020). Credit transfer, articulation & the future of work: Towards a federal strategy. *Canadian Journal of Higher Education*, 50(3), 36–48. <https://doi.org/10.47678/cjhe.vi0.188769>
- Plaid Consulting. (2020). *2013/14-2017/18 transfer students: Profile and performance*. British Columbia Council on Admissions and Transfer.
- Raudenbush, S., & Bryk, A. (2002). *Hierarchical linear models: Applications and data analysis methods*. (2nd ed.). Sage.
- Regier, K. F. (2016). Grades and withdrawal rates in cell biology and genetics based upon institution type for general biology and implications for transfer articulation agreements. *Community College Journal of Research and Practice*, 40(8), 668–680.
- Robson, K. (2021). An essay on the challenges of doing education research in Canada. *Journal of Applied Social Science*, 15(2), 183–196. <https://doi.org/10.1177%2F19367244211003471>
- Robson, K., Brown, R., Maier, R., & Ranjbar, M. (2016). *Unraveling the knot: Understanding the diverse postsecondary pathways of Toronto high school students*. Ontario Council on Articulation and Transfer.
- Robson, K. L., Anisef, P., Brown, R. S., & Parekh, G. (2014). The intersectionality of postsecondary pathways: The case of high school students with special education needs. *Canadian Review of Sociology*, 51(3), 193–215. <https://doi.org/10.1111/cars.12044>
- Sano, Y., Hillier, C., & Zarifa, D. (2020). *Transfer pathways among Ontario colleges and universities: Northern and southern differences in students who transfer*. Ontario Council on Articulation and Transfer. https://oncat.ca/sites/default/files/media-files/northern_and_southern_differences_in_students_who_transfer.pdf
- Sheehan, B., & Reti, M. (1974). Relative academic performance of college transfer students at the University of Calgary. *Research in Higher Education*, 2(4), 391–405. https://www.springer.com/journal/11162?gclid=CjwKCAiA7dKMBhBCEiwAOcrFK5h0GtU6YtB_M7Kw_qTmge_cXShjQk8aOe9p-wRva6QBRfacG8WsORoCkuYQAvD_BwE
- Simon, L. S. (1967). The cooling-out function of the junior college. *The Personnel and Guidance Journal*, 45(10), 973–978. <https://doi.org/10.1002/j.2164-4918.1967.tb04765.x>
- Skolnik, M. (2004). The relationship of the community college to other providers of postsecondary and adult education in Canada and implications for policy. *Higher Education Perspectives*, 1(1), 36–58. <http://gaia.flemingc.on.ca/~jmior/EDU655G-BC2010/Readings/Skolnik%20CC%20Relationships-2004-4.pdf>
- Skolnik, M. (2010). A look back at the decision on the transfer function at the founding of Ontario's Colleges of Applied Arts and Technology. *Canadian Journal of Higher Education*, 40(2), 1–17. <https://files.eric.ed.gov/fulltext/EJ904272.pdf>
- Skolnik, M. (2016). Situating Ontario's colleges between the American and European models for pro-

- viding opportunity for the attainment of baccalaureate degrees in applied fields of study. *Canadian Journal of Higher Education*, 46(1), 38–56. <https://files.eric.ed.gov/fulltext/EJ1098201.pdf>
- Skolnik, M. L., Wheelahan, L., Moodie, G., Liu, Q., Adam, E., & Simpson, D. (2018). Exploring the potential contribution of college bachelor degree programs in Ontario to reducing social inequality. *Policy Reviews in Higher Education*, 2(2), 176–197. <https://doi.org/10.1080/23322969.2018.1455532>
- Smith, H., & Frank, B. (2020). Investigating student experiences of engineering technology to engineering transfer in Ontario. *Proceedings of the 2020 Canadian Engineering Education Association Conference*. <https://ojs.library.queensu.ca/index.php/PCEEA/article/view/14121>
- 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*. Higher Education Quality Council of Ontario. <https://heqco.ca/wp-content/uploads/2020/03/Transfer-Pathways-in-PSE-ENG.pdf>
- Snijders, T., & Bosker, R. (2012). *Multilevel analysis: An introduction to basic and advanced multilevel modeling* (2nd ed.). Sage.
- Snowdon, K., & Brady, J.-A. (2014). *Towards a better understanding of credit transfer costs and benefits*. Snowdon & Associates. <http://snowdonandassociates.ca/wp-content/uploads/2018/06/Towards-a-Better-Understanding-of-Credit-Transfer-Costs-and-Benefits.pdf>
- Statistics Canada. (2020). *Postsecondary student information system (PSIS)*. <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5017>
- St-Denis, X., Boujija, Y., & Sartor, S. (2021). *Non-linear PSE pathways and credential accumulation*. Ontario Council on Articulation and Transfer.
- Steffler, M., McCloy, U., & Decock, H. (2018). *Which college students transfer to university? The role of parental education and neighbourhood income*. Centre for Research in Student Mobility, Seneca College. <https://www.senecacollege.ca/mobility-research/reports/Which-College-Students-Transfer-to-University-web-summary.pdf>
- Stewart, J., & Martinello, F. (2012). Are transfer students different? An examination of first-year grades and course withdrawals. *Canadian Journal of Higher Education*, 42(1), 25–42.
- Stratton, T. (2015). *Exploring the difference in undergraduate student success between rising college juniors and transfer students from the Florida College System* [Doctoral dissertation, Florida State University]. FSU Digital Archive. <https://diginole.lib.fsu.edu/islandora/object/fsu%3A291342>
- Taylor, J. L., & Jain, D. (2017). The multiple dimensions of transfer: Examining the transfer function in American higher education. *Community College Review*, 45(4), 273–293. <https://doi.org/10.1177%2F0091552117725177>
- Tikina, A. (2015). *BC transfer students: Profile and performance report (2008/09 – 2012/13)*. British Columbia Council on Admissions and Transfer. <https://www.bccat.ca/pubs/Reports/BCTransferStudents2015.pdf>
- Trick, D. (2013). *College-to-university transfer arrangements and undergraduate education: Ontario in a national and international context*. Higher Education Quality Council of Ontario. <https://heqco.ca/wp-content/uploads/2020/03/Transfer-Arrangements-Trick-ENG.pdf>
- Trick, D. (2016). *The costs of recruiting and admitting transfer students: Results of a survey of Ontario colleges and universities*. Ontario Council on Articulation and Transfer. <https://www.oncat.ca/sites/default/files/research/2015-37-Final-Report-David-Trick-and-Associates-Inc-Cost-of-Admitting-Transfer-Students.pdf>
- Vaala, L. (1989). Preference of transfer students for a transfer program. *Community College Review*, 16(4), 28–37. https://journals.sagepub.com/doi/pdf/10.1177/009155218901600404?casa_token=FKYc0uqix2YAAAAA:jNu8fKzw5iApl6Wz8Gv-VrEjqz3eW9vdKSs7mbPGwEYD_MM49p-zwvvn-YOwulYt6S1X_97yz63AqgSQ
- Walters, D. (2003). “Recycling”: The economic implications of obtaining additional post-secondary

credentials at lower or equivalent levels. *Canadian Review of Sociology*, 40(4), 463–480. <https://doi.org/10.1111/j.1755-618X.2003.tb00257.x>

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*. Ontario Council on Articulation and Transfer.

Wheelahan, L., Moodie, G., Lennon, M. C., Brijmohan, A., & Lavigne, E. (2016). *Student mobility in Ontario: A framework and decision-making tool for building better pathways*. Ontario Council on Articulation and Transfer. <https://www.oncat.ca/sites/default/files/media-files/2015-05-decision-making-tool-governing-council-of-uoft-a-decision-making-tool-and-guidelines-for-optimizing-ontario-credit-transfer-system.pdf>

Whitfield, M. (2005). Transfer-student performance in upper-division chemistry courses: Implications for curricular reform and alignment. *Community College Journal of Research and Practice*, 29(7), 531–545.

Witteveen, D., & Attewell, P. (2020). The vertical transfer penalty among bachelor's degree graduates. *The Journal of Higher Education*, 91(1), 32–57. <https://doi.org/10.1080/00221546.2019.1609323>

Xu, D., Jaggars, S. S., Fletcher, J., & Fink, J. E. (2018). Are community college transfer students “a good bet” for 4-year admissions? Comparing academic and labor-market outcomes between transfer and native 4-year college students. *The Journal of Higher Education*, 89(4), 478–502. <https://doi.org/10.1080/00221546.2018.1434280>

Young, S., Piché, P. G., & Jones, G. (2017). *Two towers of transformation: The compatibility of policy goals of differentiation and student mobility*. Ontario Council on Articulation and Transfer. <https://www.oise.utoronto.ca/hec/UserFiles/File/Two-Towers-of-Transformation.pdf>

Zarifa, D., Hillier, C. Sano, Y. (2020). *Transfer pathways among Ontario colleges and universities: The magnitude of postsecondary transfer types and the characteristics of those who transfer*. Ontario Council of Articulation and Transfer. [https://oncat](https://oncat.ca/sites/default/files/media-files/the_magnitude_of_postsecondary_transfer_types_and_the_characteristics_of_those_who_transfer.pdf)

[ca/sites/default/files/media-files/the_magnitude_of_postsecondary_transfer_types_and_the_characteristics_of_those_who_transfer.pdf](https://oncat.ca/sites/default/files/media-files/the_magnitude_of_postsecondary_transfer_types_and_the_characteristics_of_those_who_transfer.pdf)

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Notes

- 1 *Reverse transfer* refers to the movement of students from university to college. Meanwhile, horizontal or lateral transfer refers to movements across the same organizational type (e.g., college-to-college or university-to-university).
- 2 Using personal education numbers (PENs), British Columbia has managed to track movement from K–12 and through PSE. Others have since followed suit. Ontario, for example, now has similar capacity through its Ontario Education Number (OEN), introduced during the 2000s.
- 3 We also injected some additional sources in the summer of 2021 while performing the last set of revisions on our original submission.
- 4 The bulk of documents gathered during this process originated from the Alberta Council on Admissions and Transfer (ACAT), the British Columbia Council on Admissions and Transfer (BCCAT), and the Ontario Council on Articulation and Transfer (ONCAT).
- 5 We used various combinations of relevant terms, including “transfer credit,” “transfer students,” and “student mobility.”
- 6 This included journals like *Community College Review*, *Higher Education*, *The Journal of Higher Education*, *The Review of Higher Education*, *Sociology of Education*, and comparable outlets.
- 7 For example, in Ontario, Gallagher-Mackay (2017) notes that large-scale linkages of student data have been performed by provincial ministries using student OENs. However, any work on student mobility using such linkages performed internally by ministry staff would not be available to us.
- 8 More recent work by Finnie et al. (2012) with the YITS, though estimating switching rates in multinomial models, focuses predominantly on persistence rates. Other work (Childs et al., 2017) groups both program and institutional transfer together.
- 9 These findings are also highly consistent with research drawing on population-level data from Florida commu-

- nity college students, which finds that both high school grade point average and reading scores are positively correlated with college-to-university transfer (see Backes & Dunlop Velez, 2015).
- 10 For a comparison point, see more descriptive reports also funded by ACAT around the same time period (Duklas & Massey, 2018a; 2018b).
 - 11 For example, Confederation College of Applied Arts and Technology (2012) found that transfer students at their institution graduated at a higher rate than direct entries (73% vs 61%). At Lakehead University (2012), researchers around the same period found that block transfers had comparable graduation rates to direct entries (88% vs. 84%). Also using descriptive methods, academic work by Bell (1998) found that—among transfers admitted to York University's Faculty of Arts—transfers from community colleges performed on par with direct entry counterparts.
 - 12 Though we draw attention to research using this more extensive data, European academics have also analyzed in-depth institutional administrative records (see Belloc et al., 2011) and survey data to analyze the predictors of transfer (Hovdhaugen, 2009; Hovdhaugen & Aamodt, 2009).