

Predictors of Post-Secondary Academic Outcomes among Local-Born, Immigrant, and International Students in Canada: A Retrospective Analysis

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Abstract

Poor academic performance and dropout are major concerns at post-secondary institutions. Influences include sociodemographic, psychosocial, and academic functioning factors. Canadian literature is limited, and little published data directly compare academic outcomes between local-born, immigrant, and international students. We conducted a secondary analysis of data from 2,466 first-year students from a Canadian university over three years. Age, gender, first language, citizenship status, and early academic performance were among the predictors of later performance, dropout and return to studies. Local-born, immigrant, and international students had similarities and differences in risks. Limitations include the retrospective analysis and lack of information on reasons for dropout.

Keywords: immigrant student, international student, post-secondary academic performance, dropout, return to studies, predictors

Résumé

Le rendement scolaire médiocre et le décrochage scolaire sont des affaires majeures aux établissements postsecondaires. Les facteurs sociodémographique, psychosociaux et de fonctionnement scolaire sont influents. La littérature canadienne est limitée, et les comparaisons directes des résultats scolaire entre les étudiants natifs, immigrés et étrangers sont rares. Nous avons mené une analyse secondaire de données sur 2466 étudiants de première année d'une université canadienne au cours de trois années. L'âge, le genre, la langue maternelle, la citoyenneté, et le rendement scolaire au début étaient parmi les prédicteurs de la réussite scolaire ultérieure, du décrochage scolaire, et du recommencement des études. En ce qui concerne la risque, il y avait des similarités et des différences entre les étudiants natifs, immigrés et étrangers. Les limitations sont l'analyse retrospective et le manque d'informations sur les raisons du décrochage scolaire.

Mots-clés : abandon des études postsecondaires, étudiant immigré, étudiant étranger, prédicteurs, rendement scolaire postsecondaire, retour aux études

Introduction

While post-secondary success can be characterized by many elements, including personal and skills development, it is generally defined in most theories and research as good academic performance as reflected in grades or marks, persistent enrolment, and degree completion and graduation (Kuh, Bridges, & Hayek, 2006). Conversely, post-secondary failure encompasses poor academic performance, non-completion of degree, and dropout (Hoyt & Winn, 2004; Kuh et al., 2006; Tinto, 1975, 1993). Dropout can vary by locus (from the institution or from higher education), choice (voluntary or involuntary), and timeframe (temporary or permanent), but is usually defined in most studies and theoretical models as permanent withdrawal from a specific institution (Hoyt & Winn, 2004; Kuh et al., 2006; Tinto, 1975, 1993).

Post-secondary academic failure is a serious concern for educators globally, including those in Canada (Shaienks, Gluszynski, & Bayard, 2008). Rates of underperformance are rising, and student dropout is common, with most attrition occurring in the first year of studies (Bowler, 2009; Paton, 2012; Shaienks & Gluszynski, 2007). Furthermore, the majority of those who drop out tend not to return (Shaienks et al., 2008). Long-term consequences of the lack of a post-secondary education can be substantial, and include lower paying jobs, higher rates of unemployment and job loss, more financial difficulties, and more impact on functioning for the individual (Statistics Canada, 2012a, 2012b).

A wide range of complex and interactive factors contribute to reduced post-secondary achievement. Sociodemographic determinants include older age (Adam et al., 2015; Corak, 2011), male gender (Adam et al., 2015; Wan Chik et al., 2012), non-white ethnicity (Green, 2015; Sopoaga et al., 2013; Woolf, Potts, & McManus, 2011), coming from a single-parent family (Shaienks et al., 2008; Wintre et al., 2011), lack of parental role models with a post-secondary education (Shaienks et al., 2008; Shaienks & Gluszynski, 2007), negative relationships with parents (Wintre & Bowers, 2007; Wintre & Yaffe, 2000), low social support (Shaienks et al., 2008; Shaienks & Gluszynski, 2007), and financial pressures (Pleskac, Keeney, Merritt, Schmitt, & Oswald, 2011; Shaienks & Gluszynski, 2007). Psychosocial variables comprise psychological distress, including mental illness (Andrews & Wilding, 2004; Wintre & Bowers, 2007), substance abuse (Canadian Centre on Substance Abuse [CCSA], 2007; National Center on Addiction and Substance Abuse [CASA], 2007), cognitive/learning difficulties (Brooks, Iverson,

Sherman, & Roberge, 2010; Hildt, Lieb, & Franke, 2014), interpersonal difficulties (Pleskac et al., 2011; Shaienks & Gluszynski, 2007), and poor coping (Hassan et al., 2006; Lue, Chen, Wang, Cheng, & Chen, 2010). Academic functioning influences include poor fit with the program or institution of study (Schmitt, Oswald, Friede, Imus, & Merritt, 2008; Wintre & Morgan, 2009), low grades or unexpected bad grades (Pleskac et al., 2011; Shaienks & Gluszynski, 2007), low academic engagement (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Svanum & Bigatti, 2009), and low academic motivation (Friedman & Mandel, 2010; Park et al., 2012).

Immigrant and international students form a good proportion of post-secondary students, particularly in Western countries (Green, 2015; Shaienks et al., 2008). Emerging data from these countries have noted poorer academic achievement among both immigrant and international post-secondary students compared to local-born peers (Adam et al., 2015; Green, 2015; Stegers-Jager, Steyerberg, Cohen-Schotanus, & Themmen, 2012). More academic year repetition among international students compared to local-born students (Green, 2015) and higher dropout rates among immigrants versus local-born students (Shaienks et al., 2008; Shaienks & Gluszynski, 2007) have also been reported. This may be due to a greater burden of challenges. Besides the previously described influences, immigrant and international students also face migration-related challenges that can further increase stress/distress and specifically affect academic performance (Tinghög, Al-Saffar, Carstensen, & Nordenfelt, 2010; Zhang & Goodson, 2011). These include acculturative stressors (i.e., related to cultural adaptation) such as cultural differences, financial worries, and discrimination (Mental Health Commission of Canada [MHCC], 2009; Smith & Khawaja, 2011), poor language skills (Green, 2015; Yu & Shen, 2012), loss of social support networks (Hunley, 2010; Suarez-Orozco, Pimentel, & Martin, 2009), and older age at arrival (Corak, 2011; Zhang & Goodson, 2011).

Several theories and models provide frameworks from which to conceptualize post-secondary student development and influences on their academic performance, persistence, and dropout. It has been noted that theories tend to focus on specific aspects of student behaviour and, thus, no single theory can explain all factors that influence student success, but, collectively, they can provide a holistic perspective on these factors (Kuh et al., 2006). Those that appear most relevant to the current research are described below.

From a developmental standpoint, Arnett (2000, 2004) has proposed that youth in industrialized societies transition through a phase between adolescence and adulthood

called emerging adulthood (centred around ages 18 to 25 years). Pursuit of post-secondary education and/or first jobs tends to occur in this period, and while emerging adults gain new life experiences, more autonomy, and the opportunity to explore different educational and career paths, they also face the challenges of identity consolidation, independent living, new interpersonal relationships, and increased responsibilities (including meeting academic goals). These additional stressors can have an inhibiting effect on functioning and goal achievement. Tinto's (1975, 1993) sociological model of student departure, the most prominent theory of post-secondary student success, posits that student outcomes are affected by their degree of academic and social integration into the post-secondary institution. Academic integration is demonstrated through academic achievement and adaptation to institutional standards, and social integration is expressed by regular interactions with faculty and peers and involvement in campus activities. Greater integration is associated with higher commitment to the institution and to degree completion. Students' personal and family characteristics (e.g., gender, ethnicity, socio-economic status, parental and personal expectations of post-secondary achievement) and external commitments (e.g., financial pressures, family and work responsibilities) also influence their integration, institutional commitment, and persistence. Poor or reduced integration, resulting from negative academic or social experiences or excessive external demands, may reduce institutional and goal commitment and eventually lead to dropout. Bean and Eaton (2000, 2001) provide a psychological complement to Tinto's model by describing key psychological processes that facilitate integration. Students with greater self-efficacy about their academic and social skills and capacity for success, with better ability to cope with the stress of a new educational environment and experiences, and who attribute their academic or social success to their own abilities and efforts rather than to external forces, will be more motivated to keep engaging in post-secondary life and will be more successful. Higher engagement and success will lead to greater integration, and thereby to better institutional fit, commitment, and persistence. There is empirical evidence to support these theories (Demetriou & Schmitz-Sciborski, 2011; Pascarella & Terenzini, 2005), and while much research on student success remains atheoretical (Braxton, 2000), including most studies with immigrant and international students, the general data on contributors to post-secondary achievement do appear to reflect the prominent themes of the theories.

It is also of note that while the existing literature highlights some of the key influences on post-secondary academic outcomes, published studies generally assess correlates of such outcomes for student populations as a whole, or for individual groups (e.g., only immigrants or only international students), and comparisons between student groups of differing citizenship status are still sparse. Inadequate knowledge of intergroup distinctions in risks and influences may have implications for retention initiatives. In addition, factors that contribute to return to studies have been little explored and would be valuable to identify for potential interventions.

Current Investigation

The current investigation was conducted to address the above concerns and attempt to fill some of the knowledge gap. This was of particular interest as immigrant and international students form 25% or more (up to 50% in some urban centres) of post-secondary students in Canada (Association of Canadian Community Colleges [ACCC], 2007; Canadian University Survey Consortium [CUSC], 2010). To our knowledge, there are currently no available data from Canada that examine the differential contributing factors and risks related to academic outcomes between local-born, immigrant, and international students.

The current investigation was conducted at the University of Toronto Scarborough (UTSC), a large post-secondary institution in Canada, and one of three campuses of the University of Toronto. At UTSC, academic performance is estimated based on grade point average (GPA) or cumulative grade point average (CGPA) on a scale of 0.0 to 4.0, and persistence or dropout is assessed by term-to-term registration status. Its own internal evaluations indicated that poor academic performance in the first year, and even as early as the first term, was a good indicator of the likelihood of future poor performance and/or dropout. However, the influence of other pertinent risk factors, as identified in the literature, on student academic outcomes had not yet been assessed, and differences in outcomes between local-born, immigrant, and international students were also unexamined.

The aim of the investigation was to elaborate on the preliminary findings by UTSC by conducting a retrospective evaluation of the frequency of dropout among students at UTSC and to evaluate the contribution of factors captured by the university's database to poor academic performance, dropout, and return to studies for the student sample as a whole and for the Canadian, immigrant, and international student subgroups,

across time points. Due to the nature of data collected by the university, these factors were primarily demographic or academic in nature. Poor academic performance was defined as lower CGPA compared to the maximum score of 4.0, while dropout was defined as non-registration for the subsequent academic year(s).

Method

Ethics approval was obtained from the University of Toronto's ethics review board in July 2013. The study was conducted from September 2013 to May 2014. With the permission of the registrar at UTSC, data were obtained from the database of the Registrar's Office, which tracks the enrolment and academic performance of students throughout their course of study. For each student, the database compiles information on demographics as well as registration status and academic standing from term to term. As these data are part of the university's standard data collection and this was a retrospective analysis, individual informed consent from the students was not required; this was also recognized and approved by the institutional ethics review board.

Data Sample

PUTSC's student cohort from the intake year 2010–2011 was the selected population for the investigation. Student data were tracked for three years to the end of the 2012–2013 academic year for a longitudinal evaluation of academic outcomes. Data were compared between students with differing academic performance (as assessed by GPA or CGPA), between those who remained enrolled and those who dropped out (as noted by registration or non-registration for Year 2 and/or Year 3), as well as between those who returned after dropout and those who did not (per registration status).

Data Analysis

All data were anonymized and de-identified prior to the analysis. Descriptive statistics were conducted on the variables of interest, i.e., age at enrolment, gender (male, female), citizenship status (Canadian citizen, immigrant, international student), mother tongue (English, other), and date of arrival in Canada and country of origin (for immigrant and

international students). Similarities and differences between the student groups as they related to these variables were evaluated using analysis of variance (ANOVA) and chi-squares, as appropriate. Multiple linear regression was used to predict academic performance. Multiple logistic regression was used to predict dropout (continuing versus dropped out) and return after dropout (returned versus did not return). For the regression analyses, the variables described above were entered stepwise to obtain models containing only significant predictors.

Results

The total sample consisted of 2,466 students who enrolled in the fall of 2010 (see Table 1). The age range at enrolment was 15–59 years and the mean age at enrolment was 18.24 ± 1.80 years. Seventy-three percent (73%) were Canadian citizens, 15% were immigrants, and 12% were international students. Among international students, 77% arrived in Canada within the year before enrolment. Although data on ethnicity were not collected, country of origin was well tracked for international students and 90% were from Asia, primarily China (71%). Information on date of entry, country of origin, and ethnicity were largely unavailable for immigrant students, and ethnicity was also unavailable for Canadian students, but anecdotal reports from UTSC show that a good proportion of the local-born students and the majority of immigrant students who attend the university are of South/Southeast Asian ethnicity.

Similarities and differences between students based on citizenship status were examined (see Table 1). Age at enrolment differed significantly as a function of citizenship status ($F(2,2463) = 46.35, p < .001, \eta^2 = .04$); while immigrant and international students were similar in age at enrolment ($p = .11$), Canadians were younger than both ($p < .001$). Gender proportions were similar across the Canadian, immigrant, and international student groups, with 54–60% being female ($\chi^2(2, N = 2465) = 4.02, p = .13, V = .04$). The proportion of students with English as a mother tongue was highest among Canadians (65%), while the proportion with another first language was highest among international students (91%), followed by immigrants (80%) ($\chi^2(2, N = 2466) = 486.68, p < .001, V = .44$).

An examination of academic data (see Table 1) found that there were no group differences in academic performance by end of Year 1 ($F(2,2442) = 1.81, p = .16, \eta^2 = .001$). However, there were marginally significant group differences in academic performance over three years ($F(2,2446) = 2.55, p = .08, \eta^2 = .002$); post-hoc LSD tests showed that both Canadians ($p = .04$) and international students ($p = .04$) had better CGPA than immigrants and were comparable in performance to each other ($p = .51$).

A review of student registration across 2010–2013 showed that 34% of students dropped out over this period, with more than half of these (52%) dropping out either during or immediately after Year 1 (see Table 1). Only about one-fifth (21%) of the dropouts ever returned. From the full student sample, dropout in Year 1 was comparable among immigrant (21%) and international students (28%), and higher than among Canadians (15%) ($\chi^2(2, N = 2466) = 36.61, p < .001, V = .12$). Similarly, dropout over the three years was comparable among immigrant (39%) and international students (48%), and higher than among Canadians (30%) ($\chi^2(2, N = 2466) = 44.96, p < .001, V = .14$).

Since the proportion of students who dropped out at the end of Year 1 was so substantial, multiple regressions were conducted to examine predictors of academic performance and dropout both by the end of Year 1 and by the end of Year 3. In addition, as UTSC's internal analyses had noted the association of early academic indicators with future outcomes, earlier academic performance was evaluated as a predictor of later performance. Predictors of return after dropout were examined at end of Year 3.

Table 1. Demographic, academic performance, and registration data for the student sample

	Canadian (<i>n</i> = 1799)	Immigrant (<i>n</i> = 362)	International (<i>n</i> = 305)	Total Sample (<i>n</i> = 2466)
Age at enrolment (<i>M</i> ± <i>SD</i>)	18.04 ± 1.83 (Range 16–59 yrs)	18.70 ± 1.50 (Range 15–28 yrs)	18.91 ± 1.64 (Range 16–34 yrs)	18.24 ± 1.80 (Range 15–59 yrs)
Female	1,079	209	165	1,453
Male	719	153	140	1,012
Gender undisclosed	1			1
English first language	1,162	72	28	1,262
Another first language	637	290	277	1,204

	Canadian (n = 1799)	Immigrant (n = 362)	International (n = 305)	Total Sample (n = 2466)
Year 1 CGPA (M ± SD)	2.30 ± 0.92	2.26 ± 0.95	2.39 ± 1.05	2.30 ± 0.94
Year 3 CGPA (M ± SD)	2.36 ± 0.89	2.25 ± 0.92	2.39 ± 1.01	2.35 ± 0.91
Registered throughout Year 1	1,533	286	219	2,038
Dropped out in Year 1	266	76	86	428
Registered for all three years	1,260	220	158	1,638
Dropped out and did not return	423	106	128	657
Dropped out but returned	116	36	19	171

Note. M = mean; SD = standard deviation; CGPA = cumulative grade point average.

Predictors of Academic Performance in Year 1

All Students. Gender and Term 1 GPA predicted academic performance at end of Year 1 in the full student sample (see Table 2). Males had lower Year 1 CGPA than females. Higher Term 1 GPA predicted higher Year 1 CGPA. The prediction model explained 88% of variance.

Canadian students. Gender, first language, and Term 1 GPA predicted academic performance at end of Year 1 among Canadian students (see Table 2). Males had lower Year 1 CGPA than females. Those with a first language other than English had higher Year 1 CGPA than those with English as a first language. Higher Term 1 GPA predicted higher Year 1 CGPA. The prediction model explained 88% of variance.

Immigrant students. Term 1 GPA predicted academic performance at end of Year 1 among immigrant students (see Table 2). Higher Term 1 GPA predicted higher Year 1 CGPA. The prediction model explained 87% of variance.

International students. Gender and Term 1 GPA predicted academic performance at end of Year 1 among international students (see Table 2). Males had lower Year 1 CGPA than females. Higher Term 1 GPA predicted higher Year 1 CGPA. The prediction model explained 89% of variance.

Predictors of Academic Performance at End of Three Years

All Students. Gender, citizenship status, and Year 1 CGPA predicted academic performance at end of three years in the full student sample (see Table 2). Males had lower Year 3 CGPA than females. Immigrants had lower Year 3 CGPA than Canadians. Higher Year 1 CGPA predicted higher Year 3 CGPA. The prediction model explained 85% of variance.

Canadian students. Gender and Year 1 CGPA predicted academic performance at end of three years among Canadian students (see Table 2). Males had lower Year 3 CGPA than females. Higher Year 1 CGPA predicted higher Year 3 CGPA. The prediction model explained 85% of variance.

Immigrant students. Year 1 CGPA predicted academic performance at end of three years among immigrant students (see Table 2). Higher Year 1 CGPA predicted higher Year 3 CGPA. The prediction model explained 84% of variance.

International students. Age at enrolment and Year 1 CGPA predicted academic performance at end of three years among international students (see Table 2). Older students had lower Year 3 CGPA than younger students. Higher Year 1 CGPA predicted higher Year 3 CGPA. The prediction model explained 88% of variance.

Predictors of Dropout in Year 1

All students. Age at enrolment, first language, citizenship status, and Year 1 CGPA predicted dropout in the full student sample at end of Year 1 (see Table 3). Older students had higher odds of dropout than younger students. Those with a first language other than English had lower odds of dropout than those with an English mother tongue. Immigrant and international students had higher odds of dropout than Canadians. Higher Year 1 CGPA predicted lower odds of dropout. The prediction model explained 17% of variance.

Canadian students. Age at enrolment, first language, and Year 1 CGPA predicted dropout among Canadian students at end of Year 1 (see Table 3). Older students had higher odds of dropout than younger students. Those with a first language other than English had lower odds of dropout than those with an English mother tongue. Higher Year 1 CGPA predicted lower odds of dropout. The prediction model explained 22% of variance.

Immigrant students. Year 1 CGPA predicted dropout among immigrant students at end of Year 1 (see Table 3). Higher Year 1 CGPA predicted lower odds of dropout. The prediction model explained 22% of variance.

International students. None of the variables predicted Year 1 dropout among international students.

Predictors of Dropout by End of Three Years

All students. Age at enrolment, first language, citizenship status, and Year 3 CGPA predicted dropout in the full student sample by end of three years (see Table 3). Older students had higher odds of dropout than younger students. Those with a first language other than English had lower odds of dropout than those with an English mother tongue. Immigrant and international students had higher odds of dropout than Canadians. Higher Year 3 CGPA predicted lower odds of dropout. The prediction model explained 34% of variance.

Canadian students. Age at enrolment, first language, and Year 3 CGPA predicted dropout among Canadian students by end of three years (see Table 3). Older students had higher odds of dropout than younger students. Those with a first language other than English had lower odds of dropout than those with an English mother tongue. Higher Year 3 CGPA predicted lower odds of dropout. The prediction model explained 38% of variance.

Immigrant students. Year 3 CGPA predicted dropout among immigrant students by end of three years (see Table 3). Higher Year 3 CGPA predicted lower odds of dropout. The prediction model explained 38% of variance.

International students. Year 3 CGPA predicted dropout among international students by end of three years (see Table 3). Higher Year 3 CGPA predicted lower odds of dropout. The prediction model explained 7% of variance.

Predictors of Return to Studies after Dropout, Over Three Years

All students. Gender, first language, and citizenship status predicted return to studies after dropout in the full student sample over three years (see Table 4). Males had lower odds of returning than females. Those with a first language other than English had higher odds of returning than those with English as a first language. International students had lower odds of returning than Canadians. The prediction model explained 5% of variance.

Canadian students. Age at enrolment, gender, and first language predicted return to studies after dropout among Canadian students over three years (see Table 4). Older students had lower odds of returning than younger students. Males had lower odds of returning than females. Those with a first language other than English had higher odds of returning than those with English as a first language. The prediction model explained 7% of variance.

Immigrant students. None of the variables predicted return to studies after drop-out among immigrant students over three years.

International students. None of the variables predicted return to studies after dropout among international students over three years.

Table 2. Multiple linear regression models of academic performance at end of Year 1 and end of three years (significant values only)

	Academic Performance at End of Year 1				Academic Performance at End of Three Years			
	All Students	Canadians	Immigrants	Internationals	All Students	Canadians	Immigrants	Internationals
F	8685.59***	4244.05***	2302.96***	1177.69***	4600.29***	4858.04***	1898.74***	1105.74***
Adjusted R ²	.88	.88	.87	.89	.85	.85	.84	.88
	B [95% CI]	B [95% CI]	B [95% CI]	B [95% CI]	B [95% CI]	B [95% CI]	B [95% CI]	B [95% CI]
Age at enrolment								-.03** [-.06, -.01]
Gender (ref. female)	-.07*** [-.10, -.04]	-.08*** [-.11, -.05]		-.09* [-.17, -.01]	-.03* [-.06, -.01]	-.04* [-.07, -.01]		
First language (ref. English)		.04* [.01, .07]						
Citizenship status – immigrant (ref. Canadian)					-.07*** [-.11, -.03]			
Term 1 GPA	.90*** [.88, .91]	.90*** [.88, .91]	.89*** [.85, .93]	.89*** [.85, .92]				
Year 1 CGPA					.88*** [.87, .90]	.88*** [.86, .90]	.89*** [.85, .93]	.89*** [.85, .93]

Note. B = beta coefficient; CI = confidence interval; GPA = grade point average; CGPA = cumulative grade point average

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Table 3. Multiple logistic regression models of dropout at end of Year 1 and end of three years (significant values only)

	Dropout by End of Year 1				Dropout by End of Three Years			
	All Students	Canadians	Immigrants	Internationals	All Students	Canadians	Immigrants	Internationals
χ^2	266.62***	238.71***	53.81***		674.33***	553.40***	119.09***	16.02***
R ²	.17	.22	.22		.34	.38	.38	.07
	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]
Age at enrolment	1.08** [1.02, 1.14]	1.11*** [1.04, 1.19]			1.12*** [1.06, 1.19]	1.16*** [1.08, 1.25]		
First language (ref. English)	.75* [.58, .98]	.70* [.51, .96]			.72** [.57, .90]	.66** [.51, .86]		
Citizenship status - im- migrant (ref. Canadian)	1.74*** [1.25, 2.43]				1.62*** [1.21, 2.17]			
Citizenship status – in- ternational student (ref. Canadian)	2.98*** [2.10, 4.22]				3.30*** [2.39, 4.56]			
Year 1 CGPA	.42*** [.37, .47]	.31*** [.26, .37]	.34*** [.24, .47]					
Year 3 CGPA					.25*** [.22, .29]	.20*** [.17, .23]	.20*** [.14, .29]	.63*** [.49, .79]

Note. OR = odds ratio; CI = confidence interval; CGPA = cumulative grade point average

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Table 4. Multiple logistic regression models of return to studies after dropout, over three years (significant values only)

	Return to Studies after Dropout, Over Three Years			
	All Students	Canadians	Immigrants	Internationals
χ^2	24.77***	25.61***		
R ²	.05	.07		
	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]
Age at enrolment		.69** [.53, .89]		
Gender (ref. female)	.70* [.49, .99]	.62* [.40, .95]		
First language (ref. English)	2.04*** [1.37, 3.04]	1.91** [1.23, 2.97]		
Citizenship status – international student (ref. Canadian)	.35*** [.20, .63]			

Note. OR = odds ratio; CI = confidence interval

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Discussion

The above investigation provides the first critical analysis of student data collected by the Registrar's Office at the University of Toronto Scarborough. It is also one of the first studies to evaluate and compare predictors of academic outcomes between local-born, immigrant, and international students in Canada across a range of outcome parameters. Predictors of academic performance, dropout, and return to studies after dropout were identified, both those specific to certain time points and student groups, and those common across them, offering some targets for intervention strategies. Male gender, English first language, immigrant status, and poor early academic performance predicted poor later performance. Older age at enrolment, English first language, immigrant and international student status, and poor academic performance predicted greater risk of dropout. Older age at enrolment, male gender, English first language, and international student status predicted less likelihood of return to studies after dropout. The effect sizes of the prediction models were large for academic performance, and generally modest (in Year 1) to moderate (in Year 3) for dropout, but small for return to studies. The sample size of the selected student cohort was large, supporting the validity of the results. The overall dropout rate across the three years of the investigation (34%) was similar to that reported by several other Canadian centres and Western countries (Bowler, 2009; Paton, 2012; Shaienks & Gluszynski, 2007).

Early academic performance was positively associated with later performance across time points and student groups. Higher Term 1 GPA strongly predicted better Year 1 performance, and higher Year 1 CGPA similarly predicted better overall performance by end of three years. In addition, poor academic performance predicted higher risk of dropout across time points and groups (except for international students in Year 1); this matches other research on the association of academic performance and dropout among post-secondary student samples (Pleskac et al., 2011; Schmitt et al., 2008; Shaienks et al., 2008) and also adds to the literature by demonstrating similar findings in the Canadian, immigrant, and international student subgroups. The combined results also confirmed the

internal findings of the UTSC administration that poor performance early in studies was an indicator of later academic outcomes. The strength of the prediction models for Year 1 and Year 3 academic performance (with over 80% of variance explained across student groups) was driven by the early academic indicators ($r^2 = .84$ to $.89$ per model), suggesting that students (regardless of citizenship status) may enter post-secondary studies with inadequate academic skills to succeed and that these difficulties persist over time. The link between poor academic skills and poor academic achievement is well known (Connor, Tyers, Modood, & Hillage, 2004; Cotton, George & Joyner, 2013; Sopoaga et al., 2013). Also in line with UTSC's internal findings, regression models utilizing early academic indicators to predict dropout, i.e., Term 1 GPA for Year 1 dropout and Year 1 CGPA for dropout over three years (not reported in this article), were significant. However, they were weaker (about 5% less variance explained) than those described in this article, which used time-matched academic indicators, i.e., Year 1 CGPA to predict Year 1 dropout and Year 3 CGPA to predict dropout over three years, indicating that performance record over time was a stronger influence on the decision to drop out than early grades, across groups. Interestingly, academic performance did not predict return to studies, implying that it was neither a deterrent nor an encouragement to such return and that other factors were more influential. The literature on contributors to return to studies is currently sparse, limiting speculation at this time. From the perspective of student development theory, the combined findings with academic performance and dropout fit well with Tinto's (1975, 1993) model, particularly the constructs of academic integration and goal commitment; in line with the model, these results suggest that lower academic integration, demonstrated by poor academic performance and goal achievement, led to progressive decrease in commitment to degree completion and ultimately to attrition. Tinto's model does not specifically address return to studies, but notes that external (non-academic) pressures also influence dropout (Tinto, 1993); by extrapolation, resolution of these pressures could facilitate a return to education.

Among other findings, older age at enrolment was associated with worse academic performance among international students by end of Year 3, and was linked to greater risk of dropout in the full student group and Canadian subgroup across time points. Other literature has similarly noted worse academic performance (Adam et al., 2015; Corak, 2011) and higher rates of dropout (ACCC, 2008; Shaienks et al., 2008) among older post-secondary students in general and those of both local and non-local

status. It has been suggested that, developmentally, these students may be at a different stage than younger students even from the same cohort, resulting in divergent challenges and priorities (Arnett, 2000) that may influence academic outcomes. Tinto (1975, 1993) has also noted that demographic subgroups (e.g., based on age) have unique attributes, experiences, and challenges/external demands that can affect integration and academic outcomes. Reflecting this, older students often have more difficulty adapting to academic requirements than younger students (Beck, Corak, & Tienda, 2012; Corak, 2011), as well as more personal and financial responsibilities (e.g., dependents, living costs) than younger peers, which may decrease commitment to school and increase interest in joining the workforce (ACCC, 2008), culminating in poorer academic outcomes (ACCC, 2008; Corak, 2011). Such factors may similarly explain why older age at enrolment was associated with lower likelihood of return to studies only in the Canadian subgroup in our analyses; this subgroup had the widest age range and the largest proportion of older students (see Table 1).

Male gender was associated with worse academic performance in the full student group and Canadian subgroup across time points, and among international students in Year 1. This reflects other research that has also noted worse performance among male than female post-secondary students, irrespective of citizenship status (Adam et al., 2015; Green, 2015; Wan Chik et al., 2012). Male gender was also associated with a lower likelihood of return to studies in the full student sample and Canadian subgroup, but contrary to previous studies (Shaienks et al., 2008; Wintre et al., 2008), was not linked to dropout in our cohort. However, it is unlikely that gender itself is the cause of these outcomes. Referring again to Tinto's (1975, 1993) theory and its recognition of the distinctive characteristics and challenges of demographic subgroups (e.g., gender groups) that can impact integration and academic outcomes, gender differences in academic and social engagement may be more pertinent to explaining these findings. Indeed, other research has noted that, compared to females, males overestimate their academic abilities, have poorer academic skills, are less likely to seek help with academic issues, and devote more time to the social than academic aspects of post-secondary life (e.g., sports, social drinking culture), leading to worse academic performance (Cotton et al., 2013). Similarly, low social support from family or from faculty and/or peers on campus has been linked to poor academic outcomes among all post-secondary students (Baquedano, 2011; Klink, Byars-Winston, & Bakken, 2008; Shaienks et al., 2008), but males generally report lower

levels of social support than females and are also less likely than females to seek and obtain such support, even when stressed/distressed (Bíró, Veres-Balajti, & Kósa, 2016; Deasy, Coughlan, Pironom, Jourdan, & Mannix-McNamara, 2014), with resulting negative effects on their academic parameters.

Those with a non-English first language had better academic performance in the Canadian subgroup in Year 1, less risk of dropout in the full student group and Canadian subgroup across time points, and more likelihood of return to studies in the full sample and Canadian subgroup. The findings appear paradoxical, as first language is often viewed as a signifier of language proficiency, and proficiency in the language of instruction (i.e., English) is usually linked to better academic outcomes (Green, 2015; Yu & Shen, 2012). Another seeming contradiction is that a non-English first language status predicted outcomes for Canadians alone among the student subgroups, even though it is generally assumed to be a larger influence on immigrant or international students. However, first language and language proficiency are not synonymous. As well, citizenship status is not an indicator of first language or language proficiency; indeed, in a culturally diverse country like Canada, many local-born citizens have a non-English first language but are fluent in English (Statistics Canada, 2012c), and a good percentage of immigrants to Canada have good English language proficiency from arrival (Ng, Pottie, & Spitzer, 2011). The predictive relationship between first language and the Canadian subgroup not only underscores that first language and citizenship status are discrete characteristics, but furthermore, also suggests that this subgroup may be driving the results. The idiosyncrasies of our student sample may provide further clarity. UTSC anecdotal reports indicate that a good proportion of Canadian students are of South/Southeast Asian ethnicity and although English is not their first language, they are fully bilingual; education and academic achievement are also highly valued in these communities (Picot & Hou, 2012). In Tinto's (1975, 1993) model, student characteristics, such as academic intentions and personal and family expectations, are noted contributors to academic outcomes, and thus, the findings may reflect the greater academic effort of Canadian students with a non-English first language due to such factors, compared to those with an English mother tongue.

Non-Canadian citizenship status was linked to worse academic performance among immigrant students compared to Canadians by end of Year 3, and strongly predicted greater risk of dropout across time points among both immigrant and international students compared to Canadians. These findings are similar to those of the few other

investigations that have examined associations between citizenship status and academic performance (Adam et al., 2015; Green, 2015; Stegers-Jager et al., 2012) and citizenship status and dropout (Shaienks et al., 2008; Shaienks & Gluszynski, 2007). Non-Canadian citizenship also predicted less likelihood of return to studies among international students compared to Canadians. As citizenship status is not an adequate causal factor for poor academic outcomes, related but more relevant influences are likely to be at play. Again referencing Tinto's (1975, 1993) model, group differences in academic ability and integration may better explain these results. The immigrant and international students in our sample were largely ethnic minorities; ethnic minority students have been found to participate less in class discussions and be less likely to ask questions or for help (Cotton et al., 2013), have more difficulties with course content and workloads (ACCC, 2008) and also have lower entry qualifications for post-secondary studies (Connor et al., 2004; Sopoaga et al., 2013) than non-ethnic minorities, which can affect performance and may also contribute to their higher dropout (Connor et al., 2004; Sopoaga et al., 2013). Other research has found that ethnic minority students are much more likely to select a degree program based on parents' choice rather than personal interests compared to non-ethnic minorities (Cotton et al., 2013; Connor et al., 2004), which may impact academic motivation, performance, and persistence. Drawing on posited associations of external pressures (Tinto, 1993) and poor adaptation and coping (Bean & Eaton, 2000) with academic outcomes, group differences in challenges and coping may also be an influence. It is reported that compared to local-born peers, immigrant and international students experience lower social support due to the loss of the social support networks in their birth countries (Hunley, 2010; Suarez-Orozco et al., 2009), that financial pressures can weigh more heavily on them due to inequities in personal/family income and employment opportunities (MHCC, 2009; Smith & Khawaja, 2011), and that acculturative stress is common among them and is associated with higher psychological distress (Tinghög et al., 2010; Zhang & Goodson, 2011); such difficulties are linked to poorer academic outcomes among these students (Chow, 2006; Smith & Khawaja, 2011).

Besides the differential outcomes between Canadian and non-Canadian students noted above, results also varied between immigrant and international students within and across time points. Immigrant, but not international, students had worse academic performance than Canadians in Year 3. However, male gender (in Year 1) and older age at enrolment (in Year 3) were associated with worse academic performance among

international students, but not among immigrants. Year 1 CGPA predicted Year 1 dropout among immigrants but not among international students. However, while Year 3 CGPA predicted dropout in both groups, higher Year 3 CGPA reduced the risk to a much lower degree among international students (37%) than among immigrants (80%). International students, but not immigrants, had lower odds of return to studies than Canadians. Considering Tinto's (1975, 1993) model once more, differences between immigrant and international students in academic and social integration may play a role. As noted earlier, the immigrant and international students in our cohort were predominantly ethnic minorities. Compared to local post-secondary students (including ethnic minority locals), ethnic minority international students have been found to be overconfident about their academic abilities (males more so than females) but also to have poorer study skills (Cotton et al., 2013), as well as to underperform compared to local students of both ethnic minority and majority groups (Cotton et al., 2013; Sopoaga et al., 2013). Further, while immigrant students often arrive in their new country at a young age with opportunity to adapt to a new academic system before entering post-secondary studies (Beck et al., 2012; Corak, 2011), international students tend to arrive at the onset of post-secondary studies with little academic acclimatization time (Smith & Khawaja, 2011; Mori, 2000), which may contribute to the higher stress and poorer academic adjustment and performance noted over time among international students compared to local peers (Hunley, 2010; Rienties & Tempelaar, 2013). In addition, immigrant students relocate with their families and have at least family support in their new country, while international students often have no family or personal connections locally (Smith & Khawaja, 2011), and poor language skills often inhibit their ability to integrate socially with other students (Cotton et al., 2013) and build new support networks (Chen, 1999; Mori, 2000), with resulting, ongoing impact on their social adjustment and academic outcomes (Rienties & Tempelaar, 2013; Smith & Khawaja, 2011).

An important benefit of evaluating the predictive value of factors contributing to academic failure is for use in early detection of at-risk students and application of targeted interventions. It is of significance, however, that although there was much overlap between the predictors of academic performance, dropout, and return to studies identified in our analyses, the strength of the prediction models varied widely—84–89% (strong) for academic performance, but only 17–38% (moderate) for dropout (excluding the weak model of 7% for international students) and 5–7% (weak) for return to studies. Further,

while some variables were consistent predictors across time points and groups (e.g., CGPA for academic performance and dropout), others were significant only at certain time points and for specific student groups (e.g., age at enrolment and first language for academic performance). The practical implication of this is that one-size-fits-all programs to improve academic performance may not be adequate to prevent attrition or boost return to studies across student groups, and vice versa. Contributors to early academic failure may also differ from contributors to failure later in post-secondary studies. Separate, but intersecting, initiatives may be needed that can work collaboratively to improve student functioning and retention and assist with their evolving academic and life challenges, and also address group-specific vulnerability factors. The lesser model strengths for dropout and return to studies also suggest that other variables, not included in the analyses (possibly those proposed by the theoretical models described previously), may be able to predict these academic parameters more robustly across student groups and would be valuable to identify to increase the effectiveness of the initiatives. Nonetheless, study results do point to interventions that may be worth considering. The predictive role played by academic performance indicators in overall academic outcomes would support retention initiatives that include instruction on academic skills and overcoming learning obstacles, which would help to improve grades and would benefit all vulnerable students (ACCC, 2007; Gaughf, Foster, & Williams, 2014), including older students, male students, and immigrant or international students, who all had worse academic outcomes in our analyses. In addition, though not directly indicated by the results of this study but supported by the literature and the inferences of our findings, provision on campus of mental health education and peer mentors (Davies, Morriss, & Glazebrook, 2014; Hryciw, Tangalakis, Supple, & Best, 2013), cognitive and problem-solving skills-building workshops (Bean & Eaton, 2000, 2001), and academic, personal, and social support services (Reavley, Ross, Killackey, & Jorm, 2013; Tinto, 1993), would be useful for all students. These could help to improve students' academic and coping skills, reduce stress/distress, boost help-seeking and support, and thereby enhance their academic and social integration and academic outcomes.

Limitations of the Study

The strengths of the study have been noted previously. However, several limitations are acknowledged. The largely modest–moderate strength prediction models for dropout and the weak models for return to studies limit the practical applicability of their results. The study design is retrospective in nature, and analyses were limited to the relatively narrow scope of data (basic demographics, academic performance) collected by the Registrar’s Office at UTSC. Thus, it was not possible to assess the impact of a wider range of socio-demographic, psychosocial, and academic functioning factors that have been noted in the literature, including in student development models, as influences on academic failure among all student groups and that may have contributed to stronger prediction models, particularly for dropout and return to studies.

A further limitation is that the Canadian students were treated as a homogeneous group, but would logically include immigrants who had become citizens through naturalization. As UTSC does not track this information, it was not possible to know the proportion of naturalized citizens that would have been more appropriately categorized as immigrants. As well, while date of entry to Canada and country of origin were well documented for international students, this was largely lacking for immigrant students; such information may have enabled the evaluation of duration in Canada (with associated implications for acculturation and academic adaptation; see Corak, 2011; Zhang & Goodson, 2011) as an additional predictor for the immigrant and international student subgroups. Similarly, ethnicity, which may also influence academic outcomes across groups (Green, 2015; Woolf et al., 2011), was not formally collected for any student group, and thus also could not be evaluated as a predictor variable. Although country of origin was recorded for international students, nationality and ethnicity are not equivalent, and available ethnicity-related information for the Canadian and immigrant subgroups was only anecdotal.

Another important limitation is that, like most other academic centres, reasons for dropout were not tracked by the Registrar’s Office. It is possible that students may have left to join a different educational institution, or even planned to return to studies later, rather than drop out of post-secondary studies completely (Grayson & Grayson, 2003; Wintre, Bowers, Gordner, & Lange, 2006). Indeed, Canadian studies show that a good proportion of students who withdraw from one institution (60%) do so in order to

enrol at another one (Wintre et al., 2006). Feeling a poor fit with the program of study or institution or changes in needs or goals (such as wanting to work or financial difficulties) have been more frequently cited as reasons for dropout by Canadian students than poor academic performance (Shaiens & Gluszynski, 2007; Wintre et al., 2008; Wintre & Morgan, 2009). This is very reflective of the developmental concerns of this population, such as self-determination, educational and career exploration, and dealing with the benefits and challenges of increasing independence (Arnett, 2000, 2004). It also fits with Tinto's (1975, 1993) theory of student departure and the contributions of poor integration and external demands to dropout. Expanding on this, Canadian data also show that a majority of the students who transferred to a second academic centre reported better fit and adjustment, and a large proportion of these students also went on to graduate from that institution (Wintre et al., 2006; Wintre & Morgan, 2009). Availability of such stratified information as reasons for dropout and future plans after dropout in the UTSC database could have altered the definition of dropout used in the study, and thereby the results.

Conclusion

In summary, the current investigation is an important first step in identifying predictors of academic performance, dropout, and return to studies that are both common to and differentiate between local-born, immigrant, and international students at a major Canadian post-secondary institution. It is of note that due to the narrow range of variables evaluated, the predictors identified offer only a preliminary framework for the understanding and prevention of academic failure among these students. A larger prospective, longitudinal study that assesses a more comprehensive range of factors (sociodemographic, psychosocial, and academic functioning in nature) for their contribution to academic outcomes in these groups would be valuable. Such an investigation is currently underway; it will examine predictors of both academic success and failure and could lead to the development of novel, well-targeted initiatives to improve student functioning, performance, and retention.

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