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Students Starting University: Exploring Factors That Promote Success for First-Year International and Domestic Students

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There are many factors that influence the first-year university student experience, and these factors can vary depending on student characteristics. In this research, using survey data, we explore differences between domestic Canadian and international (non-Canadian) first year university students across four categories that have been identified in past research. These categories broadly influence student success: individual factors, psychological needs, social relationships and connections to campus, and learning preferences and behaviors. Two hundred and seventy-two students (domestic: $N = 185$, international: $N = 86$) responded to quantitative individual difference items. International students reported greater drive, higher self-esteem, and placed greater importance on strong social networks, social life, and faith. Further, as compared to domestic first-year students, international students reported higher campus engagement, greater preferences for textbooks and online tutorials, being alone with their thoughts, higher confidence with their major choice, and reported studying more. Importantly, international students were less likely to feel they had a safe place to live in comparison to domestic students (all $p < 0.05$). These data show that international students come to campus with differential needs, styles, and experiences, which can inform approaches taken by institutions in supporting their students' success.

Keywords: student success, individual differences, international students, domestic students, university transition

INTRODUCTION

Approximately 54% of Canadians have some sort of higher education qualification (Statistics Canada, 2017). The Canadian college and university system is comprised of over 440 institutions (Council of Ministers of Education [CMEC], 2021). These institutions are overwhelmingly public, ranging from very large institutions of over 70,000 to institutions under 1,000. Universities offer full undergraduate degree programs, and most offer some graduate programs. Colleges tend to be more vocational in focus, but many colleges also offer some range of undergraduate degree programs. Approximately half of students borrow money to pay for their education (Statistics Canada, 2020).

In the 2018/2019 academic year, there were over 2.1 million students enrolled in Canadian public universities and colleges. Of those students, 344,430 were international, an increase of 16.2% over the previous academic year, whereas the domestic student population decreased

by 0.5% (Statistics Canada, 2020). International students are actively contributing to Canadian postsecondary success and have a profound impact on the Canadian economic system. Over the past decade, the international student population has more than tripled, representing over 55% of the total enrollment growth within Canadian Universities (Statistics Canada, 2020), bringing different cultural perspectives, worldly contribution and attitudes, and knowledge that contributes to the image and development of the university and all students who attend (Vertesi, 1999; Bowry, 2002; Ngobia, 2011). International students also broaden the knowledge and understanding of their home countries, cultures, and global issues that western society may not consider impactful due to proximity (Hayle, 2008; Parsons, 2010). Thus, it is important for university administration and faculty to understand factors related to success of both domestic and international students when it comes to transitioning into university, student success, and the challenges they face during their first year of their post-secondary education.

Theoretical Background

Transitioning into university can be both exciting and difficult (Goff, 2011). Data from more than fifty years of research has identified core elements to the successful transition of students to post-secondary education (Perry, 1970; Kohlberg, 1976; Gilligan, 1977, 1982; Belenky et al., 1986). Highlighting just one model for student success, it has been argued that there are three factors to consider when understanding student success: Inputs (demographic, past experiences, etc.), environment (experiences and supports available during university) and outcomes (how the students' beliefs, knowledge, values, attitudes have evolved post-graduation) (Astin, 1994, 2007). In exploring reasons why students do *not* succeed, again exploring just one model, three specific reasons have been suggested to account for why students leave post-secondary education: Academic problems (e.g., academic skills); failure to socially and intellectually integrate into the campus culture; and low levels of commitment to educational goals (Tinto, 1993).

As understanding of student experience increases, additional factors have been identified as relevant for student success. For example, adopting and maintaining a healthy lifestyle proves to be a challenge to students that impacts their academic abilities (Racette et al., 2008; Vella-Zarb and Elgar, 2009; Crombie et al., 2013; Mueller et al., 2018; Sogari et al., 2018). Although many students are in good health at the time of university enrollment, undesirable lifestyle habits such as overeating, lack of exercise, alcohol and drug use, and poor sleep habits, developed through childhood and adolescence, can hinder students during university years (Crombie et al., 2009, 2013; McLean-Meyinsse et al., 2013; McComb and Kirkpatrick, 2016; Schroeter et al., 2019). Likewise, despite providing students with information about dangers associated with the intake of drugs, alcohol, over-eating, and other health-related behaviors, research suggests that post-secondary students engage in habits that may be unhealthy and potentially hazardous (Guthrie et al., 2015).

Highlighting lifestyle factors that can contribute to student success, most students are not meeting the recommended guidelines of physical activity, are eating less than the recommended servings of fruit and vegetables per day (Guthrie et al., 2015) replacing produce with unhealthy options (Mueller et al., 2018), and are struggling with sleep deprivation and stress (Caldwell et al., 2011). Many students experience loneliness, a general sense of unease, fear of missing out (FOMO), and feelings of inadequacy and not belonging on campus (Barker et al., 2016, 2018). Indeed, there are many well-documented challenges when transitioning into university. Despite the importance of international students in our campus communities, most of this literature pertains to domestic (and typically US) students and does not consider how transitioning into post-secondary education as an international student may differ from the domestic student experience.

Exploring Factors Associated With Post-secondary Transition for International Students

The term "international student," intended to refer to students who consider their home to be outside of the country in which they are schooling, is intentionally broad. Students from across the world study across the world. International students of course will experience the transition to post-secondary differently, and for many possible reasons. That said, there are some challenges that are shared among international students regardless of home and institution country. When considering the transition to post-secondary education, there are reasons to expect that international students may experience this transition differently than domestic students. For example, international students may be facing difficulties associated with moving to an entirely new country. Early research associated this "culture shock" to homesickness, loneliness, mental health decline, language challenges, adjustment to climate and food, financial concerns, and employability (Klineberg and Hull, 1979; Church, 1982; Berry et al., 1987; Chataway and Berry, 1989; Uehara and Hicks, 1989; Rohrlich, 1991). These experiences are important for the academic experience: in one study, international students who were on academic probation believed that these challenges were due to "culture shock" (Poyrazli and Isaiah, 2018).

In addition to international students experiencing the transition to post-secondary differently from domestic students, research has demonstrated that international students may also *cope with*, or at least perceive, the transition into post-secondary education differently than domestic students (Hanbazaza et al., 2017; Huang, 2017). Indeed, international students may handle the transition better than once was believed (Grayson, 2008, 2011). Although it was initially believed that international students experience difficulties making friends (Chapdelaine and Alexitch, 2004; Lin, 2006), more recent research demonstrates that international students report making the same number of friends and spending roughly the same amount of time with their friends, as domestic students do (Grayson, 2008). Further, international students reported having a wider range of friends from different cultures, including domestic Canadian students, in comparison to domestic students (Grayson, 2008). International students were also more actively involved in campus-related

activities such as clubs and councils, and cultural events than domestic students (Grayson, 2011). Data such as these suggest that international students are engaging with their campus communities in positive ways. Indeed, there are many important predictors of positive campus engagement: research has found that academic relationships with faculty and staff, willingness to seek advice, and making friends while on campus were positive factors related to international student success. Further, it was found that social relationships and the connections on campus are what helped international students bounce back from an academic probation situation (Poyrazli and Isaiah, 2018).

In addition to shared experiences of international students, there are of course also culture-specific factors that can influence transition to an international study experience. As one example, a shared challenge faced by international Chinese students in the United States stemmed from socio-cultural differences pertaining to the collectivistic and individualistic culture differences between North America and China (Heng, 2021). Thus, international students have both shared and unique transitions into post-secondary education.

The Current Research Question

This research project was designed to better understand factors facilitating both domestic and international student success in post-secondary education. Drawing on past research, we explore four broad classes of variables related to student success, comparing experiences of domestic and international students. These four classes of variables were selected based on student success literature and include (1) individual factors, (2) psychological needs, (3) social relationships and connections to campus, and (4) learning preferences and behaviors By understanding how these categories specifically differ between international and domestic students, we aim to provide new guidance and insights to post-secondary education institutions for supporting students as they transition into university.

Individual Factors

Many individual difference variables are relevant for student success. In this research, we explore the Big 5 as a trait-based understanding of personality, self-esteem, person- and thing-orientations, locus of control, and achievement motivation.

Personality is often thought of in the context of the Big 5 Personality Traits (e.g., Costa and McCrae, 1992): openness, agreeableness, conscientiousness, neuroticism, and extraversion. In this research, we explore individual difference variables including a very brief measure of the Big 5, self-esteem, person- and thing- orientations, and locus of control.

There is ample evidence that the Big 5 traits (neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness) are related to student success. More specifically, conscientiousness (Noftle and Robins, 2007; Caprara et al., 2011; Komarraju et al., 2011; De Feyter et al., 2012; Ivcevic and Brackett, 2014) extraversion (Komarraju et al., 2011; De Feyter et al., 2012), openness (Noftle and Robins, 2007; Poropat, 2009; Komarraju et al., 2011), and agreeableness (Poropat, 2009; Komarraju et al., 2011) have positive relationships with student success and overall achievement. Neuroticism on the

other hand has mixed results. One study found that individuals higher in self-efficacy and neuroticism did experience academic success (De Feyter et al., 2012), and another that states that neuroticism only correlates positively with academic success in highly intelligent students (McKenzie, 1989; McKenzie et al., 2000). Where other studies have shown that individuals scoring high in neuroticism experience more anxiety and worry which impacts their overall student success negatively (Hess et al., 2000; Komarraju et al., 2011; Schneider and Preckel, 2017). When considering the cross-cultural differences related to these personality traits, there is evidence to suggest that the measurement of what the traits themselves are, does not differ (Rolland, 2002; McCrae and Terracciano, 2005). For example, extraversion is the same in China, Germany, and Canada. Some research has compared cultures relative to the Big Five personality traits, and have found that individuals from the United States, Canada, and New Zealand tend to score higher on extraversion in comparison to Asian countries (McCrae and Terracciano, 2005). That being said, research studies like this are discussing an average within their specific data, and it should be noted that there are large amounts of variability in all cultures (Costa et al., 2001).

Self-esteem is an overall evaluation of the self, and can be either positive or negative (Rosenberg, 1965). Although *self-esteem* has been argued to be related to student success, early studies cast doubt on this relationship (e.g., Seligman, 1994). Interestingly, though positive self-esteem is associated with many positive outcomes, and indeed it was found to be the most dominant and powerful predictor of happiness in some research (Furnham and Cheng, 2000), the influence of self-esteem in the context of education is not necessarily intuitive. It was previously believed that the relationship between self-esteem and academic performance was a bi-directional relationship where self-esteem changed direction based on the academic performance with higher self-esteem reported when the individual is satisfied with their academic performance, and lower self-esteem when the individual is not satisfied with their academic performance (e.g., Trautwein et al., 2006). However, some research suggests that this bi-directional relationship may be linked to both low and high self-esteem individuals using self-handicapping strategies for different reasons (Martin and Brawley, 2002). Research has also demonstrated that a multidimensional measure of self-esteem (global self-esteem, academic self-esteem, physical ability self-esteem) may explain inconsistent findings, especially in situations when there is self-threat to specific domains (i.e., academia) (MacKinnon et al., 2015). Given the lack of clarity as to the role that self-esteem plays in academic success, we have included it for exploration. That being said, there is literature that does suggest that western cultures value self-esteem more than collectivist cultures (Brown, 2008), but most of these come from differences pertaining to cultural value indicators, and gender related equality (Bleidorn et al., 2016). This would suggest that self-esteem may be more of a concern for the domestic students.

Person- and Thing-Orientations capture the degree to which individuals selectively orient toward "person-based" (e.g., human-based) and "thing-based" (e.g., inanimate-based) stimuli in their environment, and it is thought that individuals gravitate

to those sources that are most preferable (McIntyre and Graziano, 2019). These orientations have been shown to predict choice of major and retention within "thing" oriented disciplines in post-secondary contexts (e.g., STEM-oriented disciplines) (Woodcock et al., 2013; Bunce et al., 2017). Further demonstrating the importance of understanding person- and thing- orientations in the context of education, individuals stronger in thing-orientation have better recall of information when reading text (McIntyre et al., 2021). More specifically, in this study (McIntyre et al., 2021) the researchers used three brief educational texts discussing science and technology, which included two versions that manipulated the orientations (person and thing) to see if individuals who were stronger in either person or thing orientation recalled more information. It was found that the framing was not significant, but that individuals stronger in thing-orientation had better recall of the text. This study demonstrates that individuals who are stronger in Thing-orientation will thrive in an environment that focuses on text related recall. Thus, individuals who are person-oriented may use other forms of learning. Importantly, despite the importance of person- and thing- orientation in the context of education, relatively little is known about cross-cultural differences in these factors, and data have not been conclusive in determining reliable differences between cultures (Woodcock et al., 2013).

Research has demonstrated that STEM-based programs are typically "thing" oriented disciplines (Woodcock et al., 2013). Given that almost one-third of the students enrolled in STEM-type programs in Canada were international students, and 1 in 5 medical students are international students (Frenette et al., 2020), exploring student success in light of person- and thing-orientation may provide new insights into ways to support students based on their dominant orientation.

Locus of Control (Rotter, 1966) is the degree to which an individual feels they have control over events in their lives, and it is an important factor in determining successful goal attainment. If a student has an *internal* locus of control, this student likely feels that they are achieving academically based on their own work, abilities, prosocial behaviors, and academic focus (Rotter, 1966; Hopkins et al., 2020). In contrast, students with an *external* locus of control tend to associate their academic outcomes and performance on chance, luck, fate, and other variables outside of their control (Rotter, 1966; Hopkins et al., 2020). A student's locus of control orientation, whether it be internal or external, reflects their learning attitude. Internal locus of control has been found to be positively correlated with academic achievement (Millar and Irving, 1995; Karaman and Watson, 2017; Chukwuorji et al., 2018) and higher levels of academic achievement in comparison to undergraduates with an external locus of control (Ghonsooly and Elahi, 2010; Sagone and De Caroli, 2014; Hopkins et al., 2020). Understanding whether a student has internal or external locus of control will be an asset in building student resources to match their needs for pursuing academic success (Rotter, 1966; Rinn et al., 2014; Naik, 2015). There is evidence to suggest that there are cross-cultural differences related to locus of control, between western and eastern societies (Parsons and Schneider, 1974), specifically that Asian countries have significantly higher external locus of control

scores in comparison to all other countries. In the same study, it was also found that students from India scored significantly lower in external locus of control in comparison to Canadian, Japanese, and French students. There was very little variability within western cultures pertaining to locus of control (Parsons and Schneider, 1974; Krampen and Wieberg, 1981).

Individuals vary in their levels of motivation for achievement. *The Achievement Goals Questionnaire* (Elliot and Sheldon, 1997) was constructed to understand how the motive to avoid failure (or the fear of failing) influenced goal-specific outcomes, and how the difference between motive to avoid failure and the need for achievement impacted student success outcomes. Research by Elliot and Church (1997), Elliot and Sheldon (1997), Elliot (1999), Elliot and Covington (2001), Elliot and McGregor (2001), Elliot and Thrash (2002), and Harackiewicz et al. (2002) has highlighted the importance of understanding whether students are avoiding failure, or striding for achievement, and how that changes their goal outcomes within academia. There is a dearth of research comparing and contrasting the role of academic achievement motivation between international and domestic students. This literature is large (Schwinger et al., 2021), and there has been a great deal of discussion around students' motivations to achieve their academic goals, and the outcomes of their success pertaining to how they approach their academics (Ross et al., 2002). Many different factors influence these outcomes (Elliot and McGregor, 2001; Elliot and Church, 2003), from self-esteem (Rhodewalt and Tragakis, 2002; Covington, 2004), personality traits (Ross et al., 2002; Conrad and Patry, 2012), self-efficacy (Arazzini Stewart and De George-Walker, 2014), self-concept, and several emotional-motivational variables (Dweck, 2017) such as fear of failure (Elliot and Church, 2003; Martin and Marsh, 2003; De Castella et al., 2013), avoidance, test anxiety (Martin et al., 2014), and past levels of achievement (Covington, 2004), all leading to self-handicapping (Schwinger et al., 2014). Understanding students' achievement goals will give an insight into many factors relevant to student success outcomes.

Psychological Needs

Psychological needs may also vary substantially between domestic and international students. Students who do not have a safe place to live, access to healthy food, and adequate sleep face significant barriers to success. Specifically pertaining to psychological needs, we explore whether international students have their basic needs met differently than domestic students. Highlighting the importance of exploring the satisfaction of basic needs, although international students are able to finance significant fees given their status, many have little additional income or funds available after their arrival, are limited in how much they can work (20 hours per week in Canada) and thus experience financial difficulties (Calder et al., 2016; Haverila et al., 2020).

Social Relationships and Connection to Campus

As noted by many student success theorists (e.g., Tinto, 1993, 2010; Astin, 1994, 2007), a student's sense of belonging is extremely important to their adjustment to university. This can be measured in several ways. For example, one can assess *social belonging* and their connection to the university, *campus*

engagement, and the importance of their *social relationships* and *social life*. International students gain a community through their social interactions on campus with both domestic and other international students (Rienties and Nolan, 2014). In addition, international students are necessarily isolated from their friends and family in their home countries once they leave for post-secondary education. Similarly, and perhaps most important for international students, the support available from their families who may be far away may greatly impact their success. Finally, their level of *faith* may be important factors in their ability and motivation to succeed (Jeynes, 2003; Regenerus, 2003; Burges et al., 2009; Chukwuorji et al., 2018), and again, could reasonably differ across domestic and international student groups.

Learning Preferences and Behaviors

Students who have low commitment to educational goals (e.g., Tinto, 1993, 2010) may have difficulty adapting to the academic culture, and thus may struggle. Although the concept of "learning styles" is not supported by research (e.g., Newton, 2015) it is certainly the case that students can identify preferences for types of learning experiences (Deale, 2019) and the match between their experience and learning preferences can influence their commitment to their education. If those learning preferences do not match the approaches used on campus, this may negatively affect student experience and success. It is not clear, however, if student learning preferences meaningfully link to success outcomes (Fan et al., 2015). Finally, considerations such as current study habits, confidence in and commitment to the selected major, and believing in one's ability to achieve their goals (i.e., *self-efficacy*) are important to understand (Tinto, 1993, 2010). There is evidence to suggest that students from individualistic societies learn better by "doing," where collectivistic students are learning more through "watching" (Marsh et al., 2006; Holtbrügge and Mohr, 2010; Sugahara and Boland, 2010), which may have a great impact on how they approach their studies overall.

OVERVIEW OF RESEARCH

This study sought to explore how constructs related to (1) individual factors, (2) psychological needs, (3) social relationships and connections to campus, and (4) learning preferences vary across a diverse group of first-year students. As discussed above, there are many relevant factors that can impact student success in the first year. However, first-year students are not a monolithic group. What characterizes a first-year student in terms of their personality, habits, and demographics may differ dramatically by whether they are domestic or international students. The purpose of our research was to begin to explore some of those differences and provide insight into what implications may come from those differences. Though we do hypothesize that international students will experience these factors differently than domestic students, we understand that this study is predominantly exploratory in nature, and we hope to learn more about how international students differ from domestic students when transitioning into university.

MATERIALS AND METHODS

Participants and Procedure

Our survey instrument was sent via email to 1493 incoming undergraduate students at a mid-size, primarily undergraduate public university on the east coast of Canada. Participants had 2 weeks to complete the survey. The university has approximately 6,700 total students with a diverse student body, 32% of whom come from over 100 countries across the globe. Most international students come from five countries or regions: China, South Asia, the Caribbean, Africa, and the Middle East. Overall, sex is equally (50:50) split, with 90% of students doing undergraduate studies in Social Sciences and Humanities, Business, or Science programs. The vast majority (86%) of students are full-time and most (67%) of students come to the university directly from high school (versus transfer from other universities/college).

Four hundred and eleven (27.5% response rate) began the survey and 272 provided sufficient responses to be usable. Students (120 Male, 146 female) ranged in age from 16 to 48 ($M = 19.00$); 248 were new undergraduate students. One hundred eighty-five respondents were domestic students and eighty-six were international[1], with the majority (144; 53%) indicating they were Caucasian (see **Table 1** for all demographic variables).

Survey Instrument

Due to space constraints, because this was an exploratory research project seeking to gain understanding differences between domestic and international students entering university across many constructs, the survey consisted of several pre-established scales, selected items from pre-established scales, and items constructed for the purpose of this study. In order to limit the size of the questionnaire that students completed, we used short (empirically validated) versions of scales, or a subset of items from those scales (see **Appendix**). In addition to asking students general demographic information, we asked questions broken into four categories: (1) individual factors, (2) psychological needs, (3) social relationships and connections to campus, and (4) learning preferences and behaviors. The survey took on average 16 min to complete.

Demographics

Students were asked to report personal characteristics (age, gender, degree program registered in, employment, relationship status, number of children, fitness level, diet, exercise and activities, socio-economic status, current living arrangements) and whether they were first generation students (i.e., had no parent or stepparent who graduated from college or university) (see **Table 1**).

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[1] 19.5% of the international students were from East Asia. 17.2% were from Africa. 16.1% were from South East Asia. 14.9% were from the Caribbean. 12.6% were from the Middle East. 9.2% were from Europe. 5.7% were from the United States of America. 2.3% were from South America. 1.1% were from Mexico. 1.1% were from Australia.

TABLE 1 | Demographics.

Characteristics	Domestic		International		Total sample		χ^2	p
	n	%	n	%	N	%		
Gender							4.419	0.220
Male	82	44.3	38	44.2	120	44.1		
Female	100	54.1	45	52.3	146	53.7		
Other	2	1.1	–	–	2	0.7		
Prefer not to say	1	0.5	3	3.5	4	1.5		
Age	M:	19.02	M:	18.97				
SES							1.554	0.460
Low	34	18.4	11	12.8	45	17.6		
Middle	136	73.5	66	76.7	203	74.6		
High	15	8.1	9	10.5	24	8.8		
Faculty							5.289	0.382
Arts	56	30.3	20	23.3	77	28.3		
Commerce	89	48.1	43	50	132	48.5		
Science	28	15.1	20	23.3	48	17.6		
Engineering	10	5.4	2	2.3	12	4.4		
Environment studies	2	1	1	1.2	3	1.1		
First Generation							2.261	0.133
Yes	50	27	16	18.6	67	24.6		
No	135	73	70	81.4	205	75.4		
Living arrangements							20.459	<0.001***
Home with Family	82	44.3	17	19.8	99	36.4		
Residence	73	39.5	42	48.8	116	42.6		
1 + roommates	23	12.4	25	29.1	48	17.6		
Living alone	7	3.8	2	2.3	9	3.3		
Relationship Status							14.738	0.002**
Yes	69	37.3	16	18.6	85	31.3		
No	95	51.4	58	67.4	153	56.3		
It's complicated	20	10.8	8	9.3	29	10.7		
Prefer not to say	1	0.5	4	4.7	5	1.8		
Children							0.324	0.569
Yes	4	2.2	1	1.2	5	1.8		
No	181	97.8	85	98.8	267	98.2		
Diet							3.331	0.343
Poor	22	11.9	11	12.8	36	13.2		
Average	96	51.9	53	61.6	150	55.1		
Good	55	29.7	17	19.8	72	26.5		
Excellent	9	4.9	5	5.8	14	5.1		
Physical Activity							15.644	0.001**
No activity	22	11.9	10	11.6	32	11.8		
Occasionally	63	34.1	46	53.5	109	40.1		
2–3 times a week	57	30.8	25	29.1	83	30.5		
4 + times a week	43	23.2	5	5.8	48	17.6		
Employment							19.125	<0.001***
Employed	83	44.9	15	17.4	98	36		
Unemployed	102	55.1	71	82.6	174	64		

N = 271.
Chi-square tests: ***p < 0.001, **p < 0.01.

Individual Factors

Personality was measured using the 50-item IPIP representation of the Big-Five Markers (subscales: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness) as presented by Goldberg (1992). For all items, participants are asked to respond to statements starting with "I. . .", allowing them to respond to the

statement in relation to themselves. Extraversion was measured with a 10-item scale ($\alpha = 0.892$) with statements like "... feel comfortable around people" or "...am quiet around strangers." Agreeableness was measured with a 10-item scale ($\alpha = 0.789$) with statements like "...take time out for others" or "...insult people." Conscientiousness was measured with a 10-item scale ($\alpha = 0.747$) with statements like "...am always prepared" or "...make a mess of things." Neuroticism was measured with a 10-item scale ($\alpha = 0.841$) with statements like "...am relaxed most of the time" or "...get upset easily." Openness was measured with a 10-item scale ($\alpha = 0.776$) with statements like "...have a vivid imagination" or "...do not have a good imagination". Response options were along a 5-point Likert scale from "very inaccurate" to "very accurate."

We used a subset of questions within The Achievement Goals Questionnaire (AGQ) (Elliot and Sheldon, 1997). Fourteen items were selected based on relevance to academia. Respondents are asked to indicate on a 1–7 Likert-type scale from "not at all" to "very true of me" how much each item is true for them. Sample items include "avoid procrastination" and "impress others with my achievements." These questions were assessed individually, as each question could provide insight into student goals.

We used only two items to measure person- and thing-orientations (Graziano et al., 2011) which assessed agreement to the questions: "I like to talk with others when I'm trying to understand new things" (person orientation) and "I like to take things apart to see how they work" (thing orientation) on a 1–7 Likert-type scale from "strongly disagree" to "strongly agree."

Self-esteem was measured by a single item "I see myself as someone who has high self-esteem" with a 1–7 Likert-type scale from "strongly disagree" to "strongly agree." This single item measurement is justified within the self-esteem literature (Robins et al., 2001a,b, 2002; De Cremer et al., 2005).

Locus of control was measured via two items which assessed agreement to the questions: "I feel like I am in control of my destiny" (internal locus of control) and "I feel like powerful others have a lot of control over how my life will turn out" (external locus of control) with a 1–7 Likert-type scale from "strongly disagree" to "strongly agree."

Psychological Needs

Psychological needs were measured by four items. Sleep was measured via two-items. The first item related to sleep, "I get as much as I need," was measured on a 1–7 Likert-type scale from "strongly disagree" to "strongly agree." The second item asked students to self-report how many hours they sleep within 24 h. Healthy food intake was measured by a single-item "I am confident I will have access to healthy food in the foreseeable future" measured on a 1–7 Likert-type scale from "strongly disagree" to "strongly agree." Safe living environment was also measured by a single item "I have a safe place to live for the foreseeable future" measured on a 1–7 Likert-type scale from "strongly disagree" to "strongly agree."

Social Relationships and Connection to Campus

Social relationships were measured via five separate items adapted from surveys that have been used on campus for several years, and which are derived from National Surveys such as the Canadian University Survey Consortium (CUSC) and National Survey of Student Engagement (NSSE). The items assessed agreement to the questions: "It's important to me that I have a strong social network on campus," "Building relationships with others is an important outcome for me in university," "I can easily connect with my family and friends if I want to (either in-person or with technology)," "My social life is the most important part of being in school," and "Faith is important to me" on a 1–7 Likert-type scale from "strongly disagree" to "strongly agree." Connection to campus was measured via two separate items which assessed agreement to the questions: "I feel connected to the university" and "I intend to be engaged in campus activities this year" on a 1–7 Likert-type scale from "strongly disagree" to "strongly agree."

Learning Preferences and Behaviors

Learning preferences were measured by nine items, where students were asked to respond to the question "I learn best when..." with options such as "when I am alone with my thoughts" or "when I am in a study group". Response options were along a 1-7 Likert-type scale from "strongly disagree" to "strongly agree." Students also self-reported hours spent on studying outside of class time per week. Self-efficacy was measured via a single-item "when I make plans, I am certain I can make them work" (Sherer et al., 1982), with a 1–7 Likert-type scale from "strongly disagree" to "strongly agree." Students were also asked if they knew what major they wanted to take; their response option was also along a 1–7 Likert-type scale from "strongly disagree" to "strongly agree."

RESULTS

Overview

We have provided overall scores on all the different individual factors measured[2]. Due to the unequal group size between international and domestic students (see **Table 1**), we conducted non-parametric Wilcoxon–Mann–Whitney U Test to determine the differences between these two groups on the variables previously mentioned using assigned mean ranking.[3] A Bonferroni correction was tested on the variables due to the multiple tests that were run, and Wilcoxon–Mann–Whitney U Test analysis being known for type-1 errors (Zimmerman, 2004). This correction was set at $p = 0.002$ (0.10/47 tests). That being said, due to the exploratory nature of the study, there will still be discussion related to the variables that are showing p-values below 0.05 (**Table 2**). We also explored the role of the student home country in the program, socio-economic status, gender, first-generation status, sleep habits, studying habits,

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[2] All variables were assessed for Multicollinearity. All VIF are < 5, and all tolerances are > 0.200, meaning there were no issues with multicollinearity with the variables.

[3] A MANOVA was also completed as generally speaking MANOVA is robust to violations of assumptions. The analysis yielded similar results. Due to the unequal sample size within the two groups, a non-parametric analysis was most appropriate to control for unequal variance. Mean Rank has been given within the analyses instead of actual means as is appropriate to the non-parametric analysis.

TABLE 2 | Mean rank comparisons between domestic and international students on all variables.

Item	Domestic		International		U	P
	Rank Average	Rank Total	Rank Average	Rank Total		
Individual Factor Variables						
Big Five Personality						
Extraversion	134.95	24966.50	138.25	11889.50	0.104	0.747
Agreeableness	139.30	25771.00	128.90	11085.00	1.040	0.308
Conscientiousness	136.06	25172.00	135.86	11684.00	0.000	0.984
Neuroticism	133.18	24638.00	142.07	12218.00	0.757	0.384
Openness	140.82	26052.00	125.63	10804.00	2.214	0.137
Self-Esteem	130.85	24207.00	147.08	12649.00	2.622	0.105
Orientation						
Person	129.88	24027.00	149.17	12829.00	3.969	0.046[t]
Thing	128.65	23800.50	151.81	13055.50	5.282	0.022[t]
Locus of Control						
Internal	138.00	25529.50	131.70	11326.50	0.399	0.528
External	135.35	25039.00	137.41	11817.00	0.042	0.838
AGQ Items						
Avoid Procrastination	127.20	23531.50	154.94	13324.50	7.657	0.006[t]
Impress others with my accomplishments	138.05	25539.50	131.59	11316.50	0.412	0.521
Make my parents proud of me	137.50	25438.00	132.77	11418.00	0.225	0.635
Avoid wasting time	**126.24**	**23354.50**	**156.99**	**13501.50**	**9.389**	**0.002***
Avoid stressful situations	137.09	25362.00	133.65	11494.00	0.117	0.732
Fulfill all my responsibilities	139.14	25741.50	129.24	11114.50	0.999	0.318
Be on time for appointments	**145.82**	**26976.00**	**114.88**	**9880.00**	**10.619**	**0.001***
Do things the best I can	142.25	26317.00	122.55	10539.00	3.992	0.046[t]
Learn new things	136.35	25225.00	135.24	11631.00	0.012	0.911
Motivate myself toward my goals	132.83	24573.00	142.83	12283.00	0.995	0.318
Avoid being overwhelmed by all I have to do	133.24	24649.50	141.94	12206.50	0.741	0.389
Be creative	135.70	25104.50	136.65	11751.50	0.009	0.925
Not get behind in my work	138.19	25565.00	131.29	11291.00	0.476	0.490
Make clear goals for my future	133.05	24615.00	142.34	142.34	0.854	0.355
Psychological Needs Measures						
Safe place to live	**145.61**	**26938.00**	**115.33**	**9918.00**	**9.860**	**0.002***
Healthy food access	142.91	26439.00	121.13	10417.00	5.047	0.025[t]
Needed Sleep	131.44	24317.00	145.80	12539.00	2.031	0.154
Time spent sleeping	142.57	26375.50	121.87	10480.50	4.311	0.038[t]
Social Relations and Connections to Campus						
Strong social network	126.69	23437.50	156.03	13418.50	8.749	0.003[t]
Building relationships	131.37	24304.00	145.95	12552.00	2.197	0.138
Easy Family connection	141.80	26232.50	123.53	10623.50	3.664	0.056
Social life most important	126.64	23428.00	156.14	13428.00	8.640	0.003[t]
Faith	**113.23**	**20947.50**	**184.98**	**15908.50**	**50.441**	**<0.001***
Connected to the Uni.	134.96	24967.50	138.24	11888.50	0.107	0.743
Campus engagement	129.36	23932.00	150.28	12924.00	4.442	0.035[t]
Learning Preferences and Behaviors						
Learning Styles						
Study group	134.30	24846.00	139.65	12010.00	0.282	0.596
Alone with thoughts	129.16	23894.00	150.72	12962.00	4.708	0.030[t]
Asking Questions	133.49	24696.50	141.39	12159.50	0.643	0.423
Online-tutorials	129.31	23921.50	150.40	12934.50	4.491	0.034[t]
Textbook	**120.97**	**22380.00**	**168.33**	**14476.00**	**22.369**	**<0.001***
Hands on	136.69	25288.00	134.51	11568.00	0.052	0.820
Demonstrations	140.42	25977.50	126.49	10878.50	2.129	0.145
Visual aids	137.37	25413.00	133.06	11443.00	0.201	0.654
Audio	132.86	24580.00	142.74	12276.00	0.971	0.325
Time spent studying	127.72	23501.00	152.14	13084.00	5.752	0.016[t]
Self-Efficacy	136.07	25172.50	135.85	11683.50	0.000	0.983
Major	128.30	23735.50	152.56	13120.50	5.906	0.015[t]

Bonferroni correction significance p = 0.002*, [t]below 0.05.

family structure, relationship status, diet, physical activity, and employment as well (see **Table 1**).

Individual Factor Variables
Big Five
No significant differences were found for any of the Big Five measures for domestic versus international students.

Self-Esteem
No significant differences were found related to self-esteem.

Person-Thing Orientation
International students (mean rank = 149.17) reported being more person oriented compared to domestic students (mean rank = 129.88, U = 9088, p = 0.046). International students (mean rank = 151.81) also reported being more thing oriented compared to domestic students (mean rank = 128.65, U = 9314.5, p = 0.022).

Locus of Control
There were no significant differences regarding both internal and external locus of control.

Achievement Goals Questionnaire Items
International students (mean rank = 154.94) reported avoiding procrastination more compared to domestic students (mean rank = 127.20, U = 9583.5, p = 0.006). International students (mean rank = 156.99) reported that they avoid wasting time more than domestic students (mean rank = 126.24, U = 9760.5, p = 0.002). Domestic students (mean rank = 145.82) reported being on time for appointments more than international students reported (mean rank = 114.88, U = 6139, p = 0.001). Domestic students (mean rank = 142.25) also reported that they do things the best that they can more than international students reported (mean rank = 122.55, U = 6798, p = 0.046). There were no significant differences on the other ten items pertaining to achievement goals.

Psychological Needs Measures
Safe Living Environment
In terms of believing they had a safe place to live for the near future, international students (mean rank = 115.33) reported less belief in this than domestic students (mean rank = 145.61, U = 6177, p = 0.002).

Food Security
In terms of believing they had access to healthy food, international students (mean rank = 121.13) reported less belief in this in comparison to domestic students (mean rank = 142.91, U = 6676, p = 0.025). This finding also supports our hypothesis and is reflected in the use of the food bank food bank on the campus where the survey was conducted. At that food bank over 60% of users are international students compared to being approximately 30% of students on campus (Daniels, 2021).

Sleep
There were no significant differences in self-reported hours of sleep needed, however, there was a significant difference relative to how many actual hours international students (mean rank = 121.87; mean hours: 6.85) slept throughout the day in comparison to domestic students (mean rank = 142.57; mean hours: 7.16). Domestic students reported sleeping more (U = 6739.5, p = 0.038). Although international students are getting less sleep, they do not appear to perceive this as a concern.

Social Relations and Connection to Campus
Strong Social Network
International students (mean rank = 156.03) reported that it was more important to have a strong social network in comparison to domestic students (mean rank = 126.69, U = 9677.5, p = 0.003).

Building Relationships
There were no significant differences in terms of perceived important outcomes of building relationships with others.

Connecting With Family and Friends
There were no significant differences in terms of perceived ability to connect with family and friends.

Social Life Importance
International students (mean rank = 156.14) were more likely to feel that their social life was the most important part of school in comparison to the domestic students (mean rank = 126.64, U = 9687, p = 0.003).

Faith
Perhaps the strongest difference was on the question regarding the importance of faith in a student's life. International students reported more importance of faith (mean rank = 184.98) than domestic students (mean rank = 113.23, U = 12167.50, p < 0.001).

Campus Engagement
International students (mean rank = 150.28) reported higher intentions for campus engagement than domestic students (mean rank = 129.36, U = 9183, p = 0.035).

University Connection
There were no significant differences in terms of university connection.

Learning Preferences and Behaviors
Learning Preferences
International students reported a preference for *using the textbook* (mean rank = 168.33) as compared to domestic students (mean rank = 120.97, U = 10735, p < 0.001). International students also reported a preference for being *alone with their thoughts* (mean rank = 150.72) and using *online tutorials* (mean rank = 150.40) as compared to domestic students (mean rank = 129.16, U = 9221, p = 0.03; and mean rank = 129.31, U = 9193.5, p = 0.034).

Study Hours
International students reported studying for more hours per week (mean rank = 152.14; Mean hours: 14.56) than domestic students (mean rank = 127.72; Mean hours: 11.16, U = 9343, p = 0.016).

Self-Efficacy
There were no significant differences in terms of self-efficacy.

Major

International students (mean rank = 152.56) were more confident in their knowledge of what major they want to pursue in comparison to domestic students (mean rank = 128.30, $U = 9379.5$, $p = 0.015$).

DISCUSSION

Summary of Findings

This research was an exploratory project to begin to understand differences between domestic and international students across four categories: (1) individual factors, (2) psychological needs, (3) social relationships and connections to campus, and (4) learning preferences and behaviors.

Interestingly, there were few differences between international and domestic students on most variables pertaining to individual factors that we explored. Using only two items, international students scored higher on both person- and thing- orientations than did domestic students. While the literature in this field is novel when it comes to international students and person- and thing- orientations (Woodcock et al., 2013), these findings would suggest institutions should be focusing on both types of learning styles when implementing course content. Future research should explore these differences more carefully and explore them within the context of a student program of study. Further, future research should also explore whether these orientations motivate both access and receptivity to different forms of academic support.

Psychological needs (see **Appendix**) were the variables that were most informative in terms of critical support needed for international students. Domestic students were more likely to report having a safe place to live for the near future, and more likely to report believing they had access to healthy food. The literature supports these findings, in that international students do struggle on average more than expected after their arrival as they are limited in how much money they can legally earn (Calder et al., 2016; Haverila et al., 2020). This is an indicator that basic needs may not be met for international students and should be a priority to be explored in greater detail within specific campus communities.

Our data suggested the clear importance of social relationships for international students, as compared to domestic students consistent with the literature (Rienties and Nolan, 2014). International students, as compared to domestic students, reported greater importance for a strong social network, greater importance for a social life, and higher intentions for campus engagement. It could be that the need for and importance of social networks are more salient for international students where domestic students are likely to be in closer proximity to their friends and families.

An important difference between domestic and international students in this category was their difference in rating of the importance of faith. International students placed much more importance on faith than did domestic students. This is supported by the literature (Jeynes, 2003; Regenerus, 2003; Burges et al., 2009; Chukwuorji et al., 2018) in that western cultures do not place as much importance on faith and religious practices. It is important that campus communities ensure comfortable access to faith-based resources for students, especially for international students who may not have clear access to these resources in the local community.

Based on this study, there appear to be differences in study behaviors for international and domestic students. International students prefer using the textbook, being alone with their thoughts, and using online tutorials to a greater degree than domestic students. This mirrors the literature pertaining to international students learning more through "watching" in comparison to "doing" (Marsh et al., 2006; Holtbrügge and Mohr, 2010; Sugahara and Boland, 2010). It should be noted that international students in this study did report that they were both Person and Thing oriented; thus they also may enjoy learning through "doing", but it highlights their preference for "watching" which may be predictive of their ultimate engagement with their studies. International students also report studying more than domestic students and have more confidence in knowing what major they want to pursue.

Many variables assessed showed no significant differences between international and domestic student in this sample. This was not entirely unexpected. It does suggest that institutions can use these results to understand when different strategies might be more effective with diverse groups of students. There are also many variables we did not assess. An example could be to explore self-handicapping, and how these factors lead to students succeeding (Schwinger et al., 2021).

Limitations and Future Directions

Despite the valuable contributions and insights provided by these data, some limitations and directions for future research remain. For example, all these data were self-reported. Although this is reasonable for personality and demographic data, there are opportunities for collecting objective measures regarding topics such health, grades, financial situation, etc., which could be worth exploring in the future.

A second limitation is that these data come from a single Canadian institution. It is likely that the mix of students at other institutions, as well as type and location of institutions could influence student responses. Thus, future work should look at other institutions in other locales to determine if similar results would be found or if different patterns might emerge.

It is also worth noting that for the purposes of this analysis, the international students were all grouped together instead of broken out by country (they could come from vastly different cultures). Because the international students at the study institution were varied and resulted in small group sizes when broken down, sub-analyses could not be done to look at the impact of country or region or original on the results. However, it stands to reason that this could have an impact. Exploring larger samples of specific populations in future research could identify valuable distinctions between groups.

Also, due to the number of variables that were assessed within the analysis, there is a probability that a family-wise type-1 error may have occurred. A Bonferroni correction was conducted and was explained that significance was at $p = 0.002$, but with the

nature of the study, we felt it necessary to discuss any variables that approached significance under p-values of 0.05.

As previously discussed, this paper took a broad and exploratory approach to measuring a variety of characteristics of students and their experiences. However, as noted in our introduction, methods, and results sections, in order to reduce as much as possible, the length of the questionnaire, we often used single-item measures of constructs (e.g., self-esteem) or only smaller subscales of existing measures. This is clearly a limitation in that it is possible that complete scales may have resulted in different outcomes. However, given the fact that few differences were found (e.g., especially on personality), this suggests that this broader approach may be an effective way to identify key characteristics or measures that should be explored further in future research.

Finally, as the survey was administered to incoming students, it would be interesting to see the survey re-administered to the same students at a later point. They may have different perceptions post the first semester, and it would be insightful to explore whether their full experience of their first semester changed their responses in the future.

CONCLUSION

What the research presented here has demonstrated is that students come to university with their own set of individual characteristics, preferences, experiences, and needs. Institutions who want to support the success of their students need to understand what those differences are. Although domestic versus international is one way of thinking about, and assessing, student uniqueness, it has within it a variety of differences that can be assessed. It is quite plausible that there is more variability within domestic or international student populations than between them but understanding differences across groups is vital as well. This research takes one step to assess differences across domains such as student personality, needs, and preferences.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

This research involved human participants and was reviewed and approved by the Saint Mary's University Research Ethics Board. Participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

SS: development of theory, verified the analytical methods, investigated the findings of the results, contributed to the manuscript development, and completed revisions. KC-R: contributed to design and relevant items in study, performed the data analysis, contributed to the manuscript development, completed revisions, including analysis, and writing. MN: development of theory, methodology, and contributed to the manuscript development. TB: consultation of expertise, contributed to the theory, and editing to the manuscript. All authors contributed to the article and approved the submitted version.

FUNDING

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APPENDIX

Appendix | Items measurements.

Individual Factors		

Personality	Extraversion	(1) Am the life of the party. (+)
(All personality measures were measured on a 5-Likert Scale, 1 being Strongly disagree to 5 being Strongly agree).		(2) Feel comfortable around people. (+)
		(3) Start conversations. (+)
		(4) Talk to a lot of different people at parties. (+)
		(5) Don't mind being the center of attention. (+)
		(6) Keep in the background. (−)
		(7) Don't talk a lot. (−)
		(8) Have little to say. (−)
		(9) Don't like to draw attention to myself. (−)
		(10) Am quiet around strangers. (−)
	Agreeableness	(1) Am interested in people. (+)
		(2) Sympathize with others' feelings. (+)
		(3) Have a soft heart. (+)
		(4) Take time out for others. (+)
		(5) Feel others' emotions. (+)
		(6) Make people feel at ease. (+)
		(7) Am not really interested in others. (−)
		(8) Insult people. (−)
		(9) Am not interested in other people's problems. (−)
		(10) Feel little concern for others. (−)
	Conscientiousness	(1) Am always prepared. (+)
		(2) Pay attention to details. (+)
		(3) Get chores done right away. (+)
		(4) Like order. (+)
		(5) Follow a schedule. (+)
		(6) Am exacting in my work. (+)
		(7) Leave my belongings around. (−)
		(8) Make a mess of things. (−)
		(9) Often forget to put things back in their proper place. (−)
		(10) Shirk my duties. (−)
	Neuroticism (Emotional Stability)	(1) Am relaxed most of the time. (+)
		(2) Seldom feel blue. (+)
		(3) Get stressed out easily. (−)
		(4) Worry about things. (−)
		(5) Am easily disturbed. (−)
		(6) Get upset easily. (−)
		(7) Change my mood a lot. (−)
		(8) Have frequent mood swings. (−)
		(9) Get irritated easily. (−)
		(10) Often feel blue. (−)
	Openness	(1) Have a rich vocabulary. (+)
		(2) Have a vivid imagination. (+)
		(3) Have excellent ideas. (+)
		(4) Am quick to understand things. (+)
		(5) Use difficult words. (+)
		(6) Spend time reflecting on things. (+)
		(7) Am full of ideas. (+)
		(8) Have difficulty understanding abstract ideas. (−)
		(9) Am not interested in abstract ideas. (−)
		(10) Do not have a good imagination. (−)
Achievement Goal Questionnaire (Subset) "During the past couple of weeks, please think about how much these statements are true to you" *(Measured on a 7-Likert Type Scale 1 being Not at all to 7 being Very true of me)*		(1) Avoid procrastination
		(2) Impress others with my accomplishments
		(3) Make my parents proud of me
		(4) Avoid wasting time
		(5) Avoid stressful situations
		(6) Fulfill all my responsibilities

(Continued)

Appendix | (Continued)

Individual Factors

		(7) Be on time for appointments
		(8) Do things the best I can
		(9) Learn new things
		(10) Motivate myself toward my goals
		(11) Avoid being overwhelmed by all I have to do
		(12) Be creative
		(13) Not get behind in my work
		(14) Make clear goals for my future
Goal Orientation	Person Orientation	I like to talk with others when I'm trying to understand new things
(Measured on a 7-Likert Type Scale 1 being Strongly Disagree to 7 being Strongly Agree)	Thing Orientation	I like to take things apart to see how they work
Locus of Control	Internal	I feel like I am in control of my destiny
(Measured on a 7-Likert Type Scale 1 being Strongly Disagree to 7 being Strongly Agree)	External	I feel like powerful others have a lot of control over how my life will turn out
Psychological Needs		
(Measured on a 7-Likert Type Scale 1 being Strongly Disagree to 7 being Strongly Agree)	Sleep	(1) I get as much sleep as I need.* (2) On average, how many hours do you sleep in each 24-h period? (Number)
	Healthy Food	I am confident I will have access to healthy food in the foreseeable future*
	Safe Living	I have a safe place to live for the foreseeable future*
Social Relationships and Connection to Campus		
(Measured on a 7-Likert Type Scale 1 being Strongly Disagree to 7 being Strongly Agree)	Social Relationships	(1) It's important to me that I have a strong social network on campus (2) Building relationships with others is an important outcome for me in university (3) I can easily connect with my family and friends if I want to (either in-person or with technology) (4) My social life is the most important part of being in school (5) Faith is important to me
	Connection to Campus	(1) I feel connected to the university (2) I intend to be engaged in campus activities this year
Learning Preferences and Behaviors		
(Measured on a 7-Likert Type Scale 1 being Strongly Disagree to 7 being Strongly Agree)	Learning Preferences	(1) I am in a study group (2) I am alone with my thoughts (3) When asking questions (4) There are online tutorials (5) Reading the textbook (6) There are hands on experiences (7) There are demonstrations (8) There are visual aids (9) There is audio (e.g., podcasts)
(Measured on a 7-Likert Type Scale 1 being Strongly Disagree to 7 being Strongly Agree)	Behaviors	(1) Each week, how many hours do you typically spend (outside of class) studying or doing schoolwork? (Number) (2) When I make plans, I am certain I can make them work* (3) I know what major I want to take.*