The Impact of Academic Acculturation and Language Proficiency on International Students' University Experience and Academic Success: A Longitudinal Study

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The Canadian Academic English Language (CAEL) assessment is a proficiency test for university admission. Most research has focused on the paper edition, not the recent computer edition (CE). Validity research on other proficiency tests found that relationships between proficiency scores and academic achievement measures can be tenuous because other factors intervene in students' chances to succeed. Research on academic success has examined academic acculturation (Berry, 1997) as one factor. However, the impact of acculturation on academic achievement has not been examined alongside language proficiency test scores. The current study investigated this issue by focusing on students with a range of CAEL scores and examining the relationship between CAEL-CE scores, academic achievement, and academic acculturation. Forty-four students at a Canadian English-medium university participated in the study. Students' grade point averages were obtained, and an academic acculturation questionnaire was administered. A subset of participants partook in focus groups. The findings and their implications are discussed.

Keywords: academic acculturation, academic achievement, academic adjustment, CAEL, international students, English language proficiency, first year university experience

International student enrollment at Canadian universities has increased dramatically in recent years: Enrollment grew threefold between 2008 and 2018, whereas domestic student numbers increased by only 10% over the same period (Statistics Canada, 2020), with 721,205 representing the largest number of international students ever in Canada in 2018 (Global Affairs Canada, 2020). In other words, 15% of all university students were international students in 2018, with the percentage rising to over 30% in mathematics and computer and informational sciences (Frenette, Choi, & Doreleyers, 2020) and accounting for 28% of all graduate students in 2014 (Universities Canada, 2014). The vast majority study in the three provinces with the largest population: Ontario (46% of international students), Quebec (15%), and British Columbia (22%; Canadian Bureau for International Education, 2020). These students contributed CND$21.6 billion to the country's universities and wider economy in 2018 and thereby supported nearly 170,000 Canadian jobs in 2016 (Global Affairs Canada, 2020).

Given these statistics, we see a definite need to examine how these students fare once they get to their chosen Canadian university. Periodically, concerns are voiced both in the general media (e.g., Dehass, 2013; Hiatt, 2018) and academic publications (e.g., Benzie, 2010; Friesen & Keeney, 2013; Hobbis, 2013; Müller & Daller, 2019) about whether international students have the necessary language skills to succeed in English-medium universities. Previous research has examined language proficiency and academic acculturation as factors that impact international students' academic success. Universities generally rely on standardized proficiency tests in order to determine whether or not students have the minimum language level for admission. An important Canadian test accepted by many Canadian institutions is the Canadian Academic English Language test, or CAEL (https://www.cael.ca/). However, there has been little research investigating predictive evidence of validity for its use in university admission. The current study addresses this gap

and examines the relationship between students' language proficiency as measured by the

CAEL, level of academic acculturation, and academic success.

The CAEL, language proficiency, and academic achievement

Research into predictive evidence of validity for other proficiency tests, such as the TOEFL

(Test of English as a Foreign Language) and IELTS (International English Language Testing

System), has examined the relationship between test scores and academic achievement,

usually through correlations. These correlations tend to be small (i.e., around .25; Plonsky &

Oswald, 2014)[1]. For the TOEFL, correlations coefficients between test scores and students'

grade point average (GPA) range from .22 to .30 (Hill, Storch, & Lynch, 1999; Light, Xu, &

Mossop, 1987). When students were grouped by high and low GPA (Van Nelson, Nelson, &

Malone, 2004) or high and low proficiency test scores and academic discipline (Cho &

Bridgeman, 2012), the strength of the association between scores and GPA increased. The

same applied when country of origin was considered (Bridgeman, Cho, & DiPietro, 2016).

Ginther and Yan (2018) examined the relationship between TOEFL subscores and GPAs in

their study and found that the relationship between the TOEFL scores and GPA varied by

subscore profile: Students with a *discrepant* profile (very high reading and listening and very

low speaking and writing scores) had lower GPAs than students with the other two score

profiles (those with lower speaking subscores compared to the other areas and those with

subscores of 21 in all skills). Findings for research on the IELTS vary somewhat: Some

studies found medium (Plonsky & Oswald, 2014) correlations between IELTS scores and

students' GPAs (Cotton & Conrow, 1998; Kerstjens & Nery, 2000; Woodrow, 2006; Yen &

Kuzma, 2009), whereas relationships were small, non-existent, or even negative in others

(Arrigoni & Clark, 2010; Dooey & Oliver, 2002; Feast, 2002; Oliver, Vanderford, & Grote,

2012). These studies usually focus on GPAs at the end of the first year and tend not to track

students over the long term, with some exceptions (Cho & Bridgeman, 2012; Feast, 2002;

Van Nelson et al., 2004).

Little such research has been conducted on the CAEL. The test was originally developed at Carleton University in the 1980s as a paper-based test and was acquired by Paragon in 2015 (Paragon Testing Enterprises, 2015). Subsequently, Paragon revised the CAEL and transformed the paper edition (CAEL-PE) into a computer edition (CAEL-CE; Paragon Testing Enterprises, 2017). Fox (2004) examined the use of CAEL-PE scores to determine the language level needed for academic work at an English-medium university and examined students' learning trajectory post-admission. In that research context, the CAEL-PE served as a placement tool, and findings revealed a low misplacement rate (3%) and a high success rate of students in language and degree courses; lack of participation and attendance were discovered as likely culprits when students did not succeed. However, Fox did not examine the relationship between students' CAEL scores and GPAs. Furthermore, Fox's study was conducted on the paper-based version of the test. No research of this kind has been conducted on the CAEL-CE, which differs in format from the paper version.

As studies on the TOEFL and IELTS indicated, other factors are likely at play and impact students' academic achievement. Fox (2004) refers to the 'central importance of sociocultural factors relating to adjustment' (p. 461). Previous research has examined the relationship between language proficiency, academic self-concept, and academic achievement to show that a larger portion of variance in academic achievement can be accounted for if factors other than language proficiency are considered (Neumann, Padden, & McDonough, 2019). Fox suggests that the impact of academic acculturation on academic success jointly with language proficiency needs to be investigated further.

Academic acculturation

Acculturation research examines change at the individual and societal level when cultures come into contact and the effect on individuals' behaviour and well-being (Berry, 1997,

2017). In contrast, academic socialization research focuses 'on the nature of interactions and the role they play in socializing individuals into the different groups and social contexts in which they seek membership' (Zappa-Hollman, 2007, p. 459). In the following, we will review research on academic acculturation, which investigates the impact studying at a university outside the home country and culture has on students (acculturation), rather than the interactions and practices that students encounter at these institutions (socialization). Following Berry, we define academic acculturation as the process of adjustment to the university setting. Research on academic acculturation broadly focuses on (1) the relationship between students' level of acculturation and their language proficiency or barriers, (2) factors that enable students' acculturation, and (3) the link between acculturation and academic achievement. In the following, we will summarize key findings from these three areas of research.

Research on academic acculturation has examined the link between language and academic acculturation. Studies have found that more advanced language proficiency is associated with higher levels of academic acculturation (Anderson & Guan, 2018; Bastien, Seifen-Adkins, & Johnson, 2018; Chow, 2006; Kuo & Roysircar, 2004) and in turn academic achievement (Chow, 2006; Mamiseishvili, 2012; Poyrazli & Isaiah, 2018). These studies, however, determined language proficiency through self-assessments, not standardized proficiency tests; such self-assessments are inherently less reliable because participants may over- or underestimate their ability because of differences between how participants view their ability versus what they can actually do. There is a need, therefore, to examine this relationship through more reliable measures of language proficiency.

Language also appears as a factor in research focused on international students' challenges. Studies have found that language barriers or difficulties impact international students' academic acculturation (Keefe & Shi, 2017; Khanal & Gaulee, 2019; Leong, 2015;

Li et al., 2017; Moon, Zhang, Larke, & James, 2020; Sherry, Thomas, & Chui, 2010; C.-W. Wang, Singh, Bird, & Ives, 2008). Furthermore, students' perceptions of their English skills are linked to their well-being with lower language levels associated with higher rates of depression (Dao, Lee, & Chang, 2007), lower self-esteem, and higher stress levels, (Mukminin, 2019). Other studies found that students who had less confidence in their English abilities had greater self-esteem (Lopez & Bui, 2014). In sum, (perceived) language abilities are not only associated with students' academic acculturation but also their wellbeing in general.

Other research has focused on factors facilitating students' academic acculturation. Studies found that longer stays in host countries are associated with higher levels of acculturation (Cheng & Fox, 2008), whereas others found that shorter stays are linked to higher levels of acculturation (Salamonson, Everett, Koch, Andrew, & Davidson, 2008) and self-confidence (Lopez & Bui, 2014). In addition, strong social relationships (Elliot, Reid, & Baumfield, 2016), participation in English for academic purposes (EAP) courses (Fox, Cheng, Berman, Song, & Myles, 2006), and support available (Ramsay, Jones, & Barker, 2007) are all associated with higher levels of academic acculturation. In turn, academic acculturation and sense of belonging and wellbeing are often (Glass & Westmont, 2014; Rienties, Beausaert, Grohnert, Niemantsverdriet, & Kommers, 2012; Salamonson et al., 2008; Senerchia, 2015) but not always (Moní, Mealy, Del Ama, & Conway, 2018) linked to academic success. These studies highlight the complex interplay between language, academic acculturation, support, and academic achievement.

A final group of studies focused on other factors influencing international students' academic achievement. Generally, international students face more academic challenges than domestic students (Zhao, Kuh, & Carini, 2005). Discrimination and prejudice negatively affect their academic performance (Poyrazli & Isaiah, 2018) and well-being (Gbadamosi,

2018; Glass & Westmont, 2014; Sam, 2001; Yao, 2018). Other challenges include adjusting to differences in pedagogical practices (Gbadamosi, 2018; Leong, 2015; Moon et al., 2020; Mukminin, 2019; Poyrazli & Isaiah, 2018; C.-W. Wang et al., 2008) and social interactions (Leong, 2015; Li et al., 2017; Mukminin, 2019).

In brief, students' self-assessment of their language proficiency is associated with academic acculturation, and evidence suggests students' academic acculturation impact academic achievement. Research on the TOEFL and IELTS shows that language proficiency correlates with academic achievement at the end of the first year (e.g., Bridgeman et al., 2016; Kerstjens & Nery, 2000), but there has been little longitudinal research on this; moreover, this relationship has not been examined for the CAEL-CE, nor has it been explored if more of the variance in academic achievement can be explained when both language proficiency and academic acculturation are considered jointly. The current study was designed to examine this and was guided by the following research questions:

(1) Are CAEL-CE overall scores and subscores correlated to students' annual GPA at the end of the first and third[2] year of university?

(2) Is students' level of academic acculturation related to their academic performance during their first three years of study?

(3) Are certain student characteristics associated with higher levels of academic acculturation and achievement?

(4) What challenges do international students encounter and what are their support needs during the first-year academic acculturation?

Methods

Research context and participants

The study took place at an English-medium university in Canada. At this institution, applicants who have to provide proof of English language proficiency can satisfy this requirement through a TOEFL iBT score of at least 75 or equivalent. Forty-four international and permanent resident students (22 male; 22 female) aged 17 to 42 ($M = 23.5$; $SD = 5.74$) participated in this study. They had resided in Canada for 1 month to 5 years ($M = 1.6$; $SD = 1.6$) and came from a variety of first language (L1) backgrounds with Arabic (18%), Mandarin (11%), French (11%), Armenian (9%), and Spanish (9%) as most common; 41% of these students spoke French as an additional language. Most participants (82%) were enrolled in their first year in a variety of undergraduate degree programs: engineering and computer science (32%), business (16%), social science (14%), humanities (11%), natural science (9%), or fine arts (9%); 9% declared no major.

Procedures and instruments

Following approval of the institutional ethics review board, potential participants in their first year of study were identified based on their performance on an in-house EAP placement test designed to determine whether students have to take post-admission EAP courses. Potential participants belonged to one of three groups: those placed in Course 1 or 2 or those exempted from EAP courses. The second author invited 237 students to participate, and 44 took a research version of the CAEL-CE in a testing center following the usual protocol in March 2019. Students' responses to the CAEL-CE were submitted to Paragon for marking, and after scoring, overall and subscores for the four skills were sent to us.

Before taking the CAEL-CE, participants completed a consent form and a questionnaire. In addition to basic biographical data, the questionnaire elicited information about participants' language use at university and beyond as well as their comfort level in

conducting different tasks in English, communication challenges, and level of academic acculturation using closed-response, limited-response, and Likert-type items. The 13 Likert-type items relating to academic acculturation (see Appendix) were developed based on our research questions and review of the prior research in this area. Acculturation items 1 to 5 were designed to assess students' level of adjustment and comfort with concrete situations that they can be expected to encounter in the university setting. Items 6 to 13 focused on students' sense of belonging in terms of different aspects of the university setting (i.e., their professors and program and studying at English away from their home country), as this factor had been identified as significant in previous research (e.g., Glass & Westmont, 2014; Rienties et al., 2012; Salamonson et al., 2008; Senerchia, 2015). Items were written by the first researcher, and alignment of these items with the constructs was reviewed by the second researcher. We also piloted these items with the target population to ensure clarity of the items. An analysis of our academic acculturation scale revealed good internal consistency of these items (Cronbach's $\alpha = .815$).

Following the analysis of questionnaire responses, a focus group protocol was developed to explore students' perspectives on their comfort level studying in English and their challenges during their first year. Sixteen students agreed to participate. The second and third author conducted, video-recorded, transcribed, and analyzed all focus groups. Each focus group was conducted on campus with four to six students per group.

In order to assess academic success, students' cumulative grade point averages (GPA) were collected from the university's student data base at the end of their first year. To longitudinally track the impact of students' language proficiency and academic acculturation on their academic success and document any changes, a second phase of data collection was scheduled for the winter 2020 term. We were able to complete the second administration of the questionnaire, but other data collection was affected by the COVID-19 pandemic. Two

small focus groups with only two participants each were conducted using the videoconferencing platform Zoom after the end of the winter 2020 term. Students' impression of their studies at that point, however, were heavily coloured by the rapid transition to remote teaching and learning in March 2020. It is beyond the scope of this article to outline the impact of remote learning on student achievement and success, especially for international students. It is pertinent, however, to outline the steps taken by the institution in our study to deal with the pandemic and mitigate any negative effects: First, this university cancelled the annual academic assessment, so no GPA data were available for 2019-2020. That data collection was therefore postponed until May 2021. As a result, our GPA data comes from Year 1 and 3 of the study, not Year 1 and 2 as originally planned. Even the delayed, post-pandemic GPA data are different, however, from pre-pandemic data as follows: (1) all *fail* grades were automatically converted to *DISC* (= course discontinued) grades and therefore not considered in the GPA calculation for the 2020-2021 academic year, and (2) students had the option to switch all courses in winter 2020 and one course each per term in the fall 2020 and winter 2021 sessions to *pass/fail* grades, which are also excluded from the GPA calculation[3]. In other words, the 2021 GPAs contain fewer failing and low grades; at the same time, these grades were not obtained under the same learning conditions as the 2019 GPA data. We have used GPA data as they were reported by the university in 2019 (Year 1) and 2021 (Year 3).

Data analysis

The questionnaire was analyzed with several goals: (1) compile the participants description (see above), (2) gain an understanding of participants' living situation and linguistic environment, (3) obtain students' self-assessment of their language skills, and (4) gauge their academic acculturation. Although above we critiqued the use of self-assessments as measures of language proficiency as unreliable, students' self-assessments of their skills in conjunction

with a reliable measure of proficiency such as CAEL-CE scores provide insight into how self-assessment and proficiency align and whether or how these two relate to academic acculturation and achievement. Closed and limited response items were coded and analyzed using descriptive statistics, while the Likert-type items on acculturation were converted into academic acculturation scores (AASs) by scoring each item on a four-point scale and converting the total score into percent. Since items 8, 9, 12, and 13 are worded negatively, these items were reverse-scored (i.e., 4 was converted into 1 etc.) We then examined the relationship between biographical factors and participants' AASs using descriptive statistics and correlations. To correct for restriction of range of CAEL overall and subscores in our sample, we used the Thorndike Case II correction formula as described by Sackett and Yang (2000; see also Ginther & Yan, 2018; Wiberg & Sundström, 2009). We chose this formula because the unrestricted variance is known for the selection variable (Ginther & Yan, 2018; Sackett & Yang, 2000; Wiberg & Sundström, 2009), in the case of our study the CAEL overall and subscores. Variance for these CAEL scores was obtained from the 2019 CAEL reliability report (Paragon Testing Enterprises, 2019) since our participants wrote the CAEL during that year.[4]

Data from the questionnaire were used to answer research questions 2 and 3. Since Moní et al. (2018) had found evidence that students' family bonds impact their sense of academic success, we conducted a MANOVA to examine the impact students' living situation on GPAs but also ASSs to help answer research question 3.

In order to answer research questions 1 to 3, we calculated Pearson correlation coefficients among AASs, CAEL-CE sub and overall scores, and GPAs. In addition, we examined change in AASs and GPA between first- and second-year AASs and between first (GPA-1Y) and third-year GPAs (GPA-3Y) by conducting a Wilcoxon signed-rank test.

Finally, we also examined the relationship between various biographic and linguistic variables and students' AASs.

In order to answer research questions 3 and 4, we drew on various data sources. First, the second author analyzed the focus group transcripts using thematic analysis with both inductive and deductive (theory-driven) coding of the data (Braun & Clarke, 2006). To ensure the reliability of our coding, the third author coded 15% of the focus group data, and Cohen's Kappa was .804. Any disagreements were resolved by discussion, and the second author reviewed the coding for the remaining data accordingly. The second author also debriefed with the first author about the analysis and reporting of the data.

Results

Before calculating the Pearson correlation coefficients between students' AASs, the CAEL-CE sub and overall scores, and GPA-1Y and GPA-3Y, we examined the scatterplots to look for outliers and check for linearity. Since both assumptions were met, we proceeded with our analysis. Table 1 displays the descriptive statistics, r values for these variables, and the corrected correlation coefficients. The mean for AASs with 78% is quite high, but individual scores among the participants vary greatly ($SD = 12.53$). As for the CAEL, writing subscores are the lowest and those for listening the highest, while reading scores have the highest standard deviation. The medium correlations (Plonsky & Oswald, 2014) between GPA-1Y and all subscores, except speaking, and the overall CAEL scores were statistically significant. All the corrected correlations are larger than the uncorrected ones except for the speaking subscore. This smaller corrected correlation for speaking is due to the smaller standard deviation in the population (10.95) compared to the standard deviation in our study (12.38). For GPA-Y3, the correlations are larger, as are the corrected correlations. AASs do not correlate with participants' GPAs or CAEL scores. We also examined the correlation between students' self-assessment of their skills and the correlations with AASs and GPAs. Self-

assessments for general English are higher than for academic contexts, with listening as the easiest and writing as the most difficult skill. Students' self-assessments of general and academic English skills do not correlate with GPAs but show small to large correlations to their AASs (see Table 2 for descriptive statistics and *r* values).

Table 1. Means, standard deviations, and Pearson correlation coefficients between AASs, CAEL-CE scores and GPAs

Variable	*M*	*SD*	(GPA-Y1)		(GPA-Y3)		(AAS)	
			r	corrected *r*	*r*	corrected *r*	*r*	corrected *r*
AAS (%)	78	12.53	.015	-	.056	-	-	-
CAEL-Writing	56	7.54	.376*	.497	.491**	.622	.108	.152
CAEL-Speaking	60	12.38	-.007	-.006	.063	.056	.119	.105
CAEL-Listening	65	12.85	.404**	.480	.514**	.596	-.013	-.016
CAEL-Reading	59	13.91	.407**	.569	.429**	.594	-.038	-.059
CAEL Overall	61	8.73	.441**	.570	.547**	.678	-.016	-.023
GPA-Y1	2.59	0.81	-	-	.845**	-	.015	-
GPA-Y3	2.72	0.67	.845**	-	-	-	0.056	-

Notes: * *p* < .05, ** *p* < .01; CAEL scores are reported on a scale from 10 to 90. GPA values range from 0 to 4.3 with 2.0 deemed satisfactory (= C grade).

Table 2. Means, standard deviations, and Pearson correlation coefficients between students' self-assessments, ASSs and GPA-Y1

Self-assessment (1=easy; 10=difficult)	*M*	*SD*	*r* (ASS)	*r* (GPA-Y1)
Speaking-academic	7.57	2.073	.646**	-.034
Listening-academic	8.68	1.272	.489**	.086
Reading-academic	8.55	1.454	.292	.000
Writing-academic	7.25	1.819	.364*	-.113
Speaking-general	8.45	1.823	.687**	-.027
Listening-general	9.23	1.097	.504**	-.070
Reading-general	9.0	1.181	.317*	.034
Writing-general	8.18	1.674	.399*	-.140

Finally, we compared AASs for Year 1 ($M = 79.1$, $SD = 7.86$) and 2 ($M = 77.6$, $SD = 11.22$) and cumulative GPA in Year 1 ($M = 2.59$, $SD = 0.82$) and Year 3 ($M = 2.72$, $SD = 0.67$) using Wilcoxon signed-rank tests. The results showed that there was no statically

significant difference in AASs between Year 1 and 2 ($Z = -.804$, $p = .442$). In contrast,

cumulative GPAs in Year 1 and 3 were statistically significantly different ($Z = -2.009$, $p =$

.045), with 13 negative ($M = 17.85$) and 25 positive ($M = 20.36$) ranks. In other words, about

two thirds of students obtained higher GPAs, whereas one third obtained lower GPAs at the

end of their third year compared to those at the end their first year.

Student questionnaire

We then analyzed the questionnaire. First, we looked more closely at students' living and

linguistic environments to examine the relationship between these variables and students'

AASs and GPAs. A third of participants lived either alone or with a roommate in residence or

an apartment; 40% lived with parents, siblings, and/or spouses. In order to examine the

impact of living situation on AASs and GPAs in Year 1 and 3, we conducted a MANOVA.

As Table 1 indicated, collinearity among AAS and GPAs is not an issue. For the MANOVA,

the Box's Test to examine the equality of covariance matrices was not significant ($p = .109$).

The findings from the MANOVA indicate that students' living situation did not influence

their AASs or GPAs-1Y, $F(4, 76) = 1.272$, $p = .289$; Wilk's $\Lambda = .878$. As shown in Table 3,

use of English in our participants' lives varies greatly. On the questionnaire, participants

entered self-reported percentages to indicate to what extent they used languages across

settings and communication modes (speaking, listening, reading, and writing). Across the

settings, percentages range from 0 to 100 with large standard deviations ranging from 17.3 to

39.3. Only the small to medium (Plonsky & Oswald, 2014) correlations between the AASs

and percentage of using English at work (.354) and speaking in English (.299) are statistically

significant. We also asked participants how they use English and their L1 at university. The

most common situations for English use at university were (1) attending and participating in

class (25%), (2) interacting orally and in writing with faculty and staff (23%), and (3) doing

schoolwork (16%). In contrast, students used their L1 or other languages to socialize with

friends and peers (61%), do schoolwork (14%), participate in leisure activities (9%), and communicate with family (8%).

Table 3. Use of English (%) and Pearson correlations coefficients with first-year AASs and GPAs

Setting/ Mode	*M*	*SD*	Minimum	Maximum	*r* (AAS)	*r* (GPA-Y1)
Home	34.5	32.6	0	100	.190	.234
School	85.4	23.3	0	100	.233	-.037
Work	55.9	39.9	0	100	.354*	-.156
Friends	51.7	26.5	0	100	.231	-.106
Family	10.5	18.3	0	80	.114	.202
To speak	66.6	23.0	10	100	.299*	-.104
To listen	77.0	17.3	20	100	-.017	-.048
To read	78.6	18.0	40	100	.424	.243
To write	66.8	25.1	20	100	.140	.190

* *p* < .05

Finally, we asked students about difficult situations at the university related to language and other areas, in which they require more support. Students most commonly reported encountering difficulty in regard to interactions with fluent English speakers (21%), writing (14%), vocabulary (14%), and accents (14%); however, 24% of the students did not encounter any language-related difficulties. In follow-up questions, we asked students to list the kind of desired support. Most commonly mentioned were language development opportunities (36%), integration activities (12%), and faculty (12%) and social (4%) support. Specifically, participants were interested in social activities to better integrate into the university (e.g., involvement with new environment), opportunities to volunteer in the

community, and interventions to address racism. Furthermore, students wanted professors to meet with them individually, be more understanding, and speak more slowly and clearly. Finally, students felt that English-speaking friends would provide practice opportunities to improve their language skills.

Student focus groups

The focus groups explored academic acculturation themes emerging from the questionnaire data. In the following, we will focus on the most commonly occurring themes from the first round of focus groups, which include obstacles encountered by our participants and cultural aspects and differences affecting our participants' experience. In addition, we will focus on one new theme that emerged from our second round of focus groups: a sense of adjustment.

Obstacles featured prominently and among the first mentioned were those concerning the admissions process and obtaining the necessary proficiency tests scores. These tests pose both a financial hurdle and a challenge when required scores cannot be obtained even after repeated testing. The following quote illustrates this:

> Okay so you take this test, right. You pay about $400 … and if you don't pass it, you need to take another one and pay exactly the same. And if you don't pass it again, … there's a course … they take, which also they need to pay money for. (SE, FG1)

Discussion also focused on academic and non-academic obstacles our participants faced during their university studies. First, participants encountered challenges with some professors and in certain programs. The students reported difficulties understanding some professors because of their professors' accents. In addition, students felt that feedback on learning was insufficient, especially assignments submitted and graded online. In some cases, culturally specific content proved challenging, such as references to card games on mathematics exams or Canadian companies in business courses. The challenges were aggravated by the fact that some participants perceived their professors unapproachable or

inaccessible. The following quote illustrates this: '99% of the time, I don't receive feedback' (RB, FG5). This can then be combined with difficulties in meeting with professors: 'If we want more information about [our] paper, we have to schedule office hours, and sometimes the teacher need[s] to … read it again and … won't … remember why she g[a]ve you that grade.' (TH, FG5). Other students felt the amount of feedback was connected to the type of course that they were taking:

> Actually, it depends on the course because in math and physics, for example, we never get feedbacks from our professor in our assignments, […] just a grade, […], but for ESL …, for example, we always get feedbacks from my professor, and that helps a lot. (MN, FG1)

Some students also experience anxiety about asking questions in the first place, 'I need to write the whole question before actually raising my hand' (SE, FG1). This anxiety can be aggravated or alleviated by the professor's attitude: 'Depends on the teacher; you know this term, … the teacher is so great; … for each question, he is giving a chocolate to everyone, … [but] I had a teacher who was like "don't ask stupid questions"' (VV, FG1); this reaction had serious consequences for the student's learning, 'that's … why people have doubts about whether I should ask or not' (VV, FG1).

Another prominent theme in our focus groups centered around **cultural aspects** of participants' experience. First, choice of major for their studies was influenced largely by cultural traditions, family members, and the home country's preferred careers and needs: 'For me, it's like in my country: … All people do civil or mechanic [engineering], so I want, I think, new things like computer stuff, or computer engineering. It's like more future for computer' (OF, FG1). 'We have something … in Syrian tradition that you will not take [= choose] your major; your family will do it [on] behalf of you.' (MF, FG2). In terms of choosing Canada and the university, again views on the importance of English and Canada

were important: 'You know, Canada is really good country to study, so I came here.' (OF, FG2). Other participants expand on this idea:

It's also about, you know, this American dream…. I was really attracted to … North America; my whole life, I always wanted to go here, and the Canada was the good choice because it's cheaper than anywhere else, and you get an opportunity to have something after your graduation, yeah. (VV, FG1)

In my country …, if someone gets North American degree, they become really like demandable in the job sector, and so Canada, USA, is the first choice in my country. (NT, FG1)

With regards to managing cultural differences, our participants pointed to the presence of other international students and a diverse student body as aiding their acculturation: 'Of course, … there is lots of international students; they can relate to us.' (RB, FG3) and 'I don't find myself …the only black or the only women, yeah. [The university] is so interactive, people respect one another' (FF, FG4). However, these differences also brought challenges when students were struggling to relate Canada-focused content to situations in their own countries. This concerned not only issues mentioned above regarding assessment but also their ability to understand concepts when the application of concepts to familiar situations in their home countries proved difficult:

In my youth popular culture class, … we are discussing … industrialization and factories and whatever the challenges. Most people are giving very good examples, but the example I knew was you have to reach a city in Kenya, so I brought them a picture of how that still exists and g[a]ve them the description, and they could easily [understand]. (FF, FG4)

One new theme emerged from focus groups at the end of the second year. Students described their **sense of adjustment** to studying in English and improvement in terms of the

language skills: 'I think after my first year, my English kind of improved a lot, I think. … My vocabulary just expanded a lot and also the construction of phrases and how to actually [write]' (TH, FG5). Another student stated, 'I understood basically everything my professors was saying' (RB, FG5). This feeling of being at ease in their new environment is summed up in the following quote:

> In the beginning, I am a little shy to speak in another language; it was actually what most I was kind of concerned, but when we have to use it like this every day, it makes part of your routine, so now I think I don't really have problems with this anymore.
>
> (TH, FG5)

Their sense of feeling more comfortable in English (i.e., encountering fewer issues with unknown vocabulary and oral comprehension as well as feeling more confident in their English abilities) is associated with feeling more at ease at university: 'As time pass[ed] by and as I got more familiar with it, I guess it got easier.' (TH, FG5)

Discussion and conclusion

In this section, we will return to our research questions (RQs), review our results to answer them, and relate our findings to the literature. RQ1 asked whether CAEL-CE overall scores and subscores are correlated to students' annual GPA at the end of the first and third year of study. The GPA-Y1 and Y3 showed medium (Plonsky & Oswald, 2014), positive, statistically significant correlations to writing, listening, reading, and overall CAEL-CE scores (see Table 1). In other words, students with higher CAEL overall and subscores were likely to have higher GPAs at the end of their first and third year, with the strength of that relationship increasing as students progressed in their studies (i.e., students with higher CAEL scores had even higher GPAs at the end of their third year). There is no prior research on the CAEL-CE in that regard, but these correlations are comparable to those in research on the TOEFL (Bridgeman et al., 2016; Cho & Bridgeman, 2012; Van Nelson et al., 2004) and IELTS

(Cotton & Conrow, 1998; Kerstjens & Nery, 2000; Woodrow, 2006; Yen & Kuzma, 2009). In fact, correlations found in the current study between CAEL overall and subscores and GPAs are larger than many found in similar studies on other tests. Surprisingly, speaking scores did not correlate with GPAs. The findings of this study, therefore, provide strong predictive evidence of validity for using the CAEL-CE in this context.

RQ2 asked whether students' level of academic acculturation relates to academic performance during the first three years at university. Our findings revealed that AASs were not correlated with first- or third-year GPAs. Most previous research had found a positive correlation between these two variables (Glass & Westmont, 2014; Rienties et al., 2012; Salamonson et al., 2008; Senerchia, 2015). Similar to the current study, Moní et al. (2018) also found that GPA was not associated with acculturation. Moní and colleagues reasoned that as students mature, their academic achievement is less impacted by their sense of acculturation. Considering that our student participants were older (mean age of 23.5 with large age range [17-42] and standard deviation [5.74]) than average university students, Moní and colleagues' explanation might hold true for our participants as well. In addition, a large portion of our participants (40%) lived with family, which might have mitigated any impact of academic acculturation on academic achievement. Moní and colleagues had found that strong family bonds had a positive impact on students' academic achievement on participants in their study. Participants in our study may have also benefitted from that support, thereby reducing the impact of academic acculturation on their academic achievement.

RQ3 examined whether certain student characteristics are associated with higher levels of academic acculturation and achievement. The student questionnaire solicited information about students' living situation, use of English, and self-assessment of their skills. Although participants belonged to three groups according to their living situation, this did not influence their AASs (see MANOVA results), similar to Grayson's (2008) finding. Grayson

found that for the international students in his study, the greatest predictors of academic

outcomes was the in-class experience. Although we did not look at this variable in particular,

our focus group data did find that class experience varied significantly for students with some

professors providing more and other less (helpful) feedback; there was also the differing

attitudes among professors towards students' questions in class which had an impact on

students' experience. In our data, however, we were not able to trace the impact of these

differences on students' academic acculturation as these aspects only appeared in our focus

groups. On the other hand, students' self-assessments and percentages of English use at work

and to communicate orally were correlated with students' AASs (see Tables 2 and 3). This is

similar to previous research on academic acculturation and language self-assessments

(Anderson & Guan, 2018; Bastien et al., 2018; Chow, 2006; Kuo & Roysircar, 2004). We can

see this association clearly in our focus group participants' impressions at the end of their

second year of study in Canada, when participants expressed how their perceived

improvements in English proficiency led to feelings of comfort and ease in the university

context. Our study also examined whether proficiency CAEL test scores as a more reliable

measure of English proficiency were related to students' AASs, but that was not the case. It,

therefore, seems that how students' *felt* about their English abilities and what they can do with

those skills (i.e., work in English) mattered much more than what their English skills actually

were. There were no significant correlations between student characteristics and GPAs. This

is contrary to other research, where sense of belonging (Glass & Westmont, 2014) and living

situation (Poyrazli & Isaiah, 2018) impacted academic success. This may be due to

differences between the studies. The sample size in our study was much smaller than that in

Glass and Westmont's. On the other hand, Poyrazli and Isaiah focused on a particular

subgroup of students (those who had been on failed academic standing and had since

recovered) rather than the broader sample of students in our study, which has been selected based on students' performance on an in-house placement test.

Finally, RQ4 examined students' challenges and need for support during their first year of study. Both on the questionnaire and in our focus groups, participants pointed to academic challenges, and only some of them were language related. In relation to language, participants encountered difficulties in oral interactions with fluent/native English speakers (21%), in writing (14%), with vocabulary (14%), and in understanding different accents (14%). Therefore, 36% of our participants looked for more language development opportunities although this need diminished as students progressed in their studies; this desire is clearly in line with research that identified language as a great challenge (Keefe & Shi, 2017; Khanal & Gaulee, 2019; Leong, 2015; Li et al., 2017; Moon et al., 2020; Sherry et al., 2010; C.-W. Wang et al., 2008). Some of our participants wanted assistance in integrating into the university life and addressing racism although participants found a diverse campus helpful in this. Experiences of racism and discrimination were also identified in other studies as an issue (Gbadamosi, 2018; Glass & Westmont, 2014; Poyrazli & Isaiah, 2018; Yao, 2018). Finally, being less familiar with the Canadian context also posed challenges for students in terms of class content, which resembles findings in other studies (Gbadamosi, 2018; Leong, 2015; Li et al., 2017; Moon et al., 2020; Mukminin, 2019; Poyrazli & Isaiah, 2018; Y. X. Wang & Bai, 2020). Generally, participants also looked for more support, feedback, and assistance from their professors. These sentiments are echoed by Grayson's (2008) findings that international students have less academic and social support.

Our findings have concrete implications for Canadian universities both with large and small numbers of international students. Universities in general are already offering EAP support to international students in the form of targeted language and writing courses, support services through writing centers and the like, and other initiatives such as conversation

groups. As always, of course, it is important for institutions to examine whether (1) these initiatives meet the needs of the target population and (2) the target population is aware of existing initiatives. However, our study also shows that these students would like to see support in other areas that go beyond language. The first speaks to a broader desire for assistance in building social networks and feeling part of a campus community. This can be a challenge especially for sizable institutions with large numbers of students. One initiative that emerged from a need during the COVID-19 pandemic to allow new students to build a sense of community in the context of remote university instruction was the home room pilot project at the institution, where our research took place. These home rooms consist of small groups of first-year students led by more senior students and focus on both providing critical information about the university as well as meeting the social needs of incoming students. The impact of such initiatives on students' sense of belonging and community will have to be examined in future research, but they have the potential of addressing some of the concerns expressed by our participants. A second issue that universities have begun to address is racism, discrimination, and microaggressions on university campuses. An ever-larger number of institutions now have anti-racism and equity, diversity, inclusion, and accessibility (or EDIA) initiatives and offices, which all make a start to bringing change in this area. Although the mandate of these offices and initiatives is broader (as it should be!) than addressing the needs of international students, they do have the potential to also deal with the issues our participants spoke to in the focus groups. As is the case with language support initiatives, however, it is, of course, important for institutions to assess whether these offices and initiatives are meeting the needs of students. Institutions with small numbers of international students and/or less diverse student bodies may face additional hurdles in providing support for these students as the participants in our study pointed to the large proportion of other students like them at the institution in our study as a key factor in helping them feel more

comfortable on campus and part of a community. Finally, faculty support was also identified as a key desire among our students. Arguably, this not only affects international students but also the student body at large. Our participants spoke to the wide variety of faculty responses to student questions and faculty feedback on students' assignments. Raising awareness among all faculty as to how crucial these two aspects are to students' learning and overall university experience may be called for to encourage best practices among all faculty.

We would like to acknowledge two important limitations of our study. First, participants in our study took a research version of the CAEL-CE. Although it was equivalent to live versions of the test, the stakes differed for tests takers: Future admission to university did not depend on the performance on the CAEL-CE because students had already been admitted. This is an important difference between our study and similar research on the TOEFL and IELTS. Research into the effects of test condition stakes on scores has found lower scores for low-stakes conditions (Cole & Osterlind, 2008; Kiplinger & Linn, 1995; Putwain, 2008; Steedle & Grochowalski, 2017); in other words, we could expect higher scores for test takers on live CAEL-CE exams. The effect of high-stakes conditions on correlations with future GPAs would have to be examined in future research. Second, the COVID-19 pandemic interrupted our planned data collection. As a result, there are some differences in terms of the students' course grades that were used to calculate GPAs at the end of the first and third year of the study. Although, as outlined above, the number of failing grades included in the GPA calculation in year 3 was likely reduced due to measures adopted by the university in this study, we were still able to observe general trends in the relationship between students' language proficiency and academic achievement. If any converted failing grades were part of a general picture of low academic achievement, the other low passing grades would have been captured in the overall GPA calculation. If, in contrast, one such failing grade was an outlier for a student who was otherwise doing well academically, the

impact of this one grade on the cumulative GPA would have been negligible. Finally, the impact of the pandemic on university education in general and the experience of international students in particular is wide-ranging and complex, which means it is impossible to disentangle its impact on our students' academic performance. As a result, future research would have to examine whether the longitudinal trend in our data that the correlation between language proficiency and GPAs is larger at the end of the third year than at the end of the first year at the beginning also applies to other research contexts.

This study adds an important component to the validity evidence of the CAEL-CE by revealing medium correlations between students' CAEL-CE scores (including three of four subscores) and GPAs. That is, our study supports the use of CAEL-CE for the purposes of university admission as students with higher CAEL-CE scores tend to do better in their academic programs. Our study also adds to the research on academic acculturation in that it provides evidence that students' perception of their skills has a bigger impact on AASs than their actual language level. Furthermore, our study identified key areas where students need more support. That is important information for institutions to have so that they can work on integrating these aspects into existing support programs for international students. Finally, our study examined the long-term impact of language proficiency at the beginning of study on academic success and that this impact increases as students advance in their degrees.

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Appendix: Academic Acculturation Scale

Using the scale provided, please rate how **nervous/comfortable you feel**…

	Very nervous			Very comfortable
1. … studying at university in English?	1	2	3	4
2. … interacting with English-speaking classmates?	1	2	3	4
3. … asking for help from classmates?	1	2	3	4
4. … asking for help from TAs/teaching assistants?	1	2	3	4
5. … asking for help from professors?	1	2	3	4

Please indicate whether it you agree or disagree with the following statements.

	Strongly disagree	Disagree	Agree	Strongly agree
6. I feel supported by my professors.	1	2	3	4
7. I feel comfortable at university.	1	2	3	4
8. I feel I need more assistance from my professors	1	2	3	4
9. I would prefer to study in my first/native language	1	2	3	4
10. I am happy to study abroad.	1	2	3	4
11. I am happy with my degree program.	1	2	3	4
12. I want to change my degree program.	1	2	3	4
13. I feel like I don't fit in at university.	1	2	3	4

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[1] Based on their review of over 300 studies and 90 meta-analyses in applied linguistics, Plonsky and

Oswald (2014) recommend using the following categories when referring to correlations: *small* for

correlations around .25, *medium* for those around .4, and *large* for those around .6. We follow their

recommendations in our article.

[2] Due to the COVID-19 pandemic, data collection was delayed from year 2 to year 3. More details

about the impact of the pandemic on our study will be provided under *Procedures and instruments*.

[3] Only a few courses grades university-wide were excluded for professional-certification or other

reasons (e.g., academic misconduct).

[4] The 2019 annual report (Paragon Testing Enterprise, 2019) lists the following SDs: CAEL overall

score: 12.33; listening: 15.93; reading: 18.68; speaking: 10.95; and writing: 10.64.