The International Journal of Management Education 14 (2016) 176–186

Contents lists available at ScienceDirect

The International Journal of Management Education

journal homepage: www.elsevier.com/locate/ijme

Research notes

Making the choice: University and program selection factors for undergraduate management education in Maritime Canada

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ARTICLE INFO

Article history:
Received 23 September 2015
Received in revised form 4 March 2016
Accepted 6 April 2016

Keywords:
University selection
Recruitment
Selection factors
Business programs
Canada

ABSTRACT

This paper examines the criteria by which university students chose a particular university for their undergraduate management education. With a data set of 456 first-year millennial undergraduate business students, from four institutions located in Canada's Maritime Provinces, exploratory factor analysis helped identify the drivers of decision-making reported by females and males, and in-province and out of-province students. A MANOVA analysis found statistically significant differences in certain selection factors between females and males, and between in-province and out-of-province students. These results suggest that a contingency-based approach to the recruitment and admissions strategies of undergraduate university administration and recruitment officials may be beneficial in enhancing confirmation and enrollment rates.

1. On the importance of university selection

As the clock ticked down to the start of another new academic year, we gazed over the freshman class and shared a common thought. What circumstances unfolded such that this particular group of students came together at the same time, to the same school, in the same program? Each with their own educational experiences, socio-cultural backgrounds, and extra-curricular interests yet all of whom, in spite of these differences, choosing to attend this university and enroll in our business program. Within the context of university selection, were our students fundamentally the same as students in freshman management classes at other schools, or did they differ in some appreciable way? We decided we wanted to know more, not just because the answers might be of benefit to our university's recruitment and admissions team, but because fundamentally, students are the lifeblood of our livelihood and to understand them better, helps us reflect on who we are as professors, what our role is as their instructors, and how we might better contribute to the academic mission of our universities.

The research objectives for this article were as follows:

1. To identify the factors millennial university students use in selecting among post-secondary institutions for their business studies;
2. To determine whether respondents of different genders employ the same selection criteria; and

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http://dx.doi.org/10.1016/j.ijme.2016.04.002
1472-8117/

3. To determine whether respondents from the same province employ the same selection criteria as those students applying from out-of-province.

For convenience purposes, we chose to study university and academic program in Maritime Canada. The region consists of the provinces of New Brunswick, Nova Scotia and Prince Edward Island, for which there are sixteen universities, accounting for 70,817 registered full-time and part-time students in 2011, of which eleven offer undergraduate commerce and administration programs (MPHEC., 2012). Using a focus group of 24 students, followed by a pilot survey and then a general survey, we identified 32 criteria related to the importance in students' decision-making as to which university to attend. We then asked first-year business students attending four of the sixteen universities in the region to assess the performance of their chosen university, and their business program, according to these criteria. Using factor analysis, we assessed the results of our importance-performance analysis and found differences in selection factors between female and male students, and between students originating from within their province of study and students who relocated from elsewhere within Canada, with our results significant at the 95% and 99% level of confidence. This research topic is of importance to university administrators, deans and recruiters who wish to stabilize or grow their undergraduate business program enrollments based upon a deeper understanding of university selection criteria.

2. What we know about university selection

As the purpose of this study was to examine millennials' selection factors in choosing universities and academic programs in Maritime Canada, a number of criteria were used in defining the scope of the literature review. A generational divide was used to segment the literature: studies were separated between those that studied millennial populations - those students born between 1980 and 2000 (Howe & Strauss, 2000), who would start entering university in 1997 at the age of seventeen – and those studies that focused on earlier generations. The focal population of the extant literature was limited to studies of undergraduate students for the purposes of comparison; this includes studies of high school students intending to pursue post-secondary education ("prospective selection studies"), and studies of university students who were asked to reflect upon the factors they considered in their choice of post-secondary institution and program ("retrospective selection studies"). Our literature review involved empirical studies listed in Business Source Complete or ABI/Inform for student samples beginning in the year 2000. For comparative purposes, we also included two students of pre-millennial students that occurred near the turn of the century. In terms of academic programs, our article focuses upon business administration, though in terms of this literature review, all programs of study were included. There was no pre-defined limit to the geographic scope of the review. The table below is a representative sample of the types of studies found in the literature according to this generational and prospective/retrospective separation (see Table 1).

Much research on college choice/university selection has been undertaken. Indeed, Henrickson (2002, 400–402) noted that approximately 1900 articles had been written on the subject in the four decades previous based upon an analysis of the Educational Resources Information Center database. However, a small fraction, some 162 articles, actually emphasized a modeling approach to the university selection issue, and of these articles, less than 70% were empirical in nature. Of the methodological approaches, factor analysis – the method employed in this article – represented just 20% of the extant statistical methods-based approaches to the topic, with other methodological techniques including probability functions (50%) and multivariate regression or descriptive statistics (Ibid, 406). Henrickson's agent-based model, drawing on the work of McDonough (1997), employed a national data set of 237,777 students from 461 American colleges and universities to produce a four–item typology of selection criteria. These include the individual student's *capital endowment*, representing factors such as gender, ethnicity, parental education levels, family income, etc.; *past capital accumulation*, including secondary school grade averages, standardized test scores, and so forth; *college choice behaviors*, such as the number of applications submitted, motivations for pursuing post-secondary education, availability of financial aid; and *anticipated capital returns*, such as career and lifestyle expectations (Ibid, 409). These categories are premised around 72 distinct variables. We drew on this article to examine whether this form of conceptualization was consistent with the experience of Maritime Canadian post-secondary institutions, in particular with millennial students, to discover if findings from the literature were consistent in a different geographical context, or whether some unique and meaningful attributes were involved in the Canadian context.

Indeed, the geographic focus of the empirical college choice/university selection literature on millennials is varied. Such recent research has included Chinese students studying in New Zealand (Kim-Choy, Holdsworth, Li, & Kim-Shyan, 2009); Indian students selecting among business schools in their home country (Reddy, 2011); as well as studies in Egypt (Roushdy,

Table 1
A sample of comparative research on university selection.

Type of study	Pre-millennial studies	Millennial studies
Students already enrolled in a post-secondary institution ("retrospective selection studies")	Salim (1995)	Yamamoto (2006); Daily, Farewell, and Kumar (2010); Reddy (2011); Roushdy (2012); Fuller and Delorey (2016).
High school students intending to pursue post-secondary education ("prospective selection studies")	Henrickson (2002)	Veloutsou, Lewis, and Paton (2004); Keskinenm Tiuraniemi, and Liimola (2008); Lang (2009).

2012); Finland (Keskinen, Tiuraniemi, & Liimola, 2008); Italy (Petruzzellis & Romanazzi, 2010); Malaysia (Ariffin, Azmi, Azhar, Suhaimi, & Ibrahim, 2008); Turkey (Yamamoto, 2006); the United Kingdom (Veloutsou et al., 2004); and the United States (Daily et al., 2010). However, Canadian empirical research on millennials' university selection criteria is much more limited. Lang (2009) employed a purposive sample and descriptive statistics to study 141 high school students from six Ontario high schools at multiple points throughout their university selection process, but prior to starting their post-secondary education. Among the key factors that Lang found included access to a specific program of study that was viewed favorably in terms of career choice, program quality, and cost, with the latter varying in terms of significance dependent upon the type of post-secondary education that the student was considering pursuing (college or university). These findings are consistent with the review of the pre-millennial literature undertaken by Henrickson (2002) that identified a four-item typology of decision factors mentioned previously. In another Canadian-situated study, Kulchitsky (2008) employed multiple research methods that featured qualitative interviews, a pilot study and ultimately a conjoint survey of 147 students enrolled at a single site, an international polytechnic college. The author found differences between students interested in an on-campus versus a distance education university experience, especially in terms of course delivery method and associated fees; his retrospective study was of students who had already chosen and started at university. Beyond the empirical work of Lang and Kulchitsky, Canadian research in this area have included cross-national comparisons, such as Austen and MacPhail (2011) study of national survey data comparing Australian and Canadian women's choices of post-secondary education. This particular study employed two large-scale longitudinal government surveys and descriptive statistics to argue for a greater role by non-university institutions in providing post-secondary education, greater transferability between types of post-secondary institutions, and greater accessibility to post-secondary institutions by students located outside of major metropolitan areas.

In terms of methodology, empirical research in the area has frequently employed descriptive statistics (Austen & MacPhail, 2011; Daily et al., 2010; Roushdy, 2012; Veloutsou et al., 2004; Veloutsou, Paton, & Lewis, 2005; Yamamoto, 2006). More analytical is the use of statistical inference methodologies, including factor analysis (Kim-Choy et al., 2009; Veloutsou et al., 2004), but as Henrickson (2002, 406) noted, this more rigorous choice of methods was employed in merely 20% of the empirical methodological modeling articles the author reviewed, with less systematic quantitative methods, such as descriptive statistics, more often being employed.

The choice of method in terms of prospective versus retrospective studies, as noted above, has implications for the design and results of the study. Prospective selection studies may be based on interviews, surveys, or combinations of the above, either at a single point in time or throughout the decision-making process. However, such an approach may be flawed because not everyone that chooses a university might be accepted; of those accepted, some may not follow through and fail to register at the institution; and if registered, may not actually enroll and attend classes. Even for those students that do follow through the process to its conclusion, the granularity of the research has been limited: the level of analysis of past research minimizes or ignores the distinguishing characteristics of individual academic institutions. From the perspective of any given university, institutional-level analysis is of much interest for recruiters, administrators and faculty alike. In contrast, retrospective approaches to the topic typically assess first-year students as to the reasons why they chose to attend a particular institution (Daily et al., 2010; Reddy, 2011; Roushdy, 2012; Salim, 1995; Yamamoto, 2006). Internal institutional surveys of a university's own students serve just such a purpose. While the advantages of this approach are self-evident from the perspective of the officials at that particular institution, it does not provide a means of comparison across institutions. Nor is it free from recall bias, as student participants in retrospective selection studies might not be able, or be willing, to report the true motivations for choosing the institution in which they ultimately enrolled, presuming they had freedom of choice in the first place (e.g., they were accepted to more than one institution and/or they were not limited in their choice of institution by their parents, financial circumstance, or other factor).

The present state of the extant literature therefore provides an opportunity for further study. Of the empirical research on millennials' university selection criteria, just two peer-reviewed studies could be found – those of Lang and Kulchitsky – that examined the decisions of Canadian millennials. Of these two, only one – the Kulchitsky article – employed a retrospective approach to the subject by assessing students who had already chosen and followed through on enrolling in a particular post-secondary institution. However, the Kulchitsky article focused not on broad-based criteria through which Canadian millennials chose to attend a particular institution; instead, it explores issues of educational delivery methods, by comparing on-campus to distance education preferences of a recent university cohort. What is missing is an empirical, cross-institutional, retrospective comparison of millennial Canadian university students' selection criteria. This article will remedy this knowledge gap, and provide a comparison to the integrative work of Henrickson as well as the many other authors whose work has preceded ours.

3. Methods

3.1. Initial focus group

The groundwork for this study followed the methods of Joseph, Yakhou, and Stone (2005): using focus groups followed by surveys, Joseph et al. described 32 criteria according to the importance in students' decision-making as to which university to attend, and the performance of the university selected according to these criteria. We undertook our own focus group, recruiting 24 student volunteers from two sections of a first-year undergraduate business course. Students were asked two questions:

1. What are all the factors, issues or criteria you considered in deciding as to which *university* to attend?
2. What are all the factors, issues or criteria you considered in deciding as to which *academic program* to enroll?

Each student was provided a worksheet with answer blanks to identify the selection factors that affected their choice of institution and for their choice of academic program for their post-secondary studies. Students were given 10 min to think of all the relevant selection factors. After 10 min of reflection, we supplied students with the Joseph et al. (2005) criteria and students were then encouraged to publicly discuss their own decision-making factors not covered by that criteria. During this debriefing portion of the focus group, students were encouraged to add additional criteria to their lists as desired. The lists were collected at the close of the focus group, and the selection criteria above and beyond the Joseph et al. criteria were added to the list. The result was 64 measures by which students could assess the importance and performance of various criteria in determining their choice of either a post-secondary institution or an academic program in which to study business.

3.2. Pilot study and general study

A paper-based survey questionnaire was designed to facilitate an importance-performance analysis, based upon the methodological approach of Joseph et al. (2005). The importance of each selection criterion, and the performance of each institution or academic program against that criterion, was used assess relevance to the decision-making process. We incorporated five-point Likert scales, ranging from "Not at all important" to "Extremely important" to assess the importance of the criterion and a scale ranging from "Very poor performance" to "Very good performance" to assess each institution and academic program. A pilot study was undertaken at one of the eleven institutions, and following revisions to the survey instrument, the pool of potential selection factors for institutions and academic programs was reduced from 64 to 58 factors by eliminating three institution-specific factors from the pilot study that were not relevant to the general study; by merging two criteria into related items to reduce an incident of potential multicollinearity; and by removing a selection factor ("lack of other options" to choose from) that was not viewed as a meaningful selection criterion as without options, the student is unable to select among universities in the first place. At this stage, additional universities were solicited to participate in the research study.

3.3. General survey and final data sample

Each of the eleven business programs at universities in Maritime Canada were solicited to participate in the study. Representatives from four universities elected to participate, with a total first-year business enrollment of approximately 770 students. Surveys were distributed to faculty in required first-year undergraduate business courses. Students were asked to voluntarily take the survey, which were collected by faculty and returned to the authors. A total of 486 survey responses were received, of which 456 were deemed completed, the latter representing a 59.2% completion rate based upon undergraduate enrollment across the four institutions surveyed. In relation to our Canadian comparators in the field, Lang (2009) sampled 141 high school students at six sites and Kultchitsky sampled 147 students at a single post-secondary site. Thus, our sample at 456 participants is much larger, and among the retrospective selection studies, involves four times as many institutions within our sample set.

3.4. Data analysis

We employed an exploratory factor analysis, using principal component extraction and direct oblimin rotation for 36 of the 58 selection criteria that pertained to university-level selection, with the remainder pertaining to academic program-level selection factors. Our sample size was 456 responses. Prior to running the analysis the data were screened for potential assumption violations. The data was not deemed to be normally distributed for many of the 36 items, most suffering from negative kurtosis. To address this issue the data was transformed with a reversed log10. The distribution of the data improved greatly with the largest negative kurtosis now −1.388. It would have been preferred if all skewness and kurtosis values were ±1 (Meyers, Gamst, & Guarino, 2006), however due to the limited violation and exploratory nature of this study we decided to proceed with our analysis.

The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.88, indicating that the data were suitable for principal component analysis, based on the criterion that values between 0.8 and 0.9 are highly desirable (Field, 2005, p. 640). Bartlett's test of sphericity was significant ($p < 0.001$) indicating adequate correlation between the variables to complete the principal component analysis (Meyers et al., 2006). A ten factor solution was extracted, based on the Kaiser-Guttman criterion of eigenvalues >1.0. The ten factors accounted for 61.7% of the total variance, however the tenth factor consisted of a single variable, so for practical purposes a nine factor solution accounting for 58.8% of total variance was extracted. Eight of the 36 items, including the single item in Factor 10, did not load adequately (>=0.5) to any of the components extracted. Table 2 displays the individual items, component loadings, communality, and corrected item-total correlation. Communalities were adequate, ranging from 0.474 to 0.781 for the 28 of 36 items loading on extracted components. When validating the extracted factors, Factor 6 (Campus), consisting of scores for location of the university and attractiveness of the campus, was deemed inadequate (Cronbach's alpha <0.6 and corrected item-total correlation <0.3); this component was not used for

further analysis. Factor 7 (Financial Feasibility), consisting of scores for excellent education at a reasonable cost and offering a variety of scholarships, had a lower Cronbach's alpha (0.611) however given that alpha inflates with more items this score was deemed adequate for a two-item scale (Field, 2005). The remaining factors had Cronbach alphas ranging from 0.700 to 0.811, indicating good subscale reliability.

Factor 1, Support (eigenvalue = 8.68), accounted for 24% of the variance and had five items. Factor 2, Sport & Recreation (eigenvalue = 3.04), accounted for 8.4% of the variance and had four items. Factor 3, Advice (eigenvalue = 1.74), accounted for 4.8% of the variance and had three items. Factor 4, Reputation (eigenvalue = 1.59), accounted for 4.4% of the variance and had three items. Factor 5, Residence (eigenvalue = 1.42), accounted for 4.0% of the variance and had three items. Factor 6, Campus (eigenvalue = 1.30), accounted for 3.6% of the variance and had two items, however as noted above, did not achieve adequate subscale reliability and was excluded from further analysis. Factor 7, Financial Feasibility (eigenvalue = 1.22), accounted for 3.4% of the variance and had two items. Factor 8, Student Recreation (eigenvalue = 1.13), accounted for 3.1% of the variance and had two items. Factor 9, Academic Resources (eigenvalue = 1.05), accounted for 2.9% of variance and had four items. After excluding Factor 6 (campus) the remaining eight factors accounted for a cumulative 55% of the variance. Using SPSS, an Anderson-Rubin factor score was calculated and saved for each of the eight factors extracted. A factor score was also created based on the mean of the original responses for each subscale item for each of the extracted factors. The Anderson-Rubin score was used to further analyze the data and the mean factor score was used to interpret a practical meaning from the results.

The two primary objectives of this exploratory study are to determine the extent to which millennial undergraduate university business students' university selection criteria vary by gender and by the in-province versus out-of-province status of the student at the time of application for post-secondary studies. To prepare the in-province variable, respondents with a home address within the same province as the university they attend were assigned a value of one and where different a value of zero. Cases without a home province or postal code or university were left with a null value. To evaluate whether there are differences between the groups, by gender or by in/out-of-province, Hotelling's T^2 two-group multivariate analysis of variance (MANOVA) was conducted; the results for each of the MANOVA analyses follows.

4. Findings

4.1. Gender

A Hotelling's T^2 two-group between-subjects multivariate analysis of variance (MANOVA) was conducted on the eight factors extracted from the dataset: support, sport and recreation, advice, reputation, residence, financial feasibility, student recreation, and academic resources. A binary choice of gender – female or male – was provided to student respondents and employed as the independent variable. After listwise deletion, N = 397 with 165 (42%) female and 232 (58%) male cases. As noted in Section 3, a reverse log10 transformation was applied to the data to meet the necessary normality assumptions, however after transformation the data was assessed to meet the statistical assumptions of MANOVA analysis.

Based on Wilks' criterion (see Appendix A), there was a significant between-group effect by gender (Wilks' λ, $F[8388] = 7.70$, $p < 0.001$, partial $\eta^2 = 0.137$). The univariate ANOVA results for each dependent measure indicated four of the eight factors are significantly affected by gender. The significant factors were support, $F(1, 395) = 15.77$, $p < 0.001$, partial $\eta^2 = 0.038$, sport and recreation, $F(1, 395) = 5.41$, $p < 0.05$, partial $\eta^2 = 0.014$, financial feasibility, $F(1, 395) = 18.81$, $p < 0.001$, partial $\eta^2 = 0.045$, and academic resources, $F(1, 395) = 25.77$, $p < 0.001$, partial $\eta^2 = 0.061$. Based on the five-point Likert scale mean factor scores (see Appendix B), it would appear that females are more interested in university support services (M = 4.35, SD = 0.52) than males (M = 4.12, SD = 0.64); are more interested in financial feasibility (M = 4.19, SD = 0.69) than males (M = 3.89, SD = 0.81); and are more interested in academic resources (M = 4.18, SD = 0.62) than males (M = 3.83, SD = 0.72). Conversely, males are more interested in sport and recreation (M = 4.15, SD = 0.78) than females (M = 4.02, SD = 0.78). No statistically significant gender-related effects were observed for the remaining factors.

4.2. Province of origin (in-province versus out-of-province)

A Hotelling's T^2 two-group between-subjects MANOVA was conducted on the eight factors extracted from the dataset. As noted previously, these were support, sport and recreation, advice, reputation, residence, financial feasibility, student recreation, and academic resources. The in-province status of the student respondent was used as the independent variable. After listwise deletion N = 371 with 212 (57%) attending school in their home province (in-province) and 159 (43%) attending school outside their home province (out-of-province). As noted in Section 3, a reverse log10 transformation was applied to the data to meet the necessary normality assumptions, however after transformation the data was assessed to meet the statistical assumptions of MANOVA analysis.

Based on Wilks' criterion (see Appendix A), there was a significant between-group effect by province of origin (Wilks' λ, $F[8362] = 6.37$, $p < 0.001$, partial $\eta^2 = 0.123$). The univariate ANOVA results for each dependent measure indicated four of the eight factors are significantly affected by province of origin. The significant components were sport and recreation, $F(1, 369) = 23.78$, $p < 0.001$, partial $\eta^2 = 0.061$, advice, $F(1, 369) = 5.48$, $p < 0.05$, partial $\eta^2 = 0.015$, reputation, $F(1, 369) = 5.75$, $p < 0.05$, partial $\eta^2 = 0.015$, and residence, $F(1, 369) = 24.52$, $p < 0.001$, partial $\eta^2 = 0.062$. Based on the mean factor scores (see Appendix B), it appears students from out-of-province are more interested in sport and recreation (M = 4.26, SD = 0.70) than

Table 2
Summary of items and factor loadings from principal components analysis with direct oblimin rotation.

Item name	Component loading*									Communality	Corrected item-total correlation
	1	2	3	4	5	6[a]	7	8	9		
	Support	Sport & recreation	Advice	Reputation	Residence	Campus	Financial feasibility	Student recreation	Academic resources		
Academic staff approachable/informed	0.806									0.669	0.671
Administrative staff approachable	0.766									0.682	0.665
Advisors are accessible and informed	0.650									0.620	0.555
Fast, hassle-free registration process	0.590									0.604	0.581
Helpful first year orientation program	0.527									0.474	0.458
Provide sports teams for entertainment		0.845								0.705	0.699
Provide student participation in sports		0.823								0.715	0.697
Provide recreational facilities/programs		0.704								0.585	0.566
Offer student activities outside class		0.657								0.648	0.558
Friends' advice			0.882							0.781	0.668
Family advice			0.821							0.727	0.481
Provide variety of internships/practicum programs			0.578							0.538	0.413
University rankings (MacLean's, etc.)				0.836						0.689	0.431
Have a well-known academic reputation				0.689						0.654	0.542
Reputation of the program of study				0.576						0.609	0.464
Guaranteed residence spot for first year students					0.863					0.771	0.678
Provides a welcoming residence experience					0.791					0.704	0.652
Treatment as an individual, rather than a number					0.623					0.570	0.488
Location of the university						0.713				0.608	0.123
Attractive campus						0.545				0.592	0.123
Excellent education at a reasonable cost							0.774			0.665	0.440
Offer a variety of scholarships							0.752			0.601	0.440
Social activities/night life								0.506		0.644	0.552
Offer student organizations outside class								0.501		0.655	0.552
Clean, spacious, well equipped classes									−0.712	0.638	0.547
Library with wide range of resources									−0.708	0.629	0.606
Safety on campus									−0.570	0.535	0.488
Bookstore conveniently located/stocked									−0.534	0.600	0.542
* Only loadings >0.5 were included in the output											
Eigenvalues	8.68	3.04	1.74	1.59	1.42	1.30	1.22	1.13	1.05		
% of variance	24.11	8.44	4.84	4.40	3.96	3.62	3.40	3.13	2.92		
Cronbach's alpha	0.80	0.81	0.70	0.67	0.77	0.22	0.61	0.71	0.75		

[a] .Component did not have adequate internal reliability (Cronbach's alpha <.6) and was excluded from further analysis.

in-province students (M = 3.96, SD = 0.84); are more interested in advice from others (M = 3.82, SD = 0.73) than in-province students (M = 3.67, SD = 0.87); are more interested in university reputation (M = 4.16, SD = 0.62) than in-province students (M = 4.07, SD = 0.61); and are more interested in residence (M = 4.34, SD = 0.67) than in-province students (M = 3.99,

SD = 0.86). No statistically significant province of origin effects were observed for the remaining factors. In addition, no statistically significant interaction effect between province of origin and gender was observed.

5. Discussion

This study advances the discussion of university selection in the management education literature. Consistent with previous studies, such as Joseph et al. (2005) and Reddy (2011), we found that there are a range of factors that students employ in assessing which university to apply to, and in which academic program to enroll. Our findings provide a more detailed level of granularity as to what the university selection factors include, with the delineation of an eight item typology which explains more of the total variance in the university selection process than exists within the extant literature. We also found that university selection differs in certain respects by both the gender of the applicant, and by the relative location of the applicant vis-à-vis their chosen university. These differences have implications for both researchers and university administrators in terms of data collection methods and processes, research methods and the breadth, depth and methodological rigor of future research.

5.1. Contributions

Our first contribution is a refinement in the selection factors which students employ in choosing among post-secondary institutions. The result of our empirical examination of university selection factors among four Maritime Canadian institutions was an eight factor solution that explained 58.8% of the total variance. The nearest comparator within the literature, Reddy (2011) undertook a similar retrospective study of millennial students at the start of their university programs. Using a smaller sample of 274 Indian business students drawn from six institutions, the author employed factor analysis and produced a six factor study with an explained variance of 58.25%. The comparison of the two studies is as follows (see Table 3):.

Thus, our study further delineates the selection process from six to eight factors, offering a more granular analysis of the selection factors than that offered by a similar millennial student, retrospective sample, and accounting for a slightly higher level of explained variance.

Our second contribution is that female and male applicants vary in their decision-making behavior. While difference in selection factors by gender has been identified previously in the literature (e.g. Joseph et al., 2005), the nature of these differences varied somewhat in our study. Specifically, that female students prioritized *support*, *financial feasibility*, and *academic resources* while male students prioritized, relative to female students, *sports and recreation*. We found greater consistency in the decision-making behavior of females and males than other studies, such as Joseph et al. (2005) who found that females also identified campus safety, accommodations, food selection, hassle-free registration and a wide range of degree choices as important factors, whereas males also attached greater importance to class scheduling and friends' advice. This suggests that a uniform approach to the recruitment of students, irrespective of gender, may be a sub-optimal approach to managing the recruitment function.

Our third contribution is that the location of the applicant, at the time of application, varies not only at the national level of analysis, but the sub-national level of analysis as well. In comparison to the work of Reddy, whose study involved selection behavior of Indian business students, our findings suggest the decision-making criteria of students in Canada differ from their Indian peers. Our findings suggest that decision-making behavior varies at the provincial level of analysis – specifically, by province of the applicant at the time of application. For example, out-of-province students rank *advice from others*, *university reputation*, and *residence* higher than in-province students, because in-province students likely have a greater awareness of their home province's universities and thus are not as concerned with advice from others, or the reputation, of a home province institution when compared to a less familiar out-of-province university. In-province students indicated a generally lower concern with residence, which is not unexpected, given that students within commuting distance of their in-province university would have a lesser need, and therefore assign a lower priority to, issues relating to residence life. As with our

Table 3
Factors comparisons across two studies.

Author/year	Reddy (2011)	Authors (2016)
Country of study	India	Canada
Sample size	274	456
Institutional coverage	Six universities	Four universities
Explained variance	58.25%	58.80%
Factors in university selection		
Factor 1	Auxiliary academic factors	Support services
Factor 2	Attainment yardsticks	Sports and recreation
Factor 3	Pure academic offerings	Advice
Factor 4	Physical facilities	Reputation
Factor 5	Personal and locations comfort zone	Residence life
Factor 6	Endorsement/ratification	Financial feasibility
Factor 7		Student recreation
Factor 8		Academic resources

comment on gender-related differences in university selection, there would also appear to be a need for differential approaches to recruitment based upon the location of the prospective applicant.

Some of our findings based upon the province of application were surprising. For example, *financial feasibility* was not significantly different for in-province and out-of-province students. As the total cost of tuition varies at some universities, with provincial bursary support available but varying on whether the applicant is applying to attend an in-province institution or is applying from elsewhere in Canada, it would be reasonable to consider that out-of-province students may have been presumed to be more interested in financial feasibility than in-province students because of the higher expenses for out-of-province applicants. Our findings, however, suggest that this is not the case. We were also surprised that out-province students were not more interested than in-province students in *support services* – such as the approach ableness of administrative, academic and advisory staff; the ease of registration; and the helpfulness of the first-year orientation program. We perceived, falsely, that students that were enrolled further away from home would be looking for more support from the institution; it appears that all students value these aspects. Lastly, we were surprised that out-of-province students prioritized *sports and recreation* – as indicated by the opportunities for students to participate in sport; the availability of varsity sports teams for entertainment; the availability of recreational facilities and programs; and the opportunity to pursue extra-curricular activities outside of class - would rank higher for out-province students than in-province. Further analysis at a more detailed level than the province of origin – such as by geographic distance from the institution based upon the postal codes of the respondents – might provide some greater understanding on this finding.

5.2. Implications for researchers

For researchers, we note that improving our understanding of university selection criteria serves our self-interest: the more our student population grows, the greater the need for faculty to teach, supervise and develop the next generation of society's leaders. That this data source is also conveniently situated in close proximity to academic researchers is also a boon to the research efforts of many, as Henrickson (2002) alluded to in her work. However, we are struck at the variation in the quality of analysis of the extant literature. The number of studies in the extant literature not involving the reporting of empirical results, or employing only descriptive statistics rather than the use of inferential techniques, was a concern. We think there is a need for greater methodological rigor on the part of researchers engaged in education studies, because the management of our education system is fundamentally the management of our future as a society. Finding the right fit between a student applicant and a post-secondary institution can have a profound impact upon the character of the student, as well as the institution; scientific examination of this process should therefore *be scientific*. However, scientific analysis is dependent on the availability of data, and the data that is most valuable is both information concerning the decision-making behavior of our students, and the decision-making behavior of students who chose other institutions. While cross-institutional analysis, such as that undertaken by our study is beneficial, it is logistically difficult to achieve by individual researchers given the limited availability of data. Each institution has a proprietary interest in safeguarding their competitive advantages by limiting research access to their students. To compensate, we would encourage university associations, such as the regional Maritime Provinces Higher Education Commission (MPHEC) and the Council of Ontario Universities (COU), or national institutions such as the Association of Universities and Colleges of Canada, to collect and disseminate information on university selection factors from every applicant before they begin their post-secondary studies, and again at the time of registration, to facilitate improved understanding of selection behavior; while Common University Data Ontario (CUDO) is a start in this direction, with further development it may evolve to benefit educators with an research interest in university selection.

5.3. Implications for university administrators

For those involved in university recruitment and admissions, our recommendation is to deepen our management of our target market segments. By enhancing the application of scientific management to the recruitment and admissions process, we can better respond to the differing needs of the student population. For example, institutions routinely ask applicants information that may enable a fine-grained target market analysis: demographic factors such as gender, geographic location of the applicant, etc. Rather than segment applicants by gender or location as separate and distinct factors, more complex analyses and institutional responses could be undertaken, such as segmentation by gender and location as a conjoined variable. Such a change could have an important impact on tasks related to the recruitment and admissions process. Recruitment fairs could offer customized information handouts given the regional characteristics of students speaking to campus recruiters. More generally, students requesting a “viewbook”, a popular campus recruitment brochure, could have one personalized to the characteristics of each applicant with the use of on-demand printing technology or customized electronic publishing; current practice suggests that this is not the case at present. For example, our review of a sample of Maritime Canadian university websites suggest the popular “viewbook” concept – wherein information of relevance to prospective student applicants may be found – was almost always a singular, universal publication, issued in the same way regardless of who requested it. In contrast, only one university located in the Maritime Canadian provinces was found to have a customizable viewbook, the content of which presumably varies with the characteristics of the applicant that orders it. Similarly, campus tours which already are variable in the dialogue conveyed to visitors, could be augmented with the use of custom phrases contingent upon the characteristics of the participants. While gender is used as a factor in the allocation of roommates for on-campus housing, along with other factors such as program of study, study behavior, etc. that may typically

be found on residence applications, province of origin could also be an added as an explicit consideration, whether to pair people with similar or dissimilar provinces of origin, depending on the desired outcome. Orientation practices could also factor in the different interests and concerns of students based on their university selection factors, such as what type of key messages are to be communicated to each target market segment and the most appropriate means of doing so.

5.4. Limitations and future research

In providing this study on university selection, we wish to acknowledge particular constraints and limitations. These include the availability of data; the generalizability of results; and methodological factors. Hindering progress in advancing both our understanding of university selection, and the application of best practices arising from the findings of university selection research, is the limited availability of data. We found in our research a reluctance of university officials and faculty to participate in our study because of fear of losing proprietary information on their students, and concerns over negative perceptions that various selection criteria preferences might reflect on a given institution. And yet, given both the similarities and differences that exist between female and male applicants, and in-province and out-of-province applicants, a business as usual approach does not seem to be sustainable if an institution wishes to strategically manage their student enrollment activities.

We also caution against making broad generalizations based upon our study. Our sample consisted of 456 business students at four Maritime Canadian post-secondary institutions. It would be speculative to generalize the results to non-business students, to other Maritime Canadian institutions, or to universities in other provinces and countries, especially since our findings suggest that geographic factors of the applicants are related to the selection factors reported by enrolled students. Additional studies of students in different programs and at additional institutions are warranted. A funded research program carried out by a network of academic researchers and endorsed by a regional or national academic association would be beneficial in providing a more holistic examination of these issues.

In terms of methodology, principle components factor analysis and MANOVA analysis served us well in carrying out this study. However, normality issues required transformation of the data making practical interpretation of the results more difficult; however, it was possible to statistically identify if and where between group variations existed. On a related note, two of the factors we identified - *financial feasibility and student recreation* – are only two-item factors; the ideal would have three or more indicators within each factor. Future research may also wish to flush out the selection factors further and to further refine the evaluative scale that was employed in this initial study.

Regarding future research, action-based researchers may wish to examine the creation of a tool to enable university recruiters and other administrators to better assess and track longitudinally how their institution performs on the selection factors that we have identified. In conjunction with university officials, researchers may wish to assess how well their institution performs on these factors and cross-reference the results with identifiable target audiences (gender, province of origin, etc.) to determine if enrollment patterns by each target audience can be predicted based upon student perceptions of institutional performance. Researchers may also wish to compare the assessments of target audiences at their institution to target audiences at comparator institutions (e.g. Austen & MacPhail, 2011). Lastly, it would be interesting to examine the extent to which university selection factors can be used as predictors of academic performance and to what extent, if any, they may be related to graduation rates.

Acknowledgements

The authors wish to express their appreciation to Canada's Social Sciences and Humanities Research Council (SSHRC) which provided seed funding for this project. The sponsoring agency had no role in any aspect of the design nor the implementation of this project.

Appendix A

Table A1
Multivariate and univariate analysis of variance for millennial university selection factors.

Source	Multivariate		Univariate							
	df	F	Support	Sport & recreation	Advice	Reputation	Residence	Financial feasibility	Student recreation	Academic resources
F ratios for gender[a,b]	8	7.70***	15.77***	5.41*	0.24	0.19	0.94	18.81***	0.75	25.77***
MSE			14.99	5.34	0.24	0.19	0.94	17.97	0.75	24.29
F ratios for in-province[c,d]	8	6.37***	0.55	23.78***	5.48*	5.75*	24.52***	0.68	1.38	0.02
MSE			0.54	22.71	5.30	5.74	23.09	0.69	1.38	0.02

Note: Multivariate F ratios were generated from Wilks' criterion.
a. Multivariate df = 8, 388.
b. Univariate df = 1, 395.
c. Multivariate df = 8, 362.
d. Univariate df = 1, 369.
*p < 0.05; **p < 0.01; ***p < 0.001.

Appendix B

Table B1
5-point likert scale significant factor mean scores and standard deviations as a function of gender.

Gender	N		Support		Sports & rec		Fin. feasibility		Academic res.	
			M	SD	M	SD	M	SD	M	SD
Male	232	58%	4.12	0.64	4.15	0.78	3.89	0.81	3.83	0.72
Female	165	42%	4.35	0.52	4.02	0.78	4.19	0.69	4.18	0.62
N=	397									

Table B2
Reverse Log10 significant factor mean scores and standard deviations as a function of gender.

Gender	N		Support		Sports & rec		Fin. feasibility		Academic res.	
			M	SD	M	SD	M	SD	M	SD
Male	232	58%	0.23	0.15	0.22	0.17	0.28	0.17	0.29	0.15
Female	165	42%	0.18	0.13	0.25	0.17	0.21	0.16	0.22	0.15
N=	397									

Table B3
5-point likert scale significant factor mean scores and standard deviations as a function of in-province university selection.

In prov.	N		Sport & rec		Advice		Reputation		Residence	
			M	SD	M	SD	M	SD	M	SD
Yes	212	57%	3.96	0.84	3.67	0.87	4.07	0.61	3.99	0.86
No	159	43%	4.26	0.7	3.82	0.73	4.16	0.62	4.34	0.67
N=	371									

Table B4
Reverse Log10 significant factor mean scores and standard deviations as a function of in-province university selection.

In Prov.	N		Sport & rec		Advice		Reputation		Residence	
			M	SD	M	SD	M	SD	M	SD
Yes	212	57%	0.26	0.17	0.31	0.18	0.24	0.14	0.25	0.18
No	159	43%	0.19	0.15	0.28	0.16	0.22	0.15	0.17	0.16
N=	371									

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