In pursuit of the "right" student:

a case study in assessing the effectiveness of enrolment management in shaping a first-year class

by

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Abstract

This study assesses the impact of undergraduate admission decision-making models on enrolment at a selective Canadian university. A quasi-experimental methodology was employed to describe actual academic and engagement outcomes of students identified by different admission decision-making models at the University of British Columbia (UBC), located in Vancouver, Canada. Academic outcomes were defined by first-year grades and retention to second year; engagement outcomes were defined by nine factors that emerged from a principal component analysis of student responses to two survey instruments assessing students' actual and intended behaviours prior to and after arrival at UBC. The study concludes that although choice of admission-making decision model does have an impact on shaping a first-year class, the effect is small. A hypothetical admission decision-making model that considers geographic location of the applicant in addition to academic ability (in order to increase national representation) was found to enroll a UBC class with lower academic ability, an equal chance of retention to second year, and a greater intention to engage in career-related enriched educational experiences. An actual admission decision-making model that considers the personal characteristics of applicants in addition to academic merit (as opposed to a grades-only model) was found to enroll a class with somewhat lower academic ability, the same chance of retention to second year, minimal differences in engagement prior to attending UBC, no difference in their intention to engage in enriched educational opportunities, a greater likelihood of engaging with peers, but an overall lower level of engagement with their schoolwork. Resource dependency theory was employed to discuss how an institution's ability to exert influence over its enrolment (i.e., its environment) is affected by the factor of applicant demand for the supply of first-year seats. The discussion also draws upon social imaginary theory to describe how admission

decision-making models based upon institution needs (as opposed to applicant merit) conflict with our sense of social justice. While the results suggest that students choose institutions more so than institutions choose students, the study discusses the benefits to both the institution and society when universities effectively manage enrolment through diverse admission decision-making criteria.

Preface

This study involves the use of two survey instruments managed by The University of British Columbia office of Planning and Institutional Research and the Indiana University Center for Postsecondary Research. All survey instruments were administered to students of The University of British Columbia (on both the Vancouver and Okanagan campsues) by UBC Planning and Institutional Research. The survey results were provided to me by UBC Planning and Institutional Research.

No part of this thesis has been previously published. I conducted all the research and wrote all the text of this thesis with the support of my supervisory committee.

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1 Introduction

This study looks at how institutions of higher education make choices about the students they enroll. Just as students choose institutions, so do institutions choose students. Prospective students are highly focused on admission criteria, eager to learn "what is required to get in"; at the same time, institutions of higher education have access to more and more information with which to render an admission decision. But how do the criteria employed by colleges and universities to select a class actually impact student outcomes? Can one admission decision-making model actually enroll a class that is markedly different than that produced by another admission-decision-making model? And if so, how does the selection criteria used by universities fit within the larger social discourse of access to higher education? These are important questions to answer when considering the variety of pressures and issues currently faced by the higher education sector, as well as the high public demand for access to selective institutions.

Accessing higher education

"Access" within a post-secondary context is defined as "the process of enabling entry to higher education" (Harvey, 2004). Between 2000 and 2006, full-time university enrolment in Canada increased by more than 190,000 students, or 31%; by 2016, enrolment is expected to grow by an additional 70,000 to 160,000 students, depending upon the growth scenario (Association of Universities and College of Canada, 2007). As of 2005, 50% of all Canadians aged 24 to 25 had enrolled in university study; BC had the lowest rate at 47% and Manitoba the highest at 61% (Statistics Canada, 2007).

Within the social discourse on the role of higher education, the growth in university enrolment represents an evolution from elite to universal access. Trow (1973) argues that when

participation in higher education reaches the level of half the population, attendance is perceived as a right and an obligation. The heightened desire for higher education stems from both the individual and the society, as the benefits of attainment are ubiquitous: higher wages, better individual health, employment stability and flexibility, higher national GDP, innovation, civic engagement, and economic growth (Statistics Canada, 2007). Furthermore, there is evidence of added benefit when the education is obtained via an elite institution (Trusheim & Crouse, 1981; Eide, Brewerb, & Ehrenberg, 1998; Hoxby, 1998; Milem & Hakuta, 2000; Dale & Krueger, 2002; Carnevale & Rose, 2003; Turner & Pusser, 2004; Davies & Guppy, 2006; Hoekstra, 2009; Williams & Filippakou, 2009). Within the context of access, elite institutions can be defined as those with selective admissions, where external demand far exceeds the availability of seats. Although higher education as a whole may be accessible to all within a massified or universal system of access, not all institutions are accessible to all students.

In considering institutions with selective admission policies, access is not determined in a manner that is value-neutral. In North American, each institution independently determines its rationale to determine who gains access and who does not – this is the admissions decision-making model. Typically, admission criteria are reflective of an institution's values, as higher education serves not only to educate academically, but also to build character and shape the citizenry (Thomas, 1991). In other cases, admission decisions represent an operationalization of an organization's strategic objectives, a mechanism to ensure enough students (and, by implication, enough revenue) to remain viable within a competitive environment. In either case, the admission decision-making model presents the potential to create tension between the organization and its external environment. This tension may be the result of misalignment between the organization's values and society's values. It may also be the result of a conflict

between external actors and the organization negotiating an exchange of resources. Within this tension, neither the prospective students nor the prospective institutions are passive actors. Students are actively trying to decide if a university is a good fit for their values (Litten, 1982; Schertzer & Schertzer, 2004; Mattern, Woo, Hossler, & Wyatt, 2010) and the university is doing the same with the prospective student. From the organization's perspective, the idea of finding a student who is a "good fit" for a particular institution of higher education is a key tenet of enrolment management.

Overview of study

In this study I look at how theories and practices of enrolment management affect student access to higher education at the undergraduate level within a selective university in Canada. To begin with, I will present an overview of enrolment management, its origins, key theoretical components, and its applicability within a Canadian higher education context. Embedded within an understanding of enrolment management is a central question: how do we understand the broad implications of how selective admissions universities choose students? And how does this understanding vary from the perspective of the individual student (i.e., the applicant), the institution, and society as a whole? Pfeffer and Salancik's (1978) resource dependency theory will be used to as framework to discuss the perspectives of the students and the institution; Bourdieu's concept of the social imaginary will be employed to understand access to higher education within the societal context. A literature review will provide an overview of how and why students access higher education, the emergence of enrolment management theories and practices among institutions of higher education, and a taxonomy of admissions decision-making models.

In the study, I will look at a sample sub-population of just under 1,500 students at the University of British Columbia (UBC) over a two-year period (2010 and 2011). The study rests on the principle that if a post-secondary institution is enrolled to capacity, changes to admission policy have a "zero-sum" effect on enrolment; for every additional student admitted, another must be refused. Both actual and hypothesized changes to UBC's admission decision-making model will be used to identify (a) students who are successful in gaining admission to UBC as a result of changes in enrolment management practices (the "newly-admitted") and (b) students who are subsequently unsuccessful in gaining admission due to the same changes in enrolment management practices (the "newly-displaced"). In one scenario, the changes in enrolment management will be related to a hypothesized admissions model that gives preference to secondary school applicants from Canadian jurisdictions outside of BC in order to enhance UBC's national presence and reputation. In another scenario, I will provide an assessment of changes already implemented at UBC that introduced the inclusion of an applicant personal profile (referred to as "Broad Based Admissions" or "BBA," consisting of short answer questions) in the admission decision-making model. Students will be described by first-year outcomes in academic performance (as measured by first-year academic performance and retention to their second year of study) and level of engagement (as measured by institutional survey data that includes questions from the New to UBC survey and the National Survey of Student Engagement).

By using enrolment data spanning two intake cycles and two UBC campuses, I employ a quasi-experimental design to observe actual first-year outcomes of students (not hypothesized or regressed student outcomes, as are often seen in the literature) to determine the impact of changes in the admission decision-making model. The analysis avoids a common pitfall of

similar studies that tend to look to entire cohorts of students to determine the impact of changes to the admission decision-making model. The methodology employed herein isolates the students who were affected by the changes; students who would have been admitted or denied in either admission decision-making model are excluded. The extent to which different outcomes were observed between the newly-admitted and the newly-displaced students speaks to the ability of the institution to actively shape its first-year class to better align with institutional goals. The extent to which the newly-admitted and newly-displaced students achieved the same first-year outcomes suggests that it is the student that selects the institution and not the other way around. In other words, if different admission criteria result in students who behave differently, then the class is shaped by the university (by virtue who they decide to admit); if student behaviour remains the same, regardless of the admission criteria used, then the class is shaped by the students (by virtue of where they decide to apply and enroll).

The results in chapter 5 show that even a highly sought-after institution like the University of British Columbia is somewhat limited in its ability to shape its incoming class. For the most part, enrolment is determined to a greater extent by students who are attracted to the university than by the university's ability to engineer a class through its admission criteria. By employing an admissions decision-making model focused on both academic merit and personal characteristics (i.e., character), UBC enrolled a class that was only slightly more likely to display first-year outcomes better aligned with the institution's values (to enroll a more engaged student). The observed differences between the newly-admitted and the newly-displaced were both positive and negative in value, with the newly-displaced students being more likely to display certain positive traits than the newly-admitted, and vice versa. By employing an admission decision-making model that placed a higher priority on institutional enrolment goals (i.e., to

enroll a more nationally representative class) than applicant merit (be it academic merit or personal characteristics), UBC was able to enroll a significantly different first-year class. But the differences noted were not all positive; trade-offs were made between academic performance of students and enrolment objectives of the institution. These trade-offs present a dilemma, placing the hypothesized enrolment practices in conflict with our socially conceived notions of how universities should afford access.

An introduction to enrolment management

Although the process of making considered admission decisions is nothing new in the world of higher education, the framework for those decisions has become increasingly structured and market driven in the past 30 years (Schmeltzer & Schertzer, 2004; Slaughter & Rhoades, 2004). Since the 1980s, there has been a growing discussion on North American campuses of the importance of enrolment management. Through professional associations, conference proceedings, and an emerging body of literature, enrolment management (or "Strategic Enrolment Management," "SEM" as often cited in the literature) has substantively influenced institution activity, organizational structures and strategic planning within the post-secondary sector. The principles of SEM rest on the ideas that enrolment is central to the organizational health of a university or college and that enrolment can be affected and controlled by the institution. Hossler and Bean (1990) reflect this idea in an early definition of strategic enrolment management as "an organizational concept and a systematic set of activities designed to enable educational institutions to exert more influence over their student enrollments" (p.5). Later, Dolence (1993) would refine the concept by introducing a link to the institution's academic mission, defining SEM as a "comprehensive process designed to help an institution achieve and maintain the optimum recruitment, retention, and graduation rates of students, where 'optimum'

is defined in the academic context of the institution" (p.8). Botranger (2004) expands the influence of SEM beyond the institution to include the student (prior to and after enrolling), defining SEM as a concept and process that fulfills the institution's organizational goals and the student's educational goals.

Regardless of the definition, strategic enrolment management rests on three key tenets. Firstly, SEM is inextricably tied to the academic mission of the institution (Dolence, 1993). Secondly, the practice of SEM is commonly tied to organizational structure (Huddleston, 1980; Kemerer, Baldridge, & Green, 1982; Hossler, 1996; Henderson, 2001). Thirdly, SEM is based on empirical evidence and data-driven decision-making, similar to a social science within the academy or a market analysis in marketplace (Hossler, 1986; Kalsbeek, 2011). Enrolment management does not just "happen" within an organization; individual actors come together within a formal structure to enact enrolment management.

A Canadian context

Although the vast majority of enrolment management literature has emanated from the United States, interest is growing on Canadian campuses (Smith & Gottheil, 2008; 2009). Because most Canadian degree-granting institutions are public, operating budgets are linked to enrolment, but are not as dependent upon tuition revenue as is the case in private institutions (typically seen in the United States). As such, Canadian institutions have historically constructed enrolment by serving whatever demand existed in the marketplace. A review of the literature shows that four factors are increasing Canadian interest in the practices of enrolment management: 1) declining demographics among traditional high school leavers, 2) the desire to reduce dependency upon public funds, 3) the influence of the higher education sector in the US,

and 4) an increasingly crowded higher education marketplace in Canada. These factors are described in detail below.

1.1.1 Declining demographics

By 2016, the traditional direct-entry post-secondary age group (the population in the 15 – 19 year-old demographic) in Canada is expected to decrease by 8% (Statistics Canada, 2005)[1]. Most provinces and territories are in decline across Canada, with the exception of Ontario, where immigration into the Greater Toronto Area is expected to maintain the current population. In Atlantic Canada (boasting Canada's highest concentration of post-secondary institutions), graduating classes may decrease by as much as 22% in the next five years. In BC, the decline is lower than average (-6%), but the long term forecast suggests that the province will not see a secondary school graduating cohort as large as the class of 2011 for another twenty years.

The impending decrease in the number of prospective university students is alarming for the province of BC considering that the system already has historically had excess capacity. As of the 2008-2009 academic year, the University of Victoria, the University of Northern British Columbia, the University of British Columbia (Okanagan campus), Capilano University, Kwantlen Polytechnic University, Thompson Rivers University, and Vancouver Island University were all enrolled below 100% capacity; together, these institutions represent 44% of the province's full time equivalency (FTE) enrolment in the university sector (Ministry of Advanced Education and Labour Market Development, personal communication, February 5,

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[1] Demographic data in this section are derived from Statistics Canada's "medium-growth, medium migration" model (2005) retrieved April 1, 2011 from http://www.statcan.gc.ca/pub/91-520-x/00105/4167883-eng.htm. .

2010). On the other hand, certain institutions, including the University of British Columbia (Vancouver campus) and Simon Fraser University (together representing 47% of the province's FTEs in the university sector), are oversubscribed and admission is competitive. Clearly, students in BC are not just looking for any university seat; there are preferences for certain institutions.

BC's post-secondary capacity was increased dramatically in 2005 and there is concern that funding will be clawed back from certain institutions if seats cannot be filled. Some argue that an increase in participation rates will make up the difference in the years to come (AUCC, 2007). Demand is expected to increase particularly from lower income backgrounds and other traditionally disadvantaged groups (Giroux, 2004), urban students, and children of new immigrants (AUCC, 2007). But according to the Organization for Economic Co-operation and Development (OECD), Canada already has the second highest level of participation in tertiary education, with 58% of 25 to 34 year-olds having attained tertiary education (OECD, 2008). In British Columbia, approximately 77.1% of 2001/02 high school graduates attend some form of public post-secondary education within the province of BC (Student Transitions Project, 2012). Once we add in the numbers of students who attend private institutions, those who leave the province of BC, and increased participation rates over the past 10 years, we can assume a high level of post-secondary participation in BC. Nevertheless, in 2004, the BC government announced a plan to expand the size of the public post-secondary sector by 25,000 seats and committed $1B to the initiative. As of the 2008/09 school year, the province's post-secondary utilization rate was 97.8%, leaving the equivalent of 4,350 funded FTEs of post-secondary seats unfilled (Ministry of Advanced Education and Labour Market Development, personal communication, February 5, 2010). In every post-secondary sector (rural colleges, urban colleges, institutes, universities, and research universities), there was excess capacity.

As of the 2011/2012 school year, the situation in BC has changed. The total number of actual post-secondary FTEs in BC is 206,494, an increase of 11,117 since 2008/09 (Ministry of Advanced Education and Labour Market Development, personal communication, December 12, 2012). Overall, the post-secondary sector is now at capacity, having reached 102.7% of funded enrolment targets[2]. But despite the increased enrolment, there are still concerns. Many institutions remain under-enrolled; the fact that the province as a whole is at capacity is due to a handful of institutions increasing their over-enrollment year after year. Over-enrolled institutions like the University of British Columbia or Simon Fraser University may choose to scale back new student intake in order to reduce the number of unfunded students on campus[3]. Should this happen and if the displaced students do not find their way to other BC institutions, the provincial system will again be under-utilized. Finally, additional data is required to determine if the overall increase in enrolment in BC is the result of increased participation[4], increased enrolment from students coming from outside of the province, or changes in how institutions count their enrolments. So while post-secondary enrolment in BC may be averting the negative effect of

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[2] In conversation with UBC Planning and Institutional Research, there is suspicion that changes in FTE enrolment in BC may be partially due to changes in how institutions count FTEs, credit loads, continuing education enrolments. While there is no doubt that there has been a change, the size of the change may be questionable.

[3] Students that are enrolled beyond funded capacity are deemed "unfunded." The institution receives only the student's tuition dollars, not the government grant, for their enrolment.

[4] The most recent post-secondary participation rate data for BC secondary school students is for 2010/2011, currently available via the Student Transitions Project (http://www.aved.gov.bc.ca/student_transitions/). Immediate entry into post-secondary has hovered around 45%-46% for the past five years, so it would be surprising to see a dramatic change for 2011/12. If this rate has in fact remained constant for 2011/12, it is hard to imagine that participation rates among older students will have changed to the point of generating an 11,117 FTE increase in the post-secondary sector, even when we consider the economic downturn in the marketplace since 2008.

declining demographics, there is enough volatility in the system to suggest that with funding somewhat tied to enrolment[5], institutions must do everything they can to maximize their enrolments to maintain viability in the marketplace.

1.1.2 The desire to reduce dependency upon public funds

The majority of Canadian universities and colleges are publically funded. In recent years, declining levels of public funding have increased engagement by universities in market-driven behaviours in order to maximize existing sources of revenue (Quirk & Davies, 2002; Young, 2002). In the 1980s, government funding provided 84% of overall funding to Canadian universities; as of 2012, government funding accounts for only 57% (Canadian Association of University Teachers, 2013). Effective enrolment management is seen as means to reduce dependency on decreasing public funding. Furthermore, public funding for Canadian higher education is seen less as a straight subsidy and more a tool strategically used by government to position research universities towards increased revenue generation (Metcalfe, 2010). This is of particular importance in terms of enrolment, considering that research schools in Canada tend to be seen as the most prestigious; one could argue that public dollars used to generate research indirectly generate market demand from prospective students for certain institutions.

Professional programs (e.g., engineering, business, medicine, etc.) typically garner the highest prestige and the greatest demand from prospective students in Canada (Davies & Guppy,

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[5] In situations where an institution is under-enrolled, fewer students can mean a loss of revenue through tuition. Although the BC provincial government funds post-secondary institutions for a certain amount of FTE enrolment, a shortfall enrollment does not necessarily result in an immediate government claw back of funds. However, this could very well be the end result for an institution after successive years of under-enrolment. Conversely, over-enrollment does not necessarily result in added funds from the government.

2006). Often, these programs receive targeted funding from government, either through specified allocation (e.g., the BC government mandates a specific number of seats in Medicine and Nursing) or by labour market driven initiatives (e.g., the BC Ministry of Education's "Doubling the Opportunity" initiative in the early 2000s, designed to increase the number of seats in electrical engineering and computer science). Tuition deregulation in professional programs has also strengthened the relationship between enrolment and budget. In Ontario, some professional programs in public universities derive over 50% of their operating budget from tuition revenue (Canadian Association of University Teachers, 2009), raising the question of whether these programs are best described as "publically funded" or "privately funded with some public subsidies." The distinction is important; the more the institution weans itself from public funding as related to enrolment, the more the institution will inevitably adapt an enrolment model based upon ability to pay. Even within the humanities, Canadian tuition has increased rapidly, from an average of $1,714 in 1991, doubling in ten years to $3,452 in 2001 (Statistics Canada, 2001) and increasing by another 32% in the subsequent decade, up to $4,660 in 2010 (Statistics Canada, 2010).

A good example of the increasing dependence upon tuition-based revenue in Canadian universities is seen in the growing importance of international student enrolment. International students typically pay a much higher rate of tuition than domestic students. Whereas provincial funding for domestic student enrolment is finite (establishing a de facto fixed capacity), international student enrolment is (theoretically) limited only by physical capacity on campus. Between 1998 and 2008, the number of foreign students studying in Canada grew from 39,547 to 95,404 (Roslyn Kunin & Associates, 2009). The growth has been of particular importance for BC; while BC accounts for 13% of the national population, 20% of foreign students attending

university in Canada do so in BC. In total $5.5 billion worth of expenditure was put into the Canadian economy in 2008 from international students who studied for six months or longer in Canada.

Admission policies play a critical role in maximizing international student enrolment. A January 3, 2013 article in Inside Higher Education reports of an ever-increasing number of US colleges and universities implementing conditional admission programs, relaxed admission standards, and specially designed "bridging" programs to enroll greater numbers of international students (Redden, 2013). A similar trend has already begun in Canada, with the University of British Columbia, Simon Fraser University, and the University of Toronto (among others) having already developed or begun development of similar types of programs. Clearly, the ability to affect enrolment has become a critical mechanism by which public institutions assert dominance over their environment, strengthening sources of private resources and reduce dependency upon public resources within the marketplace.

1.1.3 The influence of higher education sector in the US

The increasing presence of market-based behaviours among Canadian universities has moved the Canadian higher education sector closer towards its counterpart in the United States. "Academic capitalism," higher education's engagement in market-driven behaviours designed to maximize revenue (Slaughter & Rhoades, 2004), may have seen its early days in the US, but its presence within Canadian higher education is growing (Metcalfe, 2010). And just as increased attention to patents and knowledge transfer provide evidence of academic capitalism within the context of research, so does enrolment management provide a similar example within the context of administrative practice.

Canadian and US institutions of higher education share much in common. Both systems have high school structures that promote very mild streaming, relatively high post-secondary enrolment (compared to other nations), a decentralized higher education structure, and similar economies and occupational structures (Davies & Hammack, 2005). There are structural similarities between the US and Canadian post-secondary sectors related to institution types (e.g., the presence of community colleges), entry points into the sector, and student mobility between institutions (Adamuti-Trache & Andres, 2008). North American institutions show a level of dependency on tuition revenue (even among public institutions) that is not always seen among their European counterparts. Proximity and cross-border movement of students and faculty serve as a conduit for the sharing of ideas and best practices. The size and complexity of the US higher education landscape dominates the professional discussion on university administration, but in a context where Canadian institutions see the relevance to their own campuses. In fact, through the growth and influence of professional associations, conferences, trade publications, webinars, and consultancy firms, enrolment-focused market-driven behaviours within the US higher education sector have generated a thriving "how-to" industry, attracting the attention of Canadian campus administrators. For example, in 2003, the American Association of College Registrars and Admissions Officers' (AACRAO) annual Strategic Enrolment Management conference hosted 32 Canadian attendees (5% of total attendance). By 2009, not only had Canadian attendance doubled (representing 12% of total conference attendees), but a full Canadian Institution track had been introduced in the conference programming.

Like Canada, higher education communities in other parts of the world are becoming increasingly interested in exerting better control over their enrolments. Universities in the UK, Australia, and New Zealand have long been active in the recruitment of international students;

recently, many non-English speaking higher education systems (such as Germany and China) have also indicated a desire to actively recruit international students. Governments and institutions in countries where demographics suggest a decreasing post-secondary enrolment (such as Japan, South Korea and Taiwan) are looking to compensate by appealing to non-traditional local students and attracting international students (Marcucci & Usher, 2012).

In Europe, universities do not "admit" students in the same sense as in North America; students are entitled to attend tertiary study. Nevertheless, European institutions and governments can still exert influence upon enrolment. Implemented throughout the 2000s, the Bologna Process has served to replace existing national systems of higher education degrees with a single Bachelor-Master system in the hopes of increasing mobility, generating competition among universities, and making Europe as a whole look more competitive in a global context (Horstschräer & Sprietsma, 2010). In Italy, where the Bologna Process has effectively shortened the amount of time required to graduate with a post-secondary credential, participation rates have grown by 15%, particularly among students with strong academic ability, but whose parents did not attain a post-secondary education (Cappelari & Lucifora, 2009). On the other hand, in Germany, another country where the Bologna Process has served to reduce the duration of a post-secondary credential, Horstschräer and Sprietsma (2010) studied longitudinal administrative student data to find no significant effects on enrollment. While the Bologna Process assumes that competition amongst institutions leads to system-wide benefits, Mechtenberg and Strausz (2007) suggest that "in order for the competition effect to raise quality, it must overcome the free-rider effect that countries prefer their students to obtain their costly education abroad" (p. 110); mobility must be defined by students wanting to get the best, not the cheapest, education.

Recent years have brought about dramatic increases in tuition in British universities, leading to fewer applicants, many of who may be looking elsewhere for their post-secondary education. Some suggest that in a global context, higher education has maximized its traditional markets: "(i)n OECD countries, the combination of a looming demographic crunch and the realities of public finance in an era of low growth and substantial public debts means that we may have hit 'Peak Higher Education', … (as) government support for education only barely kept up with inflation in 2011 and the outlook for 2012 looks bleak given the debt crisis in the Eurozone" (Marcucci & Usher, 2012, p. 4). As public funding becomes more tenuous in the global higher education sector, institutions will move closer to a US-style model, where both private and public funding factor prominently in post-secondary budgets, and enrolment management is seen as a mechanism to ensure institutional viability.

1.1.4 Differentiation and stratification in the marketplace

Davies and Guppy (2006) suggest that one of the more significant differences between perceptions of higher education in the US and Canada has to do with where differentiation and stratification occur. In the US, a more neo-liberal and competitive post-secondary environment than Canada, there is a steeper prestige hierarchy among institutions of a similar type (e.g., universities), either as individual actors (e.g., an Ivy League school as opposed to a public 4-year college) or as members of a sector (e.g., the University of California system vs. the California State University system). In Canada, historically, most universities have been seen as relatively equal in stature, with stratification occurring mostly at the level of field of study, as students vie for more desirable (and more competitive) professional programs (Davies & Guppy, 2006).

However, as the marketplace becomes increasingly crowded in Canada, with prospective students in shorter supply, public dollars harder to come by (or with more strings attached), and

an increasing need to generate more revenue (Davies & Guppy, 2006), a Canadian university prestige hierarchy has begun to emerge (Davies & Hammack, 2005). In 2009, the presidents of Canada's G5 universities[6] argued that if Canada is to contribute to the creation of new knowledge on the world stage, their institutions need to be considered as a top-tier group with preferred access to public funding. Other research-intensive institutions in the U15[7] would be de facto "second tier," with less of a focus on research and more of a focus on undergraduate education. This stratification is legitimized not only through research and research funding, but also through accreditation. The Association of Universities and Colleges of Canada (AUCC) has forged an agreement with the federal government to increase research output; this positions the AUCC as an external body with the ability to "legitimize" institutions based upon their research output (Metcalfe, 2010). As such, the flow of federal dollars has both created and resulted in the stratification, as the Canadian government moves money toward universities and away from other post-secondary institution types (Metcalfe, 2010).

Within the province of BC, the increased system capacity has resulted in less differentiation among institution types (Dennison & Schuetze, 2004; Plant, 2007) and more stratification among similar type institutions. The current post-secondary structure in BC has its origins in John Macdonald's seminal policy document, *Higher Education in British Columbia and a Plan for the Future*. Macdonald, then president of the University of British Columbia,

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[6] A consortium of Canada's most research-intensive universities: McGill and the universities of Alberta, British Columbia, Montréal, and Toronto.

[7] A broader consortium than the G5 of Canada's most research-intensive universities, as measured by sponsored research funding and graduating PhD students. The list includes Dalhousie, McGill, McMaster, Queen's, and the universities of Alberta, British Columbia, Calgary, Manitoba, Montréal, Ottawa, Saskatchewan, Toronto, Waterloo, and Western Ontario.

argued that to equip the citizens of BC with the skills required for future prosperity, a distributed and accessible system of colleges was required throughout the province (Macdonald, 1962). Across the region, students could pursue the first year or two of their post-secondary studies locally before transferring into one BC's three universities (concentrated in southwest corner of the province). Participation rates would grow in this new model, as the presence of a college within the local community reinforced the benefits of a post-secondary education and offered a smaller financial burden to the student no longer required to move away from home in their first two years of university-level study.

Although many in Canada considered the diversity of BC's higher education system a shining model of student mobility (via a robust and highly transparent inter-institutional course-by-course articulation process), the past 25 years have seen an evolution (sometimes gradual, sometimes immediate) towards a more homogenous system. One by one, many BC institutions have drifted towards university status. The 1988 provincial access strategy *Access for All* saw the introduction of a new institution classification - the "university college." University colleges continued to meet the local needs of their communities (via certificates, diplomas, and university-transfer courses) but could now offer their own baccalaureate credentials. In 2007, another policy document commissioned by the provincial government, Geoff Plant's *Campus 2020*; *Thinking Ahead: The Report,* went even further, suggesting the elimination of the university-colleges and the creation of five new universities: the University of the Fraser Valley (formerly the University College of the Fraser Valley), Vancouver Island University (formerly Malaspina University College), Kwantlen Polytechnic University (formerly Kwantlen University College), Capilano University (formerly Capilano College), and Emily Carr University (formerly Emily Carr Institute of Art and Design). This, in addition to changes a few years prior that saw the creation

of Thompson Rivers University in Kamloops (formerly the University College of the Caribou) and a new UBC campus in the Okanagan (formerly Okanagan University College). In the span of a few short years, the number of universities in BC nearly tripled.

But unlike the Macdonald report of 1962, the changes suggested by Plant's 2007 report were not driven primarily by increasing post-secondary access in BC. In an April 2008 media release (announcing the implementation of Plant's 2007 recommendations), Advanced Education Minister Murray Coell indicated "[u]niversity designation will create new opportunities for higher learning, while allowing these institutions to market themselves more effectively across Canada and around the world" (BC Ministry of Advanced Education, 2008). With tuition being tightly regulated by the Provincial government, many of BC's post-secondary institutions were becoming increasingly interested (or dependent) upon additional revenues brought about by international students (who typically pay up to four times what domestic students pay, often amounting to the "full-fare" of their education). But recruiting an international student to a "college" (with its connotation of a "community college") or a "university-college" (a completely unknown entity to the parent of a student overseas) is considerably more difficult than recruiting to a "university." Many of BC's institutions felt hampered by their designations while recruiting overseas. So with tuition increases off the table, many institutions had been petitioning the province for full university status, motivated (in part) by the desire for increased control within the global marketplace via enrolment management.

But while many institutions now shared the same designation, sub-categories of a "university" began to emerge. Clearly, a research-intensive university such as a UBC, with its full suite of professional and doctoral programs warranted some sort of distinction from Capilano University or Kwantlen Polytechnic University, offering a mix of vocational credentials, piece-

meal transferable academic courses, and a limited number of baccalaureate degree offerings. As *Campus 2020* made distinctions between the "research-intensive" universities and the "teaching-intensive" universities[8] (Plant, 2007), a prestige hierarchy emerged. The hierarchy was inevitable. Institutions dependent upon the same resource – in this case, university-bound students – must differentiate amongst themselves in order to remain competitive in the marketplace (Gornitzka, 2004).

Schuetze and Day (2001) describe the diversity of institutions of higher education along two axes. The vertical axis measures hierarchical order of institution types in terms of perceived value to society and individuals. For example, a university is perceived to be higher on the axis than a community college. The horizontal axis measures the hierarchical order by specialization within the same institution type. For example, a comprehensive research-intensive university will rate higher on the axis than a teaching-intensive regional university. As the horizontal axis becomes more crowded, and system capacity exceeds demand, the marketplace becomes less focused on the vertical axis (the hierarchy of institution type) and more so on institution specialization (the hierarchy of institution specialization) to distinguish between the same types of institution. Inevitably, institutional reputation and perceptions of quality are used to differentiate. As it becomes increasingly important for an institution to distinguish itself among its competitors, enrolment management emerges an effective instrument to manage resource dependency within the marketplace (Wilkinson, Taylor, Peterson, & Machado-Taylor, 2007).

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[8] The distinctions blur a little as research-intensive universities also stress the importance of teaching while teaching-intensive universities also develop research agendas.

How does an institution create an identity for itself through enrolment? In some cases, universities become known for the composition of their student body, be it on metrics of quality, diversity, or size. Ultimately, the most potent enrolment characteristic of a university (within the eyes of the general population) is accessibility. The demand from the marketplace in relation to the supply of seats is taken as a proxy for institutional quality (Astin & Henson, 1977; Marginson, 2006). This perception is often seen formally, as evidenced by how an increase in the volume of applications can have a positive impact on a US university's rankings in US World and News Report. Other times, the perception is considerably less formal, as there is a value assigned to an education from a selective institution that goes beyond the worth of the education itself (Turner & Pusser, 2004; Clarke, 2007).

Selective public institutions in Canada

In the US, a formal selectivity measure exists to empirically identify the most selective institutions: *Barron's Profiles of American Colleges*. Definitions run as follows:

> *Most Competitive:* Even superior students will encounter a great deal of competition for admission to colleges in this category. In general, these colleges require high school rank in the top 10% to 20% and grade averages of A to B+. Median freshman test scores at these colleges are generally between 655 and 800 on the SAT and 29 and above on the ACT. In addition, many of these colleges admit only a small percentage of those who apply – usually fewer than one third.
>
> *Highly Competitive:* Colleges in this group generally look for students with grade averages of B+ to B and accept most of the students from the top 20% to 35% of the high school class. Median freshman test scores are generally in the range of 620 to 654 on the SAT and 27 or 28 on the ACT. These schools generally accept between one third and one half of their applicants.
>
> *Very Competitive*: The colleges in this category generally admit students whose averages are no less then B- and who rank in the top 35% to 50% of their graduating class. They generally report median freshman test scores in the 573 to 619 range on the SAT and from 24 to 26 on the ACT. These schools generally accept between one half and three quarters of their applicants.
>
> (*Barron's Profile of American Colleges, 29th Ed.*, 2011, p 249-251)

Although a similar classification does not exist in Canada, a number of variables can be used to identify selective universities in Canada[9]. Selectivity can be defined by the ratio of qualified applicants to the number of available seats; the extent to which an institution is selective is the percentage of qualified undergraduate applicants offered admission. But this definition is problematic for a number of reasons. First of all, in Canada, these data are not available on a national level. Secondly, the measure itself may not be entirely valid, as institutions can artificially increase the size of their applicant pool with unqualified students in order to appear more selective[10]. Similarly, good students may want to attend a particular school but self-select out if they do not believe they can gain admission, thereby artificially reducing an institution's selectivity.

In a Canadian context, one proxy for selectivity is the quality of the applicant pool, as measured by the mean high school admission average presented by applicants. In 2009, the top five institutions in Canada based upon mean entrance average were McGill University (Montréal, QC), l'Université de Montréal (Montréal, QC), the University of Saskatchewan (Saskatoon, SK), the University of British Columbia (Vancouver, BC), and Queen's University (Kingston, ON)[11]. But entrance grades are both imprecise and often invalid measures of institutional selectivity.

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[9] UBC does meet the criteria set out by *Barron's Profile of American Colleges, 29th Ed.* for *Most Competitive*, with the exception of percentage admitted, which falls closer to the designation of *Very Competitive*. This is an important point that will be relevant in the discussion of the results of this study (section 6.1).

[10] For example, an institution might offer to waive the application fee for prospective students with high SATs. The increase in applications makes the institution look more selective/desirable, but is not a true reflection of student demand.

[11] Maclean's Magazine, November 22, 2010

First of all, different jurisdictions in Canada use different grading scales, making it difficult to compare a grade of 80% from a secondary school in BC (where 80% equates to a "B+"), a secondary school in Alberta (where 80% equates to an "A"), or a CEGEP in Montréal (where the grade distribution is more in line with a post-secondary, not a secondary, school).

Secondly, many institutions value qualities other than academic performance as a measure of the quality of the student body. Using such metrics alters the list of Canada's most selective institutions. For example, the top five institutions in Canada in terms of Millennium Excellence Awards, awarded to students for both academic achievement and personal characteristics, are the University of Toronto (Toronto, ON), Queen's University, McGill University, the University of British Columbia, and the University of Alberta (Edmonton, AB)[12].

Finally, some would argue that institutional reputation in the marketplace can be taken as a proxy for selectivity. Survey data suggest that the perception of academic reputation is the strongest driver of application and enrolment among applicants to a research-intensive institution in Canada (Arida, 2011). Therefore, institutions with the strongest reputations are likely to be the most selective. Of the two most often cited international rankings, Shanghai Jiao Tong University Rankings (China) and the Times Higher Education Supplement (UK), only three Canadian universities consistently show in the top 50 world universities: the University of Toronto, McGill University, and the University of British Columbia.

While a definitive measure of selectivity is not available, using the three proxy methods mentioned above, four institutions seem to emerge with some consistency as the most selective in

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[12] Data as of 2009. The Millennium Excellence Awards program is currently no longer in existence and a formal source of data is no longer available.

Canada: the University of Toronto, Queens University, McGill University, and the University of British Columbia. This study will focus on the admissions decision-making processes of the latter, the University of British Columbia.

Admission decision-making processes

All institutions of higher education make philosophical decisions on how they will admit students. Even institutions without admission criteria, providing access for all, have made an institutional decision on who they want to enroll. Admission policies reflect both institutional values and institutional imperatives; students are recruited and admitted to embody and bring to life the institution's mission statement (Wilkinson et al., 2007) and to ensure that the organization remains operationally viable (Rigol, 2003). The latter underscores the importance of the environment in which the institution operates, as the admissions decision-making model must ensure that the institution thrives in the marketplace.

Statement of Problem

1.1.5 The societal perspective

From a societal perspective, access to higher education is closely linked to the ideas of merit and fairness (Carnevale & Rose, 2003). Though it is generally accepted that post-secondary institutions define merit and fairness within their own context, there is a societal expectation that some consideration be given to both in the selection process (Carnevale & Rose, 2003). There is often a legal expectation, too, as evidenced by US legal cases related to universities' use of affirmative action admissions. There is acceptance within society that merit should define post-secondary access, but what defines merit in the admission decision is a subject for debate. High school grades, standardized test scores, community engagement, leadership, artistic ability, and

athletic ability all constitute merit, but the extent to which each should affect access to higher education is contentious.

The idea of "fairness" is also important to the admission decision, particularly when considering the most desirable institutions. Whatever process and criteria are used to render an admission decision should be used consistently among all applicants. It is important to note that merit and fairness cannot always be assessed independently. Carnevale and Rose suggest that merit is "a 'dynamic concept' in that it should be measured not only by the applicants' academic achievements but by how many obstacles they had to surmount to achieve them" (2003, p.115). In this manner, fairness (or the idea that to be equitable does not always mean treating everyone the same) qualifies the idea of merit. According to a report from the College Board, overcoming societal inequities is a form of merit; a student who has faced greater disadvantages is more likely to succeed than a more advantaged student presenting similar accomplishments (Rigol, 2003). On the other hand, court rulings against affirmative action admission policies in the US (such as Hopwood v. Texas, 1996) suggest that "fairness" must not come at the expense of merit (as is the case when students from disadvantaged background displace more "advantaged" students with higher test scores). A nationwide poll in the US of more than 2,100 adults conducted in October 1999 suggests that the general public does not support policies that give more weight to social or economic circumstances than individual merit (Carnevale & Rose, 2003). It would seem that not treating all applicants the same can be seen as fair in terms of who is afforded access, but less so when considering who is denied access.

The idea of "fairness" in the admissions process is inextricably linked to the notion that education has value and leads to a positive outcome within society. If education had no value, there would be no need to dispense access with a sense of fairness; no one would complain of

being unfairly deprived of something that is worthless. However, it is important to note that the value of education is not only derived by the individual, but by society as a whole (Thresher, 1996; Milem & Hakuta, 2004; Noftsinger Jr. & Newbold Jr., 2007). Therefore, the consideration of non-merit based admissions decision-making criteria can serve the interest of fairness in a societal context even though it may not seem fair in an individual context.

1.1.6 The institutional perspective

Institutions of higher education view the admission process as a means by which to compose the optimum class. But to what extent are those processes effective? How do institutions know that they are enrolling the students they wish to enroll? While much has been written to evaluate admission decision-making models from the point of view of an outcomes-based meritocracy (i.e., how do grades, standardized test scores, etc. predict post-secondary success; examples include: Slack & Porter, 1980; Willingham, 1985; Ziomek & Svec, 1997; Salvatore, 2001; Sedlacek, 2004a, 2004b; Trapmann et al., 2007; Geiser & Santelices, 2007; Dore, Reiter, Eva, Krueger, Scriven, Siu, Hilsden, Thomas, & Norman, 2009; Sternberg, 2010) or mobilization (i.e., how the admission decision-making model can promote social and economic mobility; examples include: Tracey & Sedlacek, 1988; 1989; Bowen & Bok, 1998; Carnevale & Rose, 2003; Horn & Flores, 2003; Long, 2004; Turner & Pusser, 2004), the analyses are not always holistic. Studies often correlate between changes in admission criteria and overall class outcomes, but do not compare the traits and outcomes of those who were admitted with those who were not[13]. The problem with evaluating admission criteria solely on the

[13] Wing Jr. & Wallach (1971), Willingham (1985), Devaul et al. (1987), and Carnevale & Rose (2003) are notable exceptions that will be discussed later in this study.

basis of those admitted is that it assumes that applicant characteristics are held constant. For example, we assume that admission decision-making models that value school grades, standardized aptitude tests, civic engagement, or leadership qualities all identify a slightly different student. But what if applicants adjust their characteristics and performance to align with the institution's values? In other words, could the four different admission criteria identify the same student who is adjusting their application profile to gain admission to their preferred school? Bourdieu would explain this with his social reproduction thesis (Bourdieu & Passeron, 1977), suggesting that inequalities in cultural capital (promoting inequalities in social class) are facilitated by the education system, where schools reward students already rich in cultural capital. Considering the importance of enrolling an "optimum" class, (not to mention the resources that go into the recruitment and admissions processes) and the role education plays in facilitating social mobility, it behooves institutions of higher education to understand the validity with which their admission decision-making models effectively sort applicants.

1.1.7 The student perspective

While much has been written about "optimum" enrolment from the institution's perspective, there has not been much discussion about what "optimum" enrolment means from the student's perspective. Just as institutions want to enroll the "best" incoming class of students, so do students want to attend the "best" institution. The difference between the institution's idea of "optimum" enrolment and what the marketplace wants from the institution (i.e., student demand) creates a tension in access. In fact, this tension feeds on itself; institutions that are highly selective in their admissions are often seen as the most desirable by high academic ability students (Drewes & Michael, 2006), thereby generating more applications, making the institution even more difficult to access.

As previously mentioned, there is some expectation at a societal level that institutions select students based upon particular principles and that decisions are made in a manner that is fair and reasonably easy to understand. The tension also exists at the level of the individual. Simply put, applicants worry "will *I* get in?" The applicant is not a passive actor, waiting helplessly for an admission decision from their school of choice. Rather, applicants seek to understand the admission criteria of a particular institution and adjust their behaviour accordingly. This idea is particularly important to consider in a Canadian context for two reasons. First of all, some would argue that admission criteria are much more transparent in Canada than they are in the US. In a recent online posting, Alex Usher (2012), head of Higher Education Strategy Associates, a higher education consulting group, commented that many top US schools identify very few admission requirements on their websites, whereas Canadian schools tend to produce numerous requirements (examples cited between 13 and 19). This difference may be due to the fact that the majority of the Canadian higher education system is public, whereas the US presents a mix of public and private. As public institutions, there is likely a greater sense of accountability to the public, resulting in the clear communication of admission criteria.

Secondly, much of literature on how students choose a post-secondary institution emanates from the US, where tuition varies greatly from institution to institution. The result is that cost plays a significant role in a student's choice of post-secondary destination (Cabrera & La Nassa, 2000). Because tuition is much more consistent among institutions in Canada, cost becomes less of a decision-making factor. Drewes and Michael's 2006 study of decision-making among post-secondary applicants in Ontario suggests that cost only manifests as a factor in terms of school proximity (i.e., how far the applicant has to travel to attend) and level of scholarship offered;

after that, student services, the instructional environment, and institutional reputation become much more significant factors in the decision-making process. The University of British Columbia conducts an annual survey asking admitted students why they chose to attend or not to attend UBC. Of the respondents with the highest entrance averages, the university's overall reputation, the perceived quality of the academic experience, the individual program's (i.e., faculty or specialization) reputation, and university rankings factored as the four most influential factors in deciding where to attend; the cost of attending UBC (compared to other choices) ranked 14th out of 17 variables. These findings suggest that when cost is not an issue, perceptions of the institution itself are the most significant factors that determine why a student selected UBC.

This tension between the institution and its external environment can either be alleviated or amplified through the work of the enrolment manager. By artificially affecting an institution's application volumes and selectivity, the strategic enrolment manager can increase his/her institution's rankings and overall prestige (Fallows, 2001). In essence, the institution creates its own capital at the expense of the prospective student who now has less of a chance to gain admission. Therefore, we must conclude that an institution's approach to enrolment management can work against the best interests of the student (or not: in a perverse way, the more difficult it is to gain admission to the institution, the more the applicant values the institution if admission is offered). And if only the best students gain admission, it is in the admitted student's interest to attend, as there is perceived benefit to going where the best students go. As such, the theories and practices of strategic enrolment management play a central role in defining the student perspective of access to higher education.

Purpose of study

The purpose of this study is to determine how enrolment management practices affect the qualities of an incoming first-year class at a selective admission Canadian university, the University of British Columbia (UBC). Using data obtained over a two-year period and considering students admitted to either their first, second or alternate choice of program, a quasi-experimental methodology was designed to study first-year academic and engagement outcomes of both students admitted and students rejected by the institution. The study will employ a primarily quantitative[14] approach to describe how both actual and hypothetical changes to UBC's admissions decision-making model designed to achieve "optimum" enrolment serve to differentiate among applicants. The implications of these changes on enrolment will be discussed within the specific context of the institution and within the broader social discourse related to accessing higher education.

Significance of study

This study is significant in that it addresses a scarcity in the literature, it has significant implications for policy and resource-allocation among Canadian universities, and it speaks to the role higher education plays within our society.

Though much has been written about how universities have enacted enrolment practices to change the composition of their class (Tracey & Sedlacek, 1988; 1989; Bowen & Bok, 1998; Carnevale & Rose, 2003; Horn & Flores, 2003; Long, 2004; Turner & Pusser, 2004), the studies tend to measure the extent to which enrolment techniques affect a target populations (e.g., lower

[14] Although the analysis in this study is entirely quantitative, some of the data is drawn from survey responses derived from self-assessment, which can be considered qualitative.

income students, visible minority students), usually to positive effect; how these techniques have a negative effect on a non-target populations has not received equal study. By conceiving the admissions process as a negotiation between the institution and its environment over a finite resource, this study considers both students admitted and students displaced under a variety of admission-decision-making models to consider how a university decides who gains access and to what effect.

In addition, this study is significant as it considers enrolment management practices specifically within the context of a selective public institution. Much of the enrolment management literature and conference proceedings focus on enrolment management case studies at institutions with low-to-moderate admissions selectivity. It is rare to find enrolment management theories and case studies that emanate from an institution consistently ranked in the top fifty world universities[15]. This in no way suggests that selective admission universities do not have a need for enrolment management (in fact, as will be presented in this study, the origins of enrolment management practice can be traced back to the Ivy League institutions of the 1920s and 1930s), but that the imperative is different for an institution that exerts considerable influence over its environment.

More importantly, this study has significant policy implications for the higher education sector in Canada. Many Canadian institutions spend considerable effort and resources on

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[15] There is certainly academic literature that looks at enrolment at highly selective post-secondary institutions, particularly from the point of view of access for visible minorities or students from lower socioeconomic backgrounds. But the professional literature on enrolment management rarely focuses on selective institutions, either because such institutions are less likely to contribute to the professional literature or because such institutions do not see the relevance of enrolment management as presented within the professional literature.

understanding and adapting the US-based concept of enrolment management. Are these efforts and expenditures warranted? Canadian universities are effective in evaluating whether they achieve optimal enrolment in terms of total numbers of students or enrolment from specific sub-populations (e.g., female students, Aboriginal students, international students). But these institutions are far less likely to have clearly articulated the qualities of students who are "a good fit" for their campus (beyond the common rhetoric such as the "best and brightest" or "global citizens") and are therefore much less likely to know the extent to which they are actually able to engineer their incoming class.

Finally, the significance of this study is linked to the significance of education within society. As governments strive to promote post-secondary participation, as individuals pursue higher education to acquire intellectual, social and economic capital, and as society as a whole benefits from a more educated citizenry, it is critical to understand how enrolment management professionals within universities affect access to higher education. As stated by Wing Jr. and Wallach (1971):

> if emphasis on particular characteristics (in the admissions process) reduce the degrees of freedom in considering other characteristics, and if these relative weightings in turn rest, consciously or unconsciously, upon value judgments, then we are under both a scientific and a social obligation to learn as much as possible about what are the options. (p.70)

Without understanding the impact admission criteria have on accessing education, we run the risk of reducing the extent to which education allows for social mobility and simply enacting the social reproduction Bourdieu suggests is inherent in education (Bourdieu & Passeron, 1977).

Position of the researcher

My role in this study is both academic and professional. In my current position as Associate Registrar, Undergraduate Admissions, at the University of British Columbia, I consider myself an enrolment management practitioner. As such, much of the perspective I bring to this study reflects the lived experience of managing enrolment for a large, selective admissions institution. Conclusions drawn from this study have the potential to directly influence the enrolment process at UBC in years to come.

Currently at UBC, enrolment management issues capture the attention of the highest levels of the institution. The President, the Provost and the Deans are actively engaged in defining optimum enrolment. Multiple enrolment management structures and committees that span two campuses (one in Vancouver and the other in Kelowna) have been put in place and are active in shaping admissions policy. Numerous groups on campus, be they governing bodies, faculty members, or administrators, are actively engaged in reform of UBC's admissions decision-making model. Through this study, I will provide a means of assessing how this work is considered, and in doing so, provide conclusions that are of practical value to the campus community in addition to being of interest to a broader academic audience.

2 Review of Related Literature

The literature review in this study touches upon three key areas: the societal perspective on access to higher education; the development of enrolment management within the profession of higher education administration, and; an overview of admission decision-making models.

Accessing higher education; the societal perspective

There are three dominant themes in the literature regarding societal discourse on accessing higher education (particularly from selective institutions). The first looks at why people access higher education (the acquisition of various forms of capital); the second theme considers who accesses higher education (elite, massified and universal access); the third theme discusses the criteria by which students access selective institutions (contest vs. sponsored mobility).

2.1.1 Accessing higher education as a means of acquiring capital

The benefits of obtaining a higher education credential from a selective institution are numerous; most are related to graduate outcomes. Graduates from selective institutions enjoy increased earning potential (Trusheim & Crouse, 1981; Hoxby, 1998, Dale & Krueger, 2002[16]; Hoekstra, 2009), a higher probability of enrolment in a prestigious graduate school (Eide, Brewerb & Ehrenberg, 1998; Carnevale & Rose, 2003), and increased social stature (Turner & Pusser, 2004; Williams & Filippakou, 2009). Benefits are reaped directly by individual graduates and indirectly by groups within society. For example, Milem & Hakuta (2000) found that students from under-represented communities who attend selective schools are more likely to

[16] While Dale and Krueger's 2002 study did confirm added economic benefit for lower socioeconomic students who attended selective admissions institutions, the same results were not seen among middle and high socioeconomics groups.

return to their home community and take on leadership roles than students who attended non-selective schools. Access to selective institutions provides individuals with social and economic mobilization, as lower-socioeconomic students reap far more benefit from a top-tier education than higher socioeconomic students (Bowen & Bok, 1998; Dale & Krueger, 2002).

These outcomes (or benefits) can be described in terms of capital. Bourdieu defines capital as accumulated labour, which when appropriated by agents or groups of agents, enables them to appropriate social energy in the form of "reified or living labor" (1986, p. 46). Capital defines social and economic relationships and can be acquired or exchanged to accumulate power and resources. Bourdieu (1984) identifies four kinds of capital that are interconnected and relevant to higher education outcomes: economic, cultural, social, and symbolic.

While the connection between education and economic prosperity has not always been generally accepted in society (Witmer, 1970), today there are considerable data that suggest that post-secondary graduates fare better economically in the marketplace (Association of Universities and Colleges of Canada, 2007; Statistics Canada, 2007). The generation of capital that stems from higher education is seen at both the individual and the system level, as high levels of funding from business or government (measured as a proportion of GDP) into the university sector have been proven to act as an economic engine on a national level (Samarasekera, 2011). The transmission of economic capital is not always direct within the context of higher education (e.g., the creation of a new technology), but rather, flows through other forms of capital. For example, higher education attainment creates human capital, where individuals have more fulfilling lives, more satisfying work, and higher paying jobs (Coleman, 1988). In addition, economic capital is negotiated through converted cultural capital. Bourdieu (1986) suggests that within the context of education, cultural capital is institutionalized,

perceived as a guarantee of capital suggested by the institution offering the credential. This is of particular importance in consideration of selective institutions, where capital is created by both the education itself and the certification attached to the education (Wing Jr. & Wallach, 1971). In this sense, the individual appropriates the cultural capital of the institution; the institution's reputation becomes the graduate's reputation.

Access to higher education also offers social capital. Bourdieu defines social capital as "the aggregate of the actual or potential resources that are linked to a possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition" (Bourdieu, 1986, p. 248). Capital is acquired and exchanged through a network of social relationships, be they social obligations or social connections (Andres, 1994). Coleman (1988) argues social capital exists in three forms: as obligations and expectations, as information channels, and as social norms. All three forms are relevant to higher education. That social obligations and expectations have historically played a central role in determining access to America's most selective universities will be discussed later in this study. Information channels are critical in transmitting the worth of an institution of higher education and of specific credentials; both inform the action of individual actors and those without the information to differentiate may suffer a loss of social capital (Andres, 1994). It is expected that certain credentials will be received in certain ways by society; through these social norms, capital is created and transferred in institutions of higher education and their students.

Coleman (1988) states that there are two key methods by which social capital is developed: by introducing it to succeeding generations through family and education and through trustworthiness of social structures. With the former, social capital is both the catalyst and the output of higher education attainment, as strong family relationships promote higher education

attainment, resulting in increased external networks. Having faith in this external network, evidenced through associations and obligations among actors within the network, generates social capital. Karabel (2005) identifies a good example of both methods of generating social capital through higher education by describing Harvard, Yale and Princeton Colleges in the first decades of the twentieth century. The concept of alumni entitlement via relaxed admission standards (or "legacy" admission) for the sons of Harvard, Yale and Princeton men represents an example of the transmission of social capital through family and education. The final clubs at Harvard, the secret societies at Yale, and the eating clubs at Princeton offered internal and external networks for the transfer of capital, perceived to be of greater value than the learning in the lecture halls. The preservation of this mechanism of negotiating capital formed the underpinning of how access was afforded at the elite institutions of the day and served as a mechanism to reproduce a social hierarchy. The idea of access determined predominantly by a meritocracy (which theoretically redistributes social capital) would not become widespread among elite institutions until the 1930s. But even merit-based admission decision-making models reproduce existing social capital structures, as those with social capital are advantaged in achieving the kinds of meritorious performance universities look for when making admission decisions (Karabel, 2005; Mortenson, 2005). Thresher (1966) refers to this by stating that entrance requirements as determined by the institution are of lesser impact than those established by "accidents of socioeconomic origin, early environment, and the various levels of aspiration habitually characterizing particular groups and subcultures" (p.5). Although social capital is ubiquitous within society (Gamarnikow & Green, 1999), in a sense, educational achievement is both relative and absolute (Helliwell & Putnam, 1999), and while it is possible to acquire social capital via education, there is also an element of social capital being "zero-sum."

Rolled together, the perception of all these forms of capital speak to what Bourdieu (1986) would refer to as the "habitus"; "symbolic capital… as a socially constituted cognitive capacity" (p.56). Habitus is "a system of dispositions that are created and recreated as objective structures and personal history converge" (Andres, 1994, p.125). It is within this collection of dispositions towards higher education that capital is perceived and created. Williams and Filippakou (2009) suggest that symbolic capital is of particular importance in understanding elite formations of higher education (i.e., selective institutions). In fact, symbolic capital can often be the vehicle by which all other forms of capital present through education:

> Symbolic capital is defined through its function of mediating power through prestige, and can be associated with economic, social or cultural capital. Symbolic capital can give value and recognition to all the other forms of capital. The evaluation of an elite individual is always a combination of the various forms of capital. In that sense, it might be said that symbolic capital legitimizes the elites to other members of the group and to other social groups. It gives them access to status, power and, often, wealth. (Williams & Filippakou, 2009, p.5)

Therefore, if an education affords capital, and an education from a selective school can serve to increase that capital, the potential for capital acquisition becomes a means of stratifying institutions of higher education. With various forms of capital unequally distributed among institutions (or at least, perceived to be as such), an institutional hierarchy is inevitable. In this context, where higher education (but not every institution) is seen to be attainable by more than just the elite strata of society, the highly desirable institution is no longer labeled "elite," but "selective." Anyone may enter the selective institution, but not everyone does. Exclusion may be the result of the individual student; many may self-eliminate because they do not see themselves at a selective institution, that it is place for those who are already high in social or cultural capital (Andres, 1992). Others may be excluded directly by the institution due to the level of competition in the admissions process. In the case of the latter, the decision-making processes by which

institutions enact selectivity define access; this emerges as another dominant theme in the literature.

2.1.2 Elite, massified, and universal forms of access to higher education

Social discourse on access to higher education reflects an evolution from an elite system to a massified system, and ultimately, to a universal system. Who attends is at the heart of this evolution: "as more students … go to college or university each year, the meaning of college attendance changes – first from being a privilege to being a right, and then… to being something close to an obligation" (Trow, 1973, p.5). The evolution is not only defined by the quantity of students, but also by the qualities, measured in inputs (i.e., admission criteria) and outputs (i.e., skills and characteristics of graduates).

Since the emergence of the first universities in the Europe during the Middle Ages, students who enrolled were bright, older boys and men from a range of social classes (Cobban, 1999; Scott, 2006). Northern schools had a system of faculty governance; southern schools (usually patterned after the University of Bologna) tended to be governed more so by the students. Higher education promised, among other things, the possibility of upward social mobility. In England, the cost of tuition made it necessary for poorer students to find a guardian or a patron, although poorer students unable to secure such funding could also attend as a member of one of the order of friars. The early modern universities (1500-1800) were fuelled by the emerging nation-states of Europe, and as governing bodies emphasized the importance of advanced, secular knowledge and technical skills, growing numbers of aristocrats entered university as preparation for high office (Scott, 2006). It was not until the late fourteen or fifteenth centuries that students of nobility began to enter the English universities in significant numbers (whereas Italian, French provincial, Spanish, and German universities of the day already

enrolled substantial numbers of nobility)(Cobban, 1999). Yet despite this accessibility for students of all classes, the most prestigious English universities, Cambridge and Oxford, were defined by the aristocratic privilege of their student body. English universities became increasingly accessible to women in the 1830s (at the newly-founded University of London, University College) and by the 1870s, women were starting to enroll in Oxford and Cambridge.

The concept of "democratization" of access to universities grew in the United States in the 19th and 20th centuries to include equal access for all students through the elimination of tuition, lowering of admission standards, and the acceptance of the poor, women, and ethnic students (Vesey, 1965). Yet while access to post-secondary study may have been democratized, access to the most prestigious schools was less so, as Harvard, Yale and Princeton were primarily reserved for well to-do prep-school boys from the "appropriate" ethnic backgrounds. Those who entered the best universities or colleges were likely already rich in social and economic capital; higher education served more to maintain than to improve their status.

This perception began to quickly change during and after the Second World War, as elite North American universities were eager to mitigate decreased enrolment due to the men fighting overseas. Access increased dramatically (Thresher, 1966; Karabel, 2005). The introduction of the G.I. Bill changed the perception of access from that of a privilege to a means by which to acquire skills necessary take on elite roles within society (Trow, 2005). Public education (as exemplified by land grant colleges as well as the state college and university systems) became massified, seen as a way to provide more access to more students in order to foster a more civilized and democratic society (Thresher, 1966; Cohen, 1998). Ironically, the surge of students created such demand that even the large state-supported institutions began to tighten requirements. And when the public institutions start to ration access, a question emerged: who *should* go to college? The

answer: anyone who had the talent to participate, even if they did not yet have the desire (Thresher, 1966). As participation grew, access to higher education changed from a choice to an obligation, a tool required to shape the qualities of the citizenry in order to adapt to rapid social and technological change (Trow, 1973). The emphasis moves from the needs of the individual to the needs of the whole, as post-secondary education is perceived as essential, even mandated, similar to primary and secondary education. Individuals, institutions, the economy, and society as a whole all derive measurable benefits when education is evenly and universally distributed throughout the citizenry (Thresher, 1996; Milem & Hakuta, 2004; Noftsinger Jr. & Newbold Jr., 2007).

Who decides how access to higher education is granted is contextualized by the role of higher education within society. It is more acceptable for power over access to remain concentrated in an elite system than in a universal system. In a universal system, there is a greater concept of education serving "the public good," and in a democratic society, the interests of the public cannot be determined by the few. Trow suggests that "(t)he aim of universal access is toward the equality of group achievement rather than an equality of individual opportunity, and efforts are made to achieve a social, class, ethnic, and racial distribution in higher education reflecting that of the population at large" (1973, p. 14). A massified system administers access on the basis of individual opportunity, a meritocracy; a universal system is by definition open access, rendering the idea of merit irrelevant. While Trow acknowledges that even in a universal system, individual institutions may retain an elitist view on access, he underestimates this point when he suggests that the evolution implies a move from student selection based upon alignment with "character and values of the institution" (p.17) to the students themselves defining the character of the institution. While this may very well be the end result, institutions within a

massified approach to access may choose to admit students based upon institutional values in order to foster stratification and assert their power over their environment, presenting an image of an elite institution within a democratic system. From the perspective of access, "elite" education is seen to shape both the character of the students and the perception of the institution.

This creates a paradox. If elitist (or "selective") institutions exist in a system of universal access, access cannot be truly universal. Universal access implies equity amongst both institutions and individuals; if a hierarchy exists among institutions, then a hierarchy will exist among individuals. Stratification among institutions is "an effective way to buttress rather than undermine class structure" (Trow, 1973, p. 25). And as long as there are inequalities in society, there will be inequalities in access to higher education (Williams & Filippakou, 2009).

Is elitism necessary in a universal system of access? Arguably, yes. A diversity of institution types allows a massified system to become more universal, as all students of varying ability and interest can be accommodated. Trow (2000) suggests this is why the more diverse US higher education sector is closer to a universal system than the more homogenous European sector. But as long as there is stratification among students (on the basis of academic preparedness and ability), there will inevitably be stratification among institutions. As such, while elitism works against a principle of universal access (Trow, 2000), it is also inevitable if students of varying levels of preparedness are to be accommodated.

2.1.3 Contest vs. sponsored mobility

Thresher (1966) refers to the process of distributing access as the "'great sorting', …a social process deeply involved with the society's entire cultural pattern and system of values" (p. 3). The admission process serves as a conduit of affiliation, between the institution and the society in which it exists, and between society and the world of learning that transcends the

societal context (Thresher, 1966). In the context that higher education is a means to the acquisition of various forms of capital, who gets to determine the criteria by which the "right" student is identified is an issue of contest vs. sponsored mobility. Admission decisions based upon assessment of qualities determined by the marketplace define contest mobility, seen as an open competition (Turner, 1960). Access is determined by an agreed upon set of rules within society and the students' own efforts. As Turner describes it, "(s)ince the prize of successful upward mobility is not in the hands of an established elite to give out, the latter cannot determine who shall attain it and who shall not' (1960, p. 72).

Sponsored mobility, on the other hand, describes an educational system in which: "elite recruits are chosen, by the established elite or their agents, and elite status is given on the basis of some criterion of supposed merit and cannot be taken by any amount of effort or strategy. Ultimately, the members grant or deny upward mobility on the basis of whether they judge the candidate to have those qualities they wish to see in fellow members" (Turner, 1960, p. 72). When an institution of higher education determines criteria for what constitutes the "right" student based upon organizational values as opposed to societal values, access shifts away from contest mobility towards sponsored mobility. Applicants may still gain admission based upon their own merits and efforts, but access is ultimately afforded by the extent to which applicants reflect the character of the institution. Bennett (2009) refers to institutions that look for a reflection of their values among students as the "new elites," where access is granted based upon educational qualification, management, and bureaucratic or distinctive cultural skills, (as opposed to the traditional elites, where access is determined by kinship, landownership, or religious status). Whereas traditional elites are "not open to all on an equal basis… (t)he organization of the new elites, in contrast, is governed by the logic of openness and breadth, as it is possible for

all social groups, horizontally as well as vertically, to seek access" (Williams & Filippakou, 2009, p.4). This distinction between "traditional" and "new" elites is quite useful in describing selective institutions in an environment of massified access to higher education.

The idea of what is measured in the "contest" is of critical importance in understanding access to selective institutions (the "new elites"). In the North American context of massified education, there is a tendency to judge the contest on individual merit. This is evidenced by the fact that while selection criteria may vary among institutions, academic merit (usually determined by secondary school grades, standardized test scores, etc.) is the single most important determinant of admissibility within even the most selective institutions (Willingham, 1985; Rigol, 2003). This stands to reason; academic ability is a strong predictor of post-secondary success (Willingham, 1986; Salvatore, 2001; Geiser & Santelices, 2007; Sternberg, 2010). In addition, academic merit is accepted as both a demonstrable and defensible criterion for granting post-secondary access to selective institutions. The appropriateness of academic merit as an admission criterion reflects a societal value (Carnevale & Rose, 2003) and, particularly, an institutional value of the academy, where professors want the best students (Thresher, 1966).

On the other hand, merit can also be defined by outcomes, not just achievement. Cohen's (1984) meta-analysis of correlation coefficients from 108 studies on the relationship between academic performance (grades) and adult achievement (as determined by factors such as job performance ratings, income, promotion, satisfaction, and eminence) found only a small effect. Wing Jr. and Wallach (1971) found that personal characteristics were better predictors of adult

accomplishments than grades, particularly for students with very high grades[17]. In this light, merit may be defined more by personal characteristics than academic ability.

It is important to consider the impact of the selective institution's effect on society as a whole within the contest for mobility. Wing Jr. and Wallach (1971) suggest that the admissions process is merely a search for talent as defined by the institution. "If talents exist that are slighted by the more prestigious colleges, then students in whom such talents are represented will become less likely to exercise their proportional influence upon the overall values of society. This kind of educational selection can then be said to constitute a societal analogue to one aspect of natural selection" (Wing Jr. & Wallach, 1971, p.59). The tail now wags the dog; institutions of higher education no longer reward the values held by society, but rather, define them.

Clearly, the line between contest and sponsored mobility is not as clear as one might think. A true meritocracy in post-secondary access would suggest that capital could be redistributed among individuals with every generation (James Bryan Conant, President of Harvard, 1933 – 1953, as referenced in Karabel, 2005). But the "contest' affords certain advantages to those with more economic or social cultural capital, as students with higher socioeconomic status are the more likely to gain admission to a prestigious university (Karabel, 2005; Mortenson, 2005). Our democratic society acknowledges that the most capable students are not necessarily the most deserving, but we reward merit more than potential. Assessments of merit are often perceived as empirical, quantitative, and easily defendable to the public, whereas assessments of potential are subjective, qualitative, and without an obvious answer when a parent asks: "why did their

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[17] With the increased proportion of students with high grades in today's graduating classes (Goldman, 1985), it would be interesting to see if the results seen by Wing Jr. and Wallach in the 1960s could be replicated today.

daughter get in when my son did not?" As a result, public institutions, typically presenting a higher sense of accountability to the public, tend to lean towards merit-based means of applicant assessment to determine admissibility even if it is generally acknowledged to not be universally equitable. In doing so, a true meritocracy in postsecondary access can never be realized (Karabel, 2005).

It is important to note that while selective institutions may contribute to reproducing a social hierarchy, they are not responsible for creating it. For example, upon the demise of affirmative action as a viable method to enroll under-represented groups, universities in Texas, Florida, California, and Virginia enacted proportional representation admissions strategies (referred to as "percentage plans") whereby the top x% of any high school's graduating class could gain access to highly selective institutions within each respective state. In doing so, these institutions afforded access based upon merit in a manner that would reproduce the social composition of their respective states, not the social hierarchy. However, Long (2004) argues that these plans were ineffective, not because the institutions were not accessible enough, but because there were not enough minority students in the top x% of their high school to maintain the levels of minority enrolment found under affirmative action. The author also suggests that the failure of the percentage plans may be due to self-selection, as visible minority students opted to attend lower-tier institutions post-affirmative action. Andres (1992) refers to this as post-secondary exclusion via self-elimination, a byproduct of the student's perception of their habitus, where the acceptability of academic achievement is defined by the dominant culture. Relegation may also have played a factor, as many under-represented students may not have been able to enroll under the percentage plans because of missing pre-requisite courses. Andres (1992) suggests that this is the impact of the habitus, where students determine their educational path based upon an

acceptance of their place in the educational hierarchy. Regardless, when merit enters the admission decision, it would seem that the market often plays a greater role in determining enrolment than the institution. But does the "best" student (as defined by the marketplace) necessarily constitute the "right" students (as defined by the institution)?

The introduction of enrolment management

It is within this question that the notion and practices of enrolment management have gained attention on North American campuses. Enrolment management suggests that institutional goals and mission are both defined and supported by successful enrolment of the "right" student and that organizational health necessitates that an institution actively determine its own enrolment (Hossler, 2000a; Massa, 2003; Henderson, 2005). In terms of admission, the suitability of a first-year class may be described in terms of size, educational interest, geographic origin, tuition revenue, gender, ethnic origin, socioeconomic status, likelihood to persist, and academic ability. Although the focus of this study is on the undergraduate admission process, enrolment management takes a holistic approach in considering the fit between student and institution, from the point of being a prospective student through to alumni.

2.1.4 The history of enrolment management

The origins of enrolment management are traditionally attributed to the work of John Maguire and Frank Campanella at Boston College in the 1970s (Henderson, 2001). With the baby boomer college enrolments coming to an end, post-secondary institutions began to worry of an impending shortage of students and an associated decrease in public funding. More than 500 new colleges opened during the 1960s to accommodate the baby boomers (Coomes, 2000) and there was worry that many seats would now go empty. Institutions began to look towards enrolment management practices as a way to mitigate dependence upon public funding and

maximize tuition revenue (Coomes, 2000; St. John & Priest, 2006). Maguire (1976) identified five tactics to maximize enrolment: matching institution strengths with prospective student interests (which serves as the focus of this study), managing information systems, linking education offerings with job market demand, developing a financial aid strategy, and focusing on retention.

In the 1980s, Tom Huddleston at Bradley University developed the idea that enrolment management was more than a sum of an institution's tactics and that effective practice required a full-scale restructuring within the institution (Huddleston, 1980). Hossler (1996) also credits California State University at Long Beach, Carnegie-Mellon University, and Northwestern University with some of the earliest developments of enrolment management systems. Kemerer, Baldridge, and Green (1982) furthered the idea of a structural approach to enrolment management by linking enrolment management concepts and processes to break down the silo mentality that is pervasive in most institutions of higher education. They warned against the tendency for quick fix solutions and highlighted long-term organization planning to render enrolment management *strategic*. Hossler (1986) took the concept of strategic enrolment management even further by tying it to the entire campus and post-secondary experience: student marketing and recruitment, pricing and financial aid, academic and career counseling, academic assistance programs, institutional research, orientation, retention, and student services. Hossler's (1986) approach to enrolment management sought to "professionalize" the practice, aligning it with the academic enterprise by emphasizing research and empirical study, similar to any social science. Institutional research and marketing analyses are used to drive decisions and help the institution understand itself and its place within the market (Hossler, 1986; Kalsbeek, 2011). This structured approach helped enrolment management grow as a profession in the late 1980s and

1990s, through publications and conference proceedings sponsored by the College Board and the American Association of Collegiate Registrars and Admissions Officers (AACRAO) (Henderson, 2001).

Today, with public funding of universities in constant jeopardy and the impending decline of traditional university-entry demographics, enrolment management has grown into an industry and a discipline. There is a shared body of enrolment literature that enrolment management practitioners commonly draw upon. Many universities have staff or divisions charged with the management of enrolment and enrolment management consultants are employed by both public and private institutions to enhance enrolment practices, design marketing strategies, and maximize enrolment-related revenues.

2.1.5 The organizational context of enrolment management

Despite Botrangner's (2004) belief that SEM fulfills both organizational goals and students' goals, SEM is fundamentally an institutional construct. External influence, be it societal values or the needs of individual students, are understood through the lens of organizational goals. Enrolment management is used by institutions as a tool to exert influence over their external environments; the power of the institution is derived by students' perceptions of the potential of acquisition of capital. Moore (2010) suggests that within the construct of an educational institution's relationship with a student, Bourdieu would describe the value (or the promise) of capital as culturally arbitrary. Enrolment management provides the institution with capital that is not intrinsic to the institution, but relational; it is the relationship between the student and the institution that defines the institution's capital (Moore, 2010).

Unlike student development theory, which focuses on outcomes primarily from the student's perspective, enrolment management views outcomes primarily through the institution's

perspective. Enrolment management theories are neither pedagogical nor developmental; rather, they build on such theories within an organizational/administrative framework. Hossler and Hoezee (2001) identify numerous theoretical frameworks for understanding strategic enrolment management, all organizational theories of one form or another: resource dependency theory (how institutions extract resources from the environment), systems theory (effective SEM is based upon an open system structure), and revenue theory (for post-secondary institutions in pursuit of educational excellence, prestige and influence, costs must follow revenues). All these theoretical constructs are rooted in an understanding of how organizations are structured and how they interact with and within their environments.

That is not to say that enrolment management theory is silent on the role of the student. Rather, the student is defined within an operational context. Some of the literature on enrolment management relies on the metaphor of a "courtship" or "student-institution fit" to define the relationship between student and institution (Thresher, 1966; Abrahamson & Hossler, 1999; Hossler, 2000b; Mattern, Woo, Hossler, & Wyatt, 2010). The student is not understood independently from, but in relation to, the institution. Thresher (1966) presents this as a problematic process because "(e)ducation is, above all, an open-ended process" (p.36) that cannot be articulated and defined by an individual institution. In the "great sorting" referred to by Thresher (1966), it is the student, not the institution, doing the "sorting":

> The forces that lead a given student to apply to a specific college constitute, in the aggregate, a more far-reaching and effective sorting device than the small amount of selectivity the college is able to exercise among the relatively few students who have gone so far as to seek it out and fill out applications for it. In other words, preselection by the student and by his advisers is a more pervasive and powerful force for sorting than is selection by colleges. (1966, p. 71)

Mattern, Woo, Hossler, and Wyatt (2010) concur that students are actively looking for an institution that matches their values (as self-reported by students to the College Board when completing the Scholastic Assessment Test). However, most students do not end up enrolling in a school that matches their values, and doing so does not have any effect on academic performance or graduation (when compared to students who did enroll in a school that matches their self-reported values). It is suggested that the idea of a "good fit" is of greater importance to the institution than the student, building institutional affiliation from prospect through to alumnus/alumnae (Thresher, 1966); "fit" is the institution's "brand." Not surprisingly, enrolment management practice sees the student as the embodiment of the institutional image, either by how students affect institutional rankings (Hossler & Hoezee, 2001) or by personifying the vision statement of the institution (Wilkinson et al., 2007). In all instances, the student is observed and defined through an institutional context, not as a discreet actor.

To achieve optimum enrolment, institutions must reconceive their organizational structures. Henderson (2001) identifies four types of enrolment management structures on an increasing scale of sophistication and effectiveness: the enrolment management committee, the enrolment management coordinator, the enrolment management matrix, and the enrolment management division. The list shows an increasingly tightly coupled organizational structure (Henderson, 2001), with greater integration across the institution and broader spheres of influence. Again, this high level of integration is the result of the broad scope of enrolment management; everything from the food in the cafeteria to course offerings is understood to affect enrolment. In particular, enrolment management structuralists suggest that it is critical to bring together academic affairs and student services (Huddleston, 2001). The result is a high degree of coordination in the organization structure and, if possible, concentrated leadership.

2.1.6 Professionalization within higher education administration

The emergence of enrolment management theory and practice has served to professionalize administrative bodies within higher education. Sociologists define professionalism as "the set of beliefs, values, and norms that legitimize the occupational autonomy and social privileges of professionals" (Meisenhelder, 1983, p.295). In Henderson's aptly titled *On The Brink of a Profession: A History of Enrolment Management in Higher Education* (2001), the author suggests that the professionalization of enrolment management has grown through professional organizations, literature and conferences aimed at the higher education administrator. Noordegraaf (2007) described professionalization as "instrumental problem solving made rigorous by the application of scientific theory and technique" (p. 765). This description is certainly fitting for the practice of enrolment management, a key tenet of which is data and research-based organizational decision-making (Hossler, 1986).

The concept of professionalism is inextricably tied to the idea of power. Friedson defines "professionalism" as "the occupational control of work" (1999, p.118). SEM offers an ideology that emanates from outside the organization, from an external body of literature and practice owned by the practitioners, not the institution. Forsyth and Danisiewicz (1985) describe autonomy from the client and from the employing organization as the metrics of professionalization; the greater the autonomy on both counts, the greater the occupation is seen as a profession.

2.1.7 The origins of selective admissions

Today, enrolment management's detractors would suggest that the practice is an embodiment of academic capitalism. Slaughter and Rhoades (2004) describe academic capitalism as a means by which public research universities maximize human capital in their students,

faculty and staff to allow the organization to interact with the marketplace and flourish in the new economy. The organization is seen as a marketer and the student a consumer (Slaughter & Rhoades, 2004), an instrument to foster the organizational and financial well-being of the institution, a unit of market share (Green, 2003). Enrolment management is a reflection of a modern-day neoliberalization of higher education, more akin to a business setting than an educational setting. But from the point of view of access and admissions, the concept of enrolling the "right" student (as defined by the institution) is nothing new. Although modern-day enrolment management grew out of the "gatekeeper" role of the admission office (Hossler, 1996), as far back as the turn of the twentieth century, institutions were struggling with the notion of how to enroll a class that met organizational needs.

Hossler (1996) traces the evolution of the admissions administrator to the position of *major beadle* in the medieval university. One of the earliest notions of an admissions requirement comes from the statutes of Harvard College circa 1646, stating that no applicant may claim admission until demonstrating proficiency in Greek and Latin (Coomes, 2000). The first Office of Admissions in the US was established at Columbia University in New York City (Karabel, 2005) and while the hiring of Deans of Admission became common in the 1920s, the practice of competitive selection from within the applicant pool did not become widespread until the 1930s (Thresher, 1966; Hossler, 1996). Previously, admission was not competitive; all applicants who met fixed admission requirements were admitted.

At the turn of the century, at the "big three" colleges (Harvard College in Cambridge, Massachusetts; Yale College in New Haven, Connecticut; and Princeton College, in Princeton, New Jersey), faculty complained of a student body who frowned upon intellectualism in favour of engaging in campus life. A 1903 report assessing the academic atmosphere at Yale suggested

that "the man who attends strictly to study (the 'grind') is regarded as peculiar or even contemptible. It is believed that a man should 'know men' at Yale; that 'study is a mistake'" (in Karabel, 2005, p19). Karabel (2005) suggests that the low academic standards at Harvard, Yale and Princeton were the result of how easy it was to gain admission:

> A candidate had only to pass subject-based entrance examinations devised by the colleges…. But the tests were not especially demanding, and a young man from a feeder school like Groton could usually pass them with ease. If he did not, however, he could take them over and over again to obtain the requisite number of passes. Even the unfortunate applicant who failed to pass exams in enough subjects could still be admitted with conditions. (p.22)

The lax approach to admission was the result of institutional dependence upon tuition revenue (only a fraction of the college-bound population in the US could afford tuition at "the big three") and the desire to grow enrolment (total enrolment was not yet capped at most schools) (Karabel, 2005). But while academic ability served as the sole admission criterion to elite colleges, the institutions (and particularly their administrators) placed a high degree of value on student body characteristics that did not formally enter into the admission decision. Charles Eliot, president of Harvard from 1869 to 1909, frequently used words such as "character," "gentleman," and "manly" in describing the ideal Harvard student (Karabel, 2005, p.42). There was also an implication that such qualities fundamentally excluded certain groups of students, such as females and Jews. Because none of the aforementioned qualities were considered in the admissions process, there was a dissonance between what Harvard considered the "right" student and the means by which the institution selected its first-year class.

The marketplace served to amplify this problem. In the first two decades of the twentieth century, growing competition among post-secondary institutions lead to a relaxation of admission criteria in order to broaden the pool of prospective students. In doing so, an admission

model that considered only academic performance left institutions susceptible to enrolling students with personal characteristics deemed "unsuitable." Schools like Harvard, Yale, and Princeton, with campuses comprised of mostly white, Protestant, and wealthy sons of the New England upper classes, found themselves wrestling with "the Jewish problem"; a concern over an increasing presence of Jewish students on campus (Karabel, 2005). While this "problem" was rooted in a general antipathy for new immigrants to the US (and specifically those of the Jewish faith), it also spoke to a tension between how the institutions envisioned their respective campuses and student demand for access. The relaxation of admission criteria to expand the applicant pool increased access for (and demand from) students in public schools, where most Jewish students were enrolled. Though academically capable, Jewish students were believed to be less likely to contribute to an institution's campus life, be involved in sports, or join social clubs (the primary instrument for the negotiation of social capital on the elite college campus). Academic admission decision-making criteria proved insufficient to identify the "right" student for these institutions, as Jewish students tended to academically out-perform their Gentile classmates (Karabel, 2005).

Columbia University was the first institution in America to introduce fixed enrolment targets and the use of non-academic criteria such as "leadership" and "character" to address "the Jewish problem." Located in New York City, the home of the largest Jewish community in the world,

> Columbia faced a problem in the teens that the Big Three did not have to confront until the 20s: how to respond when academic standards of admission resulted in a large-scale enrollment of 'undesirable' students. Though the timing differed in each case, the ultimate response of (Columbia, Harvard, Yale, and Princeton) was the same: the abandonment of a system of admission based almost entirely on academic criteria. (Karabel, 2005, p.130)

In 1923, Abbot Lowell, President of Harvard from 1909 – 1933, placed a ceiling on enrolment, limiting the freshman class to 1,000. Unable to convince the college to impose a straight quota on Jewish enrolment, the enrolment target served as a basis by which to abolish an absolute standard of admission (the college's exam-based admission criteria) in favour of a competitive, discretionary process. "While selection decisions had been made almost solely on the basis of scholarship, [the new admissions process] proposed using letters from teachers and personal interviews to shed light on a candidate's 'aptitude and character'" (Karabel, 2005, p. 102)[18]. Yale followed suit the same year, with Robert Corwin, Chairman of the Yale Board of Admissions, stating that because "[n]o college or school seems to have discovered or devised any general criteria by which … to exclude the undesirable, [admission must be] based upon certain non-intellectual requirements" (Karabel, 2005, p.114). Princeton already had a foundation for the inclusion of non-academic criteria in the admission decision, having already limited freshman enrolment in 1921, and being heavily influenced by the selection criteria for the Rhodes Scholarship:

> In order to identify the kinds of boys whom Princeton wished to enroll and to screen out "undesirables," (Princeton) developed an elaborate selection process that pioneered many of the innovations that have shaped elite college admissions ever since. Perhaps the most important of these was Princeton's heavy reliance on the personal interview – an ideal device for assessing appearance, deportment, manners, and, not least, ethnic and religious background. … [T]he Committee on Admissions also required, in addition to a letter from the headmaster or principal, three personal letters of reference… [T)he admissions process seemed to bear a distinct resemblance to that of the process of selection to a private club, where members need to vouch for the personal qualities of the prospective invitee. (Karabel, 2005, p.125)

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[18] Interviews were conducted by Alumni, as if to purposefully reproduce social structures and preserve cultural and economic capital.

At the time, the formal use of anything other than academic measures of aptitude to determine university access would have seemed incongruous with the raison d'être of an institution of higher learning. European universities, generally recognized as global leaders in the creation of new knowledge, were centrally controlled, publically funded, and generally determined access solely on academic merit[19] (as defined either by secondary school assessments or standardized examinations). The formal introduction of assessments of "character" in the admission decision-making process by Harvard, Yale and Princeton marked a sea change in how post-secondary accesses is determined. And the model is one still used to this day (although the practice remains a mostly North American phenomenon). While it would be wrong to state that all universities that employ such practices do so as a form of systematic discrimination, the motivation to use non-academic criteria today is the same as it was when first considered: to compensate for the inadequacies of solely academic admission decision-model to identify students whose personal characteristics are deemed "right" for the institution. Karabel (2005) refers to this as the "'iron law of admissions': an institution will abandon a particular process of selection once it no longer produces the desired result" (p. 131).

Admissions decision-making models

2.1.8 An admission decision-making taxonomy

From the vast number, variety and environmental contexts of institutions around the world, a taxonomy of admissions-decision-making emerges. While there are a number of sources that

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[19] There are exceptions and biases and social class reproduction are factor in admission to European institutions of higher education. But, for the most part, European (and most non-North American) institutions of higher education do not formally assess personal characteristics in the admissions process.

describe the variety in admission practices (Carnevale & Rose, 2003; Rigol, 2003; Sternberg, 2010), this study will focus on one particular document, the College Entrance Examination Board's *Towards a Taxonomy of the Admissions Decision-Making Process*, Greg Perfetto, Principal Author (1999). The taxonomy was born from a series of meetings in 1998 and 1999 that brought together 60 senior college post-secondary admissions professionals (representing some of the most highly selective institutions in the US) to discuss the future of admissions. The taxonomy was established as a framework with which contextualize the discussions and to better inform the public about how access is afforded to higher education.

The taxonomy identified nine different philosophical bases of admission: entitlement, open access, meritocracy, character, enhancement, mobilization, investment, environmental / institutional, and fiduciary (Perfetto, 1999)(for a complete description, see Appendix A). Of this group, four are of particular importance to this study:

1. A *meritocratic model* suggests "access to higher education is a reward for those who have been most academically successful" (p. 6); grades, standardized test scores, and academic achievement are the primary determinants of access. It is important to note that this model might be better named as an *academic meritocratic* model, as it could be argued that a variety of criteria and accomplishments denote merit in the applicant.

2. A *character-based* model suggests that "access to higher education is a reward for personal virtue, dedication, perseverance, community service, and hard work" (p.6). These personal qualities of applicants may also be considered "merit" in specific context.

3. An *enhancement* model, where "the goal of higher education is to seek out and nurture talent" (p. 6). The criterion of "talent" is more subjective that those identified in the meritocratic and character-based models. Academic ability is relatively empirical to observe and measure; character-based criteria are less so. But the concept of "talent" is very subjective, as the institution, the applicant and society as a whole may disagree on what denotes talent.

4. The *environmental / Institutional model*, where the institution employs decision-making policies that benefit the institution and how it positions itself within tis environment.

Perfetto's taxonomy is useful in understanding the different elements of an admission decision model and will serve as effective nomenclature for the independent variable discussed in this study. But while the author is clear in stating that many institutions use the elements of more than one model in their admission practices, the taxonomy could go a step further in describing how the models themselves can overlap. For example, admitting students who are academically capable (the academic meritocratic model), who embody the values of the institution (character-based model) and are the most likely to derive benefit from access (the enhancement model) all serve to enhance the institution's reputation in the marketplace (the environmental / Institutional model).

The taxonomy also neglects to include a decision-making model that accurately acknowledges the institution in a societal or political context. While Perfetto's "investment" admission decision-making model serves to promote the "greater good and further the development of society" (1999, p.6) by conceiving "access to higher education as a means to ultimately benefit society as a whole" (1999, p. 17), it is not clear to which segments of society

he is referring. Perfetto's taxonomy is silent on the institution's responsibility (be it mandated or perceived) to its local constituents. A public institution may choose an admission decision-making model that offers preferential access for (e.g., as does the University of California system). Another may enact a decision-making model designed to reduce dependency on the local market and diversify sources of students. Thresher refers to this as colleges (including public institutions) moving away from their "natural clientele" (1966, p.71) in order to raise standards and appeal to students on a nationwide (or international) scale. Less selective colleges are left to meet the needs of those who wish to stay closer to home. This concentrates high academic ability in a handful of institutions; a positive result for the receiving schools, but less so for the society as a whole (Thresher, 1966).

Finally, in addition to considering admission decision-making frameworks, we must also consider how assessments are made within models. In a 2000 survey of undergraduate admission policies, measures of academic merit (high school GPA or rank; standardized test scores, and patterns of high school coursework) were the top three most influential admissions decision-making factors among highly selective public four-year US institutions (College Board, 2002). This is not surprising. The high school GPA is an effective tool in predicting future academic performance (Willingham, 1986; Salvatore, 2001; Geiser & Santelices, 2007; Sternberg, 2010), representative of performance in a wide variety of skills, readily available, and easy to implement due to its empirical and ordinal nature. Character and enhancement assessments such as letters of recommendation, student essays, portfolios, and interviews were identified as the next most heavily weighted criteria. Finally, environmental/institutional factors such as intended major, state of residence (this can be assumed as an institutional variable representing either (a) maintenance of a more national reputation and/or (b) out of state students paying a higher rate of

tuition), and financial need were cited as either minor factors or factors that did not enter at all into the admission decision.

2.1.9 Comparing admitted applicants with refused applicants

As previously mentioned, there are only a handful of studies that contrast different admission models in terms of the qualities of admitted students (particularly compared to those who were refused). Wing Jr. and Wallach (1971) looked at applicants to Duke University in the fall of 1967 and compared academic and personal characteristics of successful applicants with those who would have been admitted in one of three hypothetical admission models: one that considered standardized test scores alone, another that considered high school rank, and a third that considered non-academic accomplishments (e.g., leadership, artistic ability, citizenship, composition skills, editorial skills, dramatic skills, musicianship, science involvement, athletic ability, and employability). The analysis suggested significant differences among the three hypothetical models and the actual decision-making model. The authors conclude that despite Duke's professed desire for well-rounded students, a heavy reliance on academic measures comes at the expense of students with strong non-academic accomplishments.

A similar study by Willingham (1985) found slightly different results. Willingham looked at the applicant pools at nine small (total enrolment under 3,500), mostly private, liberal arts colleges and compared actual admission decisions with two hypothetical models: one based upon academic criteria only, the other including weighted values for students' personal statements, high school reference letters, and assessments of student follow-through. Each variable was

weighted in relation to its ability to predict first-year success[20]. Willingham's findings suggest that there is a high degree of similarity between the two models; 87% of the total applicant population would be admissible regardless of which model was used. The conclusion, therefore, is that the use of personal qualities in the admission decision has a minimal but important effect on shaping the first-year class.

There are a few important limitations of note in the Wing Jr. and Wallach (1971) and Willingham (1985) studies. First of all, Wing Jr. and Wallach only considered differences in admission outcomes, not differences in actual first-year outcomes. Willingham addressed this issue by using regression analyses to predict first-year performance outcomes based upon characteristics of those who actually enrolled and then assigning the outcomes to non-admitted students with the same characteristics. This, however, assumes that all other variables are being controlled. And, because the students admitted under the hypothesized models did not actually enroll, there is no way to assess the validity of the regressions against actual outcomes. In Wing Jr. and Wallach (1971), student success is defined solely by academic performance; it is more appropriate to assess the efficacy of a character-based admission model against character-based outcomes. Furthermore, in both studies, the researchers appear unaware of what constituted the actual decision-making model; the hypothetical admission decision-making models serve merely as contrasts. Lastly, the universities in both studies are all small to medium-sized private schools, where the idea of marshaling access based upon subjective assessments of applicant characteristics takes on a different connotation than within a large public university.

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[20] See section 2.3.3 of this study for more details on Willingham (1985).

A 1975 study from Pollock, Bowman, Gendreau, and Gendreau looked at the effect of different admissions models used to enroll the incoming class of 1972 at Trent University in Peterborough, Ontario. Actual Ontario secondary school applicants to Trent were randomly assigned to groups to be considered on one of five admission criteria: open admission, interview, teacher recommendations, Grade 13 academic achievement, and SACU[21] test scores. Similar to the Wing Jr. and Wallach 1971 study, the results suggested that the different admission criteria did not enroll students who were significantly different to one another in terms of geographical distribution, sex distribution, government financial assistance, and attitude and personality questionnaire data. First-year performance outcomes were no different than those seen using the traditional method of admission assessment. In fact, in some instances, the results were counter-intuitive, as students admitted under the open access model presented less instances of a failed first year than students admitted under other criteria. While some such trends were observed, statistically significant differences were not found and the study concludes that "the selection criteria produced groups that differed primarily only as to the method of selection and had characteristics in keeping with traditional university admission policies" (Pollock et al., 1975, p.13).

Although the results of the 1975 study are interesting, they bear limited relevance to university admission in the context of the current study. First of all, Trent University would not be considered a highly selective school. Although the admit rates of Trent in 1972 (66% of all

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[21] The Service for Admission to College and University, a standardized test used in the post-secondary admission process in Canada between 1966 and 1974.

Ontario direct-entry applicants) and UBC in 2010 and 2011 (54% of all BC direct-entry applicants) are not remarkably different, the level of homogeneity in each applicant pool likely is. Whereas Trent applicants in the 1970s produced academic records with a very wide range of grades (the minimum admission requirement was 60%), because UBC is widely known as one of Canada's most competitive schools, applicant self-selection results in a much more academically homogenous applicant pool. On the other hand, increased post-secondary participation rates over the past 35 years suggest that the students interested in post-secondary study may themselves present different homogeneity. Therefore, it would be difficult to assume that simply because Trent did not find any differences in their different admissions models, neither would UBC.

The two studies most relevant to the current are from Devaul, Jervey, Chappell, Caver, Short, and O'Keefe (1987) and Carnevale and Rose (2003). In the former, admission criteria and outcomes are evaluated for two groups of students admitted to the University of Texas Medical School at Houston. One group was initially admitted, the other initially refused but later admitted when the program increased capacity. The study found that in attrition and in both preclinical and clinical performance through medical school and one year of postgraduate training, there were no meaningful differences between the groups, suggesting that the traditional interview process probably does not enhance the ability to predict performance. While this study does share some similarities with the current study's methodological structure, the context of medical school admissions has limited applicability for a discussion on massified access to higher education. And the fact that the Texas medical school committee was not actively trying to change their admission decision-making model renders limited applicability to the work of enrolment managers.

Finally, Carnevale and Rose (2003) considered five alternative admissions decision-making models for admission on applicants to 146 four-year and selective colleges: academic performance; a lottery with minimum academic qualifications; a percentile plan (i.e., students who finish in the top 10% or 20% of their high school class); a percentile plan with a minimum standardized academic test score; and a preference for applicants with high academic achievement, outstanding teacher recommendations, and evidence of extra-curricular participation and leadership in students who come from less privileged families and poorer high schools. Each hypothetical model is evaluated against public opinion, the racial and ethnic diversity of the hypothesized class, socioeconomic diversity, and college performance (as determined by graduation rates). The results are discussed in terms of how each variable affects the other (e.g., what does using a standardized test score do to the racial and ethnic composition of the class?), but the applicability to outcomes is limited. Firstly, the definition of college outcome - graduation rate - is quite limited; graduation is a binary assessment, lacking the more descriptive assessments of how well the student performed academically, the types of learning activities in which the student engaged, along with other measures of a successful post-secondary experience. Secondly, the outcomes are not measured against any sort of institutional goal. And lastly, the graduate outcomes are derived and do not consider actual outcomes.

Therefore, there is an absence in the literature of studies that compare an admitted group of students against those they have displaced (the admission decision-making model being the result of enrolment management practices based upon institutional goals) to determine what are the trade-offs in terms of actual first-year academic and non-academic outcomes.

2.1.10 Concerns with assessment on grades alone

As competition for post-secondary admission increases, the importance of selective institutions place on high school admission average has served to erode the value of using academic merit in the admission decision, rendering it an inadequate tool for sorting students (Goldman, 1985; Camara, Kimmel, Scheuneman, and Sawtell, 2003; Sternberg, 2010). Côté and Allahar (2007) argue that credentialism fuels this competition, as prospective students vie for admission to the most prestigious organizations to establish their reputation in the marketplace upon that of the organization granting their degree (in other words, institutionalized cultural capital). The result is grade inflation and ever-increasing admission averages. The "gentleman's C," once the hallmark of entry into an elite education (Karabel, 2005), is now woefully inadequate in the eyes of university-bound students who push themselves and their teachers for the grades required to gain admission to top schools. Teachers comply with requests because of a growing reluctance to discriminate the talented from the untalented, as evidenced by the fact that standardized measures of assessment such as the Scholastic Assessment Test (SAT) or American College Test (ACT) have not seen overall increases on par with high school grades (Goldman, 1985), particularly for students with the strongest high school grades (Ziomek & Svec, 1997). In other situations, a focus on mastery over achievement results in students receiving multiple opportunities to re-take tests and assignments, invariably leading to higher grades[22]. The result is a significant restriction of the range in high school GPA of applicants (Camara, Kimmel, Scheuneman and Sawtell, 2003). Standardized tests have also been shown to be highly

[22] It is interesting to note that while the Flynn Effect suggests that IQ scores have increased over the years (roughly three points per decade), similar gains have not been seen in performance of school-aged children on content-related tests as vocabulary, arithmetic or general information (Neisser, 1997).

problematic in generating fair and equitable admission decisions, particularly for historically under-represented post-secondary applicant groups (Lemann, 1999; Slack & Porter, 1982; Sedlacek, 2004a). Even if the biases could be controlled, standardized tests only measure memory and analytical skills, which alone are insufficient to predict post-secondary success (Sternberg, 2010).

The concerns over grade inflation and standardized tests, coupled with the growing interest on university campuses for outcome-based assessments (such as the National Survey of Student Engagement) encourage institutions to adapt their admission decision-making practices to a new environment. Many schools employ a hybrid model of admissions decision-making to identify students with both the cognitive skills (i.e., academic merit) and non-cognitive skills (defined by Sedlacek [2004a] as variables related to adjustment, motivation, and student perceptions required to succeed in university). If retention and/or graduation are used as measures of post-secondary success, noncognitive variables have more validity than other measures for both traditional and nontraditional students (Tracey & Sedlacek, 1987; 1989). A meta-analysis by Trapmann, Hell, Hirn, and Schuler (2007) looked at a total of 258 correlation coefficients from 58 reports from 15 different countries to summarize the substantial amount of literature looking at the relationship between personal characteristics and post-secondary success. Of the "big five" personality indicators (neuroticism, extraversion, openness, agreeableness, and conscientiousness), only neuroticism and conscientiousness correlated with academic satisfaction and post-secondary grades (respectively); none of these factors correlated with retention.

In *Success in College: the Role of Personal Qualities and Academic Ability* (1985), Willingham found that high school follow-through in extra-curricular achievement (or "productivity"), quality of the students' personal statements, and quality of high school reference

letters all added small but significant predictive ability to measures of academic performance in predicting success in college. A few aspects of Willingham's study are of particular importance to the current study. First of all, Willingham does note that the added benefit of using "productivity" as an admission criterion to predict college success is particularly strong for students in the second and third quartile of academic performance. This is relevant to the current study, as UBC uses character-based admission criteria solely for students "on the margins," with good high school grades, but slightly below the competitive cut-offs for admission. Willingham does correctly note that more selective colleges (mean acceptance rate of 31%) saw more students displaced by the different models than less selective colleges (mean acceptance rate of 83%). This suggests that as one of Canada's more selective institutions, UBC could expect to see more variation in composition of the first-year class by varying its admission criteria. However, Willingham's results may apply differently to UBC due to biases in the population, as the applicant pools for small, private liberal arts colleges in the US are likely not the same as for a large public research –intensive institution in Canada. Furthermore, it is suspected that due to restriction of range in high school grades (the result of either grade inflation or a more academically capable applicant pool), the significance of Willingham's 1985 findings may very well be lower if the study was replicated today. Finally, Willingham may have found a high degree of inter-relation between the assessment variables due to problems with internal validity. For example, a school counselor may have offered a strong reference letter *because* a student has a high GPA.

Sedlacek (2004a; 2004b) avoids this problem by focusing solely on the predictive ability of "noncognitive" variables. In *Beyond the Big Test: Noncognitive Assessment in Higher Education* (2004a), Sedlacek identifies eight noncognitive variables that identify students with potential to

succeed in college when cognitive variables (e.g., high school GPA, standardized test scores) do not: positive self-concept / confidence, a realistic self-appraisal, the ability to understand and deal with racism, a preference for long-range goals over immediate needs, the availability of strong support person, successful leadership experience, demonstrated community service, and knowledge acquired in a field. Similarly, Sternberg's *College Admissions for the 21st Century* (2010) describes Tuft's University's use of the "Kaleidoscope" assessment tool, measuring creative skills, wisdom-based skills and practical skills. The author argues that if students are to be admitted to university on the basis for their potential for future leadership and citizenship, admissions decisions need to go beyond assessments of academic merit.

While the premise of a noncognitive assessment is attractive to universities as a tool to sort students, the validity of such measures is still in question. Findings regarding internal consistency within Sedlacek's noncognitive variables are mixed at best and the research he cites in support of his claim for construct validity does not substantiate his claims (King & Bowman, 2006). Dr. H.I. Reiter, Chair of Admissions, McMaster University Undergraduate MD Program, points out that many of the noncognitive assessment tools rely on applicants' self-reporting of personality traits; in other words, personal characteristics are described by self-perceptions as opposed to third-party observation of actual behaviours (personal communication, March 15, 2011). This threatens validity, as self-reported assessments tend to focus more on applicants' values and beliefs than actual behaviours (Thomas, 1991; Russell, 2004). Context specificity also serves to compromise validity in the admission decision (Eva, Rosenfeld, Reiter, & Norman, 2004); an applicant's presentation of a personal characteristic may have more to do with the context in which the characteristic is being displayed than the individual's possession of the actual characteristic.

Furthermore, much of the literature on noncognitive assessments focuses on diversity as a measure of enrolment success. While these measures may effectively identify students from under-represented groups who are more likely to succeed on campus, it is unclear if noncognitive variables are better predictors of success for the student population as a whole, particularly among highly selective institutions. Sedlacek's (2004a) case studies are limited to discreet cohorts of students (i.e., visible minority students, athletes, low academic ability) attending low-to-moderately selective institutions. It could easily be argued that these case studies have low validity when applied to the full applicant pool at highly selective institutions. Similarly, the work of Baird and Richards (1968) suggests that while non-academic and academic admissions criteria do identify different types of students, the academic criterion was defined as a C average in high school, hardly the mark of a selective institution (even in 1968). In other words, we know that noncognitive variables tell us something grades do not when a non-selective institution is looking at specific cohorts of students whose pre-university indicators suggest poor performance; do noncognitive variables also tell us something (that pre-university grades do not) when a highly selective institution considers its entire applicant pool of highly capable students? Without an answer to this question, it is unclear if noncognitive variables can be used to combat grade inflation (as claimed by Sedlacek [2004a; 2004b]), more often seen in highly selective institutions (Rojstraczer, 2003).

Similarly, Sternberg's (2010) noncognitive admissions variables correlate well with character-based inputs (such as extra-curricular activities in high school) and cognitive outputs in post-secondary study (e.g., first-year average), but are not correlated with noncognitive outputs (i.e., level and quality of engagement) in post-secondary. In other words, noncognitive and cognitive inputs both tell us something about cognitive outcomes, but neither was shown to

correlate with noncognitive outcomes. The MacMaster University Medical Program has done some work in developing a noncognitive assessment tool that has shown positive results in terms of correlating admission criteria and noncognitive student outcomes (measured independently, not self-reported)(Reiter, 2011), but these results are preliminary and based upon a long chain of correlations (Dore et al., 2009).

As suggested above, no single admission decision-making model is a perfect predictor of post-secondary success. Most institutions do not rely on a single decision-making model from the taxonomy; in most cases, a hybrid approach is employed. The defining criteria is therefore not what is the best model for sorting students, but what is the best model for sorting students to the specific institution. Noncognitive variables (or character-based assessments) may be the most appropriate model for an institution wanting to diversify its student body, but may not be appropriate for an institution wanting to combat grade inflation or make finer distinctions between a more homogeneous class.

2.1.11 Optimal enrolment as defined by the organization

From a holistic perspective, the provision of access to higher education serves the student, the organization, and society as a whole. However, from an enrolment management perspective, how institutions sort and afford access is primarily a function of the institution's relationship with its environment. This justifies the need for an admission process; colleges must choose their students carefully, for ultimately, people will judge the organization based upon the quality of the graduates (Thresher, 1966).

The growth in access resulting from higher education's evolution from elite to a universal system of education creates an increased demand for resources (Trow, 1973). Elite institutions, catering to a small population, rely on a modest consumption of (mostly private) resources.

Organizations within a massified or universal system of access, catering to the entire population, are far more dependent upon a larger network of resources, both public and private. Trow (1973) suggests the increase in complexity, size and interdependence with the environment brought about by an evolution towards universal education has resulted in a disbursement of power. Externally, power that was concentrated within the institution of higher education has shifted in part towards the state. Internally, governance and administrative authority have shifted from faculty onto administrative staff (Kirp, 2004; Slaughter & Rhoades, 2004).

The variables that describe optimum enrolment in an institutional context usually fall into one of two categories: quantity of students and qualities of students. Typically, issues regarding quantity of students dominate the discussion among less selective institutions. In these cases, institutional supply exceeds market demand, so optimum enrolment is defined by the institution's ability to extract from its environment the resources required to remain operationally viable. Some non-selective institutions target a particular group of students for a particular characteristic, creating the illusion of selection based upon student qualities. In reality, if the institution is non-selective, the issue remains one of quantity. For example, a school may target a particular under-represented group of students or a group of students more likely to persevere to second year. While these appear to be qualitative enrolment decisions, in reality, the goal is quantitative. Appealing to an under-represented population represents niche marketing that can boost overall enrolment. A first-year student more likely to persist to second year lessens the need to recruit additional students to fill spaces vacated by attrition.

Institutions perceived to be more prestigious, where the demand of supply exceeds the supply of seats, are typically more focused on enrolment issues related to particular qualities of the student body. Selective institutions preserve their symbolic capital by maintaining scarcity.

That the scarcity of access generates the perception of quality results from seeing an institution of higher education within the context of its environment (Astin & Henson, 1977). There is a zero-sum element in how selective-admission institutions position themselves in the marketplace (Marginson, 2006); the value of the education increases for those who access the institution when the volume of those who cannot access the institution increases, even in a massified system. The most highly-reputable schools are defined by their limited access: "elite doctoral universities cannot expand their production to meet full potential demand… without cruelling their raison d'être" (Marginson, 2006, p. 4).

Selective universities do not have a problem enrolling the right number of students; the goal is to get students with the right qualities. Such is a reflection of institutional choice, not necessity. Enrolment objectives based upon student qualities are likely to be more contentious than those based upon student quantities. The source of the contention is displacement – who is being turned away? In some instances, the displacement is deliberate, as in the enactment of character-based admission policies among Ivy League institutions in the 1920s and 1930s to curb Jewish student enrolment. In other cases, a qualitative approach to enrolment management resulted in inadvertent displacement, but the outcome is no less contentious. Despite the established legitimacy of race-based admission policies (through the Supreme Court decision of Bakke v. Regents of the University of California (1978)), in 1992, four white students denied entrance to the University of Texas law school filed a suit against the university. The students won the suit on the basis that race-conscious admission policies are a violation of the Fourteenth Amendment right to equal protection (Hopwood v. Texas, 1996)(Horn & Flores, 2003). The admission policies that worked against these four white students were not intended to displace them specifically. Rather, a mobilization-based decision model (see Appendix A) was used to

provide increased access for students from under-represented groups; the Caucasian students were simply displaced to make room. Even if "optimum enrolment" benefits the community as a whole, the control of access to public resources represents a loss to individual actors. This is a key argument for opponents of universities using affirmative action to select a first-year class (Horn & Flores, 2003; Turner & Pusser, 2004).

3 Theoretical Framework

This study uses a theoretical framework that draws from two established theories in the literature. Social imaginary theory provides a framework to understand how access to higher education is perceived within a social discourse. Resource dependency theory provides a framework to understand the organizational perspective in how a university manages its enrolment.

Social Imaginary Theory

3.1.1 Theoretical overview

Taylor (2004) defines the "social imaginary" as "the ways people imagine their social existence, how they fit together with others, how things go on between them and their fellows, the expectations that are normally met, and the deeper normative notions and images that underlie these expectations" (p.23). The social imaginary is not theoretical, elitist or dogmatic; it is a common understanding held by everyday people to make sense of their everyday world (Taylor, 2004; Rizvi & Lingard, 2009). Underlying the principle of the social imaginary is the idea of a "moral order (that) stresses the rights and obligations we have as individuals in regard to each other, even prior to or outside of the political bond" (Taylor, 2004, p.4). This moral order is of mutual benefit among members of society, fostering security, economic prosperity and a sense of freedom. Fundamentally, moral order rests upon an idea of social justice, where "society is working in a *fair* way, where individuals are allowed as much freedom as possible given the role they have within society" (Zelda, Majhanovich & Rust, 2006, p.2).

In a modern context, Taylor (2004) argues that there are three aspects of self-understanding that are critical to defining the social imaginary: the economy, the public sphere, and the practices and outlooks of democratic self-rule. The idea of an "economy" is seen as an ordered

"interlocking set of activities of production, exchange, and consumption, which form a system with its own laws and its own dynamic" (Taylor, 2004, p.76). The public sphere suggests the common space and media within society where the norms of the social imaginary are elaborated; the ensuing discourse provides guidance for the society to act in ways that support the norms. Though the public sphere may be defined in whatever manner the society is defined, in the current day, the social imaginary is often seen in a global context, built upon an intercultural dialog (Ganokar, 2002). Even in a global context, sovereignty within society can be instituted because of an agreement over societal norms and meanings; the content of the social imaginary. Though the commonly understood norms provide the structure necessary for self-governance, the structure is not rigid, as the social imaginary is in a constant state of flux (Rizvi & Lingard, 2009). The evolution of the social imaginary is informal and not explicit; as the content of the social discourse changes, so does the shared social imaginary upon which the discourse is centered. As such, the social imaginary is self-reflective, providing "ways of understanding the social that become social entities themselves, mediating collective life" (Ganokar, 2002, p.4).

3.1.2 Application to current study

The social imaginary serves as a bridge between the way things are and the way things should (and could) be. These two "states" need not be perceived as a dichotomy. The practices (or behaviours) within a society represent acts of self-understanding, undertaken to generate and understanding and movement towards the "ideal" social imaginary (Taylor, 2004). Thresher (1966) describes this transition through the lens of access, where "the procedures connected with admissions… are much more a series of rules and customs. Through them are conducted social stresses, the study of which can tell much about the processes of the society that contains them" (p.9). Education can be seen as a tool to enact the ideal within the social imaginary, to foster the

type of moral order, security and economic prosperity Taylor (2004) describes. Education systems transmit the narrative of the nation (Rizvi & Lingard, 2009), derived from culturally neutral aspects of modernization (e.g., technology) (Ganokar, 2002). This is of particular importance in the evolution from elite to mass to universal systems of higher education; the "universality" of higher education makes it a critical vehicle for social discourse among the "everyman." Knowledge is not a finite resource, and can therefore be seen as a right, something to which all members of society have access.

In conceiving access to education within the social imaginary, it is important to incorporate the idea of social justice. Zajda et al. (2005) describe the social justice as "the overall fairness of a society in its divisions and distributions of rewards and burdens" (p.4). Ensuring fair access to education is both an outcome and means to social justice; a sense of fairness is required to ensure access and is conceived in the social imaginary as the end result of access. Rawls (1971) specifies that this sense of fairness regulates the social cooperation and agreements that establish the structures of our society and the distribution of social benefits. But does fairness imply equity? Should all students have access to whatever institution they desire, all in the name of social justice[23]? Obviously, the answer is no. When resources are finite and in high demand, social justice in access is best defined by fairness, not equity. Different students must be treated in different ways to ensure the appropriate distribution of rewards and burdens. The idea of a "fair" distribution of a resource that is in high demand (access to higher education) brings with it complexity. Many of traditional assessments of merit (e.g., high school grades, standardized test

[23] As is often seen in European systems of higher education.

scores) carry cultural biases and are often geared towards groups that are already rich in cultural capital (Lemann, 1999; Slack & Porter, 1982; Sedlacek, 2004a).

How we access education itself is not value-neutral; there are within society "normative notions" of how education (or certain types of education) should be rationed (Taylor, 2004). There are underlying assumptions within the social imaginary that dictate how a fair and just distribution of access works; Rawls (1971) called this a "social contract" and is based upon a theory of justice that resides within a theory of rational choice. It is expected that a moral and rational logic will determine how access is afforded. Societal values and norms that enter the public sphere are used to shape access (e.g., academic meritocracy, personal characteristics, or affirmative action) and are designed to bridge the gap between what is and what should be. Carnevale and Rose's (2003) work suggests that the determination of access to higher education is within itself a system of exchange and consumption, and as such, is affected by the norms of the social imaginary (e.g., admission decision-making models based upon individual characteristics that achieve their value through social discourse). Therefore, while the actions and practices that constitute enrolment management belong to organizations and individuals, they are nested in the social imaginary. And because of the transformative role of education within a society, the relationship is one of both cause and effect: societal norms both influence and are affected by how students access higher education.

Resource Dependency Theory

3.1.3 Theoretical overview

All organizations must negotiate and interact with their environments in order to achieve their objectives (Pfeffer & Salancik, 1978; Tolbert, 1985; Gorlitz, 1999). The interactions may be direct, with clear transactional exchanges of resources (Pfeffer & Salancik, 1978; Tolbert, 1985)

or conceptualized by the involved actors' understanding and expectations. Zucker (1977, 1983) describes the latter in stating that the social perception of an organization and its actions flow from a normative understanding of how the organization interacts with its environment. Organizations establish their legitimacy and affect their ability to survive by aligning with normative expectations of their structure and behaviour (Meyer & Rowan, 1977; Rowan, 1982). In a sense, this approach imposes the theoretical framework of the social imaginary upon the expectations of an organization. This is of particular importance when considering public universities, where normative perceptions are quite different from private organizations (Tolbert, 1985; Volkwein, 1989) and, arguably, held with greater conviction.

Pfeffer and Salancik (1978) suggest that the relationship between an organization and its environment is more formal than normative. A direct negotiation and exchange of resources between the organization and its environment is defined in three ways: the extent to which power and authority in the environment is concentrated or dispersed, the availability of an organization's required resources within the environment, and the linkages between people and organizations within the environment. Resource dependency theory argues that the availability of resources is at the core of all of these variables; power to control resources, ability to access resources, and sourcing resources within the network. Similar to the normative framework, even the more direct relationship is significantly different for public institutions. For example, institutions that derive the majority of their funding from the public purse experience different dependencies than private institutions. However, regardless of whether the exchange with the environment is seen as normative or direct, the dependency influences the organizational structure (Tolbert, 1985; Hossler & Hoezee, 2001).

Like the social imaginary, the interdependence between organization and its environment is constantly in flux (Pfeffer & Salancik, 1978). The environment upon which the organization depends is not wholly dependable, and as such, the organization cannot be passive if it is to thrive. Organizational power serves as a "buffer" between the institution and its environment (Salancik & Pfeffer, 1977) and is the result of the organization's ability to manage its dependencies with external actors (Heimovics, Herman, & Coughlin, 1993; Salancik & Pfeffer, 1977). This can be done by invoking change both within the organization and in the manner the organization interacts with the external environment.

3.1.4 Application to current study

Thresher (1966) rejects the idea that post-secondary admission is merely a reflection of the supply of and demand for students. But this is the sociologist's perspective. The organizational theorist would suggest that one of the primary external resources upon which any public university is dependent is student enrolment (Pfeffer & Moore, 1980). Hence, successful enrolment management (as a process or an organization structure) is a manifestation of the post-secondary institution's dependence upon their environment. For example, a public institution will employ organization structure and processes in order to interface with government, whereas a private institution will focus more energy and resources on marketing and student recruitment. Yet the potential resource represented in every student goes beyond the dollars of government funding and/or tuition revenue; the qualities of a student body may also constitute a resource. A "high-quality" student body contributes to the institution's reputation, formally via rankings or informally via word of mouth, generating various forms of capital for the institution. In all the aforementioned examples, the ability to influence enrolment shows an institution's ability to exert control over its environment.

Education is often seen as a public good; this is particularly the case for education accessed from publically funded institutions. As such, an enrolment manager's attempt to exert control over access to public education presents the potential for conflict, as the concept of "public" suggests an absence of competition for resources. This conflict is inherent to resource dependency theory, as actors in the environment (be they students or universities) fight for control of resources. Enrolment management (and specifically, the admissions process) provides the framework by which we can observe the interaction between institutions of higher education and prospective students, as both attempt to exert desirable resources from their environments.

4 Design and Methodology

Overall approach and rationale

I seek to assess and understand the impact of enrolment management practices (as evidenced by different admissions decision-making models) on student enrolments. A quasi-experimental methodology was employed to describe actual academic and engagement outcomes (dependent variables) of subpopulations of students identified by different admission decision-making models (independent variable) at the University of British Columbia. The conditions of the independent variables represent different enrolment management practices that affect student access to higher education, creating a "displacing effect" among applicants to the institution:

i. students *denied* admission using decision-making model A who would previously have been *admitted* under admission-making model B (the *newly-displaced*), and

ii. students *admitted* using decision-making model A who would previously have been *denied* admission under admission-making model B (the *newly-admitted*).

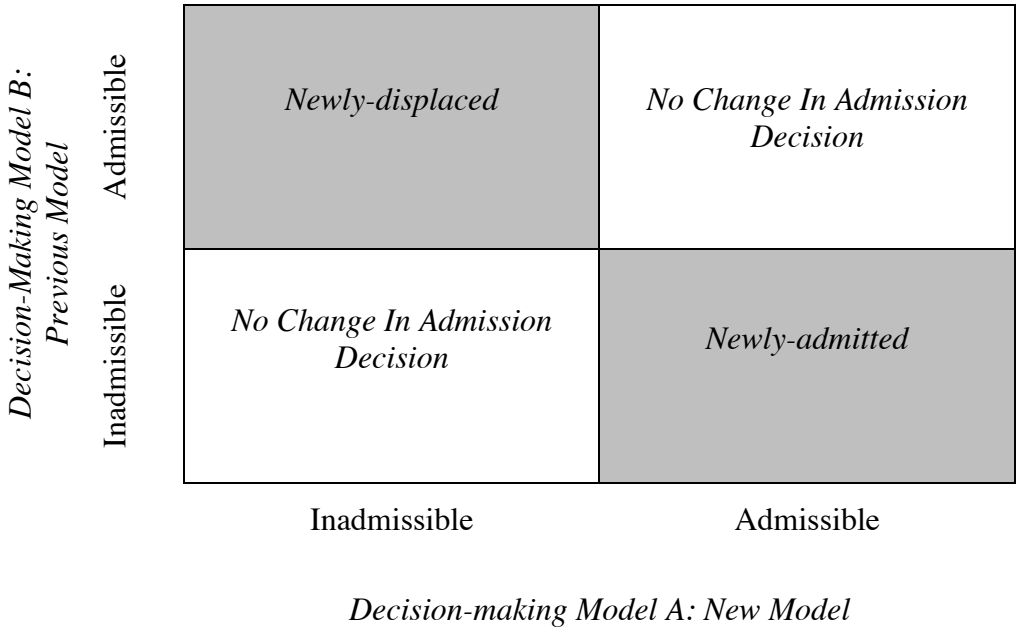
The reference to "displacement" is appropriate due to the "zero sum" nature of enrolment; because total enrolment is finite, one group of students has to be denied admission to make room for another (Sternberg, 2010). In this construction, the independent variable is seen as (a) the determinant of the "displacement" and (b) an operationalization of an institution's determination of the "right" student (i.e., "optimum" enrolment).

Measuring the differences between the newly-admitted and the newly-displaced students serves two purposes. First of all, we can evaluate the institution's ability to enroll a particular type of student. Assuming academic performance and student engagement are positive factors in the definition of "optimum" enrolment, the institution would hope that the admission decision-

making models would serve to successfully distinguish and admit a student more likely to have a higher first-year average, who is more likely to persevere in their studies, and who displays a higher level of engagement with their education and their campus community. While the anticipated differences between the two groups are not necessarily seen as value-neutral, whether the difference is perceived as a positive or a negative changes within context. For example, if the institution determines that the "right" student is someone who is highly involved in their community, an observed difference between the newly-admitted and the newly-displaced in terms of academic and engagement outcomes may be interpreted in a positive light. On the other hand, if an institution admits a group of students on the basis of their athletic ability (for example), but these students' achievements are at the same level as the students they displaced, then a lack of an observed difference between the newly-admitted and the newly-displaced is also interpreted in a positive light. Within this context, the determination of value assigned to the outcome is made by the institution and within a greater societal discourse; both will serve as the basis for discussion of the outcomes of this study.

Secondly, measuring the differences between the newly-admitted and the newly-displaced students frames an understanding of the extent to which an institution can actually shape a class of students. This study purposefully ignores the students for whom the admission decision is the same regardless of the institution's choice of decision-making model (see Figure 1). If different admission decision-making models lead to (mostly) the same admission decisions for the same students with the same outcomes, then the models show weak correlation with student outcomes. In a broader context, we can also raise question about the extent to which enrolment is shaped by the institution or by the external environment.

Figure 1: Identifying the newly-admitted and the newly-displaced students



Research questions

I seek to understand how theories of the social imaginary and resource dependency describe how a selective-admission university in Canada interacts with its environment in the context of selecting a first-year undergraduate class. More specifically,

i. Does choice of admission-making decision model matter in terms of shaping a first-year class at a selective admission university? And if so, how?

ii. How do these particular admissions models fit within the larger social discourses of access to higher education?

iii. To what extent are students selected by one admission decision-making model different than students selected by another?

These questions are answered through a two-part study. The first part evaluates the impact of an actual change in UBC's admission decision-making model (the introduction of an applicant's personal characteristics and non-cognitive traits as variables in the admission decision) over a two-year period. The second part evaluates the impact of a hypothetical change in an admission decision-making model (the introduction of applicant geographic location as a variable in the admissions variable) at UBC over the same period.

Location of the research

The location of this research is the University of British Columbia, located in Vancouver[24], BC, Canada. The university boasts a strong international and national reputation, being one of only three Canadian universities (and the sole in the province of BC) to rank in the top forty of both the Times Higher Education World University Rankings and Shanghai Jiao Tong University Academic Rankings. With a 2010 undergraduate population of 28,929 students and a mean direct-entry class admission average of 89%, UBC is one of the largest and most selective universities in Canada. In 2010, UBC received 20,679 applications from secondary school students vying for one of 4,673 first-year seats[25]. Through its strategic plan and enrolment strategies, UBC has articulated characteristics by which it defines the optimum class, referencing criteria such as academic ability, perseverance, area of academic interest, citizenship, geographic origin, entry-point (e.g., direct-entry from secondary school or transfer from another post-

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[24] Unless otherwise noted, all references to the "University of British Columbia" in this study refer to the Vancouver campus only.

[25] Excludes international enrolment; UBC's enrolment targets are based upon provincial funding which does not go towards international student enrolment.

secondary institution), readiness for university study, and level of engagement in school and/or the community.

4.1.1 Enrolling a more national first-year class.

In an October 16, 2010 open letter published in the Vancouver Sun, UBC President Stephen Toope described the benefits of diversifying the UBC student body beyond the province of BC, even when access for local students is seen as limited. "(W)ith strong demand pushing university entrance averages, how on earth can UBC be deliberately increasing the numbers of out-of-province and international students?" (Toope, 2010). Prof. Toope answers his own question by identifying numerous social, cultural and economic benefits that national and international students bring to UBC. In the end, the current mix of local vs. non-local students is "not good enough… for a university like UBC" (Toope, 2010).

In 2010, the first-year direct-entry class at UBC was comprised of 68% from British Columbia, 12% from other Canadian jurisdictions, and 20% from the rest of the world. Since 2000, UBC has actively engaged in increased recruitment activities designed to grow enrolment from other Canadian jurisdictions. Nevertheless, out of province direct-entry enrolment at UBC consistently hovers around 9% - 12%. There are a number of explanations. First of all, while the actual number of direct-entry out of province students has grown at UBC (from 403 in 2005 to 612 in 2010), growth in international enrolment has grown at a faster pace, increasing the total number of new UBC students[26]. As a result, although out of province numbers did grow, their

[26] Because international students are not counted against UBC's government funded enrolment target, an increase in international student enrolment increases UBC's total population. Unlike domestic enrolment, international enrolment is not "zero sum"; more international interest can lead to a larger overall international enrolment.

proportion of the student body remained more or less static. Secondly, the national average for out of province enrolment in Canadian universities is only 8% (compared to 20% in the US), with only a handful of universities in Atlantic Canada (where so many provinces are in close geographic proximity with one another) and McGill (with its easy geographic access to Ontario, the largest source of post-secondary–bound students in the country) having substantially higher proportion of students coming from outside the province (Davies & Hammack, 2005). Even though UBC is above the national average, Prof. Toope's comments suggest that the "right" student body for UBC should be more nationally representative and that enrolment management practices should seek to enroll a greater number of Canadian first-year students from outside of BC. A target out of province enrolment equal to 20% of the incoming class is often discussed on campus.

The comments from UBC's president underscore a tension between the needs of the institution and the needs of the external environment. Rising university entrance averages suggest increasing competition among large numbers of (primarily local) students who want to enroll at UBC but are unable to gain access. Insufficient numbers of national and international students represent groups of students who UBC wants but cannot enroll. The tension exists because the benefits of enrolling one group of students as opposed to another are unclear and easily contested. UBC states that "out-of-country students bring perspectives to the classroom and to dorms that lend otherwise unattainable insights into the global community for our local students" (Toope, 2010). It is true that research shows that a diverse student body and curricula are seen to transform and enrich the institution's educational mission (Chang, 1999). But others have argued that diversity through enrolment is in and of itself insufficient to bring about the desired outcomes. An institution's diversity is viewed within the context of the institution itself, and as

such, the institution's legacy of inclusion/exclusion, diversity within the students, faculty and staff, psychological climate, and behavioural climate (the actions of different on-campus groups toward one another) all contribute to the positive educational outcomes fostered by diversity (Milem & Hakuta, 2000).

Similarly, Prof. Toope's comments suggest that enrolment of the "right" student for UBC comes at the expense of the local student ("strong demand pushing university entrance averages"). Although a provincial institution in name, UBC is a provincial and national institution in terms of funding and an international institution in terms of academic output / reputation. While many local constituents would argue that UBC has a primary responsibility to foster access for a local student (this is particularly true within the public discourse of massified access to education), UBC's funding structure, academic output, reputation, and aspirations suggest otherwise. Tension is created by the inverse and circular relationship between institutional accessibility and reputation: increased demand from a national and international audience furthers an institution's reputation, which creates more demand from the local community, resulting in reduced access because of growing national and international competition.

4.1.2 Enrolling a well-rounded and academically engaged first-year class.

UBC has also articulated a desire to attract and admit students whose interests and values align with those held by the institution. UBC's current Strategic Plan, *Place and Promise*, references a vision to create "an exceptional learning environment that fosters global citizenship, advances a civil and sustainable society, and supports outstanding research to serve the people of

British Columbia, Canada and the world"[27]. In 1996, the university authorized the use of Broad-Based Admission (BBA) criteria in the undergraduate admission decision:

> in response to concerns that grade point averages were escalating and that it was possible that UBC, as a result of the sole emphasis on grades, was not getting the best students for particular programs…. It was disconcerting () that the competition for higher grades was resulting in some of the successful applicants being less rounded, in that they were losing the opportunity to gain experience in other activities. (UBC Senate Minutes, February 1996)[28]

Grade inflation, higher levels of secondary school achievement, BC Ministry of Education policies, and an increased desire to access UBC have all contributed to pushing UBC's academic entrance requirements higher and higher. Programs that twenty years ago were admitting students with admission averages in the high 70s now require grades in the early 90s[29].

In UBC's May 2008 Senate proceedings, a document entitled *Initial Review of UBC Undergraduate Admission Policies: Principles of Effective Undergraduate Admission to UBC* identified the following as the principle tenet of undergraduate admissions:

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[27] Vision and Values. retrieved March 1, 2011 from www.ubc.ca/about/vision.html

[28] Retrieved March 1, 2011 from www.senate.ubc.ca/vancouver/minutes.cfm?article=minute95-96/FEB/February.pdf. Note the similarities to language referenced by Karabel (2005) regarding the "grinders" who lacked the "character" to fit into the campus communities of Harvard, Yale and Princeton.

[29] Interestingly, although the admission averages required to gain admission to UBC have risen by fifteen percentage points over the past twenty years, the admissibility rate of applicants has remained more or less the same. This suggests that either (a) there has been some self-selection, as students with lower grades no longer bother applying to UBC or (b) university–bound students now present a more restricted range of high school grades.

ALIGNMENT WITH UBC'S GOALS:

> Admission policies should ensure that the institution "…attracts and retains the best undergraduate and graduate students from across BC, Canada and the world" (Trek 2010). Such students should be predisposed to take advantage of the opportunities to seek academic challenge, to do research, to develop leadership skills, to do community service, to foster global awareness, and to participate in sports and the fine and performing arts. (UBC Senate Minutes, May 2008)[30]

While numerous other principles for effective undergraduate admission are identified, the emphasis on practices that align with the institution's goals are clear within the Senate minutes: "Where two or more (admissions) principles are in conflict, the resolution should always aim to achieve the overall goals of the University."

4.1.3 Desired enrolment outcomes vs. enacted enrolment outcomes

It is important to note that not all of UBC's values factor directly into the institution's admission decision-making model. Some admissions criteria factor into every admission decision, such as academic ability (as determined by an "admission average," comprised of a mean score of grades from a collection of secondary school courses), area of academic interest (e.g., a student applying to the Faculty of Arts may be admitted with a different admission average than a student applying to the Faculty of Science), and entry-point (i.e., the university manages enrolment differently for post-secondary transfer students than direct-entry students). Other admission criteria factor inconsistently into the admissions decision–making model. For example, student characteristics and readiness for university study (i.e., Broad-Based Admission criteria) are considered by some programs and for some applicants, but are not uniformly

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[30] Retrieved March 1, 2011 from http://www.senate.ubc.ca/vancouver/minutes.cfm?article=minute07-08/0508/may.pdf. "Trek 2010" is a reference to UBC's vision document at the time.

considered in all decisions. Similarly, UBC provides special consideration for undergraduate applicants of Aboriginal ancestry, but does not consider cultural or ethnic background for other applicant groups. Finally, some of the criteria with which UBC defines "optimum" enrolment are not factored into the formal decision-making model at all. For example, while UBC wishes to increase the proportion of its first-year class from Canadian jurisdictions outside the province from 12% to 20%, geographic origin does not factor into the admission decision-making model. Similarly, while the institution would like to see 15% of its total undergraduate enrolment comprised of international students, citizenship does not formally factor into the admissions decision-making process. In other words, while UBC wants to enroll more out of province and international students, the admissions decision-making model used by the institution is "geographic origin-blind" and "citizenship-blind."

Table 1: Current matrix of admissions decision-making processes at UBC

Decision-Making Model	**Evidenced by**	**Formal consideration by UBC**
Entitlement	Absence of admission criteria	N/A
Open Access	Absence of competitive admission criteria	N/A
Meritocracy	Academic criteria: the admission average	Full
Character	Broad-based criteria: applicant written responses identifying personal characteristics, activities and accomplishments.	Partial
Enhancement	Noncognitive assessment: applicant written responses to questions designed to identify students most likely to engage and succeed in university.	Partial
Mobilization	Affirmative action; proportional representation	Low
Investment	Broad-based criteria: applicant written responses identifying qualities of leadership and potential for future contribution to the community.	Low
Environmental / Institutional	a) Intended area of study b) Geographic-based criteria (national, international representation)	a) Full b) N/A
Fiduciary	Citizenship-based criteria	N/A

Adapted from Perfetto, 1999, (p. 5-7)

Using the Perfetto's Admissions Decision-Making Taxonomy, we can describe UBC's admissions decision-making model as a hybrid (see Table 1). Considering UBC wants to enroll an engaged and geographically diverse first-year class, there is a gap between the kind of student UBC wants and the admission criteria used to select those students. This study describes the outcome of UBC's desire (both actual and hypothetical) to close that gap.

Research design

This study employs a quasi-experimental design, observing actual academic and engagement outcomes of students admitted to first-year of undergraduate study under different admission decision-making models. Campbell and Stanley (1963) describe a quasi-experiment as one where the researcher takes their work "out of the laboratory and into the operating situation" (p. 35) where it is no longer possible to have full control over the treatment of the independent variable(s) required for a true experiment. The students who form the basis of this study were not randomly assigned to study groups, but rather, were identified by various conditions of the independent variable based upon criteria outside of the experimenter's control. Similarly, the outcomes measured by the dependent variable(s) occurred naturally and were not artificially created as a result of the experimental design. This approach is inherent in the study of post-secondary student outcomes; obviously, a full year of university performance could not be artificially constructed or rendered for the sake of the experiment. The fact that the independent variables have been determined through a natural course of action lends to the construct validity of the study (which will be further described in section 4.7), as the measured results of the dependent variable(s) have not been artificially created.

The structure of this study adheres somewhat to what Stanley and Campbell (1963) call "The Recurrent Institutional Cycle Design… an inelegant accumulation of precautionary checks,

which lacks the intrinsic symmetry of the 'true' experimental designs, but nonetheless approaches experimentation" (p. 57). In the study of actual changes brought about by UBC's adoption of a Character / Enhancement decision-making model, the independent variable is changed between two or more institutional cycles in order to create different cohorts. In the study of hypothetical changes brought about by an adoption of geographic-based criteria in the admissions decision-making process, the independent variable is changed to create two different cohorts at a different UBC campus.

Data-gathering methods

The following describes how sub-populations of the UBC undergraduate student body were identified based upon two treatments of two independent variables and how data were collected for two dependent variables. All sub-populations were determined by single-stage sampling within the 2010 and 2011 direct-entry cohorts at either the Vancouver or Okanagan campus of UBC. All data used in this study were obtained either via the UBC Student Information System or from UBC student survey data collected by the UBC Planning and Institutional Research office. The survey questions originated from two different surveys. The first is the "New to UBC" survey (NUBC), administered to incoming first-year students on both campuses in August 2010 and 2011. The survey asked the incoming group of students to describe their extra-curricular activities and study behaviours in secondary school and to indicate what sorts of activities they plan to undertake at UBC. Two different version of the survey are used in this study: one for the Vancouver campus students (NUBC Vancouver) and another for the Okanagan campus students (NUBC Okanagan). The second survey instrument is the National Survey of Student Engagement (NSSE). These questions were administered to UBC students in

the spring of 2011 and 2012[31]. The NSSE instrument is managed by the Indiana University Center for Postsecondary Research and

> collects information at hundreds of four-year colleges and universities about student participation in programs and activities that institutions provide for their learning and personal development. The results provide an estimate of how undergraduates spend their time and what they gain from attending college. That is, they reflect behaviours by students and institutions that are associated with desired outcomes of college. (NSSE, n.d.)

Kuh, Kinzie, Cruce, Shoup, and Gonyea (2007) suggested that extra-curricular activities in secondary school had a significantly negative effect on first-year grades[32]. However, when broadening the definition of "engagement" to include time on task and interaction with faculty (as defined by the NSSE survey instrument), "student engagement was seen to positively affect grades and persistence to the second year of study at the same institution, even after controlling for a host of pre-college characteristics and other variables linked with these outcomes, such as merit aid and parents' education" (Kuh et al., 2007, p. 36).

4.1.4 Independent Variable 1 (x1): Identifying students affected by Broad-Based Admissions; the Character / Enhancement admissions decision-making model

In the first part of this study, I identify and describe the differences between students who have been affected by the increased use of Broad-Based Admissions (BBA) at UBC. I refer to this as the "Character / Enhancement" admission decision-making model, as BBA incorporates the principles of these two decision-making models from Perfetto's taxonomy. In recent years, many of UBC's direct-entry programs (i.e., those that take students directly from secondary

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[31] In 2011, the questions were administered as part of UBC's participation in the NSSE survey. In 2012, the same questions were administered as part of a UBC-specific survey.

[32] See section 4.7 for a discussion of validity issues related to NSSE.

school) have introduced or increased the use of BBA criteria in the admission decision. BBA assessment typically comprise of applicants' answers to four to six questions on the "personal profile" section of the undergraduate application form, assessing previous levels of engagement, self-reflection and a number of non-cognitive traits. Sample questions include:

1. Tell us about an experience, in school or out, that caused you to rethink or change your perspective. What impact has this had on you?
2. Explain how you responded to a significant challenge that you have encountered and what you learned in the process.
3. Describe up to five activities that you have pursued in one or more of the following areas: leadership/group contributions (e.g., student government, community activity, family responsibility; involvement in Aboriginal culture or community); academic achievements (e.g., research project; success in a contest; prize for high standing); sports (e.g., team membership; participation in competitions); creative and performing arts; work; service to others.

The answers are assessed holistically against a common rubric, generating scores for applicant traits such as "ability to set and achieve goals" or "leadership." Two blind reads are conducted and a mean score is produced. If the two blind reads generate an unacceptable discrepancy, the profile goes to a third reader, and the outlying score is discarded. Academic performance (as measured by grades) still serves as the primary basis of UBC's undergraduate admission decisions, but BBA criteria are increasingly used to make decisions for applicant "on the edges" of UBC's competitive criteria. For example, in 2010, the Faculty of Arts (the largest faculty at UBC, with a 2010 first-year intake of 1,641 new students) made admission decisions primarily on the applicant's academic average[33]. For the 2011 intake (1,709 new students), the faculty began to consider BBA criteria in addition to academic performance in the admission decision. In total, 14% of all students admitted to the BA program in 2011 were admitted with

[33] All references to enrolments and admission decision-making criteria refer to domestic enrolment only.

some consideration given to BBA criteria; the remaining 86% were admitted solely on the basis of academic grades. The Faculty of Applied Science (Engineering) (2010 first-year intake: 675 new students; 2011: 609), also dramatically increased its use of BBA in 2011, with 20% of the first-year pool of admitted students having been accepted on the basis of both grades and BBA information.

For the Arts and Engineering programs at UBC, BBA information is used in a limited capacity. The majority of students are admitted on grades alone; BBA qualifications are used solely for the students who fall just below the competitive admission average and are considered *in addition* to grades. However, the Faculty of Commerce introduced full-scale implementation of Broad-Based Admission criteria in 2004; all direct-entry applicants were considered on grades and BBA information. To date, no applicant is admitted to the Faculty of Commerce based solely upon admission average; even students with admission averages in the high 90s are turned away if their personal profile is weak. In 2010, the Faculty of Commerce enrolled 413 new domestic first-year students; in 2011, they enrolled 402.

In all the aforementioned examples, because total new student enrolment was not increased, the grades-only admission average had to be raised in order to create the space required to enroll more students on BBA. As the institution shifted from a predominantly academic merit-based admission decision model to a more merit/Character / Enhancement hybrid model, the criteria for admission on grades alone became more stringent. For example, in 2010, the Faculty of Arts achieved target enrolment of 1,641 new students by admitting all applicants with an admission average of 85% or higher. In 2011, the admission average for "grades-only" admission was raised to 87%, thereby creating space for students with lower grades (down to 83%) to be admitted on BBA criteria. Because the 2010 and 2011 applicant pools were similar in

size and academic ability, some of the students who would have been admitted on grades alone from 85% - 86.9% had to be refused on the basis of their BBA submission in order to admit students between 83% - 86.9% on the strength of both their BBA submission and their grades.

Table 2: Increasing use of BBA in admission decision-making model at UBC

Admission Avg (%)	Faculty of Arts		Faculty of Applied Science		Faculty of Commerce	
	2010	2011	2010	2011	2003	2004 onwards
92 – 100	Admit	Admit	Admit	Admit	Admit	Consider
91	Admit	Admit	Admit	Admit	Refuse	Consider
90	Admit	Admit	Admit	Admit	Refuse	Consider
89	Admit	Admit	Admit	Admit	Refuse	Consider
88	Admit	Admit	Admit	Consider	Refuse	Consider
87	Admit	Admit	Admit	Consider	Refuse	Consider
86	Admit	Consider	Admit	Consider	Refuse	Consider
85	Admit	Consider	Refuse	Consider	Refuse	Consider
84	Refuse	Consider	Refuse	Consider	Refuse	Consider
83	Refuse	Consider	Refuse	Consider	Refuse	Refuse
82	Refuse	Refuse	Refuse	Consider	Refuse	Refuse
81	Refuse	Refuse	Refuse	Consider	Refuse	Refuse
80	Refuse	Refuse	Refuse	Consider	Refuse	Refuse

The effect of increasing grades-only admission averages in order to consider more students on both grades and BBA is represented in Table 2. The shaded areas represent the displacement effect. Some or all of the students shaded in black in Table 2, admitted on grades alone, were displaced in subsequent years in order to accommodate some of the students shaded in grey, admitted on grades and BBA. These two groups constitute the two treatments of the independent

variable (*x1*) in the Character / Enhancement admission decision-making model, the newly-admitted and the newly-displaced. The former are determined by a cohort of 268 Arts students admitted in 2011 with an admission average of 83% - 86.9%; the latter are determined by 358 Arts students admitted in 2010[34] with an admission average of 85% - 86.9%. Similarly, an Applied Science 2010 cohort of 163 students with an admission average of 86% - 88.9% would have been displaced in 2011 to admit a cohort of 172 students with an admission average of 80% - 88.9%.

It is important to note that the displacement is not equal to the sum total of both cohorts. Of the 358 displaced Arts students in the 2010 cohort with averages in the range of 85% - 86%, some may have provided a strong enough personal profile submission to gain admission in 2011. However, this should not create a concern with internal validity. The conclusions of this analysis may suggest that an admission decision-making model that fails to effectively distinguish between two different groups of students can be deemed a poor enrolment management tool, with little impact on shaping an incoming class. In the extreme, even if the exact same students displaced because of a raised admission average were admitted on the strength of their admission average and BBA, we could still conclude that the Character / Enhancement admission decision-making model is not significantly different from a grades-only (merit-based) admission decision-making model in terms of shaping a first-year class.

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[34] Note that while the newly-admitted should equal the newly-displaced in terms of how many students UBC admits, because not all admitted students accept UBC's offer, the number of newly-admitted students does not equal the number of newly-displaced in terms of final enrolment.

In the case of the Faculty of Commerce, in 2003, the last year of grades-only admission, applicants were required to present a 92% average in order to gain admission. In 2004, the Faculty of Commerce admitted applicants down to 84% based upon the strength of both their grades and BBA. The two criteria were considered in balance; a student with grades in the mid-80s required a very strong personal profile to gain admission. Similarly, a student with a weak personal profile required an admission average in the high 90s to gain admission. Even though the Faculty of Commerce did not maintain a grades-only cut-off (as did the Faculties of Arts and Applied Science) when they began to consider BBA information, we can still identify their newly-admitted and newly-displaced students. In 2010 and 2011, the Faculty of Commerce admitted 696 and 661 direct-entry domestic students (respectively). Students were admitted on a combination of grades (minimum score of 84%) and score on a personal profile. Had the faculty admitted on grades alone, the admission cut-off would have been 91.5% and 90.5% (in 2010 and 2011, respectively) to reach the same number of domestic admits. Therefore, we can conclude that had a personal profile not been used in the admission average, all students with grades between 84% and 90.5% (2010) or 91.5% (2011) would not have been admitted and can be considered the newly-admitted in the context of this study. Conversely, students with grades above 90.5% and 91.5% would have been admitted to Commerce on grades-alone, but were not offered a place due to the strength of their personal profile. However, many of these students were admitted to their second choice of program at UBC (usually the Faculty of Arts) and decided to enroll; this group forms the newly-displaced students within the context of this study.

The university would describe a positive enrolment outcome for the introduction of the broad-based admission criteria as a) either an improvement or no difference in first–year

academic performance with b) an increase in first-year engagement among the newly admitted students.

4.1.5 Independent variable 2 (x2): Identifying students affected by preference for Canadian applicants from outside the province; the Institutional admissions decision-making model.

As previously mentioned, UBC does not currently give any preference to applicants applying from outside of the province. If UBC determined that out of province recruitment efforts have yielded all that can be expected through existing enrolment practices, applicants from Ontario, Alberta and other Canadian jurisdictions would have to be admitted to UBC with lower admission averages than applicants from BC. As enrolling more students from across Canada is seen to strengthen UBC's national reputation, the consideration of geographic origin in the admissions decisions constitutes an institution-based admissions decision-making model within Perfetto's taxonomy (hence I have named this independent variable the "institutional" admission decision-making model). Of course, there is a paradox here: enrolling students with lower grades hurts UBC's reputation (regardless of whether the students with lower grades perform differently at UBC) just as enrolling students from across Canada helps UBC's reputation. The university would describe a primary positive enrolment outcome for this hypothetical enrolment management practice as no observed difference in first–year academic performance among the newly-admitted students. A secondary positive outcome would be to see an increase in student engagement among the newly-admitted.

Again, it is important to note that overall domestic enrolment at UBC is fixed; for every additional out of province student, there must be one less BC student. Therefore, the extent to which the admission cut-off for out of province students goes down is linked to the extent to which the admission cut-off for the BC students goes up. We can therefore calculate (a) the

number of additional out of province students required for UBC to reach its target, (b) the reduction of the out-of province admission cut-off required to admit those additional students, (c) the number of current BC students who would accordingly need to be displaced, and (d) the subsequent increase in the BC-specific admission cut-off.

For example, in 2010, all students who gained admission to the UBC Faculty of Arts had to present an admission average of 85%. That same year, out of province students made up 12.9% of the new to UBC first-year Arts class. To have achieved 20% of total enrolment, 113 additional Arts students from outside the province would have been required. In 2010, approximately 32% of out of province students admitted to Arts as their first choice of program accepted UBC's offer of admission. Similarly, 19% of out of province students admitted to their second choice of Arts accepted their offer. Using these yield rates, we can calculate how many more 1st and 2nd choice offers of admission would have been required to generate 113 additional first-year Arts students. Had Arts dropped its admission GPA from 85% to 79% for out of province students only, this would have generated 237 additional first choice offers and 216 additional second choice offers. Multiplied by the abovementioned yield rates, the GPA drop to 79% would have yielded the required 118 additional first-year Arts students to bring out of province enrolment to 20%.

To compensate, and avoid overall over-enrolment, the Faculty of Arts would have had to displace an equal number of BC students. In order to do so, Arts would have been required to raise their admission average for BC students from 85% to 86%, effectively displacing 127 new first-year registrants. Hence, out of province applicants with an admission average between 79% - 84.9% would have benefitted from the new admission decision-making model at the expense of BC students with an admission average of 85% - 86.9%. These two groups provide two conditions of independent variable *x2*; the newly-admitted out of province students and the

newly-displaced BC students. A similar methodology was used to identify student sub-populations for both conditions of the independent variable (*x2*) from the Faculty of Science and the Faculty of Applied Science and the subsequent changes in admission average.

Identification and description of the newly-displaced BC students is not difficult to do because this is a hypothetical enrolment model; these students were actually admitted and enrolled at UBC. Identification of the newly-admitted out of province students is considerably more difficult – they were never admitted to UBC. As a result, while we know who these applicants are, we do not know how they would have performed or behaved in first year because they were never admitted to their first choice on the UBC Vancouver campus.

There is a way to study this sub-population of undergraduates at UBC. Every year, UBC applicants are given multiple choices on their undergraduate application. Students not admitted to their first choice may be admitted to a secondary (and sometimes tertiary) choice. In 2010, 352 students who applied to the Vancouver campus of UBC were denied admission, were made an offer of admission to a comparable program at UBC's Okanagan campus, and subsequently enrolled. In 2011, 312 did students did the same. Therefore, we can compare our two treatments of independent variable *x2* by looking at out of province students with an admission average in the newly-admitted range who applied to UBC Vancouver, were turned away, and *who enrolled at the UBC Okanagan campus* with BC students with an admission average in the newly-displaced range *who enrolled at the UBC Okanagan campus*. Although the BC students in this study did not apply to UBC Vancouver, they would have been admitted had they applied – as such, they serve as an effective proxy for the students newly-displaced by a lower admission average cut-off for out of province applicants. Student outcomes measured at UBC Okanagan

(academic performance, retention and student engagement) for both treatments of the independent variable provide a common denominator for analysis.

4.1.6 Dependent Variable 1 (y1): Academic outcomes

In the first instance, I describe significant differences between the newly-admissible and the newly-displaced students by describing differences in first-year academic performance and retention to the second year of study at UBC. This information was obtained via the UBC Student Information System. The first-year average is determined by the mean grade of all attempted courses recorded with a grade in the first-year of study during the winter session (September – April) in 2010 or 2011. Retention to second year was defined as whether the first-year student persevered to a subsequent year of study at UBC (including students who changed programs and/or campuses).

4.1.7 Dependent Variable 2 (y2): Engagement outcomes

In the second instance, I describe difference between the newly-admissible and the newly-displaced students in terms of student engagement. Student engagement is taken as a proxy for post-secondary success beyond academic performance (i.e., grades). Kuh (2009) suggests that student engagement is evidenced by

> the more students study a subject, the more they know about it, and the more students practice and get feedback from faculty and staff members on their writing and collaborative problem solving, the deeper they come to understand what they are learning and the more adept they become at managing complexity, tolerating ambiguity, and working with people from different backgrounds or with different views. (2009, p 5)

The actions and outcomes of student engagement align with UBC's articulated values, the desire to create a learning environment that fosters global citizenship and advances a civil and sustainable society. In addition, student success via engagement can also be defined in a societal

context by the successful acquisition of a credential; students who report being more engaged in their post-secondary studies are more likely to persist to graduation (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008).

Engagement outcomes will be measured by student responses on the New to UBC (NUBC) and National Survey of Student Engagement (NSSE) surveys. This study did not use the NUBC and NSSE instruments in their entirety; only questions pertaining to student-initiated or intended engagement behaviours were studied (see Appendices B and C for relevant questions). In terms of Independent Variable *x1* (the Character / Enhancement admission decision-making model), 34% of the newly-admitted completed the New to UBC survey and 25% completed the NSSE; 27% of the newly-displaced completed the NUBC and 23% completed the NSSE. In terms of Independent Variable *x2* (the Institutional admission decision-making model), 65% of the newly-admitted completed the NUBC survey and 28% completed the NSSE; 61% of the newly-displaced completed the NUBC and 25% completed the NSSE. See Table 10 for more details.

Data analysis

Table 3 provides a summary of the variables, sample pools, and data analysis that describe the impact of different admission decision-making models on enrolment at UBC:

Table 3: Summary of variables, comparison groups and data analysis

Character/Enhancement admissions model		
	Independent Variable x1: Introduction of personal profile into the decision-making criteria	
	Comparison groups	Data analysis
Dependent Variable y1: Academic performance outcomes	Newly-Admitted: Students who applied to and registered in Arts (2011), Applied Science (2011) and Commerce (2010) who would not have been admitted on grades alone Newly-Displaced: Students who applied and were admitted to Arts (2010) or Applied Science (2010) who would not have been admitted on grades alone. Students who applied to Commerce (2010), were not admitted, but who registered in other programs at UBC.	a) First-year average (GPA) b) Retention to second year
Dependent Variable y2: Engagement outcomes		a) Student engagement behaviours / intentions prior to arrival at UBC as determined by answers to questions on NUBC survey b) Student engagement behaviours in first year of UBC as determined by answers to questions on NSSE survey

Institutional admissions model		
	Independent Variable x2: Introduction of geographic consideration into the decision-making criteria	
	Comparison groups	Data analysis
Dependent Variable y1: Academic performance outcomes	Newly-Admitted: Out of province students who applied to UBC Vancouver, were denied on the basis of grades alone, admitted and registered in Arts, Science or Applied Science at the Okanagan campus (2010 and 2011). Newly-Displaced: BC students who applied to UBC Okanagan, were admitted and registered in Arts, Science or Applied Science at the Okanagan campus (2010 and 2011) that would not have been admitted if admission criteria considered geographical origin of applicant.	a) First-year average (GPA) b) Retention to second year
Dependent Variable y2: Engagement outcomes		a) Student engagement behaviours / intentions prior to arrival at UBC as determined by answers to questions on NUBC survey b) Student engagement behaviours in first year of UBC as determined by answers to questions on NSSE survey

4.1.8 Impact of models (x1 and x2) on academic outcomes (y1)

In assessing academic performance in terms of first-year average, the regression models controlled for course-load (i.e., total number of credits attempted), whether the student took a 100-level Math or English course, gender, and (where appropriate) program of study. The inclusion of a 100-level Math course was important because many UBC students indicate that Math is the most difficult course taken in first year. In addition, UBC enrolls a very diverse first-year class, many of whom acquired English as a second language; students who do not feel strong in English (including many students native speakers) elect to defer UBC's mandatory first-year writing course (usually labeled a 100-level English or Arts Studies course) to second year. Some would argue that there are significant differences in levels of educational engagement and non-cognitive attributes among male and female students (Jacob, 2002; Steinmayr & Spinath, 2008), so the regression models controlled for gender. It is strongly suspected that levels of engagement vary based upon course content and faculty culture, so program of study is also included in the model. In cases where the model suggested differences among programs, the regression model was run again for the individual program. Students who did not register in both terms (September to December; January to April) were discarded, as were students who did not obtain a first-year average of at least 40% (this was an arbitrary cut-off used to eliminate outliers, as it was assumed that students with such low grades would present too many confounding variables affecting academic performance).

It might be tempting to assume that the regression models should control for academic ability prior to first-year. After all, first-year academic performance is likely related to admission average. However, to include admission average in the regression models could potentially obscure important findings. Imagine that once the models control for admission average, the

results show that there is no difference in first-year academic outcomes between the newly-admitted and the newly-displaced (a likely outcome as admission average is so closely correlated with first-year grades). This hypothetical conclusion suggests that the new admission decision-making model does not identify a significantly different student. But in both the new and existing admission decision-making models, admission average was considered in determining the admission decision, contributing to the outcome of one student being admitted and another being refused. The new admission decision-making model had to incorporate the additional criteria of personal profiles or geographic origin to identify the newly-admissible students *because* they had lower grades. As such, admission average is actually a component of the independent variable and should not be controlled.

All students in the subpopulation (regardless of first-year average and registration in both terms of study) were included in the analysis looking at retention to second year.

4.1.9 Impact of models (x1 and x2) on student engagement outcomes (y2)

In the analysis of the two different admission decision-making models (*x1* and *x2*) in relation to engagement outcome (*y2*), subject responses to the NUBC and NSSE survey instruments were used to look for differences in students' past behaviour, anticipated level of on-campus engagement, and actual level of on-campus engagement. Responses will be analyzed in the ordinal scales native to the NUBC and NSSE instruments testing the null hypothesis that there is no difference in the level of engagement between the two sub-populations. Similar to the above, the study will control for course-load, inclusion of first-year Math and English courses, gender, and program of study (where sample sizes are sufficient).

Both the NUBC and the NSSE survey questions have obviously been pre-constructed independent of the current study. In terms of the NUBC, both the 2010 and 2011 cohorts were

surveyed in August prior to the start of their academic studies at UBC. With the NSSE, the 2010 cohort in *x1* were surveyed as part of the NSSE survey administered by the UBC Planning and Institutional Research Office in Spring 2011; the 2011 cohort in *x1* were surveyed in the Spring of 2012 as part of a UBC-specific engagement survey that employed the same questions as NSSE. All survey invitations were sent to the entire population of first-year students via the UBC Student Information System. Participants were directed to a website where survey responses are captured.

4.1.10 Multiple Regression Methodology

In order to determine the effects of the different admission decision-making criteria on the characteristics of the first-year class, a multiple regression model was employed. Using SPSS, independent variables were entered into the model in two steps. Because independent variables with greater theoretical importance should be entered early in the model (Tabachnick & Fidell, 2013), in the first step, the admission decision-making model was entered by itself. In the second step, admission-decision-making model was forced into the model simultaneously with the secondary independent (or control) variables: course load in first year, gender, whether the student enrolled in first-year Math or English, and program of study[35].

The practical implications of the results of this study require the use of a sequential, two-step multiple regression model. Imagine that the first step results showed that the admission decision-making model A is much more likely to enroll highly-engaged students than model B. When the second step is run (forcing in the secondary independent variables), the observations of

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[35] Because program of study is a categorical variable, it is entered into the regression model as a dummy variable comparing Arts (the program with the largest enrolment) against each individual program.

the dependent variable (student engagement) suggests that the relationship is stronger with courseload; student courseload is a greater determinant of student engagement than admission decision-making model. While this (hypothetical) realization is important from an analytical point of view, it is of limited use to the enrolment manager; a student cannot be selected in the admission process based upon the courseload they are expected to take once admitted. Even though the effects of courseload are being masked by the admission decision-making model, only the latter can be used to select students. Therefore, although step two of the multiple regressions (with all independent variables forced in) is important from an analytical point of view, understanding the relationship of the dependent variable (student outcomes) with the admission decision-making model alone is important from the practitioner's point of view.

4.1.11 Principal components Analysis Methodology

Because the New to UBC Vancouver, New to UBC Okanagan, and the National Survey of Student Engagement data sets involve 14, 13 and 24 individual survey questions (respectively), a principal components analysis was conducted in order to reduce the number of dependent variables in the study. As described in Tabachnick & Fidell, principal components analysis is "the solution of choice for the researcher who is primarily interested in reducing a large number of variables down to a smaller number of components" (2013, p. 640). Principal components (or factors) were extracted with a varimax rotation performed through SPSS on 258 students with NUBC (Okanagan) survey responses, 574 students with NUBC (Vancouver) survey responses, and 547 students with NSSE survey responses. The Keiser-Meyer-Olkin measure of sampling adequacy was over .70 in all groups, suggesting good sample sizes (Kaiser, 1974).

Both orthogonal rotations (varimax) and oblique rotations (direct oblimin) were used to extract factors. Because the oblique rotations produced correlations that did not exceed .32, it is

assumed that the factors are not highly correlated with one another and that the orthogonal rotations are more appropriate for the analysis (Tabachnick & Fidell, 2013). As a result of the rotations, factor scores were generated by SPSS and inserted into the dataset for each survey respondent; factor scores are "estimates of scores that subjects would have received on each of the factors had they been measured directly" (Tabachnick & Fidell, 2013, p. 655). Scores were generated via regression, where factor loadings are adjusted to take into account correlations between variables, stabilizing differences in unit measurements and variable variances (Field, 2005). Tabachnick & Fidell (2013) recommend using regression to generate factor scores when uncorrelated scores are not required (as is the case in this analysis, as it is not necessary for the principal components to be completely independent of one another). Within SPSS, factor scores are calculated by calculating the sum of the factor-loading coefficient (*B*) multiplied by the standardized score for each variable. So for example:

Factor 1 score = variable1(*B*)*variable1 score + v2(*B*)*v2 score + v3(*B*)*v3 score…

As a standardized variable, the factor scores for the sample population has a mean of 0 and a standard deviation of 1. These factor scores were later used in the analysis to run multiple regressions on a reduced number of dependent variables (now labeled "factors") measuring student engagement.

Principal component analysis factors with eigenvalues of >=1 were deemed to be important. Survey questions (or variables) that loaded with a rotated component score of roughly .30 or higher were deemed to be important (Field, 2005; Tabachnick & Fidell, 2013) in describing and defining the identified factors.

In the NUBC (Okanagan) survey, four factors were extracted (see Appendix D). Based upon the survey questions with high rotated component score loadings, I described the

underlying factors as: i) an "intention to engage in career-related enriched educational experiences "; ii) a "history of engagement in school-based activities"; iii) a "history of engagement in community-related educational experiences," and; iv) an "intention to engage in enriched educational experiences." Combined, these four underlying factors account for 53.07% of the total variance seen in the survey results serve as the dependent variables in the measurement of student outcomes.

In the NUBC (Vancouver) survey, four factors were extracted (see Appendix E). Based upon the survey questions with high rotated component score loadings, I described the underlying factors as: i) a "history of engagement in school and community"; ii) an "intention to engage in enriched educational experiences"; iii) a "history of engagement in recreational activities," and; iv) a "history of political/social activism." Combined, these four underlying factors account for 52.94% of the total variance seen in the survey results and serve as the dependent variables in the measurement of student outcomes.

In the NSSE survey, seven factors were extracted (see Appendix F). However, only the first five were used in the analysis, as the last two could not be easily described by the underlying survey questions that loaded high into the factor. Based upon the survey questions with high rotated component score loadings, the underlying factors are described as: i) "engagement to expand / change personal perspective"; ii) "engagement on assignments / schoolwork"; iii) "engagement with faculty"; iv) "engagement in conversation with diverse peers," and; v) "engagement with peers in relation to schoolwork." Combined, these five underlying factors account for 46.60% of the total variance seen in the survey results and serve as the dependent variables in the measurement of student outcomes.

Validity considerations

Validity can be defined as "whether you are observing, identifying or measuring what you say you are" (Bryman, 2004). Of particular importance are internal and external validity, the former being an assurance that the experimental treatments did in fact have an effect, the latter that the results of the experiment can be generalized beyond the current study (Campbell & Stanley, 1963). Understanding internal validity is critical in a quasi-experimental design; because the dependent variable is observed as a natural outcome, there is an inherent lack of control of confounding variables that may have unintended effects on the dependent variable. Campbell and Stanley (1963) suggest that while this lack of control results in a variety of hypotheses that prevent us from ever truly accepting the null hypothesis, validity can still be obtained by limiting the number of possible explanations to those that are the most plausible and practical.

An attempt has been made to control for variables that may have a relationship with academic and engagement outcomes. However, the study does not control for all such variables. For example, the socioeconomic background of the students in each condition of the independent variable is unknown. Whether students lived in residence in first year or whether they commuted to campus may have had an impact. The study also does not consider whether students who received transfer credit (for work completed in high school) re-took their first-year courses or went on to second-year level courses. All of these variables may very well have had an effect on student outcomes.

Because cohorts of students have been studied over time to determine the effects of the independent variable, internal validity may be compromised by recruitment bias. This suggests that observed differences between cohorts could be due not to the manipulation of the independent variable, but to the simple fact that the students recruited by UBC one year were

inherently different than those recruited in the subsequent year. While certainly possible, the plausibility of such a conclusion is suspect; there are no indicators to arouse suspicion that anything changed from cohort to cohort. UBC's program offerings, recruitment practices, and national reputation did not change significantly over the time period of this study, nor were there external variables in the secondary and post-secondary education landscape that could have plausibly had an effect on the type of student attracted to UBC. Similarly, the measuring instruments (first-year average, retention, and survey data) remained consistent from year to year as did the point-in-cycle where they were observed, thereby controlling for both measurement bias and maturation bias. Selection bias is also a concern, where Stanley and Campbell warn of "the possibility of spurious effects if the measure which is being used in the experimental design is the one on which the acceptance or rejection of the candidates… was based" (1963, p. 58). However, in the current study, selection bias is not a spurious effect – it is the independent variable.

The possibility of selection bias does re-appear in another form. In the Institutional admission decision-making model (independent variable *x2*), the study compares out of province students who originally applied to the Vancouver campus against BC students who originally applied to either the Vancouver campus or the Okanagan campus. The variation in the original enrolment intentions of the newly-admitted and the newly-displaced may appear as a cause for concern. But although applicants may have had different preferences for the Vancouver or Okanagan campuses at point of application, their mutual decisions to enroll in the Okanagan were achieved at roughly the same time and independent of this study. Their subsequent behaviours are measured in the same education environment and evaluated on the same criteria

and should serve to normalize whatever selection bias may have existed due to preference of campus.

For the dependent variable measuring academic outcomes (*y1*), there is reasonable internal and external validity in using first-year averages. On one hand, university grades can be seen merely as a rank ordering of how a group of professors perceive a student's performance; grades do not assess what has been learned, nor do they offer a holistic assessment of post-secondary success (Willingham, 1985). Furthermore, there is considerable variation in post-secondary grades and not all students are assessed in the same way. Nevertheless, first-year grades do represent a student's academic success in the eyes of the institution, and the purpose of this study is to determine enrolment outcomes in relation to an institution's objectives. Furthermore, grades are widely accepted as a measure of post-secondary success and therefore establish strong external validity, offering conclusions that would be relevant to a variety of different external audiences.

There are questions related to the validity of retention to a second year of study as a means of describing the original admission decision. On one hand, the fact that some students are not retained may reflect poorly on the original admission decision; if students leave because they did not perform well or are neither confident nor interested in continuing their university studies, perhaps they should never have been admitted in the first place. On the other hand, low retention can also reflect poorly on the institution if the students left because the institution did not meet their expectations. An assumption is made that poor retention is a factor of the former and not the latter.

Attention to validity must also be paid in terms of the survey instruments used in this study. First of all, there is the possibility of selection bias. Although roughly 1,500 students were

identified as a population for study, not all the students completed the NUBC survey or the NSSE survey. Just as both survey instruments attempt to measure engagement, one could make an argument that filling out a survey represents in of itself a form of engagement; as a result, survey respondents present a predisposition to be engaged. This is of particular importance within the context of this study, as the newly-admitted students in the Character / Enhancement admission decision-making model (using grades and a personal can be assumed to have a predisposition towards engagement. Considering that survey response rates were higher among the newly-admitted than among the newly-displaced (see Table 9), it is important to acknowledge that selection bias may exist due to a student's likelihood to participate in the NUBC or the NSSE.

There are two types of questions used from the New to UBC survey: (a) questions that ask students what kinds of activities they have already engaged in (and to what extent) prior to enrolling at UBC and (b) what kinds of activities they plan to engage in once enrolled at UBC. Both raise issues related to construct validity: an assumption must be made that reporting previous and intended behaviours is positively correlated with actually displaying that same behaviour again. In a sense, this potential bias serves as an assessment of the selection process itself, not the outcomes of the selection process. In other words, reports of high levels of engagement prior to attending UBC validate UBC's admission decision-making processes (which give preference to engaged students), but do not necessarily validate the achievement of enrolment outcomes (i.e., enrolling a class that is more engaged at UBC). Still, the assumption serves a purpose that can actually be seen to help with internal validity. Imagine a student who was very engaged in secondary school, comes to UBC with a plan to continue a similar level of engagement, but is immediately overwhelmed with the workload and suffers a difficult academic transition to post-secondary study. In order to focus on his/her first-year studies, he/she may

reduce his/her previous level of non-academic engagement. If this phenomenon is widespread, it may make it more difficult to determine the effects of the different admissions decision-making models by looking solely at actual behaviours in first year. It could therefore be argued that because this study looks at both the NUBC survey (assess previous behaviour and first-year intentions) along with the NSSE (assessing actual first-year behaviours), internal validity is increased.

In a review of the academic literature, it must be concluded that the jury is out on the validity of the NSSE as a means of assessing student success. On one hand, the psychometric properties of NSSE are acknowledged as quite strong and the survey questions are constantly refined by data collected from focus groups, cognitive testing, and various psychometric analyses (Kuh, 2009). Campbell and Cabrera (2011) provide an overview of the literature related to the positive relationships between NSSE scores and student outcomes related to persistence, leadership development, identity development, moral development, academic performance, and critical thinking skills. But it is important to remember that much of the literature promoting the validity of NSSE comes from those who administer NSSE (Kuh et al., 2001; Kuh, 2004; Carini et al., 2006, as cited in Porter, 2011; Kuh, 2009), introducing a potential for bias. NSSE's high profile in the higher education community brings about much scrutiny and discussion; for example, the Fall 2011 edition of *The Review of Higher Education* focused entirely on scholarly work critiquing the NSSE's conclusions and offering suggestions for refinement (Olivas, 2011). Critics of the NSSE often cite that there is a questionable link between high NSSE scores and student success as defined by GPA and persistence (Campbell & Cabrera, 2011; Jaschik, 2011). NSSE purports to measure engagement, student outcomes and institutional quality, but it is unclear which NSSE items measure which variable (Porter, 2011). An overview of the literature

does not support the construct validity of NSSE in predicting student success across different types of institutions (Campbell & Cabrera, 2011; Olivas, 2011). That being said, the question of validity exists primarily when defining success from the institution's perspective; the student's perception of his or her own success has validity in its own right (Willingham, 1985). Porter (2011) also argues that there is inconsistency among NSSE respondents in terms of understanding the definitions of frequency (i.e., *very often, often, sometime, never*) used in the NSSE instrument.

Although NUBC survey is an internal-to-UBC survey and the questions have not benefitted from external review, many of the concerns with student survey validity raised by Porter (2011) regarding the NSSE pertain to the NUBC as well. There are concerns with validity whenever any self-assessment of student characteristics is concerned. While the values we wish to assess exist at a symbolic level or in terms of specific behaviour, the methodological choices made tend to deal less with behaviour and more with attitudes, values, and beliefs (Thomas, 1991; Russell, 2004). This is a particular concern for NUBC questions that ask students to identify their intention to engage in certain activities in the future; what is being assessed here is an attitude towards an activity, not actual engagement in an activity. On the other hand, as both the NUBC and the NSSE ask students to report past frequency of certain behaviours, assuming honesty in student responses, the results should be non-subjective.

Nevertheless, the use of the NUBC survey helps control for a potential confounding variable in the UBC admissions process. Admissions decisions based upon a personal profile are subject to the biases and inaccuracies of the assessment tool, the scoring rubric and the assessor. If no differences are found between the newly-admitted and the newly-displaced, it may be because the process used to admit the students under the Character / Enhancement model are

fundamentally flawed. The use of the NUBC survey results serves to counter-effect the potential of such biases and inaccuracies. The NUBC gathers information of student activities (prior to entering UBC) in a value-neutral manner, outside of the high-stakes context of the admission process. Within that process, students strategically present their accomplishments for UBC to evaluate and determine admissibility. In both the presentation and the assessment, there are biases that present difficulties in constructing an accurate and empirical record of student engagement. With both the NUBC and the NSSE survey results, engagement behaviour and intentions are captured without a narrative, context, or motive (e.g., gaining admission).

Clearly, there are numerous issues with validity in this study, either due to its quasi-experimental nature or in relation to the instruments employed to measure the impact of the independent variables. While replication of the study over a number of years might help address some of the biases mentioned above, doing so is beyond the scope of the current work. But these issues should not diminish the importance of the conclusions. There is a practical relevance to the approach presented within this study. Both the methodology (quasi-experimental) and the tools of assessment (first-year averages, retention, survey instruments) are common within the profession and practice of enrolment management. Grades may be a reasonable-but-flawed measure in assessing learning outcomes; NSSE scores may be the same in terms of overall post-secondary outcomes. What both measures may lose in validity could be seen to be compensated for by their relevance across the post-secondary landscape in North America. They are the tools that enrolment managers work with, and as such, contribute to the external validity of this study.

Ethical considerations

There are two main ethical concerns in this study: the method by which data is obtained and the position of the researcher.

True to the quasi-experimental design, all of the data used in this analysis were not produced for the purpose of this study. While this can help with validity (e.g., the NSSE questions have been scrutinized with a rigor that goes beyond the scope of this study), the survey responses have been offered by students for the purposes of UBC's institutional research, not the subject of a graduate thesis. In obtaining the data, UBC Planning and Institutional Research (PAIR) informed survey recipients that information associated with the student's student numbers and email address will not be released outside of the office. Because the raw data used in this analysis were merged within PAIR, student numbers and email addresses were not released. Furthermore, considering my position as researcher, an employee of UBC with a role related to the practice and evaluation of enrolment management practices, an argument could certainly made that the data are being used in the spirit in which it was offered.

That being said, the position of the researcher precludes complete detachment from the outcomes of the study. I am part of a very active discussion on the UBC campus related to the university's enrolment practices, engaging all levels of the institution. If this study's conclusions have practical implications for how UBC enrolls new students, my day-to-day work will be affected. This should not, however, create any ethical problems within the study.

5 Results

Impact of models (*x1* and *x2*) on academic outcomes (*y1*)

Table 4 below provides a summary of the differences in academic outcomes (*y1*) between the newly-admitted and the newly-displaced in the Character / Enhancement model (*x1*) and the Institutional model (*x2*):

Table 4: Summary of Impact of Character / Enhancement (*x1*) and Institutional admission decision-making models (*x2*) on academic outcomes (*y1*) for the newly-admitted and the newly-displaced

Character / Enhancement admission decision-making model ***(x1)***

	Total (n)		Academic (n)		Admit Avg ($\bar{x}$)		Yr1 Avg *y1* ($\bar{x}$)		Retention	
Program	**Newly Admit**	**Newly Displ.**	**Newly Admit**	**Newly Displ.**	**Newly Admit**	**Newly Displ.**	**Newly Admit**	**Newly Displ.**	**Newly Admit**	**Newly Displ.**
Arts	268	358	257	342	82.9	85.5	67.3	67.2	91%	91%
Engineering	163	172	163	172	86.7	87.4	64.0	65.1	94%	84%
Commerce	197	109	192	107	88.6	92.6	68.2	73.2	94%	94%
Total	628	639	612	621	85.7	87.2	66.7	67.7	93%	89%

Institutional admission decision-making model ***(x2)***

	Total (n)		Academic (n)		Admit Avg ($\bar{x}$)		Yr1 Avg *y1* ($\bar{x}$)		Retention	
Program	**Newly Admit**	**Newly Displ.**	**Newly Admit**	**Newly Displ.**	**Newly Admit**	**Newly Displ.**	**Newly Admit**	**Newly Displ.**	**Newly Admit**	**Newly Displ.**
Arts	51	36	46	33	81.4	85.0	67.4	72.0	75%	78%
Engineering	21	12	20	11	80.8	86.0	64.2	67.4	76%	92%
Commerce	41	24	38	24	84.0	90.1	68.7	75.8	83%	75%
Total	113	72	104	68	82.2	86.9	67.3	72.6	78%	79%

The column in Table 4 titled "Total" describes the total sub-population used in the analysis regarding retention. The column in Table 4 titled "Academic" describes students used in the analysis of first-year average (I excluded students with a first-year average of less than 40% and those who did not register in both terms); these students constitute the cases included in the analysis. "Admit Avg ($\bar{x}$)" represents the mean of the students' admission averages, as calculated by the UBC Undergraduate Admissions office on secondary school courses required

for admission. "Yr1 Avg *y1* ($\bar{x}$)" refers to mean grade on all courses attempted in the students' first year at UBC. Finally, "Retention" refers to the proportion of the students who persevered on to a second year of study at UBC.

5.1.1 The Character / Enhancement model (x1)

A multiple regression was run to determine the effects of the new admission decision-making model on students' first-year averages. In other words, were the newly-admitted students expected to have a different GPA at the end of first year than those they displaced? Models were completed for all students in the aggregate and by individual program of study. Table 5 shows the unstandardized regression coefficients (*B*), intercepts and R^2 of the two-step regression models.

Table 5: Multiple regression coefficients for first-year average by outcome of the Character / Enhancement model (*x1*) (newly-admitted vs. newly-displaced, based upon academic and personal profile of applicant)

		All		Arts		Engineer		Commerce	
		B	SE	*B*	SE	*B*	SE	*B*	SE
Step 1	(Constant)	68.081 ***	.362	67.199 ***	.451	66.58 ***	.771	73.2 ***	.808
	Admit Model	-1.092 *	.514	.054	.688	-1.558	1.107	-4.977 ***	1.008
Step 2	(Constant)	53.967 ***	3.248	49.994 ***	3.86	38.11 **	11.497	61.74 ***	7.635
	Admit Model	-1.251 *	.57	.089	.678	-1.698	1.098	-6.145***	1.138
	Total credits	.541 ***	.087	.464 ***	.105	.608 ***	.204	.486***	.206
	Gender	.755	.531	1.131	.695	-.566	1.296	1.084	.956
	1st year Math	-.406	.751	1.889 *	.856	8.899	7.087	-.782	2.023
	1st year English	-.496	.814	-.392	1.269	.022	1.497	-2.023	1.57
	Arts v Engineer	-5.298***	.965					-3.209	2.789
	Arts v Comm	-.312	.98					n/a	n/a
	Arts v Science	.381	1.888					-3.788	2.077
	N	1,218		600		319		299	
Step 1	R^2	.004		0		.006		.076	
Step 2	R^2	.054		.045		.041		.122	

Note: * p < .05; **p < .01; *** p < .001 (two-tailed test)

In the model for all students, significant results were found after step 1 ($R^2 = .004$, $F(1,1216) = 4.519, p < .05$) and after step 2 ($R^2 = .054$, $F(8,1209) = 8.622, p < .05$). The results support two conclusions. First of all, the newly-admitted students using grades and a personal profile are significantly more likely to have a lower first-year average than then newly-displaced. The goodness of fit of the model is very small ($R^2 < .01$), suggesting that admission decision-making model explains less than 1% of the variance seen in first-year academic performance. The exception is in the Commerce program, where the R^2 is higher, explaining 7.6% of the variance in first-year performance in the first step, and where the first-year averages of the newly-displaced students are much higher than those of the newly-admitted (73.2% and 68.2%, respectively – see Table 4), even when we control for the effects of program of study[36]. Considering that the decision-making model is binary and first-year average is on a scale of 0 to 100, that the admission-decision-making model explains 7.6% of the variance in first-year is significant. The difference observed in first-year performance is not surprising considering that the admission averages of the newly-displaced Commerce students are so much higher than those of the newly-admitted (92.6% and 88.6%, respectively; see Table 4); Commerce's adoption of the character-enhancement model intentionally selects considerably weaker academic students with the hope that their personal characteristics will lead to positive outcome beyond first-year average.

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[36] Remember that the newly-admitted and displaced Commerce students are studying in different programs within the same cohort, whereas the newly-admitted and displaced Arts and Engineering students are studying in the same program but within different cohorts.

The second conclusion supported by the results is that credit load is a factor; students who take higher credit loads tend to do better in first year. While the impact of admission decision-making model is seen mostly in the Commerce program, the impact of credit load is seen in all programs. This stands to reason: stronger academic students are more likely to take a higher courseload in first year, regardless of how they were admitted.

A similar regression analysis was conducted to determine if admission decision-making model affected retention to second year. Table 6 shows the unstandardized regression coefficients (*B*), intercepts and R^2, where "1" denotes retention to second year and "0" denotes a drop-out or a stop-out.

Table 6: Multiple regression coefficients for retention to second year by outcome of the Character / Enhancement model (*x1*) (newly-admitted vs. newly-displaced, based upon academic and personal profile of applicant)

		All		Arts		Engineer		Commerce	
		B	SE	*B*	SE	*B*	SE	*B*	SE
Step 1	(Constant)	.894 ***	.011	.905 ***	.015	.837 ***	.024	.945 ***	.021
	Admit Model	.038 *	.016	.009	.023	.101 **	.034	.004	.027
Step 2	(Constant)	.584 ***	.089	.641 ***	.119	.168	.303	.68 ***	.173
	Admit Model	.043 *	.017	.015	.023	.102 **	.033	.017	.03
	Total credits	.015 ***	.002	.013 ***	.003	.021 ***	.005	.011 **	.004
	Gender	.01	.016	.035	.023	-.06	.039	.008	.025
	1st year Math	-.032	.023	-.05	.029	.034	.185	-.008	.051
	1st year English	-.039	.025	-.053	.041	.009	.045	-.067	.041
	Arts v Engineer	-.135 ***	.028					.033	.072
	Arts v Comm	-.041	.03					n/a	n/a
	Arts v Science	.053	.059					.067	.055
	N	1,266		626		335		305	
Step 1	R^2	.004		0		.026		0	
Step 2	R^2	.067		.059		.105		.059	

Note: * p < .05; **p < .01; *** p < .001 (two-tailed test)

In the model for all students, significant results were found after step 1 ($R^2 = .004$, $F(1,1264) = 5.68$, $p < .05$) and after step 2 ($R^2 = .067$, $F(8,1,257) = 11.226$, $p < .05$). The goodness of fit for the model was low, with $R^2 < .10$ in both steps of the model. The results suggest that while the students admitted on grades and personal profiles do not do as well in first-year as the students admitted on grades alone, they are more likely to be retained to second year. However, while the differences in first-year averages were mainly the result of students in Commerce, the differences in retention were mainly the result of students in Engineering. The newly-admitted engineers showed a 94% retention rate compared to 84% among the newly-displaced in the previous year's cohort. This is a surprising result and likely an anomaly, as 84% is an abnormally low retention rate for UBC (typically seen somewhere around 90%). It was hypothesized that the lower rate of retention among the newly-displaced engineers might have been the result of an over-representation of international students (who typically display lower retention rates than domestic students). The analysis was run again with international students removed, but the results did not change.

It is also important to note here that in the second step, total credit load again registered as a significant predictor of retention to second year. Again, more capable students are more likely to take a higher course load.

In summary, while the Character / Enhancement model (*x1*) did identify changes in first-year average and retention to second year, the predictive ability of the new admission criteria is not strong. The conclusions suggest that minor changes in the admission average of the incoming class (as in the case of Arts or Engineering) do not have an impact; a significant displacement based upon grades needs to occur before changes to first-year performance are observed (as in the case of Commerce). In the Engineering program, the newly-admitted students had (more-or-

less) the same admission average as the newly-displaced, achieved the same level of academic performance, but were more likely to be retained to second year. We can conclude that while character-enhancement model may very well enroll a student more likely to obtain a lower first-year average than the academic merit model, it is unclear if there is a significant effect on retention.

5.1.2 The Institutional model (x2)

In the Institutional model, multiple regressions were run in order to determine the effect of displacing local students with students from outside the province. Models were completed for all students in the aggregate and by individual program of study. Table 7 shows the unstandardized regression coefficients (*B*), intercepts and R^2 for the analysis of impact on first-year average and retention.

Table 7: Multiple regression coefficients for first-year average by outcome of the Institutional model (*x2*) (newly-admitted vs. newly-displaced, based upon geographic origin of applicant)

		All		Arts		Engineer		Science	
		B	SE	*B*	SE	*B*	SE	*B*	SE
Step 1	(Constant)	72.548 ***	1.066	72.003 ***	1.572	67.418 ***	2.787	75.783 ***	1.561
	Admit Model	-5.291 ***	1.367	-4.588 *	2.06	-3.198	3.47	-7.119 **	1.978
Step 2	(Constant)	62.658 ***	8.486	51.084 ***	13.395	-33.114	46.238	85.997 ***	15
	Admit Model	-5.402 ***	1.326	-4.425 *	2.03	-1.229	3.581	-6.785 **	2.158
	Total credits	.559 *	.243	.959 **	.347	4.439 *	2.004	-.149	.378
	Gender	1.474	1.385	-.359	2.086	4.951	3.841	1.793	2.094
	1st year Math	-3.589	2.293	-3.348	2.7	-18.657 *	8.553	-4.683	7.799
	1st year English	-1.857	2.322	.163	4.256	-14.202	11.692	-3.806	2.99
	Arts v Engineer	-4.819	3.342						
	Arts v Science	-.582	2.367						
	N	171		79		31		61	
Step 1	R^2	.081		.061		.028		.180	
Step 2	R^2	.176		.164		.310		.213	

Note: * p < .05; **p < .01; *** p < .001 (two-tailed test)

In the model for all students, significant results were found after step 1 ($R^2 = .081, F(1,169) = 14.99, p < .001$) and after step 2 ($R^2 = .176, F(7, 163) = 4.98, p < .001$). Based upon the R^2 scores, the goodness of fit for the model was generally low in the first step, but moderate in the second step. The Institutional model has a significant impact on student's first-year average. The newly-admitted students from out of province did not do as well academically as the newly-displaced (mean first-year averages of 67.3% and 72.6%, respectively), particularly in Arts and Sciences. It is hypothesized that the small sample sizes in Applied Sciences may be contributing to the lack of significant results because the change in mean admission average was similar to what was seen in Arts and Sciences. Again, the results are not surprising, knowing that there is a high correlation between admission average and first-year average: the newly-admitted had much lower high school grades than the newly-displaced (82.2% and 86.9%, respectively).

Table 8: Multiple regression coefficients for retention to second year of study by outcome of Institutional model (*x2*) (*x1*) (newly-admitted vs. newly-displaced, based upon geographic origin of applicant)

		All		Arts		Engineer		Science	
		B	SE	*B*	SE	*B*	SE	*B*	SE
Step 1	(Constant)	.792 ***	.049	.778 ***	.072	.917 ***	.113	.75 ***	.083
	Admit Model	-.013	.062	-.033	.094	-.155	.141	.079	.104
Step 2	(Constant)	-.371	.252	-.575	.364	-.213	.744	-.553	.585
	Admit Model	-.025	.055	-.015	.079	-.090	.142	.019	.103
	Total credits	.045 ***	.006	.048 ***	.008	.063 *	.02	.038 **	.012
	Gender	.022	.058	.006	.083	.017	.159	.011	.105
	1st year Math	-.059	.093	-.037	.105	-.152	.313	.229	.391
	1st year English	-.003	.093	.081	.155	-.432	.304	.037	.143
	Arts v Engineer	-.258 *	.128						
	Arts v Science	-.034	.095						
	N	185		87		33		65	
Step 1	R^2	0		.001		.037		.009	
Step 2	R^2	.257		.338		.316		164	

Note: * p < .05; **p < .01; *** p < .001 (two-tailed test)

In the model for all students, after step 1, the results were not significant, with $R^2 = .0$, $F(1,169) = .043$, $p > .05$; significant results were found after step 2, with $R^2 = .257$, $F(7, 177) = 8.737$, $p < .05$, but not for the admission decision-making model. Based upon the R^2 scores, the goodness of fit for the model was low in the first step, but high in the second, mostly due to the impact of credit load. These results suggest that the admission model did not have a significant impact on retention to second year; the newly-admitted students were no more or less likely to persevere in their studies.

In summary, within the Institutional model (*x2*), the introduction of preference to out of province applicants produced newly-admitted students who were weaker academically in first year than the BC students they displaced and no more likely to persevere to second year.

Impact of models (*x1* and *x2*) on engagement outcomes (*y2*)

Table 9 below provides a summary of the sub-population sizes, survey response rates, and margin of error relevant to assessing the impact of the Character / Enhancement model (*x1*) and the Institutional model (*x2*) on engagement outcomes (*y2*). In the Character / Enhancement (*x1*) model, the margin of error is good in the aggregate (in the range of +/- 4% to 6%) but much higher among individual programs (particularly for Commerce). As a result, program-specific results will need to be discussed with some caution. However, in the Institutional model (*x2*), sample sizes and response rates are acceptable in the NUBC survey, but unacceptable with the NSSE. Furthermore, program specific margins of error are particularly high. In order to minimize the likelihood of Type 1 errors, results of the Institutional admission decision-making model (x2) on student engagement will be discussed using aggregate data only.

Table 9: Summary of Survey Response Rates and Margin of Error in Character / Enhancement (*x1*) and Institutional (*x2*) models on engagement outcomes (*y2*) for the newly-admitted and the newly-displaced

Character / Enhancement admission decision-making model ***(x1)***

	Total (n)		New to UBC				NSSE			
			Response Rate		Mar. of Err (+/-)		Response Rate		Mar. of Err (+/-)	
Program	Newly Admit	Newly Displ.	Newly Admit	Newly Displ.	Newly Admit	Newly Displ.	Newly Admit	Newly Displ.	Newly Admit	Newly Displ.
Arts	268	358	29%	19%	7.93%	9.07%	28%	21%	8.15%	8.53%
Engineer	163	172	39%	40%	8.04%	7.78%	36%	26%	9.31%	10.73%
Comm	197	109	36%	33%	7.91%	11.27%	12%	26%	16.16%	13.46%
Total	628	639	34%	27%	4.62%	5.39%	25%	23%	5.71%	5.98%

Institutional admission decision-making model ***(x2)***

	Total (n)		New to UBC				NSSE			
			Response Rate		Mar. of Err (+/-)		Response Rate		Mar. of Err (+/-)	
Program	Newly Admit	Newly Displ.	Newly Admit	Newly Displ.	Newly Admit	Newly Displ.	Newly Admit	Newly Displ.	Newly Admit	Newly Displ.
Arts	51	36	65%	56%	8.59%	12.43%	25%	28%	19.89%	22.42%
Engineer	21	12	43%	67%	21.23%	17.53%	5%	8%	n/a	n/a
Science	41	24	76%	67%	7.39%	12.13%	44%	29%	14.70%	26.72%
Total	113	72	65%	61%	5.75%	7.79%	28%	25%	12.36%	16.91%

Note: Margin of error based upon 90% confidence level.

5.1.3 The Character / Enhancement model (x1)

A multiple regression was conducted for each of the four underlying factors identified in the New to UBC (Vancouver) survey results: i) a "history of engagement in school and community"; ii) an "intention to engage in enriched educational experiences"; iii) a "history of engagement in recreational activities," and; iv) a "history of political/social activism." Table 10 shows the unstandardized regression coefficients (*B*), intercepts and R^2 (goodness of fit of the regression model) in how the newly-admitted students on grades and personal profile are different than the newly-displaced students who came in on grades alone in their history of engagement and their intention to engage at UBC.

Table 10: Multiple regression coefficients of differences in engagement factors by outcome of Character / Enhancement model (*x1*) (newly-admitted vs. newly-displaced, based upon academic and personal profile of applicant) on New to UBC survey (Vancouver)

		Factor 1		Factor 2		Factor 3		Factor 4	
		B	SE	*B*	SE	*B*	SE	*B*	SE
Step 1	(Constant)	-.030	.079	.006	.076	.328 ***	.073	-.014	.083
	Admit Model	.096	.106	.040	.103	-.480 ***	.098	.180	.112
Step 2	(Constant)	.420	.709	.682	.694	-.207	.663	-1.736 **	.753
	Admit Model	-.064	.119	.063	.117	-.451 ***	.111	.208 *	.127
	Total credits	-.029 *	.016	-.021	.016	.008	.015	.037 **	.017
	Gender	-.005	.174	-.300 *	.171	.212	.163	.237	.185
	1st year Math	-.004	.164	-.024	.161	.323 **	.154	.350 **	.175
	1st year English	.292 ***	.110	.184 *	.108	-.235 **	.103	.056	.117
	Arts v Engineer	.051	.189	.209	.185	.062	.177	-.470 **	.201
	Arts v Comm	.371 *	.206	.086	.201	-.112	.192	-.125	.218
	Arts v Science	-.690 *	.353	.529	.346	-.105	.330	.021	.375
	N	381		381		381		381	
Step 1	R^2	.002		.000		.060		.007	
Step 2	R^2	.067		.044		.102		.055	

Note: * p <.10; **p < .05; *** p < .01 (two-tailed test)

Factor 1: History of engagement in school and community
Factor 2: Intention to engage in enriched educational experiences
Factor 3: History of engagement in recreational activities
Factor 4: History of political/social activism

In Factor 1 (history of engagement in school and community), the results were not significant after the first step, with $R^2 = .002, F(1,379) = .827, p > .10$; results were also not significant for the admission decision-making model after the second step, with $R^2 = .067, F(8, 372) = 3.321, p > .10$. In Factor 2 (intention to engage in enriched educational experiences), the results were not significant after the first step, with $R^2 = .000, F(1,379) = .154, p > .10$; results were also not significant for the admission decision-making model after the second step, with $R^2 = .044, F(8, 372) = 2.16, p > .10$. In Factor 3 (history of engagement in recreational activities), the results were significant after the first step, with $R^2 = .06, F(1,379) = 23.989, p < .01$; results

were also significant for the admission decision-making model after the second step, with R^2= .102, $F(8, 372) = 5.258$, $p < .01$. Finally, in Factor 4 (history of political/social activism), the results were not significant after the first step, with $R^2 = .007$, $F(1,379) = 2.596$, $p > .10$; the results were significant for the admission decision-making model after the second step, with $R^2 = .055$, $F(8, 372) = 2.699$, $p < .10$. For a summary of the principal components analysis and a description of the underlying survey questions (i.e., independent variables) that define each factor, see Appendix E.

The results suggest that there were only minor differences between the newly-admitted and the newly-displaced students in terms of their previous levels of engagement and their intention to engage while at UBC. In many cases, statistical significance had to be lowered to p <.10 (a one in ten chance of random error) in order to obtain significant results for the impact of the new admission model. And in all cases, based upon the R^2 scores, the goodness of fit for all significant models is very small, explaining less than 10% of the variance in the engagement factors.

Overall, the students admitted on grades and personal profiles were no more or less likely to have been engaged in their school or community (Factor 1) nor were they more likely to engage in enriched educational experiences at UBC (Factor 2) (community service learning, international exchange, co-operative education, or internships). When we look on a program-by-program basis, students in Commerce did present a higher level of past engagement (Factor 1) than students in the other programs. A multiple regression was run for Factor 1 on Commerce students alone and the results did suggest that in the first step, the newly-admitted students were more likely to have been in engaged in school and community (step 1: $R^2 = .062$, $F(1,103) = 7.41$, $p < .05$ (see Table 12 for a summary of all program specific multiple regression results). Although the aggregate analysis (as seen in Table 10) also suggests difference between Science

and Arts students, a faculty-specific analysis on Factor 1 did not produce statistically significant results for either program. For no other faculties was a statistically significant result found on the first two factors. We can conclude that only in the selection of students for the Faculty of Commerce was the admission-decision-making model able to identify students with a more extensive history of engagement in school or community; in no way was that admission decision-making model able to identify students with a greater intention of engaging in enriched educational opportunities.

Interestingly, the regression models did find that the newly-admitted students were much less likely to have reported previous engagement with recreational activities (Factor 3) in either step 1 or step 2. The survey questions that loaded highest for Factor 3 were "reading for pleasure" and "outdoor activities for recreation." This is the opposite of what was expected, as these types of recreational activities can contribute to an applicant having a strong personal profile. That the students previously admitted on grades alone presented a higher likelihood of reading for pleasure could be attributed to the fact that these students are more "academic" (i.e., present higher school grades) and that reading (even reading for pleasure) is something more "academic" students do. But that these students were also more likely to have engaged in outdoor activity is hard to explain. Again, the goodness of fit in the model (R^2) is very small, suggesting that while the results are significant, the independent variable explains less than 10% of the variation to responses related to the recreational activities factor.

Students admitted on grades and personal profile was more likely to have been engaged in social or political activism (Factor 4). Although the model did identify differences in behaviour between Arts students and Engineers on this factor, running the multiple regressions for this factor on a program-by-program basis did not yield significant results, suggesting that the

selection of more politically / socially active students is not specific to any one program. While this result was expected, again, the statistical significance is weak (there is a one in ten chance of random error with $p <= .10$) and the goodness of fit for the model is very small $R^2 = 055$.

Via the four factors that were extracted from student responses to the New to UBC survey, only minor differences between the newly-admitted and the newly-displaced were observed in terms of previous levels of engagement and intention to engage while at UBC. This suggests that either a) the tool used to assess character in the admission process (the personal profile questions and accompanying rubrics) does not always accurately identify students who were more engaged in high school or b) the differences in engagement prior to enrolling at UBC are marginal between the newly-admitted and the newly-displaced. The former suggests UBC might want to revisit the methodology and tools used to assess character in the admission decision; the latter suggests that the practice of making such distinctions in the admissions process is inconsequential when considering students "on the margins" of admissibility.

After assessing students' historical and intended future levels of engagement, the next question is even more important: were there any differences in level of actual engagement while at UBC? In the context of undergraduate admissions, previous behaviour and intent are only useful as predictors of future behaviour; the assumption is that students who have been engaged and want to be more engaged, *will be* more engaged while at UBC. Table 11 shows the unstandardized regression coefficients (B), intercepts and R^2 (goodness of fit of the regression model) in how the newly-admitted students on grades and personal profile are different than the newly-displaced students who came in on grades alone in terms their actual engagement at UBC.

Table 11: Multiple regression coefficients of differences in engagement factors by outcome of Character / Enhancement model (*x1*) (newly-admitted vs. newly-displaced, based upon academic and personal profile of applicant) on NSSE survey.

		Factor 1		Factor 2		Factor 3	
		B	SE	*B*	SE	*B*	SE
Step 1	(Constant)	-.038	.081	.141 *	.081	.037	.082
	Admit Model	.159	.113	-.348 ***	.113	.046	.114
Step 2	(Constant)	-1.487 **	.713	-.988	.645	-.300	.738
	Admit Model	.230 *	.117	-.340 ***	.106	-.004	.121
	Total credits	.031 *	.017	.020	.016	.010	.018
	Gender	.248	.166	.393 **	.151	.052	.172
	1st year Math	.393 **	.182	-.075	.165	.384 **	.188
	1st year English	-.042	.122	.178	.110	-.274 **	.126
	Arts v Engineer	-.520 ***	.190	-.695 ***	.172	-.069	.197
	Arts v Comm	-.421 *	.252	.226	.228	.273	.261
	Arts v Science	-.369	.388	.254	.351	-.360	.401
	N	302.000		302.000		302.000	
Step 1	R^2	.007		.031		.001	
Step 2	R^2	.091		.273		.040	

		Factor 4		Factor 5	
		B	SE	B	SE
Step 1	(Constant)	.037	.085	-.106	.086
	Admit Model	.031	.118	.278 **	.12
Step 2	(Constant)	-1.621 **	.737	-1.074	.73
	Admit Model	-.04	.121	.178	.12
	Total credits	.044 **	.018	.027	.018
	Gender	.549 ***	.172	-.28	.17
	1st year Math	.358 *	.188	.032	.186
	1st year English	-.442 ***	.126	.22 *	.125
	Arts v Engineer	-.362 *	.197	.457 **	.195
	Arts v Comm	.471 *	.261	.723 ***	.258
	Arts v Science	-.34	.401	.618	.397
	N	302		302	
Step 1	R^2	0		.017	
Step 2	R^2	.111		.173	

Note: * p < .10; **p < .05; *** p < .01 (two-tailed test)

Factor 1: Engagement to expand / change personal perspective
Factor 2: Engagement on assignments / schoolwork
Factor 3: Engagement with faculty
Factor 4: Engagement in conversation with diverse peers
Factor 5: Engagement with peers in relation to schoolwork

In Factor 1 (engagement to expand / change personal perspectives), the results were not significant after the first step, with $R^2 = .007$, $F(1,300) = 1.998$, $p > .10$; results were significant for the admission decision-making model after the second step, with $R^2 = .091$, $F(8, 293) = 3.654$, $p < .01$. In Factor 2 (engagement on assignments / schoolwork), the results were significant in the first step, with $R^2 = .031$, $F(1,300) = 9.519$, $p < .01$; results were also significant for the admission decision-making model after the second step, with $R^2 = .273$, $F(8, 2983) = 13.769$, $p < .01$. In Factor 3 (engagement with faculty), the results were not significant after the first step, with $R^2 = .001$, $F(1,300) = .167$, $p > .10$; results were also not significant for the admission decision-making model after the second step, with $R^2 = .04$, $F(8, 293) = 1.53$, $p > .10$. In Factor 4 (engagement in conversation with diverse peers), the results were not significant after the first step, with $R^2 = .00$, $F(1,300) = .071$, $p > .10$; the results were also not significant for the admission decision-making model after the second step, with $R^2 = .111$, $F(8, 293) = 4.57$, $p > .10$. Finally, in Factor 5 (engagement with peers in relation to schoolwork), the results were significant after the first step, with $R^2 = .017$, $F(1,300) = 5.343$, $p < .05$; the results were not significant for the admission decision-making model after the second step, with $R^2 = .173$, $F(8, 293) = 7.654$, $p > .10$. See Appendix F for a summary of the principal components analysis and a description of the underlying survey questions that define each factor.

The regression model did identify that students admitted on grades and personal profiles were more likely to have engaged in activities in first year that changed or expanded their personal perspectives (Factor 1). This factor includes high loadings on variable such as “tried to better understand someone else's views by imagining how an issue looks from his or her perspective” or “examined the strengths and weaknesses of your own views on a topic or issue.” This is a positive result, suggesting that the new admission decision-making model is enrolling a

first-year class more likely to engage with one another. But again, the goodness of fit is very small (R^2 <.10), suggesting that while the effect is there, the admission decision-making criteria does not explain a large amount of the variation in Factor 1. The model also picked up on differences among programs in terms of behaviours that changed or expanded students' personal perspectives (Factor 1). Re-running the regression on a program-by-program basis did show that newly-admitted Engineers were more likely to have engaged in such behaviour in both the first step ($R^2 = .051, F(1,101) = 5.443, p < .05$) and the second step ($R^2 = .110, F(5,97) = 2.386, p <$ .10). This suggests that the new admission decision-making-model does make a positive difference for the first-year class of engineers. Surprisingly, the results also showed that newly-admitted Commerce students were less likely to have reported activities that changed their perspectives (step 2: $R^2 = .217\ F(7,43) = 1.703, p < .10$), suggesting that Commerce's shifting in focus from grades to grades and personal profile did cost them some students who were more likely to want to broaden their perspectives in first year. In this sense, the new admission criteria served to work against the goals of Broad-Based Admission for the Faculty of Commerce. These surprising results can be qualified by the high margin of error in the Commerce students' response rate to the NSSE (see Table 9).

Similarly, the introduction of personal profiles in addition to grades did enroll a class of students generally less likely to engage in their assignments / schoolwork (Factor 2). The newly-admitted were less likely to have responded positively to NSSE questions such as "worked on a paper or project that required integrating ideas or information from various sources," "used e-mail to communicate with an instructor," or "included diverse perspectives different races, religions, genders, political beliefs, etc. in class discussions or writing assignments." It would be tempting to state that these results are not surprising; newly-admitted students had lower

admission averages and lower first-year averages, suggesting that they are less "academic" than then newly-displaced. But the data do not support this hypothesis. Faculty-specific regression models suggested that admission decision-making model factored significantly on Factor 2 engagement on assignment / schoolwork) for students in Arts step 1: $R^2 = .032, F(1,146) = 4.784, p < .05$; step 2: $R^2 = .114, F(5,142) = 4.764, p < .01$) and Engineering Step 1: $R^2 = .031, F(1,101) = 4.283, p < .05$; step 2: $R^2 = .114, F(5,97) = 2.505, p < .10$). For both faculties, the newly-admitted were less likely to have engaged with their assignment and/schoolwork. The Faculty of Commerce, where the greatest changes were seen in high school admission average and first-year average, did not show similar significant results. Referring back to Table 4, we can see that regardless of whether the students were newly-admitted or newly-displaced, Commerce students tend to have higher admission averages and higher first-year averages than Arts and Engineering students. We could hypothesize that the tendency for the newly-admitted students to be less engaged on their studies is mitigated by the higher overall quality of the Commerce applicant pool (*quality* defined by admission average).

Factor 3 (engagement with faculty) did not produce significant results with the changes in admission decision-making model. Interestingly, the only variables where differences were seen had to do with first-year course selection: the coefficients suggest that student who took first-year math were more likely to engage with their instructors whereas students who took first-year English were less likely to engage with their instructors. Faculty-specific phenomena were not observed.

Similarly, the admission decision-making model did not produce a significantly different class in terms of engagement Factor 4 (engagement in conversation with diverse peers). Students with a higher courseload and female students did tend to show more engagement with diverse

peers, but these differences were observed irrespective of the admission decision-making model. The aggregate model did suggest some faculty-specific differences. A faculty-specific regression model for the Commerce found that the newly-admitted had more diverse interactions with peers than the newly-displaced (step 1: $R^2 = .133$ $F(1,49) = 7.541$, $p < .01$) than the newly-displaced. However, statistical significant was lost in step 2, suggesting that while the decision-making criteria did identify students who were more likely to engage with person, it may be because the new admission-decision-making model was more likely to identify female students and/or students who are more likely to take a full courseload.

Finally, Factor 5 (engagement with peers in relation to schoolwork) did produce significant results for the admission decision-making model (step 1: $R^2 = .017$ $F(1,300) = 5.343$, $p < .05$). The newly-admitted students were more likely to have worked with classmates outside of class to prepare class assignments or used an electronic media to discuss or complete an assignment, both variables that loaded high on Factor 5. The aggregate model suggested that there were differences among faculties and program-specific multiple regressions validated the suggestion. The new admission decision-making model did identify engineers who were more likely to engage with their peers (step 1: $R^2 = .035$, $F(1,101) = 3.658$, $p < .10$; step 2: $R^2 = .099$, $F(5,97) = 2.122$, $p < .10$); the same is true for Commerce students (step 1: $R^2 = .135$, $F(1,49) = 7.623$, $p < .01$; step 2: $R^2 = .243$, $F(7,43) = 1.970$, $p < .01$). In fact, the Factor 5 program-specific regression for Commerce shows some of the strongest results of the entire analysis, suggesting that the new admission decision-making criteria is particularly effective in identifying Commerce students who are more likely to engage with their peers.

Table 12: Summary of multiple regression coefficients for significant findings (p <.10) for admission decision-making model in Step 1 (model only) and Step 2 (all independent variables) assessing impact of the Character / Enhancement model (x1) on engagement behaviours by program

		All		Arts		Engineering		Commerce	
Factor	Step	*B*	SE	*B*	SE	*B*	SE	*B*	SE
NUBC 1	1							.560 *	.215
	2								
NUBC 2	1								
	2								
NUBC 3	1	-.480 ***	.098	-.324 ***	.158	-.597 ***	.173	-.405 **	.18
	2	-.451 ***	.111	-.347 **	.166	-.567 ***	.173	-.421 *	.215
NUBC 4	1								
	2	.208 *	.127						
NSSE 1	1					.415 **	.178		
	2	.230 *	.117			.357 *	.18	-.636 *	.369
NSSE 2	1	-.348 ***	.113	-.320 **	.146	-.324 **	.157		
	2	-.340 ***	.106	-.402 *	.142	-.287 *	.157		
NSSE 3	1								
	2								
NSSE 4	1							.794 ***	.289
	2								
NSSE 5	1	.278 **	.12			.383 *	.200	.703 ***	.255
	2					.397 *	.202	1.036 ***	.313

Note: * p < .10; **p < .05; *** p < .01 (two-tailed test)

NUBC 1	History of engagement in school and community
NUBC 2	Intention to engage in enriched educational experiences
NUBC 3	History of engagement in recreational activities
NUBC 4	History of political/social activism
NSSE 1	Engagement to expand / change personal perspective
NSSE 2	Engagement on assignments / schoolwork
NSSE 3	Engagement with faculty
NSSE 4	Engagement in conversation with diverse peers
NSSE 5	Engagement with peers in relation to schoolwork

Table 12 provides a summary of the overall impact of the introduction of a Character / Enhancement decision-making model into the UBC admission decision-making process. The tables identify the coefficients for significant findings only in order to clearly demonstrate where the admission decision-making process is successful in identifying more engaged students. The results listed in step 1 suggest a practical implication to the enrolment manager; implementation of a new Character / Enhancement decision-making model can be used to identify students with

different levels of engagement, even if the model is really masking the effect of other independent variables. The results listed in step 2 show a more discreet and theoretical assessment of the impact of the decision-making model (because the additional variables forced into the second step of the regression cannot be practically implemented into the admission decision-making process). The table also identifies whether the significant results of the new admission decision-making criteria had a desirable or undesirable effect upon engagement behaviours. For example, in the case of NSSE Factor 2, the introduction of the personal profile shows a negative coefficient, the result of enrolling students who were less likely to engage on assignments and schoolwork. Overall, while a small number of significant effects were found, the goodness of fit for all the models (R^2) is quite low, suggesting that the new admission decision-making criteria was not highly accurate in identifying different students. In terms of engagement prior to attending UBC, only in the case of the Commerce was the model successful in identifying students who had been more engaged in their school and community. During the first year of study, the new admission decision-making model did identify students who were more likely to engage with one another (a desirable effect) but less likely to engage in their schoolwork (an undesirable effect). The most positive impact was seen in the Faculty of Commerce, particularly in terms of enrolling a student body that are more likely to engage with one another.

5.1.4 The Institutional model (x2)

A multiple regression was conducted for the four underlying factors identified in the New to UBC (Okanagan) survey results: i) an "intention to engage in career-related enriched educational experiences "; ii) a "history of engagement in school-based activities"; iii) a "history of engagement in community-related educational experiences," and; iv) an "intention to engage

in enriched educational experiences." Table 13 shows the unstandardized regression coefficients (*B*), intercepts and R^2 of the regression model describing how the newly-admitted students are different than the newly-displaced students in terms of their history of engagement and their intention to engage at UBC.

Table 13: Multiple regression coefficients of differences in engagement factors by outcome of Institutional model (*x2*) (newly-admitted vs. newly-displaced, based upon geographic origin of applicant) on New to UBC survey (Okanagan).

		Factor 1		Factor 2		Factor 3		Factor 4	
		B	SE	*B*	SE	*B*	SE	*B*	SE
Step 1	(Constant)	-.301 *	.155	.061	.142	.201	.156	.010	.153
	Admit Model	.399 **	.196	.189	.180	-.211	.198	.196	.194
Step 2	(Constant)	-1.150	.835	-.408	.811	-2.229 ***	.835	-.465	.822
	Admit Model	.390 **	.186	.187	.181	-.208	.186	.212	.183
	Total credits	.020	.020	.031	.019	.083 ***	.020	-.004	.020
	Gender	-.440	.292	-.209	.283	.139	.292	-.266	.287
	1st year Math	.881 ***	.292	-.166	.283	.058	.292	.191	.287
	1st year English	-.084	.193	.182	.188	.010	.193	.688 ***	.190
	Arts v Engineer	-.306	.425	-.421	.413	-1.192 ***	.425	-.161	.419
	Arts v Science	.044	.301	-.290	.292	-.174	.301	-.827 ***	.296
	N	117.000		117.000		117.000		117.000	
Step 1	R^2	.035		.009		.010		.009	
Step 2	R^2	.185		.066		.178		.174	

Note: * p <.10; **p < .05; *** p < .01 (two-tailed test)

Factor 1: Intention to engage in career-related enriched educational experiences
Factor 2: History of engagement in school-based activates
Factor 3: History of engagement in community-related educational experiences
Factor 4: Intention to engage in enriched educational experiences

In Factor 1 (intention to engage in career-related enriched educational experiences), the results were significant after the first step, with $R^2 = .035$, $F(1,115) = 4.367$, $p < .05$; results were also significant for the admission decision-making model after the second step, with $R^2 = .185$, $F(7, 109) = 3.315$, $p < .05$. In Factor 2 (history of engagement in school-based activities), the

results were not significant after the first step, with $R^2 = .009$, $F(1,115) = 1.098$, $p > .10$; results were also not significant for the admission decision-making model after the second step, with $R^2 = .066$, $F(7, 109) = 1.094$, $p > .10$. In Factor 3 (history of engagement in community-related educational experiences), the results were not significant after the first step, with $R^2 = .01$, $F(1,115) = 1.142$, $p > .10$; results were also not significant for the admission decision-making model after the second step, with $R^2 = .178$, $F(7,109) = 3.365$, $p < .01$. Finally, in Factor 4 (intention to engage in enriched educational experiences), the results were not significant after the first step, with $R^2 = .009$, $F(1,115) = 1.109$, $p > .10$; the results were also not significant for the admission decision-making model after the second step, with $R^2 = .174$, $F(7,109) = 3.289$, $p > .10$. See Appendix D for a summary of the principal components analysis and a description of the underlying survey questions that define each factor.

Even though the Institutional model is intended to enroll students based upon geography and not student behaviour, statistically significant results were found related to the newly-admitted students' intention to engage in their education while at UBC. The out of province students were more likely to want to engage in career-related enriched educational experiences (Factor 1). The results were statistically significant in both the first step and the second step, although the R^2 remains small in the first step, suggesting that the independent variable of decision-making criteria only explains 3.5% of the variance seen in engagement behaviour*s*. This conclusion is somewhat intuitive; a student willing to travel a greater distance for their post-secondary education is likely to demonstrate a higher level of desire to engage in their education.

On the other hand, the newly-admitted out of province students were not more likely to intend to pursue enriched educational experiences not directly related to career (as described by Factor 4). While this is true in the aggregate, the model does suggest some differences by

program. A program-specific model suggests that the newly-admitted out of province students in Arts were more likely to intend to engage in community service learning opportunities, international exchange, and/or student leadership activities (step 1: $R^2 = .067, F(1, 51) = 3.652, p < .10$; step 2: $R^2 = .133, F(5,47) = 2.593, p < .01$). The fact that statistical significance increases in the second step suggests that a masking effect created by the secondary independent variables (or control variables) is countered once all variables are forced into the model. These results suggest that emphasizing national enrolment enrolls a class who are significantly more likely to want to engage in a variety of enriched educational opportunities, particularly for the Arts program. While this is a very positive enrolment outcomes for any institution, the small sample sizes and high margin of error based upon Arts student responses to the NUBC survey (see Table 9) suggest caution in emphasizing these results.

In terms of previous engagement behaviours, the newly-admitted out of province students were no more likely to have engaged in school-based activities (Factor 2) or community-related educational experiences (Factor 3). The aggregate model did suggest a statistically significant difference based upon program of study; a subsequent program-specific regression confirmed that the newly-admitted out of province engineering students were less likely to have engaged in community related education experiences than the BC students they displaced (step 1: $R^2 = .330, F(1, 15) = 7.395, p < .05$; step 2: $R^2 = .408, F(4,12) = 2.063, p < .05$). While the results were highly significant, the lack of an obvious plausible explanation suggests that the small sample sizes and high margin of error may be a skewing the results.

Because the margin of error on sample sizes for the NSSE was so high, there is serious concern of Type II errors in a faculty-by-faculty analysis. However, in the aggregate analysis, there are legitimate concerns with Type I errors, as even though program of choice is being

controlled in the multiple regression, the criteria that displaces an applicant from one faculty is not the same as that which displaces an applicant from another. For example, in order to displace the right number of local students, admission averages will vary by program; the BC student who is displaced in Science might still be admissible to Arts. Therefore, these results must be viewed cautiously and without firm conclusion; they are included in this analysis of the institutional decision-making model (*x2*) in order to maintain parity with the analysis of the Character / Enhancement model (*x1*).

Table 14: Multiple regression coefficients of differences in engagement factors by outcome of Institutional model (*x2*) (newly-admitted vs. newly-displaced, based upon geographic origin of applicant) on NSSE survey.

		Factor 1		Factor 2		Factor 3	
		B	SE	*B*	SE	*B*	SE
Step 1	(Constant)	-.413 *	.217	.485 *	.265	.33	.24
	Admit Model	.341	.271	-.353	.331	-.43	.30
Step 2	(Constant)	-.626	1.482	.163	1.868	2.35	1.51
	Admit Model	.27	.288	-.295	.362	-.41	.29
	Total credits	.009	.036	.003	.046	-.01	.04
	Gender	-.037	.561	.151	.707	-1.277 **	.57
	1st year Math	-.095	.532	-.17	.67	.03	.54
	1st year English	.072	.353	.151	.445	.43	.36
	Arts v Engineer	-1.092	.916	-.114	1.154	1.01	.93
	Arts v Science	.173	.552	-.192	.696	-1.528 **	.56
	N	50		50		5.00	
Step 1	.	.032		.023		.041	
Step 2	.	.116		.053		.251	

		Factor 4		Factor 5	
		B	SE	B	SE
Step 1	(Constant)	-.362 *	.213	-.263	.245
	Admit Model	.478 *	.266	.178	.306
Step 2	(Constant)	-.422	1.451	-2.541 *	1.361
	Admit Model	.527 *	.282	-.064	.264
	Total credits	.029	.035	.107 ***	.033
	Gender	-.058	.549	-.324	.515
	1st year Math	-.671	.521	-.73	.489
	1st year English	.1	.346	.111	.324
	Arts v Engineer	.898	.896	1.889 **	.841
	Arts v Science	-.315	.541	.835	.507
	N	50		50	
Step 1	R^2	.063		.007	
Step 2	R^2	.152		.401	

Note: * p < .10; **p < .05; *** p < .01 (two-tailed test)

Factor 1: Engagement to expand / change personal perspective
Factor 2: Engagement on assignments / schoolwork
Factor 3: Engagement with faculty
Factor 4: Engagement in conversation with diverse peers
Factor 5: Engagement with peers in relation to schoolwork

Table 14 shows the unstandardized regression coefficients (*B*), intercepts and R^2 in how the newly-admitted out of province students are different than the newly-displaced BC students. In Factor 1 (engagement to expand / change personal perspectives), the results were not significant after the first step, with $R^2 = .032, F(1,48) = 1.59, p > .10$; results were also not significant for the admission decision-making model after the second step, with $R^2 = .116, F(7, 42) = .787, p > .10$. In Factor 2 (engagement on assignments / schoolwork), the results were not significant in the first step, with $R^2 = .023, F(1,48) = 1.137, p > .10$; results were also not significant for the admission decision-making model after the second step, with $R^2 = .053, F(7, 42) = .337, p > .10$. In Factor 3 (engagement with faculty), the results were not significant after the first step, with $R^2 = .041, F(1,48) = 2.051, p > .10$; results were also not significant for the admission decision-making model after the second step, with $R^2 = .251, F(7, 42) = 2.015, p > .10$. In Factor 4 (engagement in conversation with diverse peers), the results were significant after the first step, with $R^2 = .063, F(1,48) = 3.222, p < .10$; the results were also significant for the admission decision-making model after the second step, with $R^2 = .152, F(7, 42) = 1.075, p < .10$. Finally, in Factor 5 (engagement with peers in relation to schoolwork), the results were not significant after the first step, with $R^2 = .007, F(1,48) = .339, p > .10$; the results were also not significant for the admission decision-making model after the second step, with $R^2 = .401, F(7, 42) = 4.017, p > .10$. See Appendix F for a summary of the principal components analysis and a description of the underlying survey questions that define each factor.

Only in the case of Factor 4 did the new admission decision-making model seem to have an effect. The newly-admitted students were significantly more likely to engage in conversation with diverse peers. But we cannot place a lot of emphasis on this conclusion. First of all, as previously discussed, the poor survey responses on the NSSE suggest a high margin of error (as

high as 16.91% for the newly-displaced). Also, there is quite likely an additional confounding variable: the newly-admitted out of province students are more likely to live on campus than the BC students they displaced. Living in residence likely provides more opportunities for interaction with a diverse set of peers than commuting to campus, suggesting that very real possibility of a confounding variable.

We can conclude that enrolling a more nationally diverse class does produce a class with greater intention to engage. But our results as to whether these students actually do engage in first year are inconclusive, due partially to the high margin of error in sample sizes, but also in the fact that enriched educational opportunities where the newly-admitted out of province students plan to engage typically happen after first year. Activities such as co-operative education, undergraduate research, and internships typically do not happen in first-year. So whether or not these students follow through on their intention to engage is unknown. What is known is that the newly-admitted out of province students were more likely to have lower first-year averages than the BC students they displaced. In other words, there is a trade-off that occurs; UBC will enroll weaker academic students in order to bolster national reputation (by enrolling more out of province students) who have a higher potential to engage in their education. What this trade-off implies for the university and for post-secondary access will be discussed in following section.

6 Discussion

To frame the discussion of the results, I will return to the original research questions posed by this study and answer each in the following order:

i. To what extent are students selected by one admission decision-making model different than students selected by another?

ii. How do these particular admissions models fit within the larger social discourses of access to higher education?

iii. Does choice of admission-making decision model matter in terms of shaping a first-year class at a selective admission university? And if so, how?

To what extent are students selected by one admission decision-making model different than students selected by another?

The results of the regression analyses have shown that choice of admission decision-making model employed by UBC did have an impact on shaping a first-year class. In the hypothetical Institutional admissions decision-making model based upon geographic location (*x2*), selecting applicants to maximize national representation on campus would have enrolled a UBC class with lower academic ability, an equal chance of retention to second year, a greater intention to engage in career-related enriched educational experiences (NUBC Factor 1), and marginal (if any, due to a very high margin of error in the sample rates) differences in first-year engagement with their peers (NSSE Factor 5). In total, newly-admitted students showed significant differences on two out of nine engagement factors. A program-by-program analysis did reveal a few more differences, as the newly-admitted Arts students were more likely to want additional enriched educational experiences (NUBC Factor 4) and to have felt that their personal perspective changed in first year (NSSE Factor 1). The newly-admitted engineers and science

students were less likely to have engaged in community-related education experiences prior to having enrolled (NUBC Factor 3). These results are consistent with the conclusions of Wing Jr. and Wallach (1971), suggesting that enrolling for character-based characteristics does result in a less academically-prepared student.

In the model describing UBC's actual adoption of a Character / Enhancement admission decision-making model (*x1*), by selecting students in consideration of personal characteristics beyond academic performance, UBC enrolled a class with a somewhat lower academic ability (primarily in the Faculty of Commerce, where the displacement effect was greatest), an equal chance of retention to second year (with the exception of Applied Science, where the increased retention of the newly-admitted was suspect), minimal differences in levels of engagement prior to attending UBC (NUBC Factors 1, 3, and 4), no difference in intention to engage in enriched educational opportunities (NUBC Factor 2), a greater likelihood of engaging with peers in relation to schoolwork (NSSE Factor 5), a greater likelihood of expanding personal perspective in first year (NSSE Factor 1), but an overall lower level of engagement with their schoolwork (NSSE Factor 2). All in all, the newly-admitted students showed significant differences in five out of nine engagement factors, although in two cases (NUBC Factor 3, a history of engagement in recreational activities and NSSE Factor 2, engagement on assignments and schoolwork), the changes were in a negative direction, suggesting that the newly-displaced students were more desirable. Some differences were noted among programs, most notably Commerce, where the newly-admitted were more likely to have a history of engagement in their community (NUBC Factor 1) and a greater likelihood of engagement with diverse peers in first-year. In none of the models were the newly-admitted students seen to have a greater intention of engaging in enriched

educational experiences or a tendency to engage with faculty. These last two points are very important and are often seen as the primary goals of enrolling a class that is "more engaged."

It is important to remember that successful student engagement is not solely defined by the first-year experience. These results would need to be substantiated over the course of the entire undergraduate course of study; only then could we gain a true measure of whether the newly-admitted were in fact more engaged than the newly-displaced. But while longitudinal data will better answer whether these newly-admitted out of province students are different in terms of engagement than the BC students they displaced, there is little doubt that they are not as academically prepared. Considering that the newly-admitted were admitted with substantially lower admission averages than the newly-displaced, these results are hardly surprising. It is often suggested that high school grades are not strong predictors of student success and that minor differences in admission averages are not important. These results would suggest otherwise. The mean admission average of the newly-admitted out of province students was less than five percentage points lower than the mean admission average of the displaced BC students (see Table 4), but the effects were certainly seen in decreased first-year performance.

And where the new admission decision-making model did have a statistically significant impact on enrolment, the effect was often quite small. In most cases, the goodness of fit for all statistically significant differences in the regression models was consistently quite small. In the aggregate analyses for both academic and engagement outcomes, the R^2 was always below .10[37],

[37] Excluding the one dubious instance where the newly-admitted Engineers showed a much lower retention rate.

suggesting that new admission decision-making model never explains more than 10% of the variance in first-year academic outcomes.

Nevertheless, we should not dismiss these findings describing the extent to which UBC can actively construct its incoming class. Small differences can be important. The extent to which admission criteria act as a precise screening tool for success or failure in university is commonly overestimated. A professor who is frustrated with the performance of his or her class might believe that it would be easier to teach the course if the university "just admitted better students." The concerned parent wonders why some universities require a straight-A average for admission when academic ability is not the best determinant of success later in life. The reality is that there is no perfect predictor of post-secondary success. There are far too many uncontrollable extraneous variables in the first-year experience to expect strong correlations between admission criteria and first-year performance. The student with the straight-A average in high school may perform poorly in his first year whereas the student with middling grades finds her academic passion and ends up on the Dean's list. The most engaged high school student may be overwhelmed in first year and decide to limit his extracurricular activities in order to focus on his studies. At the same time, the disinterested high school student may find an area of interest in university (be it inside or outside of the classroom) that elicits a previously unseen level of engagement.

In his critique of the NSSE, Porter (2011) offers caution against conclusions drawn from small correlations within research on post-secondary student behaviour:

> In terms of evaluating surveys, we should understand that it is fairly easy to find small correlations between variables and that correlations can be misleading without any additional analyses. We should also establish criteria for judging before beginning validation research; for example, what do we mean by "highly correlated"? Much of the current validation research in higher education appears to take what I think of as the

> "greater than zero" approach—that is, if a correlation, standardized regression coefficient or reliability measure is greater than zero, then all is well. Clearly we as a field need to establish some commonly accepted minimum levels for judging relationships. (p. 73)

Porter's point is well made and a valid critique of research suggesting that the prediction of student success can be boiled down to a handful of measures. But these small gains may be all that we can expect. An argument can be made that research focused on studying human behaviour is fundamentally more prone to smaller effect sizes than typically seen in other disciplines (Hemphill, 2003). If so, the higher education community must accept that predicting and promoting student success is about searching for small changes in human behaviour, not sweeping transformations. We must accept incremental change as the best we can hope for and responsibly weigh the value of the gains against their costs. Admissions decisions based upon academic meritocracy are easy to use and typically the strongest predictors of academic success (Willingham, 1986; Salvatore, 2001; Geiser & Santelices, 2007; Sternberg, 2010). If the new admission decision-making model identifies students who are only a slightly better "fit" for the institution, are those differences worth the additional costs?

This will emerge as a critical issue for the Canadian higher education community in the years to come. As of 2012, the University of British Columbia announced that it had expanded its use of personal profiles in the admission decision to all applicants in all direct-entry programs[38]. With admission averages getting higher and higher, more selective Canadian universities may begin to take this approach, following the trend started by Harvard, Yale and Princeton nearly a century ago. In the early part of the twentieth century, the aforementioned private schools were

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[38] See http://www.publicaffairs.ubc.ca/2012/09/04/ubc-welcomes-more-b-c-students-with-new-personalized-approach/

able to screen out certain students (who lacked the "character" to fit into their campus communities) without the burdens of proof or accountability to the public. Whereas one might argue that such decisions were made to select students who would make the most of their university experience, others argue that such enrolment practices were merely manifestations of the racial discrimination of the day (Karabel, 2005). While UBC's interest in considering non-cognitive variables in the admission process is rooted in a desire for more capable and engaged students (not racial discrimination), institutions that adopt such policies must be mindful of the potential of an inadvertent impact on the ethnic composition of the class.

Today's sense of social justice dictates that public institutions demonstrate a fair admission decision-making process and a responsible use of public resources. So the question must be asked: even if the changes in admission policy are fair, are they worth all the effort? An analysis of the 2012 incoming class of UBC reveals that even under the newly expanded academic merit / Character / Enhancement admissions decision-making model, the use of applicant personal profiles altered the incoming class by roughly 12%. In other words, nearly 88% of the incoming class would have been admitted under the academic meritocratic model (i.e., grades-only) previously employed by UBC[39]. The use of personal profiles had the largest effect within the Faculty of Commerce, where the profile is scored for all applicants, not just those on the margins of admission (as is the case with many other programs at UBC); roughly 25% of the first-year Commerce class would not have been admissible on grades alone. For the remaining 75%,

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[39] This result is surprisingly similar to that found by Willingham (1985), where the use of two different admission decision-making models (one based upon academic criteria only, the other including weighted values for students' personal statements, high school reference letters, and assessments of student follow-through) at nine different colleges suggested that 87% of students were enrolled regardless of the decision-making model used.

theoretically, personal profiles were read and scored by two or more readers, representing hundreds of person-hours, to get to the same admission decision that could have been reached in seconds by a computer calculating an admission average. The workload is significant; in 2013, the UBC Vancouver campus conducted 41,509 reads of applicant personal profiles in order to enroll their incoming class. Faculty might argue that this is a worthwhile investment of time and resources in order to enroll a class of students who are more engaged, more likely to ask questions in class and more likely to work collaboratively with peers. But as this study suggests, once we strip out the students who would have been admissible under either admission decision-making model, the differences in engagement behaviours are minimal (and in some cases, non-existent). So is the introduction of the Character / Enhancement model a reasonable use of resources? The answer depends on the extent to which we accept the premise that admission criteria are imperfect predictors of first-year success, where the only change we can hope for is incremental.

Such a conclusion may initially appear to run counter to the tenets of strategic enrolment management. But we need not throw up our arms in frustration, believing that the institution is helpless in shaping its student body. Rather, it merely underscores the extent to which the organization is at the mercy of its environment. While strategic enrolment management suggests that understanding and exerting control over the external environment is critical to an institution's success, the higher education environment in the United States (where much of the literature on strategic enrolment management emanates) is much different than that of Canada. If we look at the most selective institutions in the US - Harvard, Princeton and Yale – where the use of personal characteristics in the admission decision was originally conceived, we see admission

rates of 6.3%, 8.5% and 7.7% (respectively)[40]. In other words, for every 100 students who apply to Harvard, roughly 94 are rejected. Yet for UBC, boasting one of the highest mean admission averages in Canada, roughly 52% - 59%[41] of all direct-entry applicants are offered admission. Such an admission rate is even higher than that seen for selective flagship public institutions in the US, such as the University of California at Berkeley (21.6%), the University of California at Los Angeles (25.5%), the University of Michigan – Ann Arbor (40.6%), or the University of Wisconsin – Madison (50.5%).

Though it is a common assumption that the selectivity of an institution is a proxy for quality, within the higher education community, there is a much better understanding of the impact of supply and demand on perceptions of selectivity. With a 2010/11 enrolment of 28,929, UBC's undergraduate population is roughly 10,000 students larger than that of Harvard, Yale and Princeton *combined*. With the exception of the University of Wisconsin – Madison, UBC is larger than all the previously mentioned public schools in the US. With that much supply, UBC is considerably more limited in the extent to which it can fashion its incoming class. Consider the most extreme example: if a university needed to admit only one student out of every hundred applicants (admit rate = 1%), the criteria used to make the admission decision are critical to determining the composition of the class. Even small changes to the admission decision-making

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[40] The admission rate is defined as the proportion of applicants who receive an offer of admission. All data re: admission rates of US institutions taken from US World and News Report, retrieved on Dec. 29, 2012 from school profile pages at: http://colleges.usnews.rankingsandreviews.com/best-colleges

[41] In 2010 ad 2011, 52% of all domestic direct-entry applicants to UBC's Vancouver campus were made an offer of admission to their first or second choice of program. The rate of admission jumps to 59% if we discount incomplete applicants, those who did not provide UBC with all the necessary documentation required to render an admission decision.

model could result in a completely different class. But for the university that must admit 99 out of every 100 applicants (admit rate = 99%), the admission criteria are mostly irrelevant; regardless of how decisions are made, the composition of the incoming class remains constant. In the former example (1% admit rate), resource dependency theory suggests that the organization can easily exert control over its environment; in the latter example, it is considerably more difficult for the organization to do so. As such, the environment plays a much greater role than the university in selecting the incoming class. We have seen this evidenced in the results of this study. For every available first-year seat, the Faculty of Arts has 2.3[42] qualified applicants, the Faculty of Applied Science has 3.5 and the Faculty of Commerce has 5.9. Not surprisingly, the introduction of a new admission decision-making model had a greater ability to alter the composition of the first-year Commerce class than it did for Arts or Applied Science.

The fact that the supply-to-demand ratio of applicants-to-seats is so significant casts doubt on whether changes in admission decision–making criteria can ever have a broad impact at a large public Canadian institution like UBC. For the majority of UBC programs, the ratio of applicants to available seats is simply not high enough for selection criteria to make large-scale changes to the composition of the class. Perhaps the notion of using admission criteria to significantly alter the student body is only applicable at smaller, highly competitive colleges. If this is the case, then while it is true that the admission decision-making model has an effect on the composition of the incoming class, unless there is a radical change in admission criteria, most programs at a large, selective public university in Canada can only expect to see modest change.

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[42] 2012 data. This ratio would like increase to three-to-one were we to include applicants who indicate Arts as a second choice should they not gain admission to their first choice of program, usually Commerce or Science.

There is certainly a counter-argument that the abovementioned conclusions could be explained by applicant self-selection: if more students thought they could get into UBC with lower grades and stronger personal profiles, perhaps more would apply, thereby giving UBC increased ability to engineer a first-year class. Time will tell; it will be interesting to see if UBC's applicant pool increases its academic diversity in years to come, as more students understand the importance of the personal profile in the admission decision. But even if this happens, Canadian universities that already have selective admissions should be critical in how they import American practices of enrolment management. Thorough research and data analysis are required to ensure we do not falter by blindly following in the trends of the day. In *Strategic Enrolment Intelligence: Canada's First Book on Strategic Enrolment Management*, Jim Black offers the following preface and caution to his audience:

> We believe that colleges and universities that do not have a firm grasp of the implications of environmental factors and take measured steps to seize opportunities and mitigate threats will falter. Similarly, they must leverage data and research to target institutional responses to the enrolment issues and opportunities on the horizon. The days of learning through "trial and error" are over. (Black, 2010, p.14)

Canadian universities would be wise to heed this advice before making any assumptions of the extent to which they can identify and enroll the "right" student.

How do these particular admissions models fit within the larger social discourses of access to higher education?

In reviewing Perfetto's Taxonomy of Admission Decision models (see Table 1 or Appendix A), it is important to note that the models are presented in a value-neutral manner. One is not perceived as better or more appropriate than the other. While that may be true within the taxonomy, it is not the case within society. Higher education systems in most countries admit students on the basis of a strict academic meritocracy. It is hard to imagine post-secondary access

in China being allocated on the basis of students' "well-roundedness" and volunteer work. Within North America, there seems to be a greater tolerance for the inclusion of other types of admissions models, such as character, enhancement or mobilization. But our social imaginary still places the greatest emphasis on an academic meritocracy. Although higher education serves many purposes in society, at its core, it is an academic endeavor, where academic ability constitutes the most relevant form of merit. The idea of one student gaining admission over another based upon athletic ability (for example) is not uniformly palatable, but tolerated in small numbers (and because it is acknowledged that athletes make meaningful contributions to the institution). The demise of affirmative action in the US higher education sector suggests a higher value placed on an academic meritocracy than a more mobilization-oriented approach[43].

In Canada, where the higher education sector is almost entirely public, the idea of merit is critical to our sense of social justice and the values of our social imaginary. Universities are often perceived as public resources, there but for the public good. The needs of the public are placed above those of the institution. As such, an Institutional admission decision-making model could only be broadly accepted insofar as it adhered to some sense of our perception of a meritocracy.

Yet for UBC to achieve its national enrolment goals, the differential in admission standards for out of province students would likely be perceived as unacceptable for two reasons. First of all, there is the aforementioned perception of the institution as a public good, often with an implied responsibility towards local constituents. Even with UBC's strong international presence,

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[43] It is important to note that the judgment on affirmative action was rendered by courts that are politically constructed. Therefore, social justice within a court system is a reflection of both the values of society and the values of a subset of society that happens to be in power at a particular time. In this sense, social justice theory acknowledges that all social institutions, even a justice system, can be unjust.

many BC residents argue (and assume) that some preference should be given to local students. In other words, the university should only abandon a strict academic meritocracy if it benefits the public, not the institution. BC residents' tax dollars constitute a good part of UBC's funding, and so there is an expectation that UBC serve to meet BC's needs. While some movement of students across provincial borders is to be expected, operationally, UBC is expected to ensure access for local students. Many institutions in the US do this (the University of California system is a good example), preserving access for local students either through enrolment practices or tuition structures. While a more national student body might meet UBC's reputational needs (just as a more international enrolment would meet the institution's financial and reputational needs), the displacement of local students would likely be perceived as distasteful. Even in the current post-secondary climate in BC, where there are many post-secondary institutions, some with excess capacity, that the flagship institutions within the province should turn away BC students for less qualified out of province students would likely not be well received.

Secondly, giving priority to out of province students would run against our ideas of social justice. Geographic origin is not a reflection of individual accomplishment; there is no inherent or individual merit in being from Ontario as opposed to BC. As such, giving priority access to higher education on the grounds of geographic origin violates our sense of equity and social justice. Merit, be it academic, athletic, artistic, or character-based is a reflection of individual accomplishment. While one could argue the extent to which each should be emphasized in the admission decision-making model, it could not be argued that accomplishment in any such endeavor is wholly without merit.

While there is no doubt that there is inherent value placed upon an academic meritocracy in the admissions decision-making model, for highly competitive schools, a strict focus on grades

can be seen as a fixation with minutiae. Is there really a difference between a student with an 86% average and another with an 84% average? And even if there is a difference, does the institution not benefit from creating a more diverse class even if it means de-emphasizing grades[44]? The newly-admitted students from across Canada reported a greater desire to engage in enriched educational experiences (NUBC Factors 1 and 4) such as co-operative education, student leadership activities, research activities, internships, international exchanges, and community service learning. These same out of province students were also more likely to have indicated that they had serious conversations with a more diverse group of peers (NSSE Factor 1) (although there is a suspicion that this may be the result of the newly-admitted students being more likely to live in residence on campus).

But this study has shown that introducing differential admission averages to generate even a modest increase of out of province enrolment from 12% to 20% of the first year class would displace students expected to do significantly better at UBC. The newly-admitted out of province student obtained a mean first-year average of 67.3%, roughly five percentage points lower than the BC students they displaced (72.6%). If the newly-admitted out of province students were seen to perform no differently than the newly-displaced BC students, one could make an argument the Institutional admission decision-making model maintained equity based upon merit. But is a drop in five percentage points in academic performance (i.e., merit) a worthwhile tradeoff for a student that may be more engaged in their education?

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[44] Which is not really the same thing as de-emphasizing academic merit if one assumes that there is little substantive difference between a student with an 84% average and another with an 86%.

I would argue that while the institution might choose to take the student more predisposed to engagement, the decision would be in conflict with our sense of justice within the social imaginary. The reason is simple – higher education should be a transformative experience for all students, not just those who are predisposed to being transformed. At a systems level, BC's post-secondary options should allow for access for all students, even though the prestige hierarchy may render stronger academic students predisposed to one institution over another. At an institutional level, UBC's curriculum and developmental approach to education should create engaged learners, not merely develop those who are pre-disposed to higher levels of engagement. To take out of province students (in order to bolster a national reputation) under the justification pretext that they are more predisposed to be engaged on campus undermines a broader institutional imperative for the public institution of higher learning.

However, to take students based upon a personal profile (as opposed to geographic location) would not conflict with our sense of social justice, regardless of their eventual performance at UBC. For such applicants, there is an assessment of individual merit in the Character / Enhancement admission decision-making model that is absent from the Institutional – based model. The information students present in the personal profile reflects self-determination and self-knowledge; the mere fact that the student resides outside of BC does not. This study showed that the Character / Enhancement model did in fact identify students who were significantly more likely to exhibit certain types of engagement during their education, even if their admission averages may be lower. Even though the effects were small, this does validate the admissions decision-making model to some extent.

Does choice of admission-making decision model matter in terms of shaping a first-year class at a selective admission university? And if so, how?

Obviously, the answer is "yes": how universities admit students does matter.

It is true that many of the tools used in the admission decision are imperfect predictors of success. Be it grades, level of engagement, breadth of coursework, etc., the criteria used to render access to higher education do not always generate an accurate assessment of the applicant. For example, there is much discussion within the secondary and post-secondary sectors in Canada of the prevalence of grade inflation as a phenomenon that degrades the predictive quality of the admission average. Casas and Meaghan (1995) did a careful analysis of grade inflation in the Ontario secondary schools from the mid-80s to the mid-90s and noted that grade inflation is a byproduct of both the secondary and post-secondary systems (defined by variables such as demographics, number of applicants, number of available spaces), not just the result of the collective behaviour of individual applicants. There is general consensus that standardized test scores are flawed measures of student performance and have the potential for significant cultural bias (Lemann, 1999; Slack & Porter, 1982; Sedlacek, 2004a). Even the use of broad-based admission criteria, such as extra-curricular activities, personal profiles, and other assessment of "character" are rife with issues of validity and bias.

Upon the introduction of wide-scale consideration of broad-based admission at UBC, the response from local secondary schools was a mix of support and skepticism[45]. Schools were happy to have UBC place an emphasis on students' personal characteristics and activities, but

[45] In the fall of 2011 and 2012, UBC met with over 300 secondary school counselors from across the province to discuss changes in the undergraduate admission process. The impression of "support and skepticism" comes from these discussions between the counselors and the researcher, who was present at these events.

concerned that UBC is unable to authenticate and validate the information applicants submit online as part of their application. How can UBC be certain that submissions are not the result of coaching from older brothers and sisters, parents, or even paid professionals? And if unable to validate, does the increased emphasis on Broad-Based Admissions simply introduce the potential for greater inequity in how students access post-secondary education? While there has been some discussion in the post-secondary sector about how to validate such measures (including the use of online databases such as *Turnitin for Admissions*, time-limited responses, random question generators, and keystroke dynamic assessments), we must acknowledge that to some extent, there will always be validity issues with any measure used in the university admission process. On one hand, it is very difficult for universities to validate the information provided by applicants and the assessments made by teachers. But at a more fundamental level, any assessment or criterion that can be used to describe an applicant's behaviour is inherently corrupted once included in the university admission decision-making process; the behaviour must be re-conceived within the context of a specific desired outcome. The issue goes beyond mere grade inflation. Universities may make assumptions about the character of an applicant who volunteers in the community; are those assumptions correct if the only reason the applicant volunteered was to gain admission to a university?

And to make matters worse, even when there are statistically significant relationships between the criteria used by the admissions decision-making model and first-year outcomes, the relationships are weak. This study showed that an Academic Merit / Character / Enhancement admission decision-making model did enroll a class that was different than that brought about by a purely Academic Merit decision-making model. The university was able to enroll a class that was slightly more pre-disposed to the types of engagement activities deemed a good fit with the

values of the institution. But the relationships were small. In many ways, the newly-admitted and the newly-displaced students from the two admission decision models were more similar than they were different.

So why does it matter? There are two reasons. The first has to do with ensuring that the university remains an active player in the admissions decision-making process. The second has to do with how university admissions (and the post-secondary experience itself) shape a population within a society.

As resource dependency theory suggests, the university as an organization has a lot at stake in being able to extract what it needs from its environment (Pfeffer & Salancik, 1978; Tolbert, 1985; Gorlitz, 1999). Changes in demographics, public funding, and other environmental influencers can have a positive or negative impact. The organization must adapt to these changes in order to thrive. The extent to which the organization is able to adapt is determined by the extent to which it can exert control over its environment. The institution must not be a passive actor on matters that affect its well-being; it must ensure that it remains a viable and relevant actor with its environment. As Zucker (1977, 1983) suggests, the institution's interactions with its environment normalizes its values. If a university's admission requirements shape how the institution is perceived by its environment, then it is critical for the organization to show itself as an active actor in its ability negotiate resources from its environment. This sense of institutional self-determination speaks to the concentration of power that Pfeffer and Salancik (1978) suggest defines the relationship between the organization and its environment; the organization cannot be passive if it is to thrive.

The use of a solely Academic Merit admissions decisions-making model effectively renders the university as a passive actor in the selection process. The academic assessments

represented by the secondary school grades used to decide admission did not originate from the university. Rather, the university accepts assessments made by teachers throughout the province and the country, rank orders the applicants based upon these external assessments, and determines admissibility upon that rank ordering. The university relies on secondary school teachers' adherence to a curriculum and assessment scale to determine the strength of the applicant, but makes no assessment of its own. The issue here is not necessarily that the external assessments are poor. UBC's research of BC secondary school teacher-issued grades shows a shared variance (r^2) with first-year performance of 27.7%. Compare that to a 2002 study by Geisler and Studley showing that high school GPA, Scholastic Assessment Test (SAT) scores, and subject specific Scholastic Assessment Test (SAT II) scores combine to account for 22.3% of the shared variance in freshman GPAs within the University of California system. Clearly, BC high school teachers are doing something right in their course-based assessments.

The issue is more one of control. By using grades only in the decision-making model, the university places the locus of control outside its organization. A high school teacher could give a student 99% in each of his or her courses (rightly or wrongly) and essentially guarantee the student admission to a university that uses a solely academic-meritocratic decision-making model. This has a number of potentially negative effects. Such a high degree of transparency in the admissions process puts tremendous pressure on schools and teachers to give high grades, leading to an increased restriction of range in the grades presented by applicants. It also leads to a certain amount of "gaming" in how and when students enroll in high school courses in order to present the highest possible grades to university admissions offices (Casas & Meaghan, 1995). But most importantly, the more transparent the requirements for admission are, the more the admission decision is made *for* the university, not *by* the university.

As previously mentioned in section 1.7.3, in a November 8th, 2012 blog post entitled *Narcissism of Small Differences – Admissions Edition*, published by Higher Education Strategy and Associates, an independent Canadian higher education consulting group, a comparison is made between Canadian and US university admission requirements. The author, Alex Usher, questions why Canadian universities are so picky in their admission requirements whereas American universities are so open. The post states that Ontario universities such as Brock, Lakehead, Carleton, and Guelph publish between 13 – 19 different admission requirements on their website, whereas US schools such as Harvard and Princeton only publish a single admission requirement (Usher, 2012). But is the question that these highly selective US schools are less picky in their admission requirements or that they are merely less transparent? For example, while Harvard may not require high school calculus to gain admission to its business program, a student without calculus is at such a competitive disadvantage that calculus effectively becomes an admission requirement. The idea that no specific criteria are required but all criteria are considered is not just seen in the elite private colleges in the US. The University of Michigan actually publishes online the scoring guide used by admissions counselors to determine admissibility[46]. While many would consider this a transparent display of the institution's policies, it actually serves to deliberately and strategically obscure the admissions decision-making process. The guide lists over 40 criteria that may be included in the admission decision, ranging from cumulative GPA to grasp of world events to socioeconomic background; none of the criteria have weightings attached. By combining a number of Perfetto's decision-making models, Michigan, Harvard and Princeton maintain control over their environment by making it clear that

[46] See http://www.admissions.umich.edu/applying/Template_Rating_Sheet-REV2009-10.pdf

they alone make the assessments that determine admissibility. In doing so, the selective institution exerts greater control over its environment.

Of course, this sounds very heavy–handed. But there is a positive outcome. Imagine that UBC's introduction of Character / Enhancement admission decision-making criteria does not in any way affect who gains admission. The same exact students who were admitted on grades alone are now admitted on the combined strength of their grades and a personal profile. While enrolment may not have changed, applicant behaviour has been positively affected. Prospective students gradually become more engaged in their schools and communities; they increasingly see the value of their secondary school experience beyond the grades assigned at the end of the year. In doing so, UBC's admissions policies may not necessarily select applicants that better align with the university's values; rather, UBC *creates* applicants who share the institution's values.

Imagine a scenario where two universities decide to make admissions decisions via a lottery[47]. In frustration with the imperfection of the predictive ability of traditional admission-decision-making criteria (grades, engagement, etc.), both schools decide to randomly select their incoming class. However, only one school tells its applicants that decisions will be made randomly; the other continues to tell applicants that grades, engagement, personal profiles etc. factor into the decision. Even if both schools had equally strong applicant pools to begin with, in time, we assume that things would change. We can easily imagine an outcome where the school that purports to using bona fide admission criteria ends up with better first-year outcomes, simply

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[47] Post-secondary access determined by lottery does exist. Universities in the Netherlands use a weighted lottery system based upon high school grades to determine admission to highly desirable programs like Medicine or Dentistry. While merit still plays a factor, so does luck.

because the students know what the institutions values. In this sense, the admission decision-making model does not *select* the "right" student as much as it *creates* the "right" student.

In this study, only newly-admitted students to the Faculty of Commerce showed statistically significant differences in their history of engagement in school and community (see factor NUBC 1 in Table 12). This is not surprising once we consider that the Faculty of Commerce has been emphasizing applicant personal profiles since 2004, compared to 2010 for the Faculties of Arts, Science and Applied Science (engineering). Perhaps the Faculty of Commerce, with the highest applicant-to-seat ratio of any program at UBC, has actually begun to shape the behaviour of its applicants, as opposed to the other faculties who are merely selecting applicants who exhibit a particular behaviour.

When an organization has a resource that is seen as desirable within the environment, the environment will adapt to whatever the organization puts in front of it. This particularly true for the selective admission university, where demand to gain access is greatest. Imposing admission criteria determined by student behaviours forces the student to adapt to the demands of the organization in order to gain its resources. This in turn gives the organization greater control over its environment. This control can be seen as a benefit to the organization and to the environment itself. As long as the behaviours that are encouraged fall within the accepted social imaginary of what is expected from both the institution and the student, the outcome is positive. Be it secondary school grades or personal characteristics, a student focused upon a particular institution can shape themselves into whatever form the institution wants to see. In doing so, the student chooses the institution more so than the institution chooses the student. As Thresher poses,

> while to some extent colleges select students (and even the least selective college does some selecting), to a much greater extent, in this country, students select colleges. Even the high standard college upholds its quality not so much by rejecting applicants as by establishing a reputation that attracts many able and ambitious students and … scares away the weaker one. The colleges probably intervene in the sorting process less than they suppose themselves to, and to the extent that they do intervene, it is often their reputations rather than their actions that are the effective agencies of intervention. (Thresher, 1966, p.39)

It is important to note that Thresher's work is now almost fifty years old. In that time, post-secondary participation, the number of degree-granting institutions, and society's perception of the importance and relevance of a university education have changed. Nevertheless, the results of this study suggest that Thresher's fundamental premise has not changed: institutions do not choose, students – students choose institutions. But that does not mean that the institution is helpless. By strategically using a variety of different admission decision-making models, the selective public Canadian university can exert control over its environment while still remaining true to its fundamental purpose and role within society.

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Appendices

Appendix A: Perfetto's Admission Decision-Making Model Taxonomy (1999)

The following is an overview of the nine philosophical bases or decision-making models for undergraduate admissions identified in Towards A Taxonomy of the Admissions Decision-Making Model (Perfetto, 1999):

1. ENTITLEMENT - Higher education is an inalienable right and should be made available to everyone.
2. OPEN ACCESS - College is a natural progression after high school and should be made available to everyone who is qualified.
3. MERITOCRACY - Access to higher education is a reward for those who have been most academically successful.
4. CHARACTER - Access to higher education is a reward for personal virtue, dedication, perseverance, community service, and hard work.
5. ENHANCEMENT - The goal of higher education is to seek out and nurture talent.
6. MOBILIZATION - Higher education is the "great equalizer" and must promote social and economic mobility.
7. INVESTMENT - Access to higher education should promote the greater good and further the development of society.
8. ENVIRONMENTAL/INSTITUTIONAL - The admissions selection process is designed to meet the enrollment goals and unique organizational needs of the admitting institution while promoting the overall quality of students' educational experience.
9. FIDUCIARY - Higher education is a business, and access must first preserve the institution's fiscal integrity.

Appendix B: New to UBC Survey Questions

The New to UBC (NUBC) Survey is administered by UBC Planning and Institutional Research and is sent out via email to new to UBC students in August prior to arrival on campus and the start of September classes. The survey instrument attempts to measure the impact of first-year experience for both direct entrants by establishing a "baseline" so that students can be re-surveyed in later years. Students are asked about their activities and expectation prior to attending UBC; students are also asked about their expectations and intended level of participation on campus.

Not all questions from the New to UBC survey were used for analysis in this study. The listings below identify the questions that were incorporated into the analysis. Note that the Vancouver and Okanagan campuses ask slightly different questions in their respective New to UBC surveys.

<u>New to UBC Survey, Vancouver campus</u>

1. For the activities below, indicate which ones you did during the past year:
    a. Worked on a local, provincial, or national political campaign
    b. Publicly communicated my opinion about a cause (e.g., blog, email, petition)
    c. Helped raise money for a cause or campaign

    Rating Scale for Above: Not at all; Occasionally; Frequently

2. During your last year in secondary school, how much time did you spend during a typical week doing the following activities?
    a. Volunteer work (on your own and not part of class activity)
    b. Community service as part of a class
    c. Student clubs/groups
    d. Reading for pleasure
    e. Outdoor activities for recreation

    Rating Scale for Above: None; Less than 1 hour; 1-2 hour; 3-5 hours; 6-10 hours; 11-15 hours; 16-20 hours; Over 20 hours

3. UBC is committed to providing you with at least two enriched educational opportunities during the course of your studies. Do you intend to participate in any of the following:
    a. Community service learning
    b. International learning opportunity
    c. Co-op education
    d. Student leadership activities
    e. Research activities
    f. Internships

    Rating Scale for Above: Do not intend to participate; Don't know; Intend to participate

New to UBC Survey, Okanagan campus

1. During high school, how much experience did you have participating in the following types of group activities?

    a. Academic clubs/groups (debate team, mathematics, science, etc.)
    b. Sports/Athletic teams (soccer, basketball, track & field, etc.)
    c. Performing or visual arts programs (band, choir, theatre, dance, art, etc.)
    d. Publications (student newspaper, yearbook, etc.)
    e. Volunteer work (on your own and not part of class activity)
    f. Community service as part of a class
    g. Long-term projects (more than 1 month) with an educational focus where you had to cooperate with team members to reach a common goal

    Rating Scale for Above: No experience; A slight amount of experience; Some experience; A moderate amount of experience; A great deal of experience

2. UBC is committed to providing you with at least two enriched educational opportunities during the course of your studies. How likely are you to participate in any of the following?

    a. Community service learning
    b. International learning opportunity
    c. Co-op education
    d. Student leadership activities
    e. Research activities
    f. Internships

    Rating Scale for Above: Extremely likely; Likely; Neutral; Unlikely; Extremely unlikely

Appendix C: National Survey of Student Engagement Questions

The following provides a list of the survey questions administered to the sample populations of UBC students in the 2011 National Survey of Student Engagement, the responses from which were used to measure dependent variable 3 ("Enhancement"). Note that not all questions administered to students in the NSSE survey were used in this study; only questions that assess activities / engagement that the student could have independently initiated were used. In other words, question asking the student if they "made a presentation in class" was not included because the instructor, not the student, determined such an activity. On the other hand, a question assessing whether the student "asked questions in class or contributed to class discussions" is viable because the student could independently initiate such behaviour.

In your experience at your institution during the current school year, about how often have you done each of the following?

1. Asked questions in class or contributed to class discussions
2. Prepared two or more drafts of a paper or assignment before turning it in
3. Worked on a paper or project that required integrating ideas or information from various sources
4. Included diverse perspectives (different races, religions, genders, political beliefs, etc.) in class discussions or writing assignments
5. Come to class without completing readings or assignments
6. Worked with classmates outside of class to prepare class assignments
7. Put together ideas or concepts from different courses when completing assignments or during class discussions
8. Tutored or taught other students (paid or voluntary)
9. Used an electronic medium (listserv, chat group, Internet, instant messaging, etc.) to discuss or complete an assignment
10. Used e-mail to communicate with an instructor
11. Discussed grades or assignments with an instructor
12. Talked about career plans with a faculty member or advisor
13. Discussed ideas from your readings or classes with faculty members outside of class
14. Worked harder than you thought you could to meet an instructor's standards or expectations
15. Worked with faculty members on activities other than coursework (committees, orientation, student life activities, etc.)
16. Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.)

17. Had serious conversations with students of a different race or ethnicity than your own
18. Had serious conversations with students who are very different from you in terms of their religious beliefs, political opinions, or personal values
19. Attended an art exhibit, play, dance, music, theater, or other performance
20. Exercised or participated in physical fitness activities
21. Participated in activities to enhance your spirituality (worship, meditation, prayer, etc.)
22. Examined the strengths and weaknesses of your own views on a topic or issue
23. Tried to better understand someone else's views by imagining how an issue looks from his or her perspective
24. Learned something that changed the way you understand an issue or concept

Rating Scale for Above: Very often; Often; Sometimes; Never

Appendix D: Principal component Analysis of New to UBC (Okanagan) Survey Responses: Rotated Component Scores, Communalities (h^2) and Percents of Variance

Item	Factor 1[1]	Factor 2	Factor 3	Factor 4	h^2
INTENTION: Research activities	0.803				0.66
INTENTION: Internships	0.71				0.531
INTENTION: Co-op education	0.685				0.55
Once classes start, how much time do you think you will need to spend on preparing for class each week (e.g., studying, reading, writing, doing assignments, etc.)?	0.539				0.312
Performing or visual arts programs (band, choir, theatre, dance, art, etc.)		0.728			0.589
Academic clubs/groups (debate team, mathematics, science, etc.)		0.679			0.566
Publications (student newspaper, yearbook, etc.)		0.6			0.428
Long-term projects (more than 1 month) with an educational focus where you had to cooperate with team members to reach a common goal		0.581	0.404		0.508
Community service as part of a class			0.774		0.616
Volunteer work (on your own and not part of class activity)			0.716		0.596
INTENTION: Community service learning				0.678	0.594
Sports/Athletic teams (soccer, basketball, track & field, etc.)				-0.627	0.504
INTENTION: International learning opportunity			0.389	0.503	0.457
INTENTION: Student leadership activities	0.399	0.379		0.452	0.518
Percent of variance	22.92	13.88	8.60	7.67	
N	258	258	258	258	

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

[1] Factor Labels:

Factor 1: Intention to engage in career-related enriched educational experiences

Factor 2: History of engagement in school-based activities

Factor 3: History of engagement in community-related educational experiences

Factor 4: Intention to engage in enriched educational experiences

Appendix E: Principal component Analysis of New to UBC (Vancouver) Survey Responses: Rotated Component Scores, Communalities (h2) and Percents of Variance

Item	Factor 1[1]	Factor 2	Factor 3	Factor 4	h^2
Student clubs/groups	0.776				0.638
Volunteer work (on your own and not part of class activity)	0.759				0.616
Community service as part of a class	0.744				0.603
INTENTION: Internships		0.671			0.472
INTENTION: Research activities		0.651			0.44
INTENTION: Community service learning		0.595			0.449
INTENTION: Co-op education		0.573			0.345
INTENTION: International learning opportunity		0.516			0.308
INTENTION: Student leadership activities	0.334	0.496			0.472
Outdoor activities for recreation			0.793		0.685
Reading for pleasure			0.789		0.695
Publicly communicated my opinion about a cause (e.g. blog, email, petition)				0.732	0.551
Worked on a local, provincial, or national political campaign				0.656	0.53
Helped raise money for a cause or campaign	0.372			0.631	0.606
Percent of variance	22.60	13.34	8.96	8.04	
N	574	574	574	574	

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

[1] Factor Labels:

Factor 1: History of engagement in school and community

Factor 2: Intention to engage in enriched educational experiences

Factor 3: History of engagement in recreational activities

Factor 4: History of political / social activism

Appendix F: Principal component Analysis of National Survey of Student Engagement Survey Responses: Rotated Component Scores, Communalities (h^2) and Percents of Variance

Item	Factor 1[1]	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	h^2
Tried to better understand someone else's views by imagining how an issue looks from his or her perspective	0.786							0.675
Examined the strengths and weaknesses of your own views on a topic or issue	0.766							0.624
Learned something that changed the way you understand an issue or concept	0.699							0.612
Participated in activities to enhance your spirituality (worship, meditation, prayer, etc.)	0.426			-0.321		0.421		0.585
Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.)	0.393			0.306				0.444
Used e-mail to communicate with an instructor		0.737					0.307	0.669
Worked on a paper or project that required integrating ideas or information from various sources		0.684						0.598
Included diverse perspectives (different races, religions, genders, political beliefs, etc.) in class discussions or writing assignments	0.329	0.592						0.528
Discussed grades or assignments with an instructor		0.492	0.476					0.529
Prepared two or more drafts of a paper or assignment before turning it in		0.449		-0.363				0.442
Discussed ideas from your readings or classes with faculty members outside of class			0.711					0.541
Worked with faculty members on activities other than coursework (committees, orientation, student life activities, etc.)			0.703					0.586
Talked about career plans with a faculty member or advisor			0.634					0.450
Had serious conversations with				0.786				0.711

students of a different race or ethnicity than your own								
Had serious conversations with students who are very different from you in terms of their religious beliefs, political opinions, or personal values				0.751				0.715
Asked questions in class or contributed to class discussions			0.375	0.392				0.491
Worked with classmates OUTSIDE OF CLASS to prepare class assignments					0.766			0.602
Used an electronic medium (listserv, chat group, Internet, instant messaging, etc.) to discuss or complete an assignment					0.632			0.600
Tutored or taught other students (paid or voluntary)					0.580			0.464
Put together ideas or concepts from different courses when completing assignments or during class discussions		0.301			0.418			0.423
Come to class without completing readings or assignments						0.756		0.604
Worked harder than you thought you could to meet an instructor's standards or expectations						-0.385		0.442
Exercised or participated in physical fitness activities							0.820	0.704
Attended an art exhibit, play, dance, music, theater, or other performance							0.400	0.338
Percent of variance	20.85	8.25	6.53	5.85	5.16	4.94	4.21	
N	547	547	547	547	547	547	547	

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

[1] Factor Labels:

Factor 1: Engagement to expand / change personal perspective

Factor 2: Engagement on assignments / schoolwork

Factor 3: Engagement with faculty

Factor 4: Engagement in conversation with diverse peers

Factor 5: Engagement with peers in relation to schoolwork

Factor 6: N/A

Factor 7: N/A