Access, Opportunity, and Choice

Developing Financial Aid Packaging Strategies to Facilitate Choice in Higher Education

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A dissertation submitted in partial fulfillment of the

requirements for the degree of

Doctor of Philosophy

University of Washington

2003

Program Authorized to Offer Degree: College of Education

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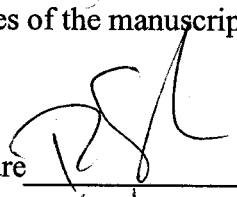
Signature 

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Abstract

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Using institutional data this paper presents a model that enables researchers and enrollment managers to assess the effectiveness of financial aid packaging policy in light of student characteristics and institutional market position. Financial aid is seen as a means to level the playing field in college enrollment by removing financial barriers to enrollment, yet differences in enrollment rates based on differences in income as well as racial / ethnic background remain. Within the context of the college choice model developed by Hossler and Gallagher (1987) this dissertation explores the factors that influence the decision to go to college, and the role of financial aid in the ultimate enrollment at a particular institution.

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Acknowledgements

I owe a great debt to my coworkers and supervisors who have been incredibly supportive, allowing me the flexibility to pursue this goal. In addition, I would like to acknowledge the support and guidance of the faculty and staff at the College of Education at the University of Washington. The faculty serving on my committee, Steven Olswang, Edward Taylor, James Banks, William Zumeta, and Kevin Laverty, have been helpful throughout my career as a student. In addition to those listed, I would like to thank Stan Slater, who served on my committee until his move to Colorado State University. Daniel Jacoby, University of Washington, Bothell, has provided a great deal of insight reading drafts of much of my work and giving me an opportunity to apprentice with him in the classroom. Kathleen Bernhard has served as a mentor and a friend, providing guidance from my application to the graduate school through my dissertation and beyond. And of course, none of this would have been possible without the love, support, and understanding of my family.

Thank you all.

Dedication

To my family and friends who supported me throughout this project, and especially to my wife Nikki for your patience, understanding, support, and most of all your love.

Thank You

Chapter I

Introduction

Universal education has been a critical factor in the economic growth of the United States and the movement toward a knowledge economy. This transformation has relied heavily on workers with the skills and knowledge developed at higher levels of education, making economic and social mobility more dependent on formal education than at any point in the past (Drucker, 1994). To meet the ever increasing demand for formal education, a postsecondary education system has developed in this country that offers the promise of opportunity for all students to continue their education and to gain skills that will enable them to fully participate in society and the economy. However, the question remains, to what extent is this promise being fulfilled, and how can educators mitigate against the barriers that face many young people today.

This research explores the factors that influence the decision to go to college and considers the specific issue of college cost and financial aid policy. Using institutional data, a model is proposed that will enable researchers and enrollment managers to assess the effectiveness of financial aid packaging policy in light of student characteristics and institutional market position. Although the model itself is apolitical, institutions must have a clear understanding of their goals for the financial aid program in order to use the model to ration aid in a way that will best support those goals.

Historically, financial aid has been grounded in a principle of providing students who might not otherwise meet the cost of attendance access to Higher Education as a means to improve national productivity, global competitiveness (especially in science and technology) and later, equity and social mobility (Lindsey, 1997, Scannel, 1992). Over the years programs have grown, allowing greater numbers of low-income students access to higher education. However, these gains have not kept pace with increases in enrollment for their more well-off peers (Ellwood & Kane, 2000, Kane, 1999, Lindsey, 1997). A drift in state and federal financial aid policy that began in the 1980's has been a movement toward what Hossler (1984) termed "comfort aid." These are funds are not necessarily targeted to the neediest students. Rather, they are designed to lessen the burden on families who would most likely send their kids to college anyway. For example, St. John (1990) finds that loans tend to encourage postsecondary enrollment for middle-income students, but they do not have the same effect for applicants in the lowest income quartile. Given that need based funding is limited, awarding financial aid is often an exercise in rationing those funds to support the neediest students.

Tierney (1997) notes that higher education is seen as a means to achieving social equity in the United States. This is founded on the "belief that a postsecondary degree is a path to opportunity for all individuals, and especially those who have been disadvantaged" (p. 173). Financial aid is a tool that helps provide opportunity for many students who might not otherwise have access to institutions of higher education. However, the level of access that should be provided is somewhat controversial. For example, is the goal of financial aid to provide access to higher education in general, or is

equity achieved only when students have access to the best institution they are qualified to attend, regardless of cost? The latter refers to a policy of need blind admission that appears to be losing favor. Defining the institutional philosophy and commitment to equity in admission is critical in determining the goals of financial aid programs and institutional pricing strategy, and they rely on a value judgment about the level or quality of opportunity the institution is willing and able to provide.

Wrestling with the idea of equal opportunity, Roemer (2000) discusses the notion of a "level playing field," which he describes as a social system that recognizes that differences exist among groups in society and as a result these groups may require different kinds of support in order to achieve equal opportunity. Roemer contrasts this with his definition of "non-discrimination," which he sees as a system in which only those attributes relevant to the particular task would be evaluated. Both of these ideas play on our sense of what is fair, and both require the player to compete. The difference is in the nature of the competition. In the level playing field model, all the players are given access to the resources that will enable them to compete, while the non-discrimination model does not necessarily make such a provision regarding resources (Roemer, 2000). Which model of fairness one favors will have important implications as the role of education is considered in fulfilling the promise of equal opportunity in society. For example, with regard to funding education, the level playing field notion would require financial support to allow access to the best institution the student is qualified to attend. The non-discrimination approach, on the other hand, would require that the student is offered the same chance to complete for admission to the institution,

but would not require that the schools make any accommodation for those students who cannot afford the cost of their education.

It is important to note, however, that funding alone will not fully address problems of equity in access to higher education. It is critical to recognize the systematic barriers faced by many students, especially the most disadvantaged students. Young people who enter school similarly qualified tend to perform better when exposed to a challenging curriculum. However, low-income and minority youth are disproportionately placed in less challenging classrooms, with less experienced teachers, which limits their opportunity to achieve at high levels. Darling-Hammond (1995/2001, 1997) describes this process as a rationing of the curriculum where "the least qualified teachers are most likely to teach the least advantaged children" (Darling-Hammond, 1997, p. 274). Access to the curriculum is an essential element in creating opportunities for students to continue their education. Jones, Yonezawa, Ballesteros, & Mehan (2002) note that underrepresented minorities still have less access to college preparatory coursework and therefore face additional barriers to college entry. Valadez (1998) finds that high SES students are more likely to have higher test scores, higher grades, and more Carnegie units in Math and English, all factors that are important in the formation of aspirations to attend college. In addition, Jacobson, Olsen, Rice, Sweetland, & Ralph (2001) found that Black students who have the appropriate academic background to enter a four-year college are less likely than White students to apply, although those who do apply are more likely to attend and complete a degree than similarly qualified White students.

This dissertation emerges, in part, from the belief that the role of financial aid should be to allow students access to the highest quality institution for which they are qualified and wish to attend. Although it is important to make this position clear, the analysis and model developed herein do not require this position. In addition, this research does not attempt to define or compare institutional quality. The research examines the higher education system in the United States with particular attention to differences in postsecondary destinations by economic and racial / ethnic background. A review of college destinations, financial aid policy and economic outcomes is followed by a discussion of college choice modes as a means to address factors that influence college choice. Finally, research results for a project that considers the influence of institutional financial aid policy on student enrollment decisions, and presents a model that allows researchers and enrollment managers to assess the effectiveness of financial aid packaging policy in the admission process, are presented.

Chapter II

Literature Review

Higher Education in the US

In 1998, there were approximately 4015 degree granting institutions that qualified for federal financial aid under Title IV of the Higher Education Act of 1965 (Title IV) (Morgan, 2001). In addition, there are 2318 non-degree granting institutions that qualify under Title IV; generally, these are shorter-term training programs. Numerous other institutions and training programs that do not receive federal funding under Title IV also provide postsecondary training. In fall 1998, 14.9 million students enrolled in institutions eligible for Title IV funding, and of those 97.2% were enrolled in degree granting institutions. Within the subset of degree granting institutions, 76.8% of the students were enrolled in public institutions, 20.7% in private not-for-profit institutions, and 2.3% in private for-profit institutions. Between 1997 and 1998 there was a slight increase in total enrollment, accounted for by increases in minority enrollment.

Differences in the type of institution students select emerge for different racial / ethnic groups. For example, Black and Hispanic students make up a greater proportion of enrollments at two-year public colleges and at private, for-profit colleges (see Table 1). In addition, Black and Hispanic students make up a larger portion at non-degree granting institutions representing 19.6% and 15.4% respectively of the total enrollment in these institutions, compared to 10.9% and 8.7% in degree granting institutions (Morgan, 2001).

Table 1. Undergraduate Enrollment Rates by Gender, Race, and Sector.

Title IV Degree Granting Institutions - Fall 1998								
	Public Two Year		Public Four Year		Private Not for Profit Four Year		Private For Profit (all)	
	All Undergrad	First time, first year	All Undergrad	First time, first year	All Undergrad	First time, first year	All Undergrad	First time, first year
Total Students	**5,269,032**	**861,514**	**4,704,249**	**792,772**	**2,086,785**	**425,518**	**334,070**	**112,976**
Male	42.4%	46.9%	45.4%	45.6%	42.7%	44.2%	50.0%	53.3%
Female	57.6%	53.1%	54.6%	54.4%	57.3%	55.8%	50.1%	46.8%
White, non-Hispanic	66.4%	67.1%	72.7%	73.3%	74.4%	75.1%	60.3%	58.3%
Black, non-Hispanic	11.9%	13.3%	10.9%	11.6%	10.9%	10.7%	17.7%	17.8%
Hispanic	12.8%	12.1%	6.9%	6.4%	5.4%	5.4%	13.1%	15.4%
Asian / Pacific Islander	6.6%	5.1%	6.4%	6.4%	5.0%	5.3%	5.3%	4.7%
American Indian / Alaska Native	1.3%	1.4%	1.0%	1.0%	0.6%	0.5%	1.1%	1.3%
Nonresident alien	1.0%	1.1%	2.2%	1.4%	3.7%	3.0%	2.6%	2.5%
Source: NCES Fall Enrollment in Title IV Degree-Granting Postsecondary Institutions: 1998								

The development of the community college system is seen by many to be the hallmark of American higher education. The community college often serves a dual role of providing vocational training designed to move students directly into work and providing academic training, usually in the form of general education requirements, designed to allow students to transfer to a four-year college or university and complete a baccalaureate degree (Phipps, Shedd, Merisotis, & Carroll, 2001). The low cost and open admission policies of community colleges allow for unparalleled access to higher education, but the role of the community college in reducing inequality is less clear.

Kane and Rouse (1999) note that community colleges provide access to higher education for students who probably would not attend any postsecondary intuition in their absence, but it is also apparent that the community college draws some students away from baccalaureate institutions. They go on to indicate that bachelors degree completion rates are lower for students who start at a community college, even when those students strongly identify their intent to complete a baccalaureate degree. Kane and Rouse find that the payoff for a year of credits at community college is about equivalent to a year of credits at a baccalaureate institution, and that there is an additional premium for completion of an associates degree with a return of 15-27% over a similarly qualified high school graduate. This compares to a return of 10-16% for two years worth of credits with no degree.

In general, minority students are better represented in community colleges than in four-year colleges. This is most evident among Hispanic students, but the trend is consistent for all minority groups (see Table 1) (Morgan, 2001).

Four-year colleges and universities account for 72.9% of the total undergraduate enrollment among degree seeking students (Morgan, 2001). A number of differences emerge in enrollment patterns at four-year colleges. White students make up a slightly larger portion of students at private not-for-profit colleges compared to enrollment at public four-year colleges. This difference is accounted for by lower enrollment of Hispanic and Asian Pacific Islander students at private not-for-profit institutions. Black students make up roughly the same portion of the students at public four-year and private not-for-profit four-year colleges and universities (see Table 1). Braxton (1990a) found that high-income students are more likely to enroll in more selective institutions, but he does not find cost of attendance to be associated with income. Apparently in contrast, Hearn (1984) finds that low SES students are less likely to attend high-resource / high-cost institutions, a subset of high cost institutions.

Labor Market Return

Several studies find an increasing wage premium for additional years of postsecondary education (Ashenfelter & Rouse, 2000; Ellwood & Kane, 2000; Kane, 1999). For example, Ellwood & Kane (2000) find an upward trend in wage premium for a bachelors degree. Their analysis of Annual March Population Survey data shows the wage premium climbing from 15% for men, and 20% for women to nearly 50% for men and 70% for women in the late 90's.

Kane (1999) examined wage growth between 1980 and 1992 using data from Bureau of the Census 1995 Historical Income Tables. He finds that of workers aged 25-

44, on average, only those workers with four or more years of college saw an increase in real wages, while workers in those age ranges with some college and high school graduates experienced a decline in real earnings. Workers 45-54 years of age, with at least some college, saw real wage increases, while high school graduates saw a decline in real earnings. Cipollone (1995) finds that, on average, people with higher levels of education have higher earnings, and this relationship holds up when groups are subdivided by race, ethnicity, gender, ability, and social background, as well as across national boarders and political systems. In addition, Cipollone finds that earnings differentials increase with the level of education, and workers who have more education tend to enjoy earnings growth further into their careers.

This is not to say that education eliminates differences in earnings by gender or race. Even when controlling for academic background characteristics, substantial differences in earnings emerge by race and by gender, although the earnings gap does appear to narrow with additional years of education (Horn, Zahn, & Carroll, 2001, Jacobson, et al., 2001).

Jacobson et al. (2001) explore the relationship of achievement and Black-White inequality. They find that when comparing groups with similar levels of academic achievement, the earnings gap between White and Black workers is substantially smaller than when comparing populations on the whole. Specifically, they find that Black women earn as much, or more, than White women when controlling for academic achievement. Among men, an earnings differential is still present, but it is 2/5 smaller when controlling for academic achievement. In addition, Jacobson et al. find that young

Black men are more likely to attend college than Whites with similar academic credentials, and they are at least as likely to complete a degree.

Earnings differentials also exist based on gender. Horn, Zahn, & Carroll (2001) studied outcomes for students who received their baccalaureate degree in 1992-3 and did not go on to graduate school. The authors find that wages for women were about 80% of men's wages in 1997. The authors also find enormous variation in the earnings for both men and women depending upon the field of study one chooses to enter. Field of study can also make a substantial difference in earnings differentials. For example, women who enter engineering see virtually no difference in earnings when compared to men in the same cohort, yet substantial differences remain in most other fields. Within fields of study differences also exist. Judy and D'Amico (1997) find that there are workers in each field of study who earn below the median wage for all categories. They report a median income for engineers of $53,289 for males between 35-44 in 1993; of this group 9.1% earn $30,000 or less. In addition, they find representation from all fields of study in the highest earning group.

The influence of institutional quality on outcomes is immensely complex. A number of studies have examined the impact of institutional characteristics and outcomes (Dale & Kreuger, 1999, James, Alsalam, Conaty, & To, 1989). James et al. (1989) find that there is a positive income effect from attending a private eastern school. However, they also find that choice of major has a greater impact on future earnings than choice of school. This is an important finding because much of literature on college choice, especially related to the role of financial aid, is concerned with access to the most

selective institutions. Dale and Kreuger (1999) find that students who come from a more disadvantaged background and attend highly selective colleges realize greater benefits than those from more advantaged backgrounds. Overall they find that students who are accepted to elite schools and choose instead to attend a lower ranked institution suffer no loss in earning capacity. However, they do find that students who attend more expensive schools tend to earn more than their peers who attend less costly institutions.

There may be institutional effects related to persistence and completion. Adelman (1999) indicates that completion rates are higher, and time to completion is lower, for students who attend highly selective schools. Kane and Rouse (1995) examined factors that encourage greater levels of education, and found that degree attainment is greater for students who first attend a four-year college. This is supported by Adelman (1999) who finds that completion rates for students who attend a four-year college is 63% by age 30, and over 90% for students who attend highly selective colleges. By contrast he finds that only 26% of students who begin college at a community college transfer to a four-year school, but of those who transfer over 70% complete a bachelors degree.

Overall it is clear that additional years of education have a positive impact on future earnings. The extent to which institutional characteristics impact future earnings is less clear. Selection of a four-year college does appear to be associated with the completion of more years of education, and an increased likelihood of bachelor's degree attainment (Adelman, 1999). Also, attendance at a more selective institution appears to influence timing and rate of degree completion. Finally, differences in attendance rates and institutional selection appear to be associated with race / ethnicity, and income.

These differences cannot reasonably be attributed entirely to differences in preferences. As factors that influence college choice are considered using models developed to understand the interactions of these factors, the differences are quite complex, involving interactions among socio-economic background, academic preparation, and cultural factors. An attempt to level the playing field for economically disadvantaged students is the provision of Financial Aid.

Financial Aid

The financial aid system in the United States has evolved over the years from an informal provision for a select few students who did not have the financial means to attend college to a critically important resource for a large number of financially needy students. Modern financial aid began as a means to reward and retrain returning solders from the Second World War through the GI bill. This was followed by the National Defense Loan program (later renamed Perkins Loan program), which was a response to the cold war fear of loosing ground in technology following the Sputnik launch in 1958. With the Higher Education Act of 1965 financial aid was established as a means to provide access and choice in college enrollment opening the doors for large numbers of students with fewer financial resources to participate in higher education (Linsley, 1997).

The 1960s and 70s were a time of significant growth in state and federal financial aid programs and college enrollment in general. By the 1980s support for these programs weakened. This resulted in a relative decline in the value of aid targeted to the neediest students at a time when college costs were rising faster than the rate of inflation. Aid policy was beginning to shift toward students from middle-class families, a trend which

continues today (Hossler, 1984, Kane, 1999, Linsley, 1997, Manski & Wise, 1983). The College Board (2000) indicates that even with substantial gains in the Pell grant program at the end of the 1990s award amounts have returned only to 1986/87 levels when adjusted for inflation.

With reauthorization in 1992 and the addition of the Unsubsidized Stafford Loan and the Parent Loan for Undergraduate Students (PLUS), income limits to qualify for loans were removed and families could borrow up to the cost of attendance at any eligible school. Since that time loan debt has increased substantially, mostly for middle- and upper-income students (College Board, 2000; Kane, 1999). Increased dependence on loans was accompanied by changes in the criteria for dependent status, making it more difficult for students to exclude parent resources.

A number of proposals for reform of the financial aid system in the US have been advanced. Breneman and Galloway (1996) review a number of policy approaches that may serve to better target Pell Grant. They note that a $100 increase in the maximum Pell requires an additional expenditure of $320 million dollars. At the time of their writing it would have cost $6 billion to increase Pell from the maximum award of $2340 to the authorized amount of $4100. They offer seven alternative models to redistribute Pell. The first suggestion would be to "front-load" the Pell Grant, limiting eligibility to the first two years of college enrollment. This alternative would provide the greatest savings in the program and allow for substantial increases in the maximum Pell award without additional spending (although it would still not reach the maximum authorized amount). Kane (1999) points out that "front-loading" aid, especially grants, would serve

to reduce risk for low-income students and therefore encourage postsecondary enrollment. Another of the policy options Breneman and Galloway (1996) examined would be to exclude proprietary institutions from Pell eligibility. They suggest that it might make more sense for propriety institutions to seek funding from the Department of Labor (DOL). Reallocating Pell from proprietary institutions would allow for a $2710 Pell Grant, or if combined with the "frontloading" strategy, could result in a maximum Pell award of $3720 with no increase in the total cost of the program. However, the savings indicated here are suspect because DOL would still need to come up with funds to replace Pell for those students attending proprietary institutions.

The other proposals presented by Breneman and Galloway (1996) offered smaller savings. They included greater restrictions on income to qualify for Pell, exclusion of programs less than one year, or less than two years in length, or elimination of awards smaller than $600 per year. These policy options have smaller impacts on the maximum award. It is important to note that the research on completion rates refers to a system with Pell Grant extending through the baccalaureate degree, so it is difficult to say that those same results would occur in the absence of Pell Grant for upper division work.

Wei, Horn, and Carroll (2002) find that Pell recipients who attend a two-year school are more likely than non-recipients to complete an associates degree, and among the least academically prepared students at four-year schools, those who receive Pell grants are more likely to complete a degree than non-recipients. These findings suggest that Pell grants do benefit students who exhibit a number of risk factors and changes to the program should be approached cautiously.

A number of studies have classified the problem of lower enrollment rates for low-income students as a problem of credit constraints, limiting students' ability to invest in human capital (Kane, 1996; 1999). Kane (1999) points out that the federal limits on loans are too low to cover the cost of attendance for low-income students. Subsidized borrowing (those loans for which the federal government pays the interest while the student is enrolled) is limited to $2625 for first-year students, and increases to $3500 for second-year students, and $5500 for third- and fourth-year students. These limits have not changed since 1992 despite dramatic increases in the cost of attendance at postsecondary institutions in the US. The result has been a shift to greater reliance on Parent Loans (PLUS) and private lending. Either of these options place the lowest income borrowers at a disadvantage because credit worthiness is considered for these loans, and especially in the private lending market, interest rates are higher.

Relaxation of eligibility requirements for student loans in the early 90's has lead to an increase in unsubsidized borrowing, and allows for parents to borrow up to the total cost of attendance for a dependent child. In fact, the majority of growth in student aid over the last ten years has been in the unsubsidized and parent loan programs (College Board, 2000; Kane, 1999). As Kane (1999) indicates, this system does not do much for families with short-term liquidity issues, because the subsidized loans are often not sufficient to meet the cost of attendance, and parent loans require payments while the student is enrolled in school. Another requirement that receives less attention is that, unlike student loans, parent loans require that the parents have adequate credit to finance the loan. Students may have an option for additional loans if the parents are denied, but

their limits are lower such that they may not meet their entire cost of attendance. In addition, the process is cumbersome, slow, and potentially embarrassing, because parents need to apply and be denied credit before the dependent student becomes eligible for additional funding. The equation is further complicated for students who have parents who are unwilling to complete the financial aid application, or unwilling to borrow to support their child's education. Reauthorization in 1992 made it more difficult for children to be considered independent thus increasing the already strong influence parents have in the college enrollment decision.

Kane (1999) asserts that a critical flaw in the US financial aid system is the uncertainty faced by potential college matriculants. The offer of aid occurs too late in the application process to effectively provide choice in the college selection process because families are faced with an environment where net cost is uncertain until the student has been accepted to an institution. Outcomes are perhaps even more uncertain with great variation in individual returns on higher education (Judy & D'Amico, 1997). Kane (1999) offers a solution that has been tried in Australia, and to a small degree in the United States. He asserts that much of the risk associated with borrowing could be removed by creating a loan program that is forward looking. He suggests that rather than an up-front subsidy of the interest on student loan, limits should be raised to allow students to finance the full cost of attendance, and repayment should be contingent on future earnings.

The assumption here is that students may be encouraged to enroll in postsecondary programs if the repayment policy can reduce the risk of acquiring a large

amount of loan debt with no guarantee of higher earnings upon graduation or departure from school. For the program to work efficiently, it needs to be implemented on a broad basis so that it is not limited to those students who are not likely to repay their loans. All borrowers would be required to repay based on a percentage of their earnings after they leave school until the debt is paid off (with interest), with no penalty for pre-payment. This option currently exists under the Direct Lending program, but it does not address some of the issues Kane (1999) sees as important, including increased loan limits, and elimination, or less emphasis on family's past earnings and assets.

Ultimately, the goal is a more transparent system where students would know the amount of money available, and the terms of the obligation much earlier in the process. The effect of such an approach is questionable, especially with regard to enrollment for low-income applicants. Federal loan programs already have a number of provisions to reduce the risk to borrowers through extended repayment and forbearance options. St. John (1990) notes that increases in loans tend to encourage enrollment for middle-income students, but not for low-income students. Hossler (1984) finds that low-income and low-ability students are less likely to accept loans. However, the broader issue, improving transparency in the financial aid system, is something that has the potential to address the current lack of accurate information on pricing in higher education.

Pricing and Economic Return

A number of studies have examined the influence of price on enrollment decisions. In general these studies indicate that a decrease in net price is associated with

an increased chance a student will enroll in college (Kane, 1999; Hossler, 1984; Leslie & Brinkman, 1987; McPherson & Schapiro 1991; St. John, 1990). In addition, research indicates that minority and low-income youth are less likely to enroll in higher education, essentially making college choice decisions that are not in their best interest economically. Researchers tend to attribute these disparities to differences in preferences, constraints on short-term liquidity, and incomplete information (Kane 1999, 1996; McPherson & Shapiro, 1997, 1991).

In a meta-analysis of "student demand studies," Leslie and Brinkman (1987) reviewed 25 studies including cross sectional and time series data at both the national and institutional levels between 1927 and 1976. As economic theory would predict, they found consistent results indicating that enrollment declines when tuition rises, and enrollment climbs when tuition is reduced. Most of the studies reviewed indicated a larger effect for tuition decreases than for tuition increases, and in general the findings suggested that financial aid had less of an impact per dollar than a decrease in tuition. The authors attribute this effect to the fact that students don't have a clear picture of their financial aid eligibility, so they make decisions largely based on tuition rather than net price (price after financial aid is deducted). This problem of transparency in pricing is explored in much greater depth by Kane (1999) and McPherson and Shapiro (1991).

Hossler (1984) points out that an important weakness in demand studies is that demand does not appear to respond to changes in return on investment to the extent that would be predicted by most models. Generally, this has been attributed to discounting the return at a very high rate, a significant decline in opportunity cost of attending college when economic times are bad, or a hedge against unemployment. Overall return on investment is less of an influence than price or family income.

Using data from the High School and Beyond study, St. John (1990) compared the effects of a change in tuition, and an equivalent change in various forms of financial aid, on the enrollment decision. Breaking the sample into sub-groups by income quartile, he found that low and middle-income students were more responsive to an increase in financial aid than the equivalent decrease in tuition. For low-income students the effect is especially strong for increases in grant aid, while middle-income students were most responsive to loans. Hossler (1984) finds an increase in aid to be roughly equivalent to a decrease in tuition of the same dollar amount. Manski and Wise (1983) find that an increase in aid is roughly equivalent to a decrease in tuition at four-year institutions, but that students at two-year colleges are much more responsive to changes in aid than in tuition.

In more recent work Kane (1999) cites similar relationships. Looking at a number of studies and data sources, the general trend seems to be that a $1000 drop in tuition is associated with about a 5-6% increase in the chance a student will enroll in college. However, in his own analysis of NELS data, Kane finds only a .8% increase in the likelihood a student will attend a four-year college, and 4.5% increase in the chance a student will attend a two-year college, associated with a $1000 reduction in tuition. In an earlier work Kane (1996) notes that studies may overestimate the demand elasticities for college enrollment by looking at too narrow a time frame. Looking at two data sources, he found a trend of Black students delaying entry into postsecondary education in states with higher tuition. When he looked at the enrollment by age 21-22, he found little difference in enrollment rates for high tuition and low tuition states. Kane states that "the effect of tuition levels on college enrollment may be overstated by as much as one-third

by neglecting to account for higher rates of delayed entry in high tuition states." (Kane, 1996 p.190).

This combination of economic, social, and cultural factors that contribute to the college choice decision is exceedingly complex. The college choice process amounts to a number of related choices that will determine whether a student attends college, and where those students who choose to attend will end up going. In addition, factors that have the greatest influence on the college choice decision will change depending upon where a student is in his or her decision-making process.

College Choice

Hossler and Gallagher (1987) present a model that provides insight into the decisions students make at critical stages during their college choice process. Their model breaks the college choice process down into three phases: predisposition, search, and choice. Different influences are important in each of these stages. The predisposition stage is primarily concerned with the formation of aspirations to attend college, and ends with a tentative decision to go to college. Here, parental encouragement seems to be the most critical factor, but a number of other factors, including student achievement and parent education, are also important. Following the predisposition phase students move into the search phase, usually by the tenth or eleventh grade. During the search phase students begin to examine options. While parental encouragement and ability remain important, issues such as cost, SES and high school resources gain in relevance. By the eleventh or twelfth grade students narrow their

Table 2. College Choice Model

Stages	Factors	Outcomes
Predispositions: Grades 7-9	Parental encouragement and support Parental Saving for college Socioeconomic Status Parental collegiate experiences High school academic resources Student Ability Information about college	Reading, writing, math, and critical thinking skills Career and occupational aspirations Educational aspirations Enrollment in college-bound curriculum
Search: Grades 10-12	Parental encouragement and support Educational aspirations Occupational aspirations Socioeconomic status Saliency of potential institutions Student ability High school academic resources	Listing of tentative institutions Narrowing list of tentative institutions Securing information on institutions
Choice: Grades 11-12	Educational aspirations Occupational aspirations Parental encouragement Perceived institutional attributes (quality, campus life, majors, availability, distance) Perceived ability to pay (perceived resources, perceived costs)	Awareness of college expenses and financial aid Awareness of institutional attributes and admission standards Attaining scholastic aptitudes and attitudes Perceived support from family and friends Institutional commitment Submission of applications Preregistration Attendance Application for financial aid

Source: Adapted from Nora and Cabrera, 1992.

(Cabrera & La Nasa, 2000)

selections down to a set of institutions to which they will apply and thus progress to the choice phase of the model. At this point educational and occupational aspirations are of primary importance. In addition, institutional attributes and ability to pay become critical factors (see table 2) (Cabrera & La Nasa, 2000; Hossler, Braxton, & Coopersmith, 1996; Hossler & Gallagher, 1987; Hossler, Schmit, & Vesper, 1999).

A number of studies have examined the influences that effect different stages of the college choice process. These studies have identified variables that could be classified into broad categories including: ability and achievement, socioeconomic status, significant others, aspirations and values, demographic characteristics, residence characteristics, high school characteristics, and expectations of college (Hossler, 1984). The categories are not mutually exclusive and there is a considerable overlap due to strong associations between the variables. These relationships add to the complexity of studying the relative influence of any one aspect of the choice decision.

Ability and Achievement

Ability and achievement are among the most important factors in formation and realization of aspirations to go to college (Ellwood & Kane, 2000; Hossler, 1984; Hossler, Braxton, & Coopersmith, 1996; Hossler, Schmit, & Vesper, 1999). In their analysis of High School and Beyond (HSB) and National Educational Longitudinal Study (NELS) data, Ellwood and Kane (2000) indicate that achievement was the single most important factor in the students' decision to attend postsecondary education. Hossler, Schmit, and Vesper (1999) state that "next to parental encouragement, student achievement (as measured by self-reported grade point average) was the best predictor of

postsecondary aspirations...students who earn better grades receive more encouragement from parents – and also from teachers, peers, and other family members – to continue their education. In addition, grades are an indicator of success, and success itself encourages continued involvement in the source of that success - school" (p. 25-26).

The strong influence of achievement is not necessarily enough to overcome other factors that negatively influence enrollment. Choy (1999) found that low-SES, high-achieving students are less likely than middle and high-income students to enroll in postsecondary education after high school.

Socioeconomic Status

Family income and parent education levels have a significant, positive impact on college enrollment (Choy, 1999; Hearn, 1984; Hossler, 1984; Manski & Wise, 1983; Valadez, 1998). Manski and Wise (1983) also found that parent income and student academic preparation are associated with attendance at more expensive, and more selective institutions and that financial aid may encourage enrollment at higher ranked schools.

Choy (1999), in an NCES report on College Access and Affordability, found that over the past 20 years increasing proportions of high school seniors are moved directly to college. However, notable differences in the enrollment patters emerge based on differences in income. Students from higher-income families are more likely to enroll, as are students whose parents have higher levels of education. The type of institution students choose is also associated with income. In general, higher-income families are

more likely to send their children to private, not-for-profit institutions, or public four-year institutions. Of those who apply, low-income students exhibit enrollment patterns similar to middle-income students. These students are more likely to attend a two-year public college, or four-year public college. Braxton (1990a) found that students from high SES families generally attend more selective schools. However, the cost of the institution is not related to SES. In earlier work, Hearn (1984) found that low-SES students were less likely to enroll in high-resource, high-cost institutions.

Spaulding (2001) finds that SES has a strong positive association with the selection of a four-year college. However, financial aid appears to offer a mitigating effect for low-SES students. Specifically, for both aid applicants and non-applicants income was associated with the selection of a four-year college, but the effect size was smaller for aid applicants. In addition, less college savings had a negative impact on selection of a four-year college for non-applicants, but it was not significant for aid applicants.

Significant Others

Hossler (1984) found that consistent support of parents is a critical element in the formation of college aspirations to attend college and parental support remains important throughout the college choice process. Peer support can also be an important factor in the formation of college aspirations. Valadez (1998) found that having peers going to college has a positive influence on enrollment for Whites, but no significant effect for non-Whites. Valadez (1998) also finds substantially less influence of parental encouragement for non-White students. Hossler, Braxton, and Coopersmith (1996) found

that minorities spend more time thinking about college, but they apply and enroll in college less often.

Aspirations and Values

Consistent expectations of college enrollment are associated with a greater likelihood a student will enroll in college (Hossler, 1984, Adelman, 1999). Adelman (1999) found that students who consistently aspire to receive a bachelors degree complete their BA more quickly. Spaulding (2001) found that the student's expectation of completing a BA is strongly associated with the selection of a four-year college.

Students with less exposure to college are less likely to enroll. A number of factors corroborate this notion. For example, studies have indicated effects on college enrollment associated with proximity to college, parent education level, siblings and peers (including other family members) going to college. (Hossler, Schmit, & Vesper, 1999). McClelland (1990) stated "individuals from disadvantaged backgrounds who fail to develop or maintain high aspirations do not simply need a single individual to point out the appropriate path to them; they need to be surrounded by enough examples of success to believe that it is actually possible for them to attain it.

Valadez (1998) found that White and non-White students differ in their ability to turn aspiration into action. In a study of students who identified as aspiring to complete a bachelors degree, he found that despite higher scores on self-concept measures, non-White applicants were less likely to apply to college by the end of the 12th grade. In general he found that non-White students are less well prepared academically and more likely to come from a low-income family. Valadez concluded that aspirations alone are

not enough to allow students to successfully enter and complete college; students need to be better prepared to achieve academic success (Valadez, 1998).

Demographic Characteristics

Hurtado, Inkelas, Briggs and Rhee (1997) examined student predisposition and college application behavior as indicators of access, choice, and educational opportunity. They found that most students seek some form of postsecondary training, but the level and type varies considerably depending upon race. In addition, they found that the number of applications a student submits is associated with race/ethnicity, income, and ability level.

As indicated earlier, the type of institution a student attends varies by race, and to a lesser extent, gender (Morgan, 2001). Hearn (1984) found that controlling for academic background, Black students, female students, low-income students, students whose parents have less education, and students from larger families are all less likely to enroll in a highly selective institution.

Residence

Proximity to a college or university makes a difference in enrollment rates. Students who live closer to a college or university and those who live in urban areas are more likely to attend college. Students from states with more private colleges are more likely to attend a private college, and students from states with a better developed public college system are more likely to attend a public school. Students who attend college outside their home state are more likely to attend a private institution (Hossler, 1984).

High School Characteristics

School quality is positively associated with postsecondary enrollment (Hossler, Braxton, & Coopersmith, 1996). Additionally, there is a clear connection between school quality and achievement (Darling-Hammond, 1997, 1995/2001). Improvements in overall school quality generally results in improvements of individual achievement. Education reforms that raise expectations for student work and provide students with alternative means to acquire knowledge such as cooperative participation, small group activities, and an expectation that everyone can learn, positively effect peer relationships and home school connections, and minimize negative effects associated with race and SES (Banks & Banks, 1995; Darling-Hammond, 1995/2001, 1997; Ladson-Billings, 1995; Mehan, Lintz, Okamoto, & Wills, 1995/2001; Slavin 1995/2001; Shofield, 1995/2001).

Teachers and counselors in schools have a significant impact on the formation of aspirations for continued education, and the later realization of those aspirations. Minority youth tend to rely on high school counselors and teachers for information about postsecondary opportunities more often, but they are less able to convert that information into action (Hossler, Braxton, & Coopersmith, 1996; Valadez, 1998). Valadez (1998) found that non-White students get more assistance in the college application process, but they are less likely to apply. In further analysis, he finds that for Whites, getting help with the college application process is positively associated with college attendance, while it is not a significant factor for non-Whites. For both groups getting help with a financial aid form has a negative impact on enrollment. Qualitative work on the college choice process by McDonough (1997) suggests that counselors in lower SES high

schools may lower the aspirations of students based on characteristics other than achievement.

Private high schools generally have higher rates of students who go on to college, regardless of family background (Persell, 1997). This is not necessarily due to better quality education. Darling-Hammond (1997) notes that public schools often do a better job of preparing students than private schools do. More likely the effect is the result of a greater degree of student-teacher interactions, more effective counseling, and higher aspirations of peers and parents (McDonough, 1997, Persell, 1997).

In public schools there are class-based differences in the resources available to students. Upper- and middle-class students are exposed to better facilities, a more diverse curriculum which is much more likely to include college preparatory and advanced placement courses, better prepared teachers, and more extracurricular activities (Persell, 1997; Darling-Hammond, 1997). High minority and low SES schools tend to offer fewer college prep courses. Even in schools that do offer such courses, however, minority and low SES students tend to be disproportionately tracked into a lower or vocational curriculum (Persell, 1997; Darling-Hammond, 1997; Kincheloe, 1999; Rose, 1989/1990). Kincheloe (1999) writes "The best research indicates clearly that tracking lowers the achievement of those in the lower/vocational tracks without improving the performance of those in the higher/academic tracks" (p.140). Hossler, Braxton, and Coopersmith (1996) found that school track may be a better predictor of postsecondary enrollment than grades.

Expectations of College

Students expectations about school are important factors in the choice process. However, they are not necessarily an accurate depiction of a school. Students have a tendency to make decisions about schools based on very little information about them and may not be terribly diligent in their efforts to discover more information or sort facts from fiction. As a result students may not know what to really expect in the institution they finally select (Hossler, 1984).

Other considerations in the College Choice process

Hurtado et al. (1997) suggest that college choice models may reflect the behavior of high-income students, but that they do not adequately explain behavior of low-income students. Low-income students conduct a much more limited search and apply to fewer schools. In fact many students either don't apply or apply to only one school by the end of 12th grade. This was the case for 75% of Latino students and 44% of Asian American students in their study. Consistent with these findings, Braxton (1990a) found that low-SES students consult fewer sources in their college search process. Alternative choice models have examined market factors and individual preferences, pricing and economic return, and cultural norms to explain differences in enrollment patterns.

Market Factors and Individual Preferences

Studies that have examined market factors tend to apply various techniques to describe a matching process in which the preferences of the individual are matched to the characteristics of the school. In these models the schools collect or purchase data related to student preferences to determine their position relative to the competition, and make

adjustment in their marketing and outreach strategies to improve their image in the eyes of their target student population. Kealy and Rockel (1987) present findings on a study that considers students' perceptions of Colgate University. They assert that the enrollment decision is a tradeoff between cost and quality, and an institution's marketing and recruitment should be evaluated based on students' impression of the institution rather than their ultimate matriculation decisions. Hossler (1984) provides a model to help enrollment managers finesse their image for prospective students. He categorizes institutional characteristics according to those that are essentially fixed, like locus of control (e.g. public vs. private), general tuition levels, location, and academic program orientation, and those characteristics that are more or less flexible such as net price, academic program focus, student life programs, and communication strategy. The aim is to manage institutional image in a way that will attract the desired student population, thus enhancing the efficiency of the matching process described above.

McDonough (1997) describes the process of selecting institutions as a reflection of the social status of a students' family. She uses Bourdieu's concept of cultural capital to explain differences in the resources students bring to the college application process, and their sense of what type of postsecondary experience is appropriate. Three important factors emerge that differentiate students largely by SES. First, students from lower SES groups tended to have an expectation that they would be responsible for the bulk of their college expenses, while students from higher SES families had an expectation that the parents would be responsible for the majority of the bill. This may help to explain differences in students' response to price in higher education, especially among high

achieving low-income students who tend to enroll in less selective institutions than their higher income peers. Ellwood and Kane (2000) found that "the differences in college enrollment rates between high- and low-income youth [could be explained] simply by referring to the choices their parents are able to create for them by their ability or willingness to pay for college" (p. 304). Secondly, McDonough (1997) found that students from high SES high schools feel a sense of entitlement to more elite colleges whereas students from lower SES high schools feel entitled to lower tier four-year colleges or community college. Again, this explains differences in application and enrollment patterns for these student groups. Finally, McDonough found differences in access to information and support in the college search and application process according to the high school environment and family background that have important implications for the choice set developed by the student and the ultimate application and enrollment behavior.

A common element in different representations of the choice process is the importance of financial resources. The family's ability and willingness to pay for college clearly impacts whether and where a student chooses to attend. What is less clear is how these financial concerns impact, or are impacted by, other aspects of the choice process, and how to effectively mitigate for differences in financial resources. For example, given the importance of financial considerations one would expect financial aid to have a greater impact on enrollment decisions than it appears to have. The relatively small influence financial aid plays is likely due to self-selection that occurs earlier in the choice process.

Summary

Students choose to go to college, and select particular institutions, for a variety of reasons. The decision-making process is complex, but the results at the macro level are consistent. Students who come from wealthier, better educated families are more likely to attend college. Family wealth and education level effect not only the decision to go to college, for those who choose to attend college, these factors also effect where a student chooses to go. Wealth is a factor in proximity and sector of the schools students consider. Families with greater financial resources tend to send their children to schools further away, and are more likely to enroll their children in a four-year college, especially a private four-year college. Family wealth is also correlated with academic predictors like grades, test scores, and college preparation in high school, all factors that contribute to the advantage in educational attainment enjoyed by children from wealthier families. The financial aid system in the US has changed substantially over time and, especially in the 60's and 70's, was seen not only as a means to provide access to higher education regardless of family wealth, but also to facilitate college choice so that students would be able to attend the best institution they are qualified and inclined to attend. During the past two decades state and federal financial aid policies have increasingly favored the middle class, in many cases at the expense of the neediest students.

Chapter III

Methodology

Students today are faced with rising college costs and a relative decline in need based student aid. At the same time, many colleges are experiencing increased enrollment demand and declining state support. These factors may discourage enrollment of low-income and minority students despite the increasing importance of a college degree to social and economic mobility in this country. Although many colleges are actively pursuing strategies to attract and retain a diverse student body, waning support for affirmative action and targeted scholarships for minority students makes this goal difficult to achieve. Understanding how students make enrollment decisions is a critically important part of designing an enrollment strategy that enhances diversity on campus.

Using the college choice model presented by Hossler and Gallagher (1987) as a guide, one finds that factors important in the college choice process change as the student gets closer to the selection of an institution. This study focused on issues connected to cost of attendance – a factor that is important throughout the college choice process, but one that changes substantially in the final stage of the process. In the predisposition and search phase of the college choice process, there is a somewhat abstract notion of cost and an important influence of family income that affects whether a student chooses to attend college and what types of colleges a student considers. Throughout these stages students are working on a set of assumptions about cost that may or may not reflect

reality due to the way students gather information about colleges and the complexity in the college pricing and financing schemes that exist in American higher education. As students enter the choice phase of the decision process, they get more concrete information about the cost of attendance, and the influence of cost moves from an indirect influence on the process to a direct concern about affordability – if students are unable to afford their first choice institution they are likely to select a less expensive alternative or delay entry. Understanding the decision making process of young people is complicated by the fact that differences in enrollment behavior are associated with a complex array of background characteristics. As discussed in preceding sections, virtually every aspect of a student's life seems to impact this decision.

Family income is an important factor in whether a student will develop a predisposition to attend college, and if s/he does choose to go to college, income will impact the type of schools s/he chooses to apply to and ultimately attend (Cabrera & La Nasa, 2000; Hossler, Braxton & Coopersmith, 1996; Hossler & Gallagher, 1987; Hossler, Schmit, & Vesper, 1999). Although a number of studies have estimated the marginal effect in enrollment associated with a change in net price (Hossler, 1984; Kane, 1999; Leslie and Brinkman, 1987; Manski & Wise, 1983; McPherson and Schapiro 1991; St. John, 1990;), the role of financial aid in the enrollment decision is often difficult to isolate from other factors. Linsley (1997) notes that through the 1970s, minority participation in higher education greatly increased. This is typically associated with affirmative action, but as Linsley notes, this was also a time of significant growth in federal and state financial aid programs. The 1980s saw a waning of support for need-

based financial aid programs in favor of benefits to middle-income students. Coincident with this is a decline in African-American participation rates to pre-1965 levels by 1985. Since that time a number of changes have occurred in the financial aid system in the US, which many argue represent a continued movement toward what Hossler (1984) termed "comfort aid;" those funds targeted toward middle-income students who would likely attend with or without the aid.

While state and federal programs have moved away from their focus on need-based aid, institutions have felt pressure to do the same. Many institutions manage a number of federal and state funded campus based (including, but not limited to: SEOG, Perkins, and Workstudy) and institutional aid funds (usually from current tuition revenue and endowments). For these funds, schools tend to have a great deal more latitude on how (or to whom) the aid is distributed. While the financial aid professional community encourages institutions to target their aid to the neediest students, often there is pressure from parents and other interested parties to award institutional funds to students based on academic merit or other non-financial criteria. A change in emphasis away from need-based awards represents a shift away from the ideal of access and choice for all students and may also represent a less efficient use of institutional funding in the management of enrollment.

Previous research indicates a need for a better understanding of the role financial aid plays in the college choice process. The literature demonstrates that financial aid does influence college enrollment in general, especially for low- and middle-income students. However, it is important to note that there is variation in the influence of aid by aid type,

by income group, and by race/ethnicity. In general these studies indicate that a decrease in net price is associated with an increased chance a student will enroll in college (Kane, 1999; McPherson and Schapiro 1991; St. John, 1990; Leslie and Brinkman, 1987). The impact of changes in award policy at individual institutions is less well understood, and is likely to vary considerably depending upon institutional characteristics and the population served.

Somers and St. John (1997) argue that analysis of institutional data is essential to better understand factors that influence enrollment at a particular institution. They compare data from four schools, and their findings indicate that, controlling for other factors, applicants with more aid offered were actually less likely to enroll, suggesting that aid offered was not sufficient to encourage enrollment in those institutions. Somers and St. John also found that different types of aid, and different institutional characteristics, influence enrollment in different ways. For example, at one of two public doctoral institutions included in their study, they found that applicants tended to respond positively to loans and workstudy, while other financial aid variables had a negative influence on enrollment. At the other three institutions included in the study, financial aid variables, when significant, had a negative impact on enrollment. The effect size and significance did vary by institution. The study highlighted considerable differences between institutions, providing support for their contention that a better understanding of enrollment effects using specific institutional cases is a critical step in better understanding the role of financial aid in enrollment management and facilitating choice for students.

It is critical that institutions understand their position in the market relative to competing institutions and factors that are most important in attracting and matriculating students. Although the literature discussed provides some insight into the college selection process, it is important to recognize that each applicant and his/her family will approach the enrollment decision in their own way. Kane (1999) notes that "...parents and students may not always think like good economists when it comes to investing in higher education" (p.145). The implication is that factors other than costs and expected returns have the greatest influence on the decision to enroll, and these economic risks and benefits may not be effectively evaluated. That said, it is important to note that cost does matter and schools may need to commit more resources to gift aid for low-income and otherwise disadvantaged students to address affordability concerns and encourage enrollment. To do that, enrollment managers need tools that enable them to make student aid award decisions that will maximize enrollment yield.

Theoretical Basis and Research Questions

Financial aid plays a significant role in the decision to attend college in general and in the ultimate college enrollment decision. St. John (1992) provides a model for using existing institutional data to better understand the effectiveness of financial aid, and improve enrollment management practice and theory. Drawing on his framework, this study seeks to develop a new model that will enable institutions to assess the efficiency of their financial aid packaging strategy by looking at the effect of financial aid on enrollment yield in light of student background characteristics. In addition, this model

will add variables that include information on the relative position of the target institution in a student's choice set (Braxton, 1990b), and the ultimate destinations for those students who do not attend the subject school. While the data under investigation, and subsequent analysis, will only apply to one institution, the model will be generalizable to other institutions. Most of the data used is readily available from institutional sources, however, this study will draw upon some resources that may require the purchase of outside data, or additional data collection by the institution, specifically with regard to some of the outcome measures that use data from the National Student Clearinghouse.

This study will address the following research questions:

- How do students from different economic backgrounds respond to their offer of admission and does the financial aid award have an impact on this decision?
- How does the financial aid award interact with other factors in the student's decision to enroll? Does financial aid substantially affect where students choose to enroll?
- Is financial aid sufficient to facilitate choice in the college enrollment decision of low-income applicants? Specifically, is financial aid sufficient to bridge the financial gap for students with fewer economic resources and allow them to access their first choice destination?

- How can packaging policy be modified to better address financial constraints of the neediest students to better ensure that low-income financial aid applicants are not deterred by cost of attendance?

Sample

A case study is used to examine the impact of financial aid on enrollment. This study will investigate enrollment yield at the University of Washington for the freshmen class of autumn 2001. The University of Washington is an Urban, Comprehensive Research institution with selective admission. The UW offered admission to 10,937 freshmen for autumn 2001, of these 5583 (51%) returned their enrollment confirmation, indicating their acceptance of the offer of admission. For the purposes of this study, those students who were offered freshman admission, applied for financial aid, and were considered "dependent" for the purposes of financial aid, were included. Additionally, the sample is restricted to those students who are considered Washington Residents for tuition purposes at the time aid was awarded. These limitations yield a sample of 3,484 Washington residents who were financial aid applicants and who were offered freshman admission to the University of Washington in Autumn 2001.

Data

Data were obtained through institutional sources. Academic and background information on students offered admission was provided by the Office of Admissions. In addition, the Office of Admissions provided the National Student Clearinghouse data that indicates the actual destinations of students who matriculate at other institutions. The Office of Student Financial Aid provided detailed award and budget information for

students offered admission. The award data reflects the initial offer of award sent to the students following their offer of admission. This study considers both the students initial decision to enroll and their ultimate matriculation decision in Autumn Quarter 2001. Award data is limited to the initial offer of aid.

The data files provided were linked using the "syskey" variable, a unique identifier used in the UW database system. Files provided by the Office of Admissions consisted of a series of tables in Microsoft Access; some of these files were created by merging institutional files using other key variables (like social security numbers) which were removed by the data provider prior to delivery. The National Clearinghouse data included the FICE codes of the schools where students enrolled in Autumn 2001. These data were matched with institutional information including school name, school sector, and school control using a "crosswalk table" developed by The Institutional Codes Bridge project (1995). This procedure was repeated for the listing of schools on the FAFSA. The files obtained from the Office of Student Financial Aid included a set of Microsoft Excel files. In all cases data were converted first to Microsoft Excel 5.0 worksheets, then imported into SPSS 9.0 files. These SPSS files were then merged using the "Syskey" variable to match cases. The resulting SPSS file was then reduced to include only those students who met the selection criteria described above for this study. The study procedures were reviewed and received the appropriate approval from the University of Washington Human Subjects division (see Appendix A for Human Subject Division approval letter).

Independent Variables

A series of different analyses will be performed. The variables used in the various analyses are categorized in the following groups (see Appendix B for coding information):

1. **Socio-demographic characteristics** including: race/ethnicity, gender, expected family contribution (EFC) – EFC provides the measure of the family's economic resources used in the determination of the financial aid award. Here it is used as a composite measure of economic resources that takes into consideration student and parent income and assets, including college savings, family size, and parents age. Parent education, and parent alumni status are also considered.
2. **Academic predictors** including: high school GPA and test scores (SAT or ACT).
3. **Choice Set:** Data from the FAFSA are used to create measures to indicate the relative position of UW in the choice set which include: The total number of institutions on FAFSA; Ranking of UW on FASA; Type of number one institution (two-year, four-year); and, Control of the number one institution (public, private).
4. **Financial Aid award:** Financial Aid variables were grouped at various levels of aggregation for different analyses. The categories include: Total Aid Offered; Self-Help aid; Gift aid; Parent Loan; Percent of total budget met with Grant Aid; Parent loan; Student loans; Federal / State Grants; Campus Based

and Institutional Grants; Workstudy; and Unmet Need (the portion of cost of attendance not met by aid).

Dependent Variables

A number of different analyses are conducted in the course of this study. This requires the use of several dependent variables including:

1. **Accept**: Whether the student has accepted the initial offer of admission.
2. **Matric:** The type of institution the student ultimately enrolled in (UW, 2 year public, 2 year private, 4 year public, 4 year private).
3. **Matric-2yr:** Whether the student has matriculated at UW vs. a 2-year college.

Packaging Policy

The University of Washington packages student aid using an "equity packaging" formula. Need-based funds are awarded to students based on EFC ranking and other factors including loan debt for some funds. Student awards based on the "Traditional" budget receive a maximum of 55% of the total budget in gift aid. Scholarship funds including non need based institutional gift funds and other "outside" aid are not counted against equity, therefore some students receive gift awards greater than 55% of their budget. (University of Washington Office of Financial Aid, 2002)

Analytic Approach

The analysis is broken down into three parts using a variety of statistical techniques and various levels of aggregation for the financial aid variables. An analysis of descriptive statistics is carried out, followed by a series of logistic regression analyses. Finally, discriminant analysis is used to develop a predictive model that allows for classification of new cases. This final model allows for the prediction of enrollment decisions of applicants under various award policy variants and estimates the effect on enrollment associated with a change in the financial aid award policy. All statistical analyses were conducted using SPSS 9.0 for Windows. The award simulations used in the final model are calculated using Microsoft Excel.

Descriptive Analysis

Descriptive analysis, including frequency tables and cross-tabulation analysis, is used to provide better understanding of the data, and enrollment decisions of various groups of applicants. Frequency analysis is an important tool to summarize data and provides the researcher with an overall understanding of the variables under consideration. Cross-tabulation analysis provides a means to easily compare groups in an intuitive manner. (Zikmund, 1991). Cross-tabulation analysis also provides an easy way to calculate and compare enrollment yields for various subgroups of students. The dependent variables *accept* and *matric* are analyzed using descriptive analysis. Finally, correlation analysis provides researchers with a means to compare the linear relationships between variables (Moore & McCabe, 1999).

Logistic Regression

A series of logistic regressions are used to determine the influence of each variable on the odds a student will enroll. The method was selected because of its strength in estimating effects for a dichotomous dependent variable. A dichotomous outcome variable does not allow for efficient use of Ordinary Least Squares regression (OLS) due to inaccurate estimation, and invalid tests of significance that result from lack of a normal distribution of errors, and lack of homoscedasticity (the error term varies depending upon the value of the independent variables). Logistic regression or Probit are typically called for in such an application. The results of the two methods are generally considered to be equivalent and each allows for a linear representation of the effect on the outcome. Logistic regression provides a linear representation of an S shaped probability distribution. (Pampel, 2000; Somers & St. John, 1997; Menard, 1995; Kleinbaum, 1994; St. John, 1992). The results of this analysis are a set of log odds, which may be reported as the delta-p statistic, a calculation that estimates the percent change in the probability of the outcome measure based on a unit change in the independent variable at a particular value (usually the series mean) (St. John, 1992; Peterson, 1984). Alternatively the results may be reported as the change in the odds the outcome will occur. In this case the relationship to the dependent variable is linier so may be understood to be the effect for the full range of values (Pampel, 2000).

Data are entered into a series of models that test the influence of financial aid (and other predictor variables) for all applicants. The first series of models considers the broad categories of aid: "Self Help Aid" which consists of workstudy and loans, "Gift

Aid" consisting of grants, need based scholarships, and tuition waivers and exemptions, and finally, "Parent Loans" are included in a separate category. The data are entered in the following blocks:

Block 1 Socio-demographic characteristics: race/ethnicity, gender, EFC, parent education, and parent alumni status.

Block 2 Academic predictors: grade point average and test scores.

Block 3 Choice Set: Number of schools listed on the FAFSA, Placement of UW on the FASA (1-6), Type of number one school (2 year, 4 year), Control of number one school (public, private).

Block 4 Financial Aid variables.

Dependent Variable: Accept (receipt of the enrollment deposit prior to the deadline).

Data were next entered into a similar model for those students who were considered low-income. This study defines low-income students as those students whose EFC (expected family contribution) is less than or equal to half the cost of attendance using the standard institutional aid budget. For this group, the series of models again uses the broad categories of self-help, gift, and parent aid. In a second analysis, the aid variable is disaggregated to measure the effect of Grant Aid; Parent loan, Student loans, Federal / State Grants, Campus Based and Institutional Grants, and Workstudy.

Discriminant Analysis

Discriminant analysis is a procedure that is used to classify cases into two or more mutually exclusive categories. The analysis is useful in both interpretation of data and in

classification of new data (Klecka, 1980). The final model developed in the analysis will be applied to estimate the effect on enrollment resulting from a change in financial aid award policy. Specifically, the model is used to estimate the change in enrollment yield for a subgroup of applicants who were awarded aid based on the "traditional" budget of low-income applicants (as defined above) if the percentage of their need that is met by grants is changed. The model uses the same variables as those used in the logistic regression analyses indicated above. The analyses are run using the FA-3 level of aggregation for the financial aid variables (percent of total budget met by gift aid) with accept as the outcome variable. For the purposes of this analysis, the total amount of grant aid available to freshmen applicants is assumed to be fixed, meaning that some applicants will end up receiving larger awards of gift aid while others will receive lower gift awards.

Limitations

This study has a number of limitations that should be noted. The decision to use EFC as a measure of socioeconomic status was a compromise. The advantage of EFC is that it considers a range of variables, including both parent and student income and assets, family size, number in college, and age of the eldest parent. The formula is designed as a measure of a family's ability to contribute toward the child's education and, as such, is a good proxy to compare students from different backgrounds. What is lost are individual effects of each of these variables on the outcome which may be valuable information in better understanding decisions students make.

Although the data gleaned from the student's application for financial aid provides a good deal of information on the choice set that student was considering, more information on preferences would have been helpful. It was hoped that survey data for a subset of applicants who took the ACT would be available. The ACT includes a survey which asks students to weigh the relative importance of a number of factors important in the college choice process. Those data were unavailable for this study.

Finally, the model developed here is clearly a starting point. Further analysis with additional years of data, more sophisticated award simulations, and the addition of more information on preferences are necessary to further develop this model. Although the research draws on existing data sources, the management and matching of these data sources would need to be simplified in order to use an analysis such as the one developed here on a systematic basis. In the current form the admissions and financial aid data may be linked easily, but the choice set variables require a number of steps to match and code which could be automated with a time minimal commitment by an experienced database programmer.

Chapter IV

Presentation of Data

Descriptive results

The average applicant earned $3111 in 2000 and came to the University of Washington from a family earning an average of $81,311. There is considerable variance in the income of both students and parents with a standard deviation of $17,479 and $55,967 respectively. The average student was offered grant aid that would cover 14% of his/her cost of attendance; unmet need averaged $1311. Detailed data on average award amounts for individual funds are listed in appendix C, table 3. On average, students listed more than 3 schools on the FAFSA and there was little difference in number of schools listed based on ethnicity or gender (see appendix C, table 2). The average Parent had at least some college beyond a two-year degree. As indicated previously, admission to the University of Washington is competitive. The average GPA of students offered admission was 3.71 with a standard deviation of .26, and an average SAT of 1181 with a standard deviation of 155.

UW Rank on FAFSA

Students who rank UW higher on the FAFSA are more likely to accept their offer of admission and ultimately enroll. 80.2% of students who listed UW as the first school on the FAFSA accepted their offer of admission. The relationship between the placement of UW on the FAFSA and enrollment supports the use of position on the FAFSA as a ranking by the students (see Figure 1). Students who listed UW in the second, third, fourth, fifth, and sixth positions accepted their offer of admission 41.3%, 35.4%, 29.2%,

28.7%, and 21.3% of the time respectively. The relationship of UW Rank and acceptance is correlated at r = .404.

Low-income students tended to rank UW higher, as did some minority groups. Students in the first EFC quartile listed UW first 66.3% of the time compared with 57%, 54.1%, and 47% for the second, third, and fourth quartiles. The correlation of EFC and UW Rank is r = -.159 indicating that higher levels of income are associated with a lower ranking of UW. White students listed UW in the first position 54.3% of the time. African Americans and Hispanics listed UW in the first spot 52.3% and 58.6% of the time respectively. Asian / Pacific Islander students tended to rank UW higher, listing the school first 67.8% of the time, and Native Americans listed UW first less often, 46.2% of the time. Women listed UW first about as often as men did, 55.2% and 57.4% respectively. Parent Education and Alumni status were also associated with UW Rank. Parents with more years of Education ranked UW lower (r = -.165), as did students whose parents were alumni (r = -.101).

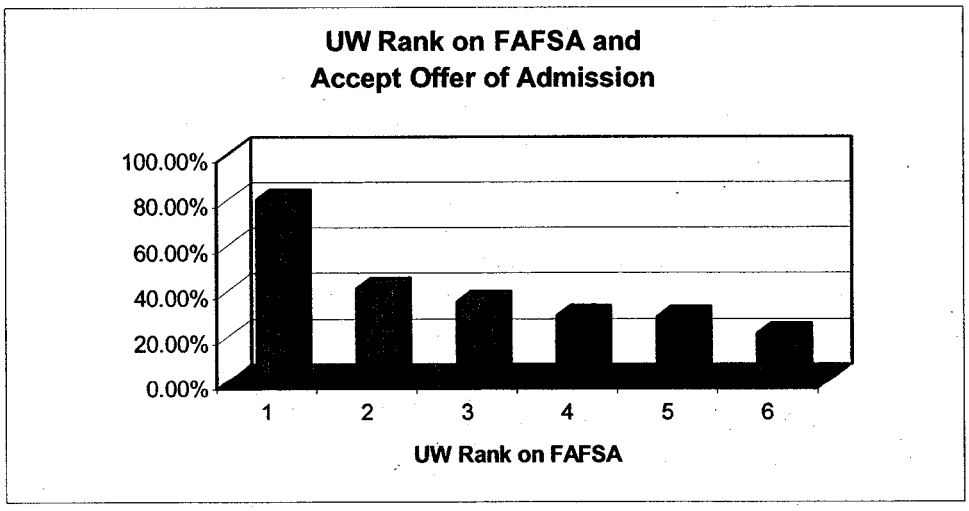

Figure 1. UW Rank on FAFSA and Accept offer of Admission

Number of Schools Listed on FAFSA

Students who listed more schools on the FAFSA accepted the offer of admission less often. Of students who list only one school on the FAFSA, 96.6% accept their offer of admission. The yield drops to 69.9% for students who list two schools, and 57.9%, 50.8%, 46.6% and 37.8% for three, four, five and six schools respectively (see Figure 2). Although the average number of schools listed is about same when looking at White vs. non-White applicants, this masks differences that emerge when minority groups are disaggregated. Comparing students who listed six schools on the FAFSA reveals differences by race / ethnicity. About 16.8% of White students listed six schools compared to 27.3% of African American students. Asian / Pacific Islander students list six schools about 16.5% of the time and Hispanic and Native American students list six schools 17.1% and 33.3% of the time respectively. Men listed six schools about as often as women, 17.2% and 17.4% respectively. Students from families with greater financial resources were more likely to list six schools. Students in the highest EFC quartile listed six schools 20.8% of the time compared to 14.8%, 18.9% and 15% for third, second, and first income quartiles respectively (see Figure 3). The relationship yields a significant association between EFC and number of schools listed ($r = .115$). Students who listed more schools less often included UW in the top spot ($r = -.508$), and they were more likely to list a private school first ($r = .363$). Students whose parents had more years of education, and children of UW alumni listed more schools ($r = .145$ and $r = .079$ respectively). Finally, students who listed more schools had higher test scores ($r = .113$).

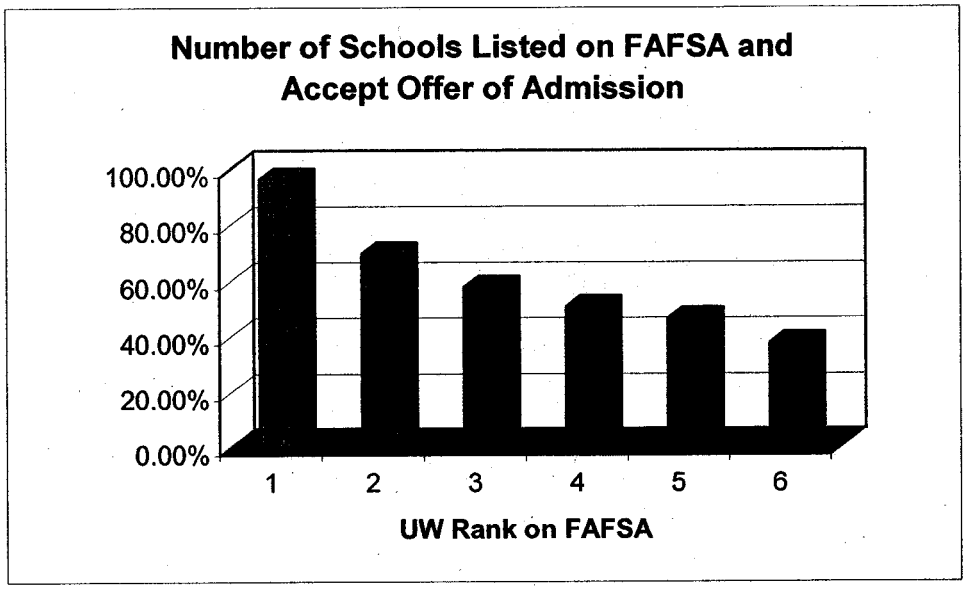

Figure 2. Number of Schools listed on the FAFSA and Accept offer of admission.

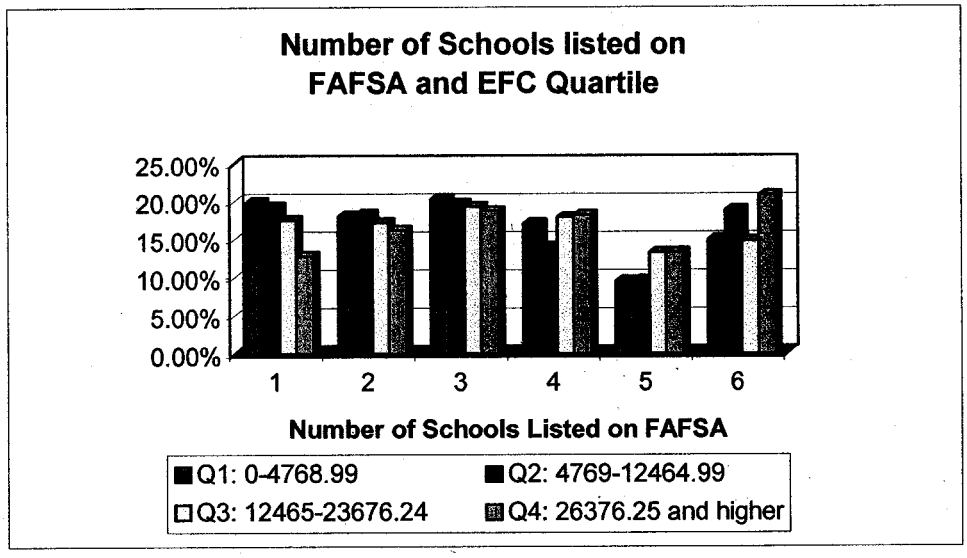

Figure 3. Number of Schools listed on the FAFSA and EFC.

Control

Students who rank UW lower matriculate at private schools more often than schools in other sectors (see Figure 5). Of students who listed a private school first, only 32.9% accepted their offer of admission to UW compared to 71.7% of students who listed

a public institution first. Listing a private school first is negatively associated with acceptance of the admission offer (r = -.355). Matriculation data indicate that students who list a private school first enroll in a private four-year institution 46.3% of the time, UW 30.9% of the time, and another public four-year school 7.4% of the time. If a public school is listed first, 69.4% of the students offered admission matriculated at UW, 15.3% enrolled in another four-year public school, and 8.1% enrolled in a private four-year school.

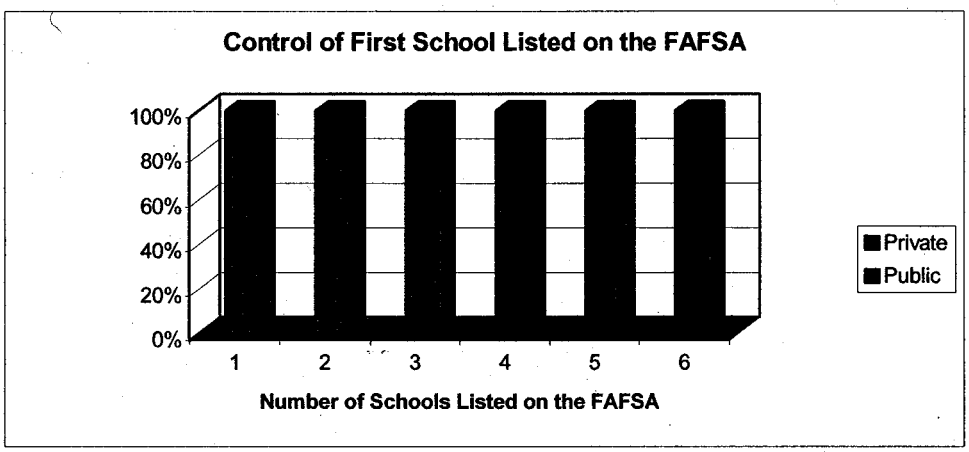

Figure 4. Control of First School listed on the FAFSA and Number of Schools listed on the FAFSA

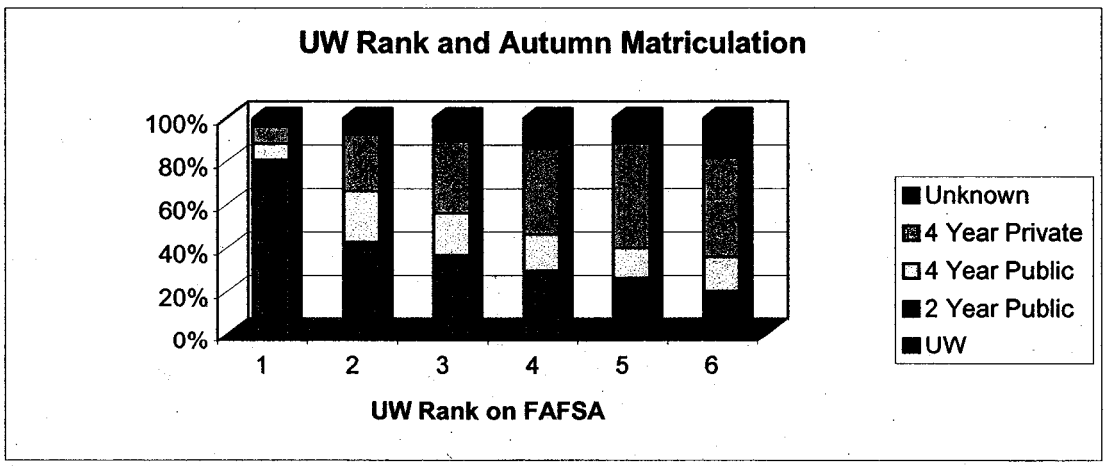

Figure 5. UW Rank on FAFSA and Matriculation.

Men listed a private school first about as often as women (27.4% and 27.7% respectively). There were differences by ethnicity, overall minority students were less likely to list a private school first (r = -.076). White and Native American students most often listed a private school first (29.2% and 30.8% respectively). African Americans, Hispanics, and Asian / Pacific Islanders listed a private school slightly less often (25%, 24.3%, and 20.3% respectively). Students with fewer financial resources listed private schools in the first position less often than students from higher income groups. Students in the first income quartile listed a private school first 19.4% of the time compared with 23.9%, 28.7%, and 38.2% for the second, third, and fourth income quartiles (r = .175). Students who listed a private school first tended to have higher grades (r = .119), higher test scores (r = .248), and better educated parents (r = .171) who were more often UW alumni (r = .109).

Race / Ethnicity and Gender

Although there are differences in how often minority applicants listed University of Washington first on the FAFSA, African American, Asian / Pacific Islander, and Hispanic students accepted their offer of admission at a remarkably similar rate (75.0%, 73.7%, and 76.7% respectively). White and Native American students accepted their offer of admission less often: (57.4% and 52.5% respectively). Overall, non-White applicants accepted their offer of admission more often than white applicants (r = .154). Non-White applicants also tended to have slightly lower GPAs (r = -.132) and test scores (r = -.223). Minority applicants came from families that had fewer financial resources (r

= -.173) and had parents who had fewer years of education (r = -.163), and who were less often UW alumni than White applicants (r = -.091).

Women accounted for 55.7% of those offered admission to the University of Washington for the fall of 2001. Of the women offered admission, 58.7% accepted their offer, compared 62.6% of men. Women accept their offer of admission less often than men (r = -.039). Of those who returned their enrollment deposit, 97.7% of the men matriculated in the fall compared to 95.7% of the women. Women and men apply to roughly the same number of schools, listing an average of 3.45 and 3.33 schools respectively, there was no significant correlation between gender and number of schools listed on the FAFSA. About 27.4% of the men in this population listed a private school as their first choice institution, roughly the same as the number of women, 27.7%, with no significant correlation between gender and listing of a private school first on the FAFSA. Women had slightly lower test scores (r = -.185) and slightly higher GPAs than men (r = .067). Parent education was slightly lower for women (r = -.057).

Parent Education and Alumni Status

In general, there was a negative association between parent education and acceptance of the offer of admission (r = -.124). Applicants whose parents had "some schooling" (less than High-School diploma) accepted their offer of admission 87.7% of the time. The yield is just over 66% for children of high school graduates or those with some college. Of children whose parents earned a two-year degree, 61.6% accepted their offer of admission as did 56.9% and 53.6% of students whose parents held a bachelors degree or beyond respectively. Matriculation data indicate that students whose parents

had more years of schooling tended to matriculate at private schools more often. Children of parents with schooling beyond a bachelors degree matriculated in a private school 25.3% of the time, this compares to 11.1% for children of high school graduates and 4.6% of children of parents with "some schooling" (see appendix D table 28). Children of UW Alumni also accepted their offer of admission less often, 50.0% of students for whom both parents are alumni and 56% of students with one parent who is an alum accept their offer of admission compared to 61.1% acceptance rate when neither parent is an alum. This relationship persisted even when the sample was limited to only those students who had at least one parent with a bachelors degree or higher. In this instance, 49.8% of students for whom both parents are alumni and 53.7% of students with one parent alum accepted their offer compared to 56.4% when neither parent is an alum. Data on matriculation decisions suggest that UW alumni are more likely to send their kids to a private four-year school. Of applicants whose parents had at least a bachelors degree, 32.1% of students with two alumni parents enroll in a private four-year school compared with 22.2% and 22.7% for no alumni parent and one alumni parent respectively.

Expected Family contribution

As indicated, family financial resources, as measured by EFC, interact with other variables in important ways. Low-income applicants tend to rank UW higher in their choice set ($r = .159$) while higher income students generally include more schools in their choice set ($r = .115$), and more often list a private school first ($r = .175$). Higher income students were less likely to accept their offer of admission and more likely to enroll in a

private four-year school than low-income students. Students in the highest income quartile accepted their offer of admission 53.6% of the time, compared to 70.8% of students in the lowest quartile. The middle quartiles had admissions yields of 56.8% for the second income quartile, and 58.7% for the third quartile. Overall, the relationship between EFC and acceptance of the admission offer yielded an r = -.113. Matriculation data reveal that higher income students are attending private, four-year colleges at a higher rate than the other income groups, 24.6%, compared to 14.9%, 20.8%, and 17.5% for income quartiles one, two, and three respectively. Students in the second quartile are more likely to enroll in a two-year college. 4.2% of students in the second income quartile enrolled in a two-year public institution. This compares to 2.7% for the lowest income quartile and 1.8% and 1.7% for the third and fourth income quartiles. In addition, higher income students tend to have higher grades (r = .106) and test scores (r = .224), and are more likely to have parents with more years of schooling (r = .283) and more often have parents who are UW alumni (r = .192). Minority applicants (non-White) tended to have fewer family financial resources than White students (r = -.173).

Accept Offer of Admission

Students who ranked UW higher on the FAFSA tended to accept their offer of admission more often while those who listed more schools or listed a private school first were less likely to accept their offer of admission. In addition, students who had better grades (r = -.085), higher test scores (r = -.154), better educated parents, and students who were children of UW alumni were less likely to accept their offer of admission. Minority applicants were generally more likely to accept their offer of admission, although there is

some variation when groups are disaggregated, and women were slightly less likely to accept their offer of admission. Financial aid variables also had significant associations with acceptance of the offer of admission. The total aid offered was correlated with acceptance at r = .139. When award amounts are aggregated at the FA-2 level, Self Help aid is positively associated with acceptance (r = .065) as is Gift Aid (r = .151). PLUS loan has a negative association with acceptance (r = -.051). When the awards are disaggregated further at the FA-4 level, Federal and State grant are positively associated with acceptance with an r = .136, as are Institutional grant, r = .098, and college workstudy, r = .098. Unmet need has a negative association with acceptance with an r = -.276.

Matriculation

As discussed in the previous sections, data on matriculation decisions reveal important information about interaction of a number of background characteristics and the apparent choice set students were considering. Generally speaking, children from wealthier backgrounds matriculate in a private four-year school more often than students with fewer economic resources. This pattern is also evident for students whose parents have more years of education, and students who have higher GPAs and test scores.

The matriculation data also suggest what may be a relationship between income level and enrollment in a two-year college. As indicated earlier, students in the second income quartile enrolled in two-year colleges more often than students in the other income groups. Further analysis of this group reveals important differences in their financial resources when compared to students in the first income quartile. The students

in the second income group have less unmet need than the poorest group of students, however, the majority of their budget is met by some combination of self-help aid, primarily EFC, Stafford Loan, and PLUS loan. Students in the first EFC quartile, on average, have about 47% of their cost of attendance met by gift aid compared to 6% of the cost of attendance met by gift aid for the second income quartile. EFC, Stafford Loan, and PLUS loan combine to make up 27.4% of the budget for students in the first income quartile, compared to 90.7% for students in the second income quartile.

A comparison of students who matriculate at the two-year college and students who matriculate at UW reveals important differences in their financial aid awards. Students who matriculated at the two-year college received higher average student loan awards and PLUS loan awards ($1582 and $1377 respectively) compared to UW matriculants ($1026 and $565 respectively). In addition, two-year college matriculants had lower workstudy awards ($310 compared to $401 for UW matriculants), lower gift awards ($1390 compared to $2292 for UW matriculants), and greater unmet need ($2550 compared to $620 for UW matriculants). These differences in award amounts may indicate that lack of funding for UW attendance may influence the decision to attend a two-year college for some students.

Logistic Regression results

The logistic regression analysis added variable groups in steps. At step one of four, the sociodemographic variables were entered into the model. Ethnicity, gender, and parent education were significant. The odds a Non-White student would accept were

96.17% greater than for a similarly qualified White student. Women were 17.24% less likely then men to accept. Students whose parents had a greater level of education were 8.89% less likely to accept their offer of admission. Overall predictive accuracy of the model at step one is 60.97% with a $p < .001$.

In step two, the academic predictors were added. Ethnicity, gender and test scores were significant. Non-White applicants were 86.94% more likely to accept admission while the odds women would accept were 21.62% lower than for men. An increase of 10 points on the SAT decreased the odds a student would attend by 11.07%. Parent education was no longer significant. The overall accuracy at step two is 61.26%, $p < .001$.

In step three, the choice set variables were added, and the predictive power of the model improves to over 71%, $p < .001$. In this model ethnicity, number of schools listed, UW rank, and control of first school are significant with associated change in odds of acceptance of 115.94%, -29.40%, 42.39% and –50.83% respectively. Gender and test scores are no longer significant predictors in the model.

The final model, including the FA-2 financial aid variables (aggregated as Self-Help, Gift, Parent Loan), yields a predictive model at 71.54% accuracy, $p < .001$. Variables statistically significant in the final model include ethnicity, GPA, number of schools, UW rank, control of first school listed, gift aid, and PLUS. This analysis indicates that the odds of enrollment are 82.91% greater for minority (non-white) applicants than for white applicants. A tenth of a point increase in GPA yields a 5.93% decrease in the odds a student will enroll. Listing an additional school on the FAFSA is

associated with a 30.19% decrease in the odds a student will enroll. Ranking UW higher yielded a 42.3% increase in the odds a student would accept his/her offer of admission. Students who list a private school first were 51.46% less likely to accept their offer of admission. A $100.00 increase in gift aid improved the odds a student would enroll by .93% and a similar increase in PLUS loans decreased the chances a student would enroll by 1.16%.

The impact of these variables on the probability of enrollment was calculated for the average applicant. On average 60.4% of students in this sample accepted their offer of admission. The probability a non-White applicant would accept his/her offer of admission was 14.44% greater than that of a similarly qualified white applicant with similar background characteristics and financial aid award. Students with higher GPAs were less likely to enroll, for otherwise similarly qualified applicants a tenth of a point increase in GPA decreased the probability they would accept the offer of admission by 1.46%. Listing an additional school decreased the probability the average student would attend by 8.59%, and ranking UW higher on the FAFSA increases the probability a student will accept his or her offer by 8.44% for each rank. An otherwise average student who listed a private school first on the FAFSA was 17.29% less likely to enroll than one who listed a public school first. Financial aid variables also had a significant impact on enrollment. For the average applicant a $100 increase in gift aid resulted in a .22% increase in the probability he/she would accept the offer of admission, while a $100 increase in student loans decreased the probability a student would accept by .28%.

The second analysis used the FA-4 level of aggregation (Loans, Campus and Institutional Grants, Federal and State Grants, Workstudy, Parent Loan, and Unmet Need) for the financial aid variables. The model predicts the dependent variable accurately 74.95% of the time with $p < .001$. Significant variables in this model include: Ethnicity, Number of Schools listed on the FAFSA, UW Rank, Control of the first school listed (public or private), Federal and State Grant, Unmet need, and Institutional grant. Non-White students were 73% more likely to accept their offer of admission than White students. An additional school listed on the FAFSA decreased the odds a student would accept his/her offer of admission by 30.57%. Students who ranked UW higher were 41.68% more likely to accept their offer of admission, while students who listed a private school first were 47.87% less likely to accept their offer of admission. A $100.00 increase in Federal / State Grant yields a 1.25% increase in the odds a student will accept his/her offer of admission. A similar increase in Institutional Grant improves the odds a student will accept by 1.31%. A $100.00 increase in unmet need reduces the odds a student will accept the offer of admission by 2.65%.

Again, the change in probability was calculated for the average applicant. The probability non-White applicants would accept the offer of admission was 13.11% greater than for White applicants. Students who listed an additional school were 8.72% less likely to accept their offer of admission, while students who ranked UW higher had 8.33% higher probability they would accept the offer of admission. Listing a private school first decreased the probability a student would accept by 15.58%. For the average student a $100 increase in loans increased the probability he/she would accept by .3%

and a similar increase in institutional grant increased the probability a student would accept by .31%. A $100 increase in unmet need decreased the probability a student would accept by .64%.

In the third analysis the procedures were repeated for the subgroup of applicants whose EFC was at or below the median for all applicants. In step one (socio-demographic predictors) Ethnicity, Gender, and EFC are significant The odds a non-White student would enroll were 98.43% greater than for a similarly qualified White applicant. Women were 23.11% less likely to accept the offer of admission, and a $100 increase in EFC was associated with a .47% decrease in the odds a student would accept the offer of admission. When the academic predictors were added Test Scores were significant. An additional 10 points on the SAT was associated with a 15.7% decrease in the odds a student would accept the offer of admission. Ethnicity, Gender, and EFC remain significant in step two (see appendix F, table 2). With the addition of the choice variables the model included the following statistically significant variables: ethnicity, gender, EFC, parent alumni status (Legacy), number of schools listed on the FAFSA, UW rank, and control of first school listed, test scores were not significant in this step. In the final step the financial aid variables at the FA-2 aggregation level were added. This model correctly estimated acceptance for 76.14% of the cases ($p < .001$) with a model that included ethnicity, gender, parent alumni status, GPA, number of schools listed on the FAFSA, UW rank, control of first school listed on the FAFSA, and PLUS loans as statistically significant predictors. Minority applicants were 65.30% more likely to enroll than white applicants and women were 30.73% less likely to enroll than similarly

qualified men. An additional parent who is a UW alum increased the odds a student would accept the offer of admission by 69.3% when controlling for other factors. An increase of one tenth of a grade point decreased the odds a student would accept his/her offer of admission by 7.30%. As indicated in the earlier analysis, students who listed more schools were less likely to enroll. An additional school listed on the FAFSA decreased the odds of acceptance by 30.03%, and listing a private school first further decreased the odds of enrollment by 63.41%. Ranking UW one rank higher improved the odds a student would enroll by 65.46%. A $100 increase in PLUS loan yielded a 1.57% decrease in the odds a student would accept his/her offer of admission.

The average student in this subgroup had a probability of .638 that he/he would accept the offer of admission. The probability non-White applicants in this subgroup would accept their offer of admission was 11.60% greater than for similar White applicants, while the probability a woman would accept the offer was 8.48% lower than for a similarly qualified man. An additional parent who is an alum raises the probability an applicant will accept the offer of admission by 7.65%. An increase of one tenth of a point on GPA decreased the probability a student would accept by 1.74%. Students who listed more schools on the FAFSA were less likely to accept the offer of admission while students who ranked UW first were more likely to accept. An additional school listed on the FAFSA decreased the probability a student would accept by 8.24% and students who ranked UW higher had an 11.62% greater probability they would accept. Listing a private school first decreased the probability a student would accept his/her offer of

admission by 23.21%. An increase of $100 in PLUS loan decreased the probability an otherwise average student would accept the offer of admission by .36%

For the fourth analysis of this set the financial aid variables were disaggregated to the FA-4 level, which adds more specific categories for the aid variables, and includes unmet need which is not accounted for in the FA-2 variable set. Again, this model includes only the subgroup of applicants with an EFC at or below the median. The model accurately predicts 83.54% of the cases ($p < .001$) and includes the following statistically significant variables: gender, EFC, number of schools listed on the FAFSA, UW rank, control of first school listed on the FAFSA, unmet need, parent loan. Ethnicity, which had been significant in all the prior analyses was not significant. The odds a woman would accept her offer of admission were 34.99% lower than for a similarly qualified man. Students who came from families with greater economic resources were less likely to enroll. A $100 increase in EFC was associated with a 1.47% decrease in the odds the student would accept the offer of admission. Parent alumni status and GPA were not significant in this analysis. Students who listed more schools on the FAFSA were less likely to enroll, the odds a student would accept his/her offer were 29.98% lower if an additional school was listed on the FAFSA. If the first school listed on the FAFSA was private the odds of acceptance were decreased by 59.23%. Ranking UW higher resulted in a 56.64% increase in the odds a student would accept his/her offer. Higher unmet need decreased the odds a student would enroll by 3.17% for a $100 increase, a similar increase in parent loan decreased the odds a student would accept the offer of admission by 1.73%.

Estimates for the average applicant in the first and second EFC quartiles indicate that the probability a woman applicant would accept the offer of admission was 9.94% lower than for a similarly qualified male applicant. An additional $100 in EFC was associated with a .34% decrease in the probability a student would enroll. Listing an additional school on the FAFSA decreased the probability the student would accept his/her offer of admission by 8.23%. Ranking UW higher on the FAFSA increased the probability a student would accept the offer of admission by 10.36% while listing a private school first decreased the probability by 20.71%. An increase in the parent loan award of $100 yielded a .40% decrease in the probability the average student would accept his/her offer of admission and a similar increase in unmet need decreased the chances a student would accept the offer of admission by .74%.

Because the academic predictors were highly correlated with one another, and yielded inconsistent results in the last set of analyses, additional regressions were run, each with one of the two academic predictors removed from the analysis. This change in the academic predictors yielded few substantive changes in significance or coefficients (see appendix F, tables 3 and 4). For the low-income subgroup there were a few noteworthy differences. The parent alumni status variable (legacy) is significant when using the FA-2 financial aid variables. An additional parent alum is associated with an increase in the odds a student will enroll of 69.30% and 41.17% respectively for the tests with both academic predictors and the test using SAT only. Parent alumni status is not significant in the model using GPA only as the academic predictor. When SAT score is used as the only academic predictor it is significant in the model using the FA-2 financial

aid variables. SAT is not significant in the model using both academic predictors, nor is SAT significant in the models using the FA-4 financial aid variables.

As a final step, a set of regressions were run examining the aid variables individually. These analyses reveal individual effects of the financial aid variables that may be masked when the variables are entered into the model together and/or aggregated. In this set of analyses GPA is used as the academic predictor. This discussion will be limited to low income applicants, a table with the coefficients and significance for all applicants is provided in appendix F, table 5.

When the aid variables are entered into individual models, a number of background variables are significant. These are generally consistent with the earlier low-income analyses. As in all of the earlier models, the Number of Schools listed, the rank of UW on the FAFSA, and the Control of the first school listed on the FAFSA are significant with powerful influence on the dependent variable. Ethnicity is also an important factor in each of these analyses. In the tests that control for Self Help Aid, Loans, Unmet Need, and PLUS Loan, EFC is significant. In these models a $100 increase in EFC results in a decrease in the odds a student will accept the offer of admission of .43% - 1.24%. Parent alumni status is significant, with strong positive influence on enrollment, in the models that consider Federal and State Grant, Institutional Grant, College Workstudy, and Parent Loan. An additional parent alumni increases the odds a student will enroll by 38.2% - 39.09% when controlling for other factors. A tenth of a point increase in High School GPA decreases the odds a student will enroll by 6.26%

– 7.42% in the tests that consider Gift Aid, Loans, Institutional Grant, and Parent Loan (see appendix F, table 6 for coefficients and significance).

Aid variables yield coefficients consistent with earlier analyses. When aggregated, Self Help variables do not emerge as significant, however, individually, Workstudy has a positive influence on enrollment, while loans have negative influence on enrollment. A $100 increase in Workstudy improves the odds a student will enroll by 2.3%, while a similar increase in loans decreases the odds a student will enroll by 2.43%. Unmet need and parent loans are not accounted for in the self help variable. A $100 increase in unmet need decreases the odds a student will enroll by 3.19%, a similar increase in parent loan is associated with a 1.99% decrease in the odds a student will accept the offer of admission. Gift aid had a positive influence on enrollment. An additional $100 in gift aid improved the odds a student would accept the offer of admission by 1.43%. Federal and State Grant improved the odds a student would enroll by 1.6% and Institutional grants increased the odds a student would accept by .89%.

Discriminant Analysis

Discriminant analysis was used to create a function that could be used to predict admissions yield for a set hypothetical award scenarios. In order to provide better estimates, and for computational ease, the analysis was limited to the subgroup of applicants who were awarded aid based on the traditional student budget. For these students the maximum award of need based gift aid was typically 55% of the cost of

attendance. The analysis generated a function that correctly classified 70.3% of the cases and was significant at $p < .001$.

$$D = -.478E + .140G - .015P - .058A + .056H - .024T + .333N - .327U + .379Y + .731C - 1.104F - 2.629$$

Where E = Ethnicity, G = Gender, P= Parent Education, A= Parent Alumni Status, H=High School GPA, T= Test Scores, N= Number of Schools listed on the FAFSA, U= UW rank on the FAFSA, Y = Type of first school listed on the FAFSA, C = Control of first school listed on the FAFSA, F = FA_3 (Percent of budget met by gift aid).

A set of hypothetical awards were then calculated using maximum gift awards of 40%, 50%, 60%, and 70%. These awards were calculated with the assumption that no new aid was available so existing funds were reallocated based on EFC ranking. Using the estimates of FA_3 for each of the test award scenarios, discriminant scores were calculated. These scores were compared to the group centroids for each state of the outcome variable and cases were thus classified into the group with a centroid score closest to the calculated discriminant score for that case.

Limiting the analysis to those cases correctly classified using the observed data, net changes in the dependent variable are small, and by themselves mask slightly greater changes in response to changes in the award. Reducing the maximum gift aid has the effect of providing grant aid to a slightly greater number of students, and resulted in small net gains in admission yield. Because this is a reallocation of funds rather than an addition of new funds, both positive and negative effects on yield were expected so, in

addition to the net change in yield, the number of cases that change from accept to decline, and from decline to accept, are also reported.

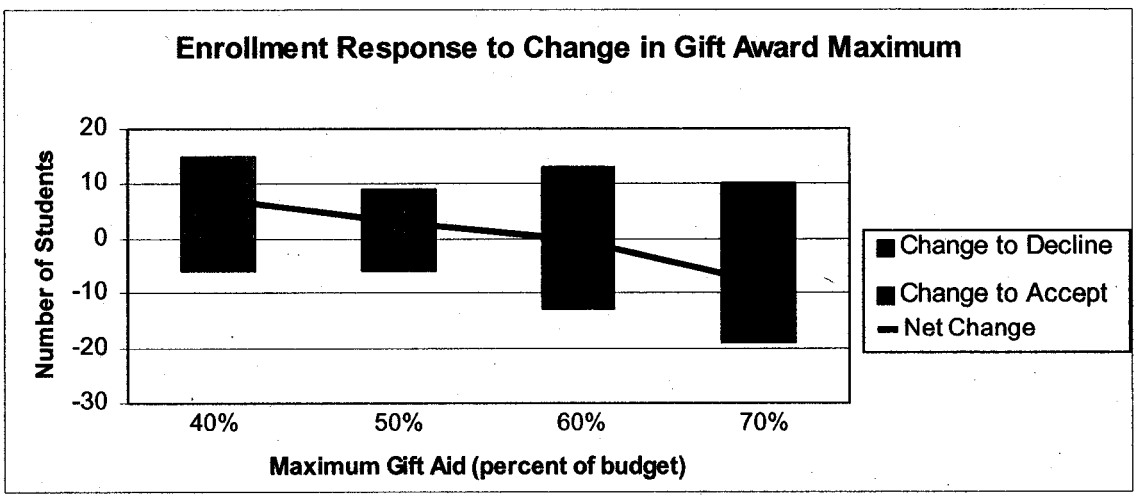

Figure 6. Enrollment Response to Change in Gift Award Maximum.

With a hypothetical gift aid maximum of 50%, there is a net gain in enrollment of 3 students out of 2124 in this sample. Six students changed to decline and nine students changed to accept. At 40% gift aid the net gain is nine students. Again six students change to decline, and this time 15 students change to accept. An increase of the maximum gift award to 60% yields no net gain or loss with 13 students changing in each direction. With an increase in gift award to 70% of the cost of attendance there is a net loss in the admission yield with 19 students changing to decline and 10 changing to accept (see Figure 5). Cross tabulation of the direction of the change and UW Rank reveal that students who changed their enrollment decision (in either direction) ranked UW as one of their top three schools. At the 40% and 50% gift aid levels more of the students who changed to accept ranked UW second. At the 60% and 70% gift levels most of the changes to decline were students who ranked UW first while the majority of

changes to accept were students who ranked UW second or third (see appendix G, table 4). As expected, most of the changes in these simulations occurred in the first EFC quartile, although 1/3 of the changes to accept in the 40% gift simulation occur in the second EFC quartile.

Chapter V

Findings and Discussion

Financial aid plays a significant role in the college choice process. At the time of the ultimate matriculation decision the financial concerns turn from the broader, perhaps more abstract notions of cost, to the more specific issues of affordability that cannot be fully evaluated by the student until the financial aid award is offered. This may explain the relatively small influence of financial aid on the enrollment decision found in this and other institutional studies looking at the impact of aid on enrollment (Somers & St. John, 1997, St. John, 1992). Essentially, the influence of financial aid at this stage is limited due to the self-selection that occurs earlier in the choice process. By now students have a fairly well-defined set of preferences and the data presented here seem to confirm that these preferences are paramount in the final selection of a college. Those preferences in turn may have been influenced by other factors such that the choice set and ranking identified on the FAFSA may not represent a student's ideal choice set, but rather represent what the student sees as a realistic set of schools pre-screened for affordability and odds of admission. McDonough (1997) finds that students may experience a cooling out of their aspirations as they work through their college choice process in earlier stages effectively lowering aspirations to attend more selective and/or more prestigious institutions. With regard to issues of affordability, the analysis of EFC quartile and choice variables appears to support the self-selection claim. Students from the lowest

EFC quartile tend to list fewer schools on the FAFSA indicating a more limited choice set, and they are more likely to list a public four-year school first and rank UW higher.

While family financial resources appear to impact the enrollment decision, the results from the various analyses were mixed. Multivariate analyses indicated a significant influence of EFC in the low-income sub-group when using the FA-4 financial aid variables, and in several of the models considering individual financial aid variables. In addition, choice set variables including UW Rank, the number of schools listed on the FAFSA, and control of the first school listed on the FAFSA consistently had a strong influence on the enrollment choice. Financial aid had an independent effect on the decision to enroll when controlling for other factors. The study finds that additional parent loans and unmet need decreased the odds a student would enroll. When all applicants were included in the analysis Gift aid had a positive effect on enrollment. Although gift aid was not significant in the low-income model when all aid variables were entered together, it was significant when evaluated individually. When the aid variables were evaluated independent of one another the findings indicate a positive impact on enrollment from Gift aid, federal and state grant, institutional grant, and college workstudy. Students who received larger amounts in student loans, parent loan, or unmet need were less likely to enroll.

Controlling for other factors, financial aid had an influence on the enrollment decision, although less powerful than other factors. It may be the student's perception of the availability of aid that encourages or discourages students to apply for admission to a particular school. Once the application has been sent and the student receives an offer of

admission, financial aid becomes a means to an end, facilitating the choice the student has already made. If this is the case, then it would be unlikely that financial aid awards would be sufficient to change the minds of students in large numbers. However, if the aid is insufficient then students may be compelled to choose an alternative institution that is more affordable (either through a better award, or lower cost of attendance). The negative influence of unmet need , and arguably the negative influence of PLUS loan, in this study supports the notion that an insufficient aid package may discourage enrollment. However, data presented here do not suggest that substantial numbers of students chose alternatives to UW due to insufficient funding.

Income may also be an important factor. This study uses EFC as a composite measure of wealth so a direct finding on income is not indicated. However, parent income and EFC are highly correlated ($r = .780$). For most of the analyses, EFC was not significant, however for low-income applicants EFC was significant when using the FA-4 financial aid variables, and for several of the tests of individual financial aid variables. Although this study does not consistently find a direct influence of EFC on the enrollment decision, there is evidence that family economic resources impact the enrollment decision which may be mediated through the choice set variables. There was a negative correlation between family economic resources and the position of UW in the choice set. Students from wealthier families less often ranked UW first in their choice set and accepted their offer of admission at a lower rate. However, with median earnings of $73,140.50 in 2000, the population of students offered admission to UW is considerably wealthier than the typical Washington family which earned a median of $ 45,776 in 1999

(United States Census Bureau, 2003). So it would be a mistake to interpret these results as an indication that UW serves a primarily low-income population of students. Far from it. Still, those in the lowest EFC quartile, with parents earning a median income of $32,053, accepted their offer of admission 70.8% of the time, compared to 53.6% of those in the highest EFC group. High-EFC applicants matriculated at private four-year colleges more often than other groups, but the second largest group of private matriculants was students in the second income quartile. Enrollment rates at two-year colleges were low for all groups, however, students in the second income quartile attend two-year colleges about 1/3 more often than the lowest EFC group and more than twice as often as the two highest groups. Further investigation using the choice set variables as the dependent variables may provide greater insight into the role of many of the background variables in the choice process.

Bivariate analyses indicate that students from the fourth and second EFC quartiles are more likely to attend a private school than students in the first and third income quartiles. Given that there is little evidence that those who ranked UW highest were unable to attend due to cost, it appears that financial aid at UW may be sufficient to facilitate choice. Students who listed private schools first appeared to be able to enroll in private schools for the most part, although not to the same degree as those who listed a public school first fulfilled their preference. Stiff competition from private schools is evident, especially for high-income and high-achieving students, and the data suggest that for some applicants UW serves as a "backup school". Multivariate analysis of the matriculation decisions at public vs. private schools is beyond the scope of this study, but

would be an interesting area for further study, especially with regard to differences in family wealth, and the influence of financial aid variables.

Some evidence suggests that a limited number of families in the lower middle-income group chose less expensive alternatives. Students in the second income quartile were more likely to attend a two-year college than students from the other income groups. The second income quartile is a kind of transition group, generally students in this group do not receive gift aid, yet they still have a fair amount of financial need that is funded primarily by loans. There are substantial differences in the awards of students who matriculated at two-year colleges when compared to those who matriculated at UW. Students who attended a two-year college rather than UW tended to have greater loan awards and unmet need and less workstudy and gift aid than those who matriculated at UW. These relationships were not tested using multivariate analysis, a step that may be valuable if a sample with a larger number of students attending two-year colleges can be found.

While financial aid did have an independent effect on enrollment, the type of school (public vs. private) listed first on the FAFSA, the number of schools listed on the FAFSA, and the rank of UW on the FAFSA provide the most consistent impact on the enrollment decision. In all, the choice variables appear to be excellent indicators of the student's enrollment decision. Students who list UW first on the FAFSA accept their offer of admission at a rate of 80.2%, and 78% of those offered admission matriculate in the fall. 96.6% of students listing only one school on the FAFSA enroll in UW. All the multivariate models tested indicate a strong positive influence of UW rank on enrollment

when controlling for other factors. Further, a greater number of schools listed on the FASA (an indicator of a broader choice set), and listing a private school first had a strong negative association with enrollment. This suggests that students who ranked UW highly did not appear to be deterred by the cost of attendance. Of students who listed a private school first, 46.3% matriculated in private schools and 30.9% matriculated at UW. Since admissions and financial aid decisions at the other schools are unknown it is impossible, with this data set, to determine whether funding played a role in the selection of UW. This issue may warrant further examination. Students who listed a public school first enrolled in a public school 87.5% of the time, while those who listed a private school first enrolled in a private school 46.3% of the time. With this data set, net cost and admission decisions for the other schools are unknown, but the disparity in the rate at which students matriculate in the type of school (public vs. private) they ranked first may be an indicator that cost is an influence, but it could just as easily be related to the disposition of the application at the first choice school. For example, the private schools a student is considering may be more selective than UW and as a result that student may be less likely to be admitted and enroll in his/her first choice institution.

Decisions by minority applicants seem somewhat more complex. In most of the analyses Ethnicity had a strong, independent, influence on enrollment. Non-White students appear to be much more likely to enroll than White students. African American and Hispanic students rank UW first about as often as White applicants, yet they accept the offer of admission to UW at a substantially higher rate. This could be related to differences in the choice set these students are considering, or it could be

related to cost of attendance. In 1998 voters in Washington State passed an initiative that ended affirmative action in college admissions. The UW response to this change was to reaffirm its commitment to diversity, backed up by an aggressive recruitment effort and the development of privately funded diversity enhancement scholarships targeted at "high market" African American students. Yield was extremely high for students offered these scholarships (Affolter-Caine, Martinez, Murphy, & Heller, 2002). These scholarships, the intense recruiting efforts, and perhaps a higher value placed on the offer of admission to UW due to the elimination of affirmative action, combine to make UW more attractive to minority applicants, especially African American students. Therefore, the ethnicity finding, although interesting, may not be the best indicator in light of the extraordinary steps taken to enroll those students, including substantial merit based gift aid for "high market" African American students not accounted for in this study. For students in the lower half of the EFC distribution ethnicity is an important predictor when the FA-2 financial aid variables are used, but when the FA-4 financial aid variables, which control for unmet need, are used, ethnicity is no longer a significant predictor in the model. Unmet need would account for scholarship funds not included in the model so this finding may lend support to the notion that the merit scholarships contributed to the increased odds of enrollment for non-White applicants in this study, but it is likely not the whole answer. In the tests of individual aid variables, ethnicity remains an important predictor in the model that tests unmet need as the only financial aid variable.

Low-income women were considerably less likely to accept their offer of admission than similarly qualified men. For this sub-group gender has a consistent

influence on enrollment, independent of other factors. However, when all students offered admission were included in the model, gender was not significant once the choice set variables were added. This may be an indication that differences in matriculation decisions amount to preferences, which, for all applicants, are accounted for when the choice variables are added to the model. For the low-income sub-group, gender remains significant even after the choice variables added suggesting that preferences are not as well defined for this sub-group, or that the choice variables do not measure preferences as well for low-income students.

Children of alumni enrolled less often than children whose parents did not attend UW. However, when controlling for other factors the results are mixed. For the low-income group parent alumni status has a positive influence on enrollment in some of the analyses. This further supports the notion that low-income students may view their postsecondary options differently. It may also be an indication that students are somewhat polarized in their view of attending the school their parents attended. There may be students who include UW because their parents went there, but they have no intention of going, while others may give it more serious consideration. One would expect these preferences to be accounted for in the choice variables, and for all applicants this may be the case. Although not significant, there is a change in the coefficient of the legacy variable once the choice variables are added with a negative relationship prior to the addition of the choice variables and a positive relationship after the addition of the variables. On the low-income analyses the legacy variable is consistently positive, although not consistently significant. One might infer from this that the low-income

students may have a more limited choice set and are more heavily influenced by parents such that a student who ranked UW lower may be persuaded to attend UW.

Financial aid provides for access and choice in the enrollment decision. The relationship between financial aid and the final college choice is complex. In the case of UW it appears that those students who identify UW as their first choice are overwhelmingly able to attend. It is also apparent that UW serves as a backup school for many highly qualified applicants. Bivariate analysis indicates that students with higher grades and test scores accept their offer of admission less often, however this relationship was not consistently borne out when controlling for other factors in the choice set. GPA is significant when using the FA-2 variables, and in several of the analyses using individual aid variables. In these tests students with higher grades were less likely to enroll. GPA was not significant in the tests using the FA-4 financial aid variables. Academic ability is an important factor early in the process in the formation of aspirations and in the search stage (Hossler, Braxton, & Coopersmith, 1996, Cabrera & La Nasa, 2000). As a result, the choice set and preferences may be heavily influenced by ability and an independent effect of ability on enrollment in the choice stage may not consistently emerge.

Award Modifications

Simulations based on the discriminant analysis indicate that, using existing funds, changes in packaging strategy can be used to optimize admission yield. The model presented in this study demonstrates that existing data sources including: ethnicity,

gender, parent education, parent alumni status, high school GPA, test scores, number of schools listed on the FAFSA, UW rank on the FAFSA, type of first school listed on the FAFSA, control of first school listed on the FAFSA, and the percent of the student budget met by gift aid, may be used to project enrollment yield. The results of this analysis for UW indicate that modifications of the award strategy may be warranted, and could potentially improve yield at the margin, although the demonstrated effects are small. By spreading out the need-based aid to a greater number of students, it appears that admission yield may be positively impacted. This analysis lends support to the notion that insufficient aid may cause students to choose other alternatives. The negative effects of reallocation of aid demonstrated by the simulations in the higher gift models tended to impact students who ranked UW first more while the benefits in these models appeared to more heavily favor students who ranked UW second or third. Overall, the simulations demonstrate that award modifications can impact student enrollment decisions.

The model presented offers a means to optimize the aid packaging strategy, essentially allowing enrollment managers to determine how much aid is enough. However, the model presented here is a starting point. The model needs further refinement to improve accuracy of the predications, and should be coupled with a more sophisticated award simulation that would allow the use of more detailed financial aid packages that more accurately reflect institutional award policy. The simulations presented were based on a reallocation of existing aid funds, the model would also allow for simulations based on new funding which should mitigate for the negative enrollment

effects associated with reallocation of funds.. A further refinement of the model would be to include some type of feedback mechanism to consider effects on retention and completion associated with changes in financial aid packaging policy. It may also be advisable to run simulations with data from more than one admission cycle in order to calculate the coefficients for the discriminant equation. Finally, it is important to consider the expense of changing strategy, especially if reallocation of funds is being considered. For example, if gains in yield are in higher income students at the expense of the lowest income applicants, the strategy may not achieve the desired goals.

Implications

The literature suggests that need-based financial aid is essential in the provision of access to higher education, especially for low-income students. At the institutional level, marginal changes in award amounts seem less important than other factors in the enrollment decision. In this study, the relatively small impact of financial aid variables may be a reflection of UW's place in the market. Those students who list UW first on the FAFSA are apparently able to attend, while those who rank UW lower are not easily swayed by a few extra dollars in their aid package. The attendance patterns of those students who decline their offer of admission support the notion that proximity is critical in the college choice set. The top two schools students who decline their offer to attend are both Washington public four-year schools. Of the top five private schools attended by students who declined their offer of admission, three were in Western Washington, one in Eastern Washington, and one was in southern California. In fact, out of the top ten

schools students enrolled in, eight were in Washington State. It is important to note again that this study included Washington State residents who applied for financial aid. For this group of applicants the choice set appears to be somewhat constrained, tied largely to proximity. If this data set were to include those who did not apply for aid, the range of "peer" institutions might be somewhat different.

An important finding in this study is the relationship of schools listed on the FAFSA. Although clearly not designed as a ranking, this listing appears to be very useful in research when treated as a ranking. The addition of the choice set variables dramatically improved the predictive capabilities of the logistic regression models. The choice set data appear to be more useful predictors than many of the background variables tested. The differences in significance of many of the background variables between the analysis of all applicants, and low-income applicants may indicate that the explanatory power of the choice set variables is dependent upon the populations being tested. As indicated earlier, an analysis using the choice set variables as the dependent variables may illuminate this question further.

In many respects this research has stimulated more questions than it has answered, but the analysis has also provided some insight into how these questions might best be addressed. Directly related to the current project, a deeper analysis of the influences on preferences and on the decision-making process would be extremely useful. This might include interviews or surveys of students, parents, and other significant contributors in the college choice process. As discussed earlier, the survey data already collected for students who take the ACT may also be a good starting point.

Access to a larger data set that includes financial aid and admissions data for all institutions in the State would also be valuable in addressing a number of questions left unanswered in the current study. Especially important would be the application status at the other schools listed on the FAFSA. For the subset of students who began their studies at a two-year college, information about their progress and success in transferring to a four-year school would provide a better understanding of the role of the community college in the choice process. Finally, the model developed here using discriminant analysis provides an understanding of the impact of changes in award strategy. Further refinements, which may include additional years of data, more sophisticated award estimates, and a means to consider effects on retention as well as admission yield, would enhance the usefulness and accuracy of the model.

Conclusion

This study provides researchers and enrollment managers with a set of tools that may help them to better understand the decisions students make in choosing a college. Drawing on Hossler and Gallagher's (1987) college choice framework, and St John's (1992) work analyzing effects of institutional aid, this research has attempted to test some of the assumptions in these frameworks and to add to the toolbox new ways to construct and analyze institutional data sources. By itself, the use of the Ranking of UW on the FAFSA would have proved a useful tool, but by matching the school code data with other data sources, this study gleaned much more information about the schools listed in the choice set. Likewise, the clearinghouse data provide actual matriculation decisions of the students. Used together these data give a clear indication of the choices students are

considering, the position of UW in that choice set, and the final matriculation decisions. Independent of the choice set variables, financial aid still has a significant effect on enrollment decisions, and the model presented in this study provides the beginning framework for a system to maximize the effectiveness of financial aid packaging.

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Appendix A: Human Subjects Division Approval

RECEIVED
Human Subjects
NOV 0 7 2002
UW

UNIVERSITY OF WASHINGTON

Human Subjects Division
Grant and Contract Services Box 355752

HUMAN SUBJECTS REVIEW COMMITTEE APPLICATION

BOX FOR COMMITTEE USE ONLY
MASTER ☐ COMM ☐ INVESTIGATOR ☐

APPLICATION NO. 02-5188- 01

Send nine copies of this form (including one copy with original inked signatures) and nine copies of all relevant materials (consent forms, questionnaires, instruments, drug information summary, data collection forms, debriefing statement, advertisements, etc.) to the Human Subjects Division, Box 355752. Do not leave blanks. Attach one copy of each research proposal, and/or one copy of the protocol and investigator's brochure for clinical trials. Students should attach one copy of thesis or dissertation proposals. For information and assistance, visit our web site at http://depts.washington.edu/hsd or call (206) 543-0098. We will not accept handwritten and/or incomplete forms. (Use 10 point type or larger throughout application.) The contents of this application and attachments will be kept confidential within the limits of the law.

☒ **Check this box if your project falls into one or more of the minimal risk ("expedited") categories of research (see web site for listing of categories) and send us only three copies of all your materials.**

I. PRINCIPAL INVESTIGATOR (Provide all the information requested. Correspondence will be directed to this person. You may designate a contact person other than yourself in section II., below.)

Name Randall Spaulding Title Student Position
Department College of Education Division Leadership and Policy Studies
Mail box or address 9025 171st Ave, Redmond, WA 98052
Telephone 425-882-7785 Fax e-mail rss@u.washington.edu

II. CONTACT PERSON (Provide all the information requested. This person does NOT have signatory authority with regard to this application.)

RECEIVED
Human Subjects Division

Name N/A Title Position
Mail box or address
NOV 0 7 2002
Telephone Fax e-mail
UW

III. TITLE OF PROJECT: Access, Opportunity, and Choice Developing Financial Aid Packaging Strategies to Facilitate Choice in Higher Education

IV. SIGNATURES: The undersigned acknowledge that: 1. this application represents an accurate and complete description of the proposed research; 2. the research will be conducted in compliance with the recommendations of and only after approval has been received from the Human Subjects Review Committee (HSRC). The principal investigator is responsible for reporting any serious adverse events or problems to the HSRC, for requesting prior HSRC approval for modifications, and for requesting continuing review and approval.

A. Investigator: Randall Spaulding — TYPED NAME PLUS SIGNATURE — DATE 11/1/02

B. Faculty sponsor (for student): Steven Olswang — TYPED NAME PLUS SIGNATURE — DATE 11/1/02

C. The Chair, Dean, or Director signing below acknowledges that this proposed activity has received intra-mural review and approval of scientific merit and investigator qualification.

Patricia A. Wasley, Dean — TYPED NAME PLUS SIGNATURE — DATE 11/1/02

Patricia A. Wasley

Deri C Faris — HUMAN SUBJECTS REVIEW COMMITTEE SIGNATURE — NOV 8 2002 DATE — APPROVE ☒ DISAPPROVE ☐

Subject to the following conditions:

Period of approval is one year, from NOV 8 2002 through NOV 7 2003

Appendix B: Coding

Variable Description	Variable Name (SPSS)	Categories (if applicable)	Value	Comment
Filter Variables				
Financial Aid Status	famatch	Did not apply	0	Did not apply removed from analysis
		Applied for Aid	1	
Financial Aid Dependent Status	Depend	Dependent	0	Independent removed from analysis
		Independent	1	
Residency Status	Res	Resident	1	Non-Resident and Internatinal applicants removed from analysis
		Non-Resident	2	
		International Applicant	3	
Admit Status	Admit	Admit	0	Denied applicants removed from analysis
		Deny	1	
Socio-Demographic Predictors				
Gender	Gender	Male	0	
		Female	1	
Ethnicity	Eth	White	0	Ethnicity not indicated set to system missing
		Non-White	1	
Ethnicity-2	Eth-2	White	0	Ethnicity not indicated set to system missing
		African American	1	
		Asian / Pacific Islander	2	
		Hispanic	3	
		Native American	4	
Highest Parent Education	Par_ed	Some Schooling	1	Highest level of Parent Ed (either parent).
		High School Graduate	2	
		Some College	3	
		2 Year College Degree	4	
		4 Year College Degree	5	
		Post Graduate Study	6	
Total Alumni Status	Legacy	Neither Parent UW Grad	0	
		One Parent UW Grad	1	
		Both Parents UW Grads	2	
Expected Family Contribution	EFC2	Continuous / 100		
Academic Predictors				
High School GPA	HSGPA	4.0 Scale * 10		
SAT / ACT Score	Highscore	SAT equivalent scores - continuous / 100		
Choice Set				
Number of institutions on FAFSA (or ACT)	Inst	1-6		
Ranking of UW on FAFSA (or ACT)	uwrank	UW Listed First	6	Reverse order to so that sign on coefficient will be intuitively correct.
		UW Listed Second	5	
		UW Listed Third	4	
		UW Listed Fourth	3	
		UW Listed Fifth	2	
		UW Listed Sixth	1	
Type of Number One Institution.	fai1type	Two-Year College	1	
		Four Year College	2	
Locus of Control of Number One Institution	fai1cont	Public	1	
		Private	2	
Financial Aid / Price				
FA-1	FA-1	Total Aid offered - continuous / 100		
FA-2				
Self-Help Aid	Self	Continuous / 100		Does not include Unmet Need
Gift Aid	Grant	Continuous / 100		
Parent Loan	PLUS	Continuous / 100		
FA-3				
Percent of Budget Met by Gift Aid	FA-3	Gift Aid / Cost of Attendance		
FA-4:				
Loans	Loan4	Continuous / 100		
Campus / Institutional Grant	IGrant4	Continuous / 100		
Federal / State Grant	FSGrant4	Continuous / 100		PELL / SNG
Workstudy	CWS4	Continuous / 100		
Parent Loan	PLUS4	Continuous / 100		
Unmet Need	Unmet4	Continuous / 100		Students unfunded financial obligation
Outcome				
Confirmation Deposit	Accept	Reject / Not Received	0	
		Received / Accept	1	
		Defer		removed from analysis
UW Matriculation	Matric	UW	0	
		Two-Year Public	1	
		Two-Year Private	2	
		Four-Year Public	3	
		Four-Year Private	4	
UW vs. Two Year / Not attending	Matric2	UW	0	
		Public Two-Year	1	

Appendix C: Descriptive Statistics

Table 1: Descriptive Statistics		
	All	
	Mean	Std. Dev.
Socio Demographic Variables		
Parent Education	4.62	1.41
Total Alumni Status	0.29	0.59
Expected Family Contribution (EFC)	17,975.68	19,171.54
Additional Variables:		
Parent Income	81,311.76	55,967.83
Student Income	3,111.62	17,479.37
Family Size	4.1	1.2
Academic Predictors and Choice Set		
High School GPA	3.714	0.261
SAT Score	1182	155
Number of Schools Listed on the FAFSA	3.39	1.70
UW Rank on the FAFSA	5.11	1.30
Financial Aid Variables		
Office of Financial Aid (Scholarship)	205.82	848.34
Diversity Enhancement Scholarship	242.97	1,714.60
Federal Pell Grant	485.72	1,111.10
SEOG	107.07	312.57
University Tuition Exemption	389.18	1,113.99
State Need Grant	447.52	1,050.45
College Work Study	338.23	881.80
Stafford Loan	755.68	1,142.70
Unsubsidized Loan	3.19	88.00
Perkins Loan	243.67	834.80
PLUS Loan	625.51	1,550.44
Remaining Need	1,311.39	3,001.10

Table 2: Descriptive Statistics by Ethnicity				
	White		Non-White	
	Mean	Std. Dev.	Mean	Std. Dev.
Socio Demographic Variables				
Parent Education	4.74	1.30	4.24	1.61
Total Alumni Status	0.31	0.30	0.20	0.51
Expected Family Contribution (EFC)	19,728.65	19,522.55	12,700.24	16,447.68
Additional Variables:				
Parent Income	86,885.61	55,147.23	65,499.84	5,575.42
Student Income	3,420.73	22,563.92	2,624.94	4,381.47
Family Size	4.1	1.1	4.1	1.3
Academic Predictors and Choice Set				
High School GPA	3.740	0.237	3.668	0.283
SAT Score	1200	142	1126	168
Number of Schools Listed on the FAFSA	3.40	1.69	3.31	1.77
UW Rank on the FAFSA	5.09	1.27	5.24	1.30
Financial Aid Variables				
Office of Financial Aid (Scholarship)	198.42	827.04	233.34	914.25
Diversity Enhancement Scholarship	-	-	902.32	3,214.14
Federal Pell Grant	323.19	909.66	919.54	1,430.91
SEOG	80.04	281.04	188.97	387.22
University Tuition Exemption	342.93	1,060.26	523.62	1,247.70
State Need Grant	313.60	902.43	801.48	1,308.19
College Work Study	255.47	781.69	553.53	1,071.49
Stafford Loan	793.26	1,167.32	721.76	1,116.43
Unsubsidized Loan	2.74	80.04	5.79	121.78
Perkins Loan	180.90	713.42	422.97	1,081.09
PLUS Loan	680.31	1,593.83	575.45	1,539.01
Remaining Need	1,322.19	3,007.11	1,290.89	2,967.48

Table 3: Descriptive Statistics by Gender				
	Men		Women	
	Mean	Std. Dev.	Mean	Std. Dev.
Socio Demographic Variables				
Parent Education	4.71	1.38	4.55	1.43
Total Alumni Status	0.29	0.59	0.29	0.59
Expected Family Contribution (EFC)	18,382.11	19,022.33	17,652.29	19,288.29
Additional Variables:				
Parent Income	81,638.14	53,958.64	81,050.96	57,529.27
Student Income	3,641.71	25,738.02	2,689.74	4,610.82
Family Size	4.1	1.1	4.1	1.2
Academic Predictors and Choice Set				
High School GPA	3.695	0.268	3.730	0.255
SAT Score	1214	153	1156	152
Number of Schools Listed on the FAFSA	3.33	1.74	3.45	1.68
UW Rank on the FAFSA	5.14	1.28	5.08	1.32
Financial Aid Variables				
Office of Financial Aid (Scholarship)	156.92	748.61	244.51	917.96
Diversity Enhancement Scholarship	213.46	1,606.70	266.33	1,795.46
Federal Pell Grant	443.60	1,054.30	519.06	1,153.24
SEOG	101.20	307.59	111.72	316.46
University Tuition Exemption	396.88	1,119.47	383.08	1,109.88
State Need Grant	437.81	1,038.91	455.20	1,059.70
College Work Study	313.82	857.48	357.55	900.33
Stafford Loan	742.97	1,135.79	765.74	1,148.34
Unsubsidized Loan	3.37	92.04	3.04	84.70
Perkins Loan	236.65	828.45	249.23	839.97
PLUS Loan	627.82	1,571.87	623.69	1,533.68
Remaining Need	1,276.37	2,990.61	1,339.25	3,009.89

Table 4: Descriptive Statistics by Income Quartile (low-income)				
	EFC Q1		EFC Q2	
	Mean	Std. Dev.	Mean	Std. Dev.
Socio Demographic Variables				
Parent Education	3.91	1.53	4.48	1.42
Total Alumni Status	0.15	0.43	0.25	0.55
Expected Family Contribution (EFC)	1,894.73	1,536.87	8,552.10	2,239.45
Academic Predictors and Choice Set				
High School GPA	3.666	0.289	3.713	0.249
SAT Score	1127	158	1171	145
Number of Schools Listed on the FAFSA	3.24	1.68	3.33	1.75
UW Rank on the FAFSA	5.37	1.12	5.14	1.29
Financial Aid Variables				
Office of Financial Aid (Scholarship)	424.32	1,201.19	378.58	1,106.20
Diversity Enhancement Scholarship	287.90	1,783.86	239.69	1,734.59
Federal Pell Grant	1,878.77	1,466.62	38.75	341.45
SEOG	418.14	502.63	7.51	83.77
University Tuition Exemption	1,488.37	1,765.48	51.38	429.36
State Need Grant	1,649.64	1,450.64	116.57	558.04
College Work Study	1,306.14	1,318.72	42.54	330.07
Stafford Loan	913.86	1,192.41	1,945.94	1,044.17
Unsubsidized Loan	6.23	127.78	6.10	123.29
Perkins Loan	951.68	1,433.00	24.73	277.02
PLUS Loan	823.65	1,873.90	1,644.74	2,041.88
Remaining Need	2,985.89	4,635.56	2,240.96	2,773.08

Table 5: Descriptive Statistics by Matric 2 (enrollment in 2 year college)				
	Enrolled at UW		Enrolled at 2-year	
	Mean	Std. Dev.	Mean	Std. Dev.
Socio Demographic Variables				
Parent Education	4.47	1.47	4.24	1.44
Total Alumni Status	0.26	0.56	0.15	0.42
Expected Family Contribution (EFC)	16,222.85	17,816.51	11,202.46	9,488.00
Academic Predictors and Choice Set				
High School GPA	3.697	0.264	3.655	0.261
SAT Score	1163	154	1134	158
Number of Schools Listed on the FAFSA	2.84	1.64	3.55	1.75
UW Rank on the FAFSA	5.54	0.97	5.31	0.93
Financial Aid Variables				
Office of Financial Aid (Scholarship)	204.34	845.93	107.83	603.65
Diversity Enhancement Scholarship	359.94	2,079.07	-	-
Federal Pell Grant	612.49	1,227.37	441.38	1,091.94
SEOG	130.50	338.02	94.99	300.59
University Tuition Exemption	440.50	1,175.43	244.97	897.60
State Need Grant	544.61	1,139.57	501.13	1,113.59
College Work Study	401.14	944.29	301.34	866.16
Stafford Loan	734.12	1,131.02	1,297.46	1,253.77
Unsubsidized Loan	1.53	58.82	28.34	263.19
Perkins Loan	291.15	908.28	256.60	859.00
PLUS Loan	564.59	1,505.00	1,377.00	2,081.57
Remaining Need	620.43	1,864.55	2,550.01	3,888.61

Appendix D: Cross Tabulation Tables

Table 1: UW Rank on FAFSA 6=first position * Accept offer of admission Cross tabulation			
	Accept offer of admission		
UW Rank	0	1	Total
First School	370	1501	1871
%	19.78%	80.22%	100%
Second School	406	286	692
%	58.67%	41.33%	100%
Third School	204	112	316
%	64.56%	35.44%	100%
Fourth School	170	70	240
%	70.83%	29.17%	100%
Fifth School	87	35	122
%	71.31%	28.69%	100%
Sixth School	70	19	89
%	78.65%	21.35%	100%
Total	1307	2023	3330
%	39.25%	60.75%	100%

Table 2: UW Rank on FAFSA 6=first position * EFC Quartile Cross tabulation					
	EFC Quartile				
UW Rank	0-4768.99	4769-12464.99	12465-23676.24	26376.25 and up	Total
First School	538	464	447	386	1835
%	29.32%	25.29%	24.36%	21.04%	100%
Second School	147	181	173	182	683
%	21.52%	26.50%	25.33%	26.65%	100%
Third School	54	63	101	91	309
%	17.48%	20.39%	32.69%	29.45%	100%
Fourth School	40	49	64	85	238
%	16.81%	20.59%	26.89%	35.71%	100%
Fifth School	20	37	24	39	120
%	16.67%	30.83%	20%	32.50%	100%
Sixth School	12	20	18	39	89
%	13.48%	22.47%	20.22%	43.82%	100%
Total	811	814	827	822	3274
	24.77%	24.86%	25.26%	25.11%	100%

Table 3: UW Rank on FAFSA 6=first position * Ethnicity 2 Cross tabulation						
	Ethnicity 2					
UW Rank	White	African American	Asian / Pacific Islander	Hispanic	Native American	Total
First School	1062	46	424	82	18	1632
%	65.07%	2.82%	25.98%	5.02%	1.10%	100%
Second School	426	22	89	31	14	582
%	73.20%	3.78%	15.29%	5.33%	2.41%	100%
Third School	203	6	41	10	3	263
%	77.19%	2.28%	15.59%	3.80%	1.14%	100%
Fourth School	144	9	34	8	2	197
%	73.10%	4.57%	17.26%	4.06%	1.02%	100%
Fifth School	83	3	10	6	1	103
%	80.58%	2.91%	9.71%	5.83%	0.97%	100%
Sixth School	37	2	27	3	1	70
%	52.86%	2.86%	38.57%	4.29%	1.43%	100%
Total	1955	88	625	140	39	2847
	68.67%	3.09%	21.95%	4.92%	1.37%	100%

Table 4: UW Rank on FAFSA 6=first position * Gender Cross tabulation			
	Gender		
UW Rank	Male	Female	Total
First School	846	1025	1871
%	45.22%	54.78%	100%
Second School	302	390	692
%	43.64%	56.36%	100%
Third School	144	172	316
%	45.57%	54.43%	100%
Fourth School	90	150	240
%	37.50%	62.50%	100%
Fifth School	55	67	122
%	45.08%	54.92%	100%
Sixth School	37	52	89
%	41.57%	58.43%	100%
Total	1474	1856	3330
	44.26%	55.74%	100%

Table 5: UW Rank on FAFSA 6=first position * Autumn Matriculation Cross tabulation						
	Autumn Matriculation					
UW Rank	UW	2 year public	4 year public	4 year private	unknown	Total
First School	1460	47	139	145	80	1871
%	78.03%	2.51%	7.43%	7.75%	4.28%	100%
Second School	269	27	163	178	55	692
%	38.87%	3.90%	23.55%	25.72%	7.95%	100%
Third School	108	7	62	105	34	316
%	34.18%	2.22%	19.62%	33.23%	10.76%	100%
Fourth School	66	5	40	95	34	240
%	27.50%	2.08%	16.67%	39.58%	14.17%	100%
Fifth School	31	1	17	59	14	122
%	25.41%	0.82%	13.93%	48.36%	11.48%	100%
Sixth School	18	-	14	41	16	89
%	20.22%	-	15.73%	46.07%	17.98%	100%
Total	1952	87	435	623	233	3330
%	58.62%	2.61%	13.06%	18.71%	7.00%	100%

Table 6: Number of Schools Listed (Trans 1) * Accept offer of admission Cross tabulation			
	Accept offer of admission		
Number of Schools Listed	Decline	Accept	Total
One	20	560	580
%	3.45%	96.55%	100%
Two	175	406	581
%	30.12%	69.88%	100%
Three	273	376	649
%	42.06%	57.94%	100%
Four	276	285	561
%	49.20%	50.80%	100%
Five	204	178	382
%	53.40%	46.60%	100%
Six	359	218	577
%	62.22%	37.78%	100%
Total	1307	2023	3330
%	39.25%	60.75%	100%

Table 7: Number of Schools Listed (Trans 1) * EFC Quartile Cross tabulation					
	EFC Quartile				
Number of Schools Listed	0-4768.99	4769-12464.99	12465-23676.24	26376.25 and up	Total
One	161	157	145	105	568
%	28.35%	27.64%	25.53%	18.49%	100%
Two	146	149	142	133	570
%	25.61%	26.14%	24.91%	23.33%	100%
Three	165	160	160	154	639
%	25.82%	25.04%	25.04%	24.10%	100%
Four	139	115	148	150	552
%	25.18%	20.83%	26.81%	27.17%	100%
Five	78	79	110	109	376
%	20.74%	21.01%	29.26%	28.99%	100%
Six	122	154	122	171	569
%	21.44%	27.07%	21.44%	30.05%	100%
Total	811	814	827	822	3274
%	24.77%	24.86%	25.26%	25.11%	100%

Table 8: Number of Schools Listed (Trans 1) * Ethnicity 2 Cross tabulation						
	Ethnicity 2					
Number of Schools Listed	White	African American	Asian / Pacific Islander	Hispanic	Native American	Total
One	330	12	147	21	6	516
%	63.95%	2.33%	28.49%	4.07%	1.16%	100%
Two	345	10	124	19	3	501
%	68.86%	2.00%	24.75%	3.79%	0.60%	100%
Three	384	15	111	31	9	550
%	69.82%	2.73%	20.18%	5.64%	1.64%	100%
Four	335	13	89	23	6	466
%	71.89%	2.79%	19.10%	4.94%	1.29%	100%
Five	233	14	51	22	2	322
%	72.36%	4.35%	15.84%	6.83%	0.62%	100%
Six	328	24	103	24	13	492
%	66.67%	4.88%	20.93%	4.88%	2.64%	100%
Total	1955	88	625	140	39	2847
%	68.67%	3.09%	21.95%	4.92%	1.37%	100%

Table 9: Number of Schools Listed (Trans 1) * Gender Cross tabulation			
	Gender		
Number of Schools Listed	Male	Female	Total
One	292	288	580
%	50.34%	49.66%	100%
Two	253	328	581
%	43.55%	56.45%	100%
Three	276	373	649
%	42.53%	57.47%	100%
Four	236	325	561
%	42.07%	57.93%	100%
Five	163	219	382
%	42.67%	57.33%	100%
Six	254	323	577
%	44.02%	55.98%	100%
Total	1474	1856	3330
%	44.26%	55.74%	100%

Table 10: Number of Schools Listed (Trans 1) * Autumn Matriculation Cross tabulation						
	Autumn Matriculation					
Number of Schools Listed	UW	2 year public	4 year public	4 year private	unknown	Total
One	552	14	2	1	11	580
%	95.17%	2.41%	0.34%	0.17%	1.90%	100%
Two	396	13	90	52	30	581
%	68.16%	2.24%	15.49%	8.95%	5.16%	100%
Three	366	18	114	106	45	649
%	56.39%	2.77%	17.57%	16.33%	6.93%	100%
Four	273	14	90	133	51	561
%	48.66%	2.50%	16.04%	23.71%	9.09%	100%
Five	172	9	56	114	31	382
%	45.03%	2.36%	14.66%	29.84%	8.12%	100%
Six	193	19	83	217	65	577
%	33.45%	3.29%	14.38%	37.61%	11.27%	100%
Total	1952	87	435	623	233	3330
%	58.62%	2.61%	13.06%	18.71%	7.00%	100%

Table 11: FAFSA institution 1 control * Accept offer of admission Cross tabulation			
	Accept offer of admission		
FAFSA institution 1 control	Decline	Accept	Total
Public	672	1700	2372
%	28.33%	71.67%	100%
Private	606	297	903
%	67.11%	32.89%	100%
Total	1278	1997	3275
%	39.02%	60.98%	100%

Table 12: FAFSA institution 1 control * EFC Quartile Cross tabulation					
	EFC Quartile				
FAFSA institution 1 control	0-4768.99	4769-12464.99	12465-23676.24	26376.25 and up	Total
Public	640	612	580	499	2331
%	27.46%	26.25%	24.88%	21.41%	100%
Private	154	192	234	308	888
%	17.34%	21.62%	26.35%	34.68%	100%
Total	794	804	814	807	3219
%	24.67%	24.98%	25.29%	25.07%	100%

Table 13: FAFSA institution 1 control * Ethnicity 2 Cross tabulation						
	Ethnicity 2					
FAFSA institution 1 control	White	African American	Asian / Pacific Islander	Hispanic	Native American	Total
Public	1370	63	484	103	27	2047
%	66.93%	3.08%	23.64%	5.03%	1.32%	100%
Private	564	21	123	33	12	753
%	74.90%	2.79%	16.33%	4.38%	1.59%	100%
Total	1934	84	607	136	39	2800
%	69.07%	3%	21.68%	4.86%	1.39%	100%

Table 14: FAFSA institution 1 control * Gender Cross tabulation			
FAFSA institution 1 control	Gender		Total
	Male	Female	
Public	1052	1320	2372
%	44.35%	55.65%	100%
Private	398	505	903
%	44.08%	55.92%	100%
Total	1450	1825	3275
%	44.27%	55.73%	100%

Table 15: FAFSA institution 1 control * Autumn Matriculation Cross tabulation						
FAFSA institution 1 control	Autumn Matriculation					Total
	UW	2 year public	4 year public	4 year private	unknown	
Public	1647	67	362	191	105	2372
%	69.44%	2.82%	15.26%	8.05%	4.43%	100%
Private	279	18	67	418	121	903
%	30.90%	1.99%	7.42%	46.29%	13.40%	100%
Total	1926	85	429	609	226	3275
%	58.81%	2.60%	13.10%	18.60%	6.90%	100%

Table 16: Ethnicity 2 * Accept offer of admission Cross tabulation			
Ethnicity	Accept offer of admission		Total
	Decline	Accept	
White	865	1167	2032
%	42.57%	57.43%	100%
African American	24	72	96
%	25%	75%	100%
Asian / Pacific Islander	175	491	666
%	26.28%	73.72%	100%
Hispanic	34	112	146
%	23.29%	76.71%	100%
Native American	19	21	40
%	47.50%	52.50%	100%
Total	1117	1863	2980
%	37.48%	62.52%	100%

Table 17: Ethnicity 2 * EFC Quartile Cross tabulation					
	EFC Quartile				
Ethnicity	0-4768.99	4769-12464.99	12465-23676.24	26376.25 and up	Total
White	383	518	542	553	1996
%	19.19%	25.95%	27.15%	27.71%	100%
African American	44	24	14	12	94
%	46.81%	25.53%	14.89%	12.77%	100%
Asian / Pacific Islander	263	160	126	108	657
%	40.03%	24.35%	19.18%	16.44%	100%
Hispanic	55	31	28	29	143
%	38.46%	21.68%	19.58%	20.28%	100%
Native American	17	11	6	5	39
%	43.59%	28.21%	15.38%	12.82%	100%
Total	762	744	716	707	2929
%	26.02%	25.40%	24.45%	24.14%	100%

Table 18: Ethnicity 2 * Gender Cross tabulation			
	Gender		
Ethnicity	Male	Female	Total
White	935	1097	2032
%	46.01%	53.99%	100%
African American	36	60	96
%	37.50%	62.50%	100%
Asian / Pacific Islander	262	404	666
%	39.34%	60.66%	100%
Hispanic	58	88	146
%	39.73%	60.27%	100%
Native American	14	26	40
%	35%	65%	100%
Total	1305	1675	2980
%	43.79%	56.21%	100%

Table 19: Ethnicity 2 * Autumn Matriculation Cross tabulation						
	Autumn Matriculation					
Ethnicity	UW	2 year public	4 year public	4 year private	unknown	Total
White	1125	55	309	405	138	2032
%	55.36%	2.71%	15.21%	19.93%	6.79%	100%
African American	69		3	17	7	96
%	71.88%		3.13%	17.71%	7.29%	100%
Asian / Pacific Islander	479	13	41	89	44	666
%	71.92%	1.95%	6.16%	13.36%	6.61%	100%
Hispanic	111	3	10	16	6	146
%	76.03%	2.05%	6.85%	10.96%	4.11%	100%
Native American	20		9	9	2	40
%	50%		22.50%	22.50%	5%	100%
Total	1804	71	372	536	197	2980
%	60.54%	2.38%	12.48%	17.99%	6.61%	100%

Table 20: Gender * Accept offer of admission Cross tabulation			
	Accept offer of admission		
Gender	Decline	Accept	Total
Male	578	966	1544
%	37.44%	62.56%	100%
Female	801	1139	1940
%	41.29%	58.71%	100%
Total	1379	2105	3484
%	39.58%	60.42%	100%

Table 21: Gender * EFC Quartile Cross tabulation					
	EFC Quartile				
Gender	0-4768.99	4769-12464.99	12465-23676.24	26376.25 and up	Total
Male	366	358	400	395	1519
%	24.09%	23.57%	26.33%	26.00%	100%
Female	491	499	457	462	1909
%	25.72%	26.14%	23.94%	24.20%	100%
Total	857	857	857	857	3428
%	25%	25%	25%	25%	100%

Table 22: Gender * Ethnicity 2 Cross tabulation						
	Ethnicity 2					
Gender	White	African American	Asian / Pacific Islander	Hispanic	Native American	Total
Male	935	36	262	58	14	1305
%	71.65%	2.76%	20.08%	4.44%	1.07%	100%
Female	1097	60	404	88	26	1675
%	65.49%	3.58%	24.12%	5.25%	1.55%	100%
Total	2032	96	666	146	40	2980
%	68.19%	3.22%	22.35%	4.90%	1.34%	100%

Table 23: Gender * Autumn Matriculation Cross tabulation						
	Autumn Matriculation					
Gender	UW	2 year public	4 year public	4 year private	unknown	Total
Male	944	37	180	282	101	1544
%	61.14%	2.40%	11.66%	18.26%	6.54%	100%
Female	1090	51	268	386	145	1940
%	56.19%	2.63%	13.81%	19.90%	7.47%	100%
Total	2034	88	448	668	246	3484
%	58.38%	2.53%	12.86%	19.17%	7.06%	100%

Table 24: Highest Parent Education * Accept offer of admission Cross tabulation			
Highest Parent Education	Accept offer of admission Decline	Accept	Total
Some Schooling	8	57	65
%	12.31%	87.69%	100%
High School Gradate	85	167	252
%	33.73%	66.27%	100%
Some College	154	304	458
%	33.62%	66.38%	100%
2 Year Degree	113	181	294
%	38.44%	61.56%	100%
4 Year Degree	389	514	903
%	43.08%	56.92%	100%
Postgraduate Study	497	575	1072
%	46.36%	53.64%	100%
Total	1246	1798	3044
%	40.93%	59.07%	100%

Table 25: Highest Parent Education * EFC Quartile Cross tabulation					
Highest Parent Education	EFC Quartile 0-4768.99	4769-12464.99	12465-23676.24	26376.25 and up	Total
Some Schooling	46	12	5		63
%	73.02%	19.05%	7.94%		100%
High School Gradate	87	84	53	25	249
%	34.94%	33.73%	21.29%	10.04%	100%
Some College	131	126	121	71	449
%	29.18%	28.06%	26.95%	15.81%	100%
2 Year Degree	85	94	64	45	288
%	29.51%	32.64%	22.22%	15.63%	100%
4 Year Degree	180	223	247	241	891
%	20.20%	25.03%	27.72%	27.05%	100%
Postgraduate Study	102	239	293	420	1054
%	9.68%	22.68%	27.80%	39.85%	100%
Total	631	778	783	802	2994
%	21.08%	25.99%	26.15%	26.79%	100%

Table 26: Highest Parent Education * Ethnicity 2 Cross tabulation						
	Ethnicity 2					
Highest Parent Education	White	African American	Asian / Pacific Islander	Hispanic	Native American	Total
Some Schooling	1		37	16		54
%	1.85%		68.52%	29.63%		100%
High School Gradate	123	5	79	13	4	224
%	54.91%	2.23%	35.27%	5.80%	1.79%	100%
Some College	299	13	66	22	9	409
%	73.11%	3.18%	16.14%	5.38%	2.20%	100%
2 Year Degree	180	10	53	13	5	261
%	68.97%	3.83%	20.31%	4.98%	1.92%	100%
4 Year Degree	540	15	174	25	7	761
%	70.96%	1.97%	22.86%	3.29%	0.92%	100%
Postgraduate Study	681	21	159	30	9	900
%	75.67%	2.33%	17.67%	3.33%	1%	100%
Total	1824	64	568	119	34	2609
%	69.91%	2.45%	21.77%	4.56%	1.30%	100%

Table 27: Highest Parent Education * Gender Cross tabulation			
	Gender		
Highest Parent Education	Male	Female	Total
Some Schooling	26	39	65
%	40%	60%	100%
High School Gradate	105	147	252
%	41.67%	58.33%	100%
Some College	177	281	458
%	38.65%	61.35%	100%
2 Year Degree	130	164	294
%	44.22%	55.78%	100%
4 Year Degree	407	496	903
%	45.07%	54.93%	100%
Postgraduate Study	510	562	1072
%	47.57%	52.43%	100%
Total	1355	1689	3044
%	44.51%	55.49%	100%

Table 28: Highest Parent Education * Autumn Matriculation Cross tabulation						
Highest Parent Education	Autumn Matriculation					Total
	UW	2 year public	4 year public	4 year private	unknown	
Some Schooling	56	1	3	3	2	65
%	86.15%	1.54%	4.62%	4.62%	3.08%	100%
High School Gradate	160	12	38	28	14	252
%	63.49%	4.76%	15.08%	11.11%	5.56%	100%
Some College	297	15	53	68	25	458
%	64.85%	3.28%	11.57%	14.85%	5.46%	100%
2 Year Degree	178	9	44	50	13	294
%	60.54%	3.06%	14.97%	17.01%	4.42%	100%
4 Year Degree	492	25	133	190	63	903
%	54.49%	2.77%	14.73%	21.04%	6.98%	100%
Postgraduate Study	552	18	138	271	93	1072
%	51.49%	1.68%	12.87%	25.28%	8.68%	100%
Total	1735	80	409	610	210	3044
%	57.00%	2.63%	13.44%	20.04%	6.90%	100%

Table 29: Total Alumni Status * Accept offer of admission Cross tabulation			
Total Alumni Status	Accept offer of admission		Total
	Decline	Accept	
Neither Parent UW Grad	970	1526	2496
%	38.86%	61.14%	100%
1 Parent UW Grad	207	263	470
%	44.04%	55.96%	100%
Both Parents UW Grad	113	113	226
%	50%	50%	100%
Total	1290	1902	3192
%	40.41%	59.59%	100%

Table 30: Total Alumni Status * EFC Quartile Cross tabulation

Total Alumni Status		EFC Quartile 0-4768.99	4769-12464.99	12465-23676.24	26376.25 and up	Total
Neither Parent UW Grad		614	645	633	560	2452
	%	25.04%	26.31%	25.82%	22.84%	100%
1 Parent UW Grad		65	108	125	167	465
	%	13.98%	23.23%	26.88%	35.91%	100%
Both Parents UW Grad		20	46	55	102	223
	%	8.97%	20.63%	24.66%	45.74%	100%
Total		699	799	813	829	3140
	%	22.26%	25.45%	25.89%	26.40%	100%

Table 31: Total Alumni Status * Ethnicity 2 Cross tabulation

Total Alumni Status		Ethnicity 2 White	African American	Asian / Pacific Islander	Hispanic	Native American	Total
Neither Parent UW Grad		1447	55	515	113	31	2161
	%	66.96%	2.55%	23.83%	5.23%	1.43%	100%
1 Parent UW Grad		310	14	58	6		388
	%	79.90%	3.61%	14.95%	1.55%		100%
Both Parents UW Grad		140	2	30	8	3	183
	%	76.50%	1.09%	16.39%	4.37%	1.64%	100%
Total		1897	71	603	127	34	2732
	%	69.44%	2.60%	22.07%	4.65%	1.24%	100%

Table 32: Total Alumni Status * Gender Cross tabulation

Total Alumni Status		Gender Male	Female	Total
Neither Parent UW Grad		1097	1399	2496
	%	43.95%	56.05%	100%
1 Parent UW Grad		220	250	470
	%	46.81%	53.19%	100%
Both Parents UW Grad		97	129	226
	%	42.92%	57.08%	100%
Total		1414	1778	3192
	%	44.30%	55.70%	100%

Table 33: Total Alumni Status * Autumn Matriculation Cross tabulation						
	Autumn Matriculation					
Total Alumni Status	UW	2 year public	4 year public	4 year private	unknown	Total
Neither Parent UW Grad	1474	71	328	454	169	2496
%	59.05%	2.84%	13.14%	18.19%	6.77%	100%
1 Parent UW Grad	254	8	67	104	37	470
%	54.04%	1.70%	14.26%	22.13%	7.87%	100%
Both Parents UW Grad	110	2	28	70	16	226
%	48.67%	0.88%	12.39%	30.97%	7.08%	100%
Total	1838	81	423	628	222	3192
%	57.58%	2.54%	13.25%	19.67%	6.95%	100%

Table 34: Total Alumni Status * Accept offer of admission Cross tabulation			
	Accept offer of admission		
Total Alumni Status	Decline	Accept	Total
Neither Parent UW Grad	594	769	1363
%	43.58%	56.42%	100%
1 Parent UW Grad	184	213	397
%	46.35%	53.65%	100%
Both Parents UW Grad	108	107	215
%	50.23%	49.77%	100%
Total	886	1089	1975
%	44.86%	55.14%	100%

Table 35: Total Alumni Status * EFC Quartile Cross tabulation					
	EFC Quartile				
Total Alumni Status	0-4768.99	4769-12464.99	12465-23676.24	26376.25 and up	Total
Neither Parent UW Grad	220	325	385	410	1340
%	16.42%	24.25%	28.73%	30.60%	100%
1 Parent UW Grad	45	92	103	153	393
%	11.45%	23.41%	26.21%	38.93%	100%
Both Parents UW Grad	17	45	52	98	212
%	8.02%	21.23%	24.53%	46.23%	100%
Total	282	462	540	661	1945
%	14.50%	23.75%	27.76%	33.98%	100%

Table 36: Total Alumni Status * Ethnicity 2 Cross tabulation						
	Ethnicity 2					
Total Alumni Status	White	African American	Asian / Pacific Islander	Hispanic	Native American	Total
Neither Parent UW Grad	827	23	252	43	14	1159
%	71.35%	1.98%	21.74%	3.71%	1.21%	100%
1 Parent UW Grad	260	11	52	4		327
%	79.51%	3.36%	15.90%	1.22%		100%
Both Parents UW Grad	134	2	29	8	2	175
%	76.57%	1.14%	16.57%	4.57%	1.14%	100%
Total	1221	36	333	55	16	1661
%	73.51%	2.17%	20.05%	3.31%	0.96%	100%

Table 37: Total Alumni Status * Gender Cross tabulation			
	Gender		
Total Alumni Status	Male	Female	Total
Neither Parent UW Grad	639	724	1363
%	46.88%	53.12%	100%
1 Parent UW Grad	185	212	397
%	46.60%	53.40%	100%
Both Parents UW Grad	93	122	215
%	43.26%	56.74%	100%
Total	917	1058	1975
%	46.43%	53.57%	100%

Table 38: Total Alumni Status * Autumn Matriculation Cross tabulation						
	Autumn Matriculation					
Total Alumni Status	UW	2 year public	4 year public	4 year private	unknown	Total
Neither Parent UW Grad	735	33	186	302	107	1363
%	53.93%	2.42%	13.65%	22.16%	7.85%	100%
1 Parent UW Grad	205	8	59	90	35	397
%	51.64%	2.02%	14.86%	22.67%	8.82%	100%
Both Parents UW Grad	104	2	26	69	14	215
%	48.37%	0.93%	12.09%	32.09%	6.51%	100%
Total	1044	43	271	461	156	1975
%	52.86%	2.18%	13.72%	23.34%	7.90%	100%

Table 39: EFC Quartile * Accept offer of admission Cross tabulation			
EFC Quartile	Accept offer of admission		
	Decline	Accept	Total
0-4768.99	250	607	857
%	29.17%	70.83%	100%
4769-12464.99	370	487	857
%	43.17%	56.83%	100%
12465-23676.24	354	503	857
%	41.31%	58.69%	100%
26376.25 and higher	398	459	857
%	46.44%	53.56%	100%
Total	1372	2056	3428
%	40.02%	59.98%	100%

Table 40: EFC Quartile * Ethnicity 2 Cross tabulation						
EFC Quartile	Ethnicity 2					Total
	White	African American	Asian / Pacific Islander	Hispanic	Native American	
0-4768.99	383	44	263	55	17	762
%	50.26%	5.77%	34.51%	7.22%	2.23%	100%
4769-12464.99	518	24	160	31	11	744
%	69.62%	3.23%	21.51%	4.17%	1.48%	100%
12465-23676.24	542	14	126	28	6	716
%	75.70%	1.96%	17.60%	3.91%	0.84%	100%
26376.25 and higher	553	12	108	29	5	707
%	78.22%	1.70%	15.28%	4.10%	0.71%	100%
Total	1996	94	657	143	39	2929
%	68.15%	3.21%	22.43%	4.88%	1.33%	100%

Table 41: EFC Quartile * Gender Cross tabulation			
	Gender		
EFC Quartile	Male	Female	Total
0-4768.99	366	491	857
%	42.71%	57.29%	100%
4769-12464.99	358	499	857
%	41.77%	58.23%	100%
12465-23676.24	400	457	857
%	46.67%	53.33%	100%
26376.25 and higher	395	462	857
%	46.09%	53.91%	100%
Total	1519	1909	3428
%	44.31%	55.69%	100%

Table 42: EFC Quartile * Autumn Matriculation Cross tabulation						
	Autumn Matriculation					
EFC Quartile	UW	2 year public	4 year public	4 year private	unknown	Total
0-4768.99	591	23	71	128	44	857
%	68.96%	2.68%	8.28%	14.94%	5.13%	100%
4769-12464.99	474	36	111	178	58	857
%	55.31%	4.20%	12.95%	20.77%	6.77%	100%
12465-23676.24	488	15	137	150	67	857
%	56.94%	1.75%	15.99%	17.50%	7.82%	100%
26376.25 and higher	446	11	127	211	62	857
%	52.04%	1.28%	14.82%	24.62%	7.23%	100%
Total	1999	85	446	667	231	3428
%	58.31%	2.48%	13.01%	19.46%	6.74%	100%

Appendix E: Correlation Tables

Correlations

		Gender	Ethnicity 1	Highest Parent Education	Total Alumni Status	Expected Family Contribution (EFC)	High School GPA	SAT Score	Number of Schools Listed (Trans 1)	UW Rank on FAFSA 6=first position	FAFSA Inst 1 Type	FAFSA Inst 1 Control	Total Aid Offered	Self Help Aid	Gift Aid	Parent Loan	Percent of Cost met by Gift Aid	Student Loan	Campus Based / Institutional Grant	Federal and State Grant	College Workstudy	Unmet Need	Accept offer of admission	Two Year College Matriculation
Gender	Pearson Correlation																							
	Sig. (2-tailed)																							
	N																							
Ethnicity 1	Pearson Correlation	0.066																						
	Sig. (2-tailed)	0.000																						
	N	2980																						
Highest Parent Education	Pearson Correlation	-0.057	-0.163																					
	Sig. (2-tailed)	0.002	0.000																					
	N	3044	2609																					
Total Alumni Status	Pearson Correlation	-0.006	-0.091	0.312																				
	Sig. (2-tailed)	0.736	0.000	0.000																				
	N	3192	2732	3044																				
Expected Family Contribution	Pearson Correlation	-0.019	-0.173	0.283	0.192																			
	Sig. (2-tailed)	0.268	0.000	0.000	0.000																			
	N	3428	2929	2994	3140																			
High School GPA	Pearson Correlation	0.067	-0.132	0.073	0.034	0.106																		
	Sig. (2-tailed)	0.000	0.000	0.000	0.053	0.000																		
	N	3478	2974	3039	3186	3422																		
SAT Score	Pearson Correlation	-0.185	-0.223	0.318	0.155	0.224	0.341																	
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000																	
	N	3473	2972	3033	3181	3417	3467																	
Number of Schools Listed (Trans 1)	Pearson Correlation	0.034	-0.025	0.145	0.079	0.115	-0.014	0.113																
	Sig. (2-tailed)	0.052	0.180	0.000	0.000	0.000	0.411	0.000																
	N	3330	2847	2915	3058	3274	3324	3319																
UW Rank on FAFSA 6=first position	Pearson Correlation	-0.025	0.054	-0.165	-0.101	-0.159	-0.082	-0.238	-0.508															
	Sig. (2-tailed)	0.157	0.004	0.000	0.000	0.000	0.000	0.000	0.000															
	N	3330	2847	2915	3058	3274	3324	3319	3330															
FAFSA Inst 1 Type	Pearson Correlation	-0.030	-0.045	0.047	0.023	0.049	0.001	0.058	0.006	0.029														
	Sig. (2-tailed)	0.085	0.017	0.011	0.199	0.006	0.936	0.001	0.721	0.099														
	N	3275	2800	2868	3007	3219	3269	3264	3275	3275														
FAFSA Inst 1 Control	Pearson Correlation	0.002	-0.076	0.171	0.109	0.175	0.119	0.248	0.363	-0.661	0.030													
	Sig. (2-tailed)	0.887	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037													
	N	3275	2800	2868	3007	3219	3269	3264	3275	3275	3275													
Total Aid Offered	Pearson Correlation	0.034	0.285	-0.279	-0.147	-0.510	-0.068	-0.202	-0.036	0.101	-0.040	-0.105												
	Sig. (2-tailed)	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.041	0.000	0.021	0.000												
	N	3450	2949	3015	3162	3399	3444	3440	3300	3300	3245	3245												
Self Help Aid	Pearson Correlation	0.022	0.120	-0.257	-0.150	-0.519	-0.201	-0.260	-0.039	0.114	-0.021	-0.131	0.750											
	Sig. (2-tailed)	0.203	0.000	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.227	0.000	0.000											
	N	3450	2949	3015	3162	3399	3444	3440	3300	3300	3245	3245	3450											
Gift Aid	Pearson Correlation	0.034	0.314	-0.230	-0.115	-0.403	0.018	-0.130	-0.026	0.073	-0.043	-0.070	0.933	0.463										
	Sig. (2-tailed)	0.044	0.000	0.000	0.000	0.000	0.299	0.000	0.130	0.000	0.015	0.000	0.000	0.000										
	N	3450	2949	3015	3162	3399	3444	3440	3300	3300	3245	3245	3450	3450										
Parent Loan	Pearson Correlation	-0.001	-0.031	-0.083	-0.060	-0.257	-0.088	-0.101	-0.030	0.047	-0.028	-0.068	0.035	0.298	-0.115									
	Sig. (2-tailed)	0.938	0.094	0.000	0.001	0.000	0.000	0.000	0.089	0.007	0.114	0.000	0.042	0.000	0.000									
	N	3450	2949	3015	3162	3399	3444	3440	3300	3300	3245	3245	3450	3450	3450									
Percent of Cost met by Gift Aid	Pearson Correlation	0.033	0.325	-0.235	-0.113	-0.402	0.011	-0.140	-0.031	0.076	-0.044	-0.077	0.918	0.443	0.992	-0.117								
	Sig. (2-tailed)	0.055	0.000	0.000	0.000	0.000	0.529	0.000	0.073	0.000	0.012	0.000	0.000	0.000	0.000	0.000								
	N	3430	2929	2996	3143	3399	3424	3420	3280	3280	3225	3225	3430	3430	3430	3430								
Student Loan	Pearson Correlation	0.013	0.060	-0.188	-0.131	-0.493	-0.196	-0.224	-0.052	0.101	-0.019	-0.129	0.539	0.886	0.243	0.494	0.225							
	Sig. (2-tailed)	0.439	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.263	0.000	0.000	0.000	0.000	0.000	0.000							
	N	3450	2949	3015	3162	3399	3444	3440	3300	3300	3245	3245	3450	3450	3450	3450	3430							
Campus Based / Institutional Grant	Pearson Correlation	0.030	0.244	-0.123	-0.056	-0.242	0.127	0.001	0.005	0.008	-0.013	-0.012	0.649	0.146	0.791	-0.088	0.779	0.030						
	Sig. (2-tailed)	0.074	0.000	0.000	0.002	0.000	0.000	0.937	0.793	0.639	0.449	0.508	0.000	0.000	0.000	0.000	0.000	0.081						
	N	3450	2949	3015	3162	3399	3444	3440	3300	3300	3245	3245	3450	3450	3450	3450	3430	3450						
Federal and State Grant	Pearson Correlation	0.022	0.237	-0.244	-0.126	-0.385	-0.108	-0.209	-0.047	0.108	-0.054	-0.099	0.797	0.585	0.751	-0.090	0.752	0.357	0.189					
	Sig. (2-tailed)	0.192	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000					
	N	3450	2949	3015	3162	3399	3444	3440	3300	3300	3245	3245	3450	3450	3450	3450	3430	3450	3450					
College Workstudy	Pearson Correlation	0.025	0.155	-0.243	-0.108	-0.325	-0.118	-0.197	-0.002	0.081	-0.015	-0.074	0.727	0.719	0.584	-0.130	0.571	0.315	0.255	0.661				
	Sig. (2-tailed)	0.148	0.000	0.000	0.000	0.000	0.000	0.000	0.900	0.000	0.392	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
	N	3450	2949	3015	3162	3399	3444	3440	3300	3300	3245	3245	3450	3450	3450	3450	3430	3450	3450	3450				
Unmet Need	Pearson Correlation	0.010	-0.005	-0.087	-0.065	-0.308	0.043	0.003	0.079	-0.091	-0.020	0.084	0.286	0.329	0.204	0.267	0.197	0.333	0.122	0.196	0.173			
	Sig. (2-tailed)	0.539	0.791	0.000	0.000	0.000	0.012	0.859	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
	N	3484	2980	3044	3192	3428	3478	3473	3330	3330	3275	3275	3450	3450	3450	3450	3430	3450	3450	3450	3450			
Accept offer of admission	Pearson Correlation	-0.039	0.154	-0.124	-0.065	-0.113	-0.085	-0.154	-0.372	0.404	-0.014	-0.355	0.139	0.065	0.151	-0.051	0.151	0.024	0.098	0.136	0.098	-0.276		
	Sig. (2-tailed)	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.422	0.000	0.000	0.000	0.000	0.003	0.000	0.166	0.000	0.000	0.000	0.000		
	N	3484	2980	3044	3192	3428	3478	3473	3330	3330	3275	3275	3450	3450	3450	3450	3430	3450	3450	3450	3450	3450	3484		
Two Year College Matriculation	Pearson Correlation	0.017	-0.060	-0.032	-0.040	-0.056	-0.032	-0.038	0.087	-0.048	-0.137	0.038	-0.019	0.050	-0.050	0.105	-0.049	0.082	-0.055	-0.019	-0.019	0.190	-0.933	
	Sig. (2-tailed)	0.422	0.010	0.172	0.081	0.010	0.146	0.078	0.000	0.030	0.000	0.089	0.396	0.023	0.021	0.000	0.025	0.000	0.011	0.388	0.378	0.000	0.000	
	N	2122	1875	1815	1919	2084	2120	2116	2039	2039	2011	2011	2089	2089	2089	2089	2078	2089	2089	2089	2089	2122	2122	

Appendix F: Logistic Regression Results

Table 1: Logistic Regression - All Applicants

	Step 1			Step 2			Step 3			Step 4 FA-2			Step 4 FA-4			
	Significance: Step: p<.001 Model: p<.001 Classification Accuracy 60.97%			Significance: Step: p<.001 Model: p<.001 Classification Accuracy 61.26%			Significance: Step: p<.001 Model: p<.001 Classification Accuracy 71.66%			Significance: Step: p<.001 Model: p<.001 Classification Accuracy 71.54%			Significance: Step: p<.001 Model: p<.001 Classification Accuracy 74.95%			
All Applicants n= 2375	Exp. (B)	Sig	% change in odds	Exp. (B)	Sig	% change in odds	Exp. (B)	Sig	% change in odds	Exp. (B)	Sig	% change in odds	delta P	Exp. (B)	Sig	% change in odds	delta P
P Accept = 0.6042																	
Eth 1	1.9617	0.0000	96.17%	1.8694	0.0000	86.94%	2.1594	0.0000	115.94%	1.8291	0.0000	82.91%	14.44%	1.7300	0.0000	73.00%	13.11%
Gender	0.8276	0.0294	-17.24%	0.7838	0.0070	-21.62%	0.8577	0.1302	n.s.	0.8626	0.1494	n.s.	-	0.8795	0.2293	n.s.	-
EFC2	0.9996	0.0549	n.s.	0.9996	0.1334	n.s.	1.0002	0.4783	n.s.	1.0002	0.5859	n.s.	-	0.9996	0.1916	n.s.	-
Par_Ed	0.9111	0.0058	-8.89%	0.9407	0.0787	n.s.	0.9905	0.8048	n.s.	1.0033	0.9339	n.s.	-	0.9947	0.8984	n.s.	-
Legacy	0.9801	0.7937	n.s.	0.9934	0.9323	n.s.	1.0691	0.4480	n.s.	1.0735	0.4254	n.s.	-	1.0595	0.5280	n.s.	-
HSGPA10			-	0.9809	0.3085	n.s.	0.9621	0.0667	n.s.	0.9407	0.0050	-5.93%	-1.46%	0.9676	0.1434	n.s.	-
TSTSCR10			-	0.8893	0.0004	-11.07%	1.0218	0.5712	n.s.	1.0107	0.7833	n.s.	-	1.0389	0.3439	n.s.	-
Nschool			-			-	0.7060	0.0000	-29.40%	0.6981	0.0000	-30.19%	-8.59%	0.6943	0.0000	-30.57%	-8.72%
UWRank			-			-	1.4239	0.0000	42.39%	1.4230	0.0000	42.30%	8.44%	1.4168	0.0000	41.68%	8.33%
FAI1Type			-			-	0.8073	0.7413	n.s.	0.8286	0.7734	n.s.	-	0.7620	0.6969	n.s.	-
FAI1Cont			-			-	0.4917	0.0000	-50.83%	0.4854	0.0000	-51.46%	-17.29%	0.5213	0.0000	-47.87%	-15.58%
Self			-			-			-	0.9945	0.1678	n.s.	-			-	-
Gift			-			-			-	1.0093	0.0000	0.93%	0.22%			-	-
Plus100			-			-			-	0.9884	0.0010	-1.16%	-0.28%	0.9949	0.2589	n.s.	-
FSGrant4			-			-			-			-	-	1.0125	0.0044	1.25%	0.30%
Loan4			-			-			-			-	-	1.0062	0.3053	n.s.	-
Unmet4			-			-			-			-	-	0.9735	0.0000	-2.65%	-0.64%
IGrant4			-			-			-			-	-	1.0131	0.0000	1.31%	0.31%
CWS4			-			-			-			-	-	1.0067	0.5216	n.s.	-

Table 2: Logistic Regression - Low Income

	Step 1			Step 2			Step3			Step 4 FA-2				Step 4 FA-4			
	Significance: Step: p<.001 Model: p<.001 Classification Accuracy 63.12%			Significance: Step: p<.001 Model: p<.001 Classification Accuracy 64.26%			Significance: Step: p<.001 Model: p<.001 Classification Accuracy 77.02%			Significance: Step: p<.001 Model: p<.001 Classification Accuracy 76.14%				Significance: Step: p<.001 Model: p<.001 Classification Accuracy 83.54%			
	Exp. (B)	Sig	% change in odds	Exp. (B)	Sig	% change in odds	Exp. (B)	Sig	% change in odds	Exp. (B)	Sig	% change in odds	delta P	Exp. (B)	Sig	% change in odds	delta P
Low Income n= 1136																	
P Accept = 0.6383																	
Eth 1	1.9843	0.0000	98.43%	1.8381	0.0000	83.81%	2.0255	0.0000	102.55%	1.6530	0.0039	65.30%	11.60%	1.4024	0.0799	n.s.	-
Gender	0.7689	0.0430	-23.11%	0.7132	0.0123	-28.68%	0.6970	0.0221	-30.30%	0.6927	0.0226	-30.73%	-8.48%	0.6501	0.0177	-34.99%	-9.94%
EFC2	0.9953	0.0068	-0.47%	0.9955	0.0092	-0.45%	0.9960	0.0453	-0.40%	0.9993	0.8408	n.s.	-	0.9853	0.0002	-1.47%	-0.34%
Par_Ed	0.9450	0.2197	n.s.	0.9779	0.6368	n.s.	1.0469	0.3970	n.s.	1.0569	0.3162	n.s.	-	1.0931	0.1562	n.s.	-
Legacy	1.0138	0.9169	n.s.	1.0641	0.6411	n.s.	1.4038	0.0406	40.38%	1.6930	0.0484	69.30%	7.65%	1.3278	0.1334	n.s.	-
HSGPA10			-	0.9940	0.8214	n.s.	0.9678	0.2813	n.s.	0.9270	0.0210	-7.30%	-1.74%	0.9966	0.9237	n.s.	-
TSTSCR10			-	0.8430	0.0006	-15.70%	0.9369	0.2613	n.s.	0.9127	0.1244	n.s.	-	0.9621	0.5639	n.s.	-
Nschool			-			-	0.7065	0.0000	-29.35%	0.6997	0.0000	-30.03%	-8.24%	0.7002	0.0000	-29.98%	-8.23%
UWRank			-			-	1.6471	0.0000	64.71%	1.6546	0.0000	65.46%	11.62%	1.5664	0.0000	56.64%	10.36%
FAI1Type			-			-	0.7279	0.6437	n.s.	0.7215	0.6345	n.s.	-	0.7889	0.7566	n.s.	-
FAI1Cont			-			-	0.3801	0.0000	-61.99%	0.3659	0.0000	-63.41%	-23.21%	0.4077	0.0003	-59.23%	-20.71%
Self			-			-			-	0.9926	0.1613	n.s.	-			-	-
Gift			-			-			-	1.0073	0.0525	n.s.	-			-	-
Plus100			-			-			-	0.9843	0.0003	-1.57%	-0.36%	0.9827	0.0015	-1.73%	-0.40%
FSGrant4			-			-			-			-	-	0.9960	0.5242	n.s.	-
Loan4			-			-			-			-	-	0.9838	0.0596	n.s.	-
Unmet4			-			-			-			-	-	0.9683	0.0000	-3.17%	-0.74%
IGrant4			-			-			-			-	-	0.9951	0.2999	n.s.	-
CWS4			-			-			-			-	-	1.0053	0.6552	n.s.	-

Table 3: Logistic Regression - GPA as Academic Predictor

	All Applicants						Low Income					
	FA-2			FA-4			FA-2			FA-4		
	Significance: Model: p<.001 Classification Accuracy 71.55%			Significance: Model: p<.001 Classification Accuracy 74.95%			Significance: Model: p<.001 Classification Accuracy 75.53%			Significance: Model: p<.001 Classification Accuracy 82.81%		
	Exp. (B)	Sig	% change in odds	Exp. (B)	Sig	% change in odds	Exp. (B)	Sig	% change in odds	Exp. (B)	Sig	% change in odds
Eth 1	1.8190	0.0000	81.90%	1.7106	0.0000	71.06%	1.7079	0.0018	70.79%	1.4172	0.0673	n.s.
Gender	0.8612	0.1329	n.s.	0.8629	0.1550	n.s.	0.7321	0.0460	-26.79%	0.6681	0.0221	-33.19%
EFC2	1.0002	0.5452	n.s.	0.9996	0.2204	n.s.	0.9993	0.8423	n.s.	0.9854	0.0002	-1.46%
Par_Ed	1.0069	0.8578	n.s.	1.0044	0.9134	n.s.	1.0448	0.4174	n.s.	1.0909	0.1578	n.s.
Legacy	1.0725	0.4300	n.s.	1.0607	0.5179	n.s.	1.3661	0.0614	n.s.	1.3249	0.1340	n.s.
HSGPA10	0.9413	0.0034	-5.87%	0.9729	0.1974	n.s.	0.9157	0.0049	-8.43%	0.9940	0.8579	n.s.
Nschool	0.6996	0.0000	-30.04%	0.6970	0.0000	-30.30%	0.7007	0.0000	-29.93%	0.6998	0.0000	-30.02%
UWRank	1.4308	0.0000	43.08%	1.4215	0.0000	42.15%	1.6702	0.0000	67.02%	1.5726	0.0000	57.26%
FAI1Type	0.8263	0.7701	n.s.	0.7845	0.7263	n.s.	0.6637	0.5469	n.s.	0.7474	0.7027	n.s.
FAI1Cont	0.4972	0.0000	-50.28%	0.5399	0.0000	-46.01%	0.3601	0.0000	-63.99%	0.4107	0.0003	-58.93%
Self	0.9942	0.1470	n.s.			-	0.9936	0.2191	n.s.			-
Gift	1.0093	0.0000	0.93%			-	1.0071	0.0572	n.s.			-
Plus100	0.9888	0.0014	-1.12%	0.9951	0.2753	n.s.	0.9847	0.0005	-1.53%	0.9831	0.0019	-1.69%
FSGrant4			-	1.0130	0.0031	1.30%			-	0.9967	0.6039	n.s.
Loan4			-	1.0060	0.3196	n.s.			-	0.9850	0.0774	n.s.
Unmet4			-	0.9737	0.0000	-2.63%			-	0.9685	0.0000	-3.15%
IGrant4			-	1.0130	0.0000	1.30%			-	0.9950	0.2877	n.s.
CWS4			-	1.0042	0.6812	n.s.			-	1.0039	0.7371	n.s.

Table 4: Logistic Regression - Test Score as Academic Predictor

	All Applicants						Low Income					
	FA-2			FA-4			FA-2			FA-4		
	Significance: Model: p<.001 Classification Accuracy 71.60%			Significance: Model: p<.001 Classification Accuracy 74.58%			Significance: Model: p<.001 Classification Accuracy 76.10%			Significance: Model: p<.001 Classification Accuracy 83.48%		
	Exp. (B)	Sig	% change in odds	Exp. (B)	Sig	% change in odds	Exp. (B)	Sig	% change in odds	Exp. (B)	Sig	% change in odds
Eth 1	1.8818	0.0000	88.18%	1.7659	0.0000	76.59%	1.7137	0.0018	71.37%	1.4022	0.0768	n.s.
Gender	0.8260	0.0576	n.s.	0.8611	0.1547	n.s.	0.6536	0.0072	-34.64%	0.6492	0.0158	-35.08%
EFC2	1.0002	0.5575	n.s.	0.9996	0.1961	n.s.	0.9988	0.7092	n.s.	0.9852	0.0002	-1.48%
Par_Ed	1.0008	0.9833	n.s.	0.9910	0.8268	n.s.	1.0564	0.3190	n.s.	1.0928	0.1572	n.s.
Legacy	1.0748	0.4159	n.s.	1.0586	0.5330	n.s.	1.4117	0.0397	41.17%	1.3297	0.1315	n.s.
TSTSCR10	0.9784	0.5503	n.s.	1.0233	0.5474	n.s.	0.8744	0.0180	-12.56%	0.9602	0.5304	n.s.
Nschool	0.7037	0.0000	-29.63%	0.6975	0.0000	-30.25%	0.7054	0.0000	-29.46%	0.7003	0.0000	-29.97%
UWRank	1.4138	0.0000	41.38%	1.4106	0.0000	41.06%	1.6331	0.0000	63.31%	1.5649	0.0000	56.49%
FAI1Type	0.8663	0.8273	n.s.	0.7842	0.7274	n.s.	0.7637	0.6969	n.s.	0.7919	0.7603	n.s.
FAI1Cont	0.4731	0.0000	-52.69%	0.5158	0.0000	-48.42%	0.3544	0.0000	-64.56%	0.4060	0.0003	-59.40%
Self	0.9962	0.3406	n.s.			-	0.9950	0.3281	n.s.			-
Gift	1.0084	0.0000	0.84%			-	1.0058	0.1127	n.s.			-
Plus100	0.9885	0.0011	-1.15%	0.9951	0.2743	n.s.	0.9844	0.0003	-1.56%	0.9826	0.0015	-1.74%
FSGrant4			-	1.0128	0.0037	1.28%			-	0.9960	0.5245	n.s.
Loan4			-	1.0074	0.2242	n.s.			-	0.9839	0.0577	n.s.
Unmet4			-	0.9732	0.0000	-2.68%			-	0.9682	0.0000	-3.18%
IGrant4			-	1.0125	0.0001	1.25%			-	0.9950	0.2741	n.s.
CWS4			-	1.0071	0.4986	n.s.			-	1.0054	0.6515	n.s.

Table 5: Logistic Regression - Individual Financial Aid Variables - All Applicants

FA Variable	Self Help	Gift	FS Grant	Loan	Unmet Need	Inst. Grant	Workstudy	PLUS
n=								
p<								
Classification Accuracy								
Eth 1	114.18% **	86.11% **	103.67% **	111.05% **	106.82% **	92.30% **	110.23% **	106.11% **
Gender	-	-	-	-	-	-	-	-
EFC	-	0.07%	-	-	-0.10% **	-	-	-
Par_Ed	-	-	-	-	-	-	-	-
Legacy	-	-	-	-	-	-	-	-
HSGPA10	-	-4.74%	-	-4.51%	-	-5.07% *	-	-4.51%
Nschool	-29.20% **	-30.22% **	-29.75% **	-29.25% **	-29.17% **	-29.92% **	-29.78% **	-29.25% **
UWRank	43.21% **	42.31% **	41.99% **	43.30% **	43.45% **	43.28% **	42.22% **	43.47% **
FAI1Type	-	-	-	-	-	-	-	-
FAI1Cont	-49.59% **	-50.11% **	-49.92% **	-50.01% **	-45.31% **	-49.84% **	-49.95% **	-49.77% **
Self	-	-	-	-	-	-	-	-
Gift	-	0.95% **	-	-	-	-	-	-
FSGrant4	-	-	1.09% **	-	-	-	-	-
Loan4	-	-	-	-1.27% *	-	-	-	-
Unmet4	-	-	-	-	-2.49% **	-	-	-
IGrant4	-	-	-	-	-	1.12% **	-	-
CWS4	-	-	-	-	-	-	1.95% *	-
Plus100	-	-	-	-	-	-	-	-1.60% **

Significance: p < .05 unless otherwise noted.
* p < .01
** p < .001

Table 6: Logistic Regression - Individual Financial Aid Variables - Low Income

FA Variable	Self Help	Gift	FS Grant	Loan	Unmet Need	Inst. Grant	Workstudy	PLUS
n=								
p<								
Classification Accuracy								
Eth 1	99.77% **	80.82% **	97.82% **	85.96% **	60.55%	93.66% **	107.44% **	83.11% **
Gender	-27.12%	-26.51%	-27.05%	-26.37%	-32.99%	-27.23%	-27.83%	-27.74%
EFC	-0.52%	-	-	-0.47%	-1.24% **	-	-	-0.43%
Par_Ed	-	-	-	-	-	-	-	-
Legacy	-	-	39.09%	-	-	38.20%	38.99%	38.51%
HSGPA10	-	-7.31%	-	-7.42%	-	-6.26%	-	-6.53%
Nschool	-29.23% **	-31.32% **	-29.56% **	-29.92% **	-30.21% **	-29.78% **	-30.00% **	-29.45% **
UWRank	65.43% **	69.13% **	68.58% **	63.21% **	58.79% **	66.72% **	66.50% **	66.41% **
FAI1Type	-	-	-	-	-	-	-	-
FAI1Cont	-62.94% **	-62.72% **	-62.03% **	-64.91% **	-54.79% **	-62.73% **	-62.72% **	-63.59% **
Self	-	-	-	-	-	-	-	-
Gift	-	1.43% **	-	-	-	-	-	-
FSGrant4	-	-	1.60% **	-	-	-	-	-
Loan4	-	-	-	-2.43% **	-	-	-	-
Unmet4	-	-	-	-	-3.19% **	-	-	-
IGrant4	-	-	-	-	-	0.89%	-	-
CWS4	-	-	-	-	-	-	2.30% *	-
Plus100	-	-	-	-	-	-	-	-1.99% **

Significance: p < .05 unless otherwise noted.
* p < .01
** p < .001

Appendix G: Discriminant Analysis

Table 1: Discriminant Analysis - Estimated Enrollment Effects				
	40% Gift	50% Gift	60% Gift	70% Gift
Change to Accept	15	9	13	10
Change to Decline	-6	-6	-13	-19
Net Change	9	3	0	-9

Table 2: Discriminant Analysis - Estimated Enrollment Effects by EFC								
	40% Gift		50% Gift		60% Gift		70% Gift	
EFC Quartile	Change to Decline	Change to Accept	Change to Decline	Change to Accept	Change to Decline	Change to Accept	Change to Decline	Change to Accept
0-4768.99	6	10	5	9	12	13	18	10
4769-12464.99	0	5	1	0	1	0	1	0
12465-23676.24	0	0	0	0	0	0	0	0
26376.25 and up	0	0	0	0	0	0	0	0
Total	6	15	6	9	13	13	19	10

Table 3: Discriminant Analysis - Estimated Enrollment Effects by Ethnicity								
	40% Gift		50% Gift		60% Gift		70% Gift	
Ethnicity	Change to Decline	Change to Accept	Change to Decline	Change to Accept	Change to Decline	Change to Accept	Change to Decline	Change to Accept
White	3	9	4	5	9	10	13	9
African American	1	0	1	0	1	0	1	0
Asian / Pacific Islander	0	2	0	1	1	0	2	0
Hispanic	1	0	0	0	0	1	1	0
Native American		1	0	1	0	1	0	1
Not Indicated								
Total	5	12	5	7	11	12	17	10

Table 4: Discriminant Analysis - Estimated Enrollment Effects by UW Rank								
	40% Gift		50% Gift		60% Gift		70% Gift	
UW Rank	Change to Decline	Change to Accept	Change to Decline	Change to Accept	Change to Decline	Change to Accept	Change to Decline	Change to Accept
First School	2	5	3	2	9	5	12	3
Second School	3	7	2	4	2	5	2	5
Third School	1	2		2		3	1	2
Fourth School								
Fifth School								
Sixth School								
Total	6	14	5	8	11	13	15	10

Vita

Randy Spaulding is currently working as the coordinator of the Master of Arts in Policy Studies program at the University of Washington, Bothell. As the first staff person hired for this program he has been intimately involved in its growth and success. His teaching and research is focused on the role of the university in the economy, issues of equity and choice in postsecondary education, professional placement, and economic rewards. Future work will examine the influence of structures within the university on retention and completion, and differences in employment outcomes (initial placement and access to job ladders) of students from different backgrounds – specifically looking at family income, race/ethnicity, and disability. Mr. Spaulding has also served as Coordinator of Financial Aid, and as an admission advisor at UW Bothell. As a member of Student Affairs in a rapidly growing branch campus he has had the opportunity to be involved in all facets of student services from recruitment through graduation and beyond. Prior to work in higher education Mr. Spaulding spent several years in Sales and customer service after receiving his MBA and BS in Small Business Management from the University of Montana.