The Pennsylvania State University

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THE RELATIONSHIP BETWEEN ALUMNI GIVING AND RECEIPT OF INSTITUTIONAL SCHOLARSHIPS AMONG UNDERGRADUATE STUDENTS AT A PUBLIC, LAND-GRANT INSTITUTION

A Thesis in

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by

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ABSTRACT

This study examines the relationship between alumni giving and receipt of institutional scholarships at a public research university. The study analyzed student and alumni records of 17,418 alumni who graduated from The Pennsylvania State University between (and including) December 2000 and August 2003.

The study's conceptual framework was modeled after Volkwein's (1989; 1998) Conceptual Model of Alumni Gift-Giving Behavior, in which four key constructs contribute to alumni giving: demographic background, academic and social integration, capacity to give, and motivation to give. Variable within each of these constructs were tested in order to determine which contribute to two dependent variables: giving (a dichotomous variable) and amount of giving (a continuous variable).

Both logistic and ordinary least squares regression analyses were employed to determine which factors are related to giving. Of the demographic variables, gender and family income influenced the decision to make a gift but not the amount of giving and year of graduation was significant in four of the five models. Of the academic and social integration variables, number of student activities, grade-point average, and academic college, were predictive of both giving and the amount of giving. Amount of loan debt, the single capacity to give variable, was not predictive of either giving or the amount of giving.

Within the motivation to give construct, the primary variables of interest were scholarship receipt and scholarship amount. Scholarship receipt was found to impact the decision to make a gift but not the size of the gift. The amount of scholarships received

impacts both giving and the amount of giving. Alumni Association membership, the third motivation to give variable, was the most predictive of all of the variables in the study, impacting both giving and the amount of giving.

Further analysis is recommended in order to develop a comprehensive portrait of aid receipt as a predictor of alumni giving, to determine if particular types of aid receipt result in giving to particular areas within the university, to determine whether the conceptual model's predictive ability could be improved with the addition or subtraction of variables, and to determine if the relationship between aid receipt and giving differs based on college or university characteristics.

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Chapter 1

Introduction

Turbulent political winds and a shifting financial landscape have combined to create a perfect storm of issues for higher education institutions across the country. State budget deficits in the early twenty-first century led to massive cuts in state appropriations to higher education institutions. In 2003, state appropriations to higher education nationwide increased just 1.2 percent from the previous year and appropriations actually declined in 14 states (Trombley, 2003). Although state appropriations rose in all but two states in 2006-2007 from 2005-2006 and rose by 5 percent or more in 28 states (Palmer, 2006), there are indications that states' deficits, and by extension their reduced support of higher education, may continue for many years despite a more rosy economic outlook (Jones, 2006).

Public institutions of higher education, which have traditionally been heavily reliant on state financing, have responded by increasing tuition at record rates. In 2006-2007, the average tuition increase at four-year, public universities was 6.3 percent, down from the previous year (7.1 percent) and from the double-digit increases of 10.5 percent in 2004-2005 and 14.1 percent in 2003-2004 (College Board, 2005a, 2006a).

At the same time, increases in merit-based aid and a decline in the proportion of grants as a part of students' aid packages mean that college has become less affordable

for many students (College Board, 2006b). The proportion of undergraduate funding in the form of grants has declined every year since 2001; while 52 percent of undergraduate aid was in the form of grants in 1994-1995, this had declined to 46 percent in 2004-2005 (College Board, 2005b).

As a result, greater numbers of students are assuming greater amounts of loan debt to finance their undergraduate educations. From 1989-1990 to 1999-2000, the percentage of undergraduate students who borrowed money in the form of loans to finance their educations at four-year, public universities rose from 26 percent to 46.6 percent (National Center for Education Statistics, 2004). The median debt of those who received bachelor's degrees from public universities in 2004 was $15,500 (College Board, 2005b).

In order to mitigate what some view as out-of-control tuition increases, and to increase the amount of institutional aid available to students, public colleges and universities are becoming increasingly reliant on private funds. Colleges and universities raised $28 billion in 2006, just over half of which came from individuals (Council for Aid to Education, 2006). While gifts to higher education institutions still represent around ten percent of their expenditures in a given year, these gifts are playing a more crucial role in institutions' viability, and many of these gifts (30 percent of gifts received by colleges and universities in 2006) come from institutions' alumni (Council for Aid to Education, 2006).

Why alumni give to their alma maters has been an often-studied but little understood phenomenon. Volkwein's model of alumni gift-giving suggests that giving patterns are tied to their demographic backgrounds, their academic and social integration

while enrolled at their college or university, and motivation and capacity to give (Volkwein et al., 1989).

If motivation to give is an important component of gift-giving behavior, then there remains the possibility that a proportion of the alumni who make gifts to their alma mater are motivated, at least in part, because they want to "give back" to their university as a result of having received some sort of benefit as an undergraduate. If that benefit was institutional aid, then universities may actually be helping themselves financially by dispensing more institutional aid to students in the form of grants and scholarships.

Statement of the Problem

"The demographic changes we are facing combined with the unmistakable trend of flagging state support and the associated privatization of public higher education are trends that tell our future – and it is a future filled with enormous challenge," said Penn State President Graham Spanier during a 2004 address at the Pennsylvania Press Club (Spanier, 2004b). In 1984, tuition replaced state funding as Penn State's largest source of revenue. In 2003-2004, tuition and fees comprised 69 percent of the revenue in its general funds budget and just 25 percent were from state appropriations. In 1970-1971, by comparison, state funding accounted for 62 percent of Penn State's general funds budget and tuition just 32 percent (Spanier, 2004a). This has resulted in a nearly 110 percent increase in tuition over the past decade, totaling $11,024 in 2005-06 for lower-division undergraduate students who are Pennsylvania residents, nearly twice as high as the

national average of $5,491 at public, four-year colleges and universities (College Board, 2005a).

The sting of declining state support is particularly harsh for the nation's land-grant universities, of which Penn State is one. Land-grant institutions, perhaps more so than other public universities, have a historical mission of service to the citizens of the states in which they are located. The education of the "industrial classes" is a tenet upon which land-grant institutions were established and thus, accessibility remains an important feature of today's land-grant universities (National Association of State Universities and Land-Grant Colleges, 1995).

For Penn State and many universities like it, the old view of private gifts as "margin of excellence" funds is waning – private support now has a more direct impact on the daily operations of the university. As a result, Penn State, like many public universities across the country, has redoubled its efforts to raise private funds from alumni, corporations, foundations and other external sources. While the university received $839 million in gifts during the first one hundred and forty years of its existence, it has raised $1.8 billion in the last ten (Spanier, 2005). Gifts to Penn State totaled $165.2 million for the 2005-2006 fiscal year, and a capital campaign that concluded in 2003 raised a total of $1.37 billion.

As Penn State raises tuition to make up for the erosion of state funding, it must offset these increases in order to compete for the "best and brightest" students and make a Penn State education affordable and accessible. Thus, much of its fundraising efforts in the last ten years have focused on providing increased support for students and resulted in the creation of 1,400 undergraduate scholarships and awards and 225 graduate

scholarships, fellowships and assistantships (Spanier, 2005). The University awarded more than $67.6 million in institutional grants and scholarships to undergraduate students in 2004-2005, more than double the $31.6 million awarded in 1995-1996 (Office of Student Aid, 1996, 2005).

Most university presidents would agree that obtaining more private funding is a worthy goal, and there is little disagreement that institutional aid is a useful means by which universities can attract the "best and brightest" students. But there is little information about whether the latter can influence the former; in other words, whether the provision of institutional aid can actually lead to more private funding, in the form of alumni gifts, later on.

There is a small body of research that attempts to determine what factors affect alumni gift-giving. Variables examined include student involvement (Ashcraft, 1995; Baker, 1998; Buchanan, 1998; Gaier, 2001; Gallo & Hubschman, ; Hanson, 2000; Koole, 1981; Miller & Casebeer, 1990; Nelson, 1984; Odom, 1995; Rosser, 1997; Taylor & Martin, 1993, 1995; Volkwein & et al., 1989), academic or educational variables such as degree received (Ashcraft, 1995; Beeler, 1982; Dietz, 1985; Enyard, 1993; Gallo & Hubschman, ; Haddad, 1986; Hanson, 2000; Korvas, 1984; Miller & Casebeer, 1990; Mosser, 1993; Nelson, 1984; Oglesby, 1991; Volkwein & et al., 1989; Volkwein & Parmley, 1998), attitudinal variables (Baker, 1998; Beeler, 1982; Koole, 1981; Martin, 1993; McKinney, 1978; Mehl, 1995; Murillo, 2003; Taylor & Martin, 1993, 1995), demographic variables (Ashcraft, 1995; Baade & Sundberg, 1996; Baker, 1998; Dahl, 1981; Dietz, 1985; Eldridge-Karr, 1991; Enyard, 1993; Gallo & Hubschman, ; Haddad, 1986; Hanson, 2000; House, 1987; Koole, 1981; Korvas, 1984; McKee, 1975;

McKinney, 1978; McNally, 1985; Mehl, 1995; Murillo, 2003; Odom, 1995; Oglesby, 1991; Okunade & Berl, 1997; Rosser, 1997; Selig, 1999; Taylor & Martin, 1993, 1995; Volkwein & et al., 1989; Volkwein & Parmley, 1998), and alumni involvement (Enyard, 1993; Gaier, 2001; Hanson, 2000; Ikenberry, 1999; Korvas, 1984; Murillo, 2003; Rosser, 1997).

Some of the above studies did include receipt of scholarships or grants as predictor variables. Many, however, examine private colleges or universities that do not face the same types of financial challenges as public universities (Beeler, 1982; Haddad, 1986; Koole, 1981; Korvas, 1984; Oglesby, 1991). Of those that do examine giving at public universities, some fail to distinguish between institutional scholarships and other private scholarships (Dietz, 1985), study male donors only (Dahl, 1981), or study a specific type of giving such as major gifts, planned gifts, or gifts in a single fiscal year (Enyard, 1993; Mehl, 1995; Odom, 1995; Oglesby, 1991). The author could find just one study that specifically focused on the receipt of aid as a single determinant of alumni giving at a public university, and that study defined giving very broadly – as a single gift in a ten-year period (Enyard, 1993).

Purpose and Significance of the Study

The purpose of this study is twofold: (1) to determine whether alumni who received institutional scholarships as undergraduates are more likely to be donors to their alma mater as alumni than alumni who did not receive institutional aid, and (2) whether alumni who received institutional scholarships as undergraduates give larger amounts

than alumni who did not receive institutional scholarships. In accomplishing this purpose, the study will attempt to make several contributions to the literature.

First, this study hopes to more clearly delineate the relationship between the receipt of institutional aid and alumni giving at a public, land-grant university. It attempts to shine light on some of the mystery pertaining to the private support on which these universities increasingly depend; namely, support from alumni, many of whom received financial support from the university as undergraduates. It attempts to determine whether universities, by investing in undergraduate students through the provision of institutional scholarships, can reap benefits later on through increased rates and amounts of giving by alumni who were the recipients of that aid.

While several other studies have examined variables pertaining to alumni giving at land-grant universities, this study will include several elements that are missing from one, two, or all of the studies. First, this study is based upon an existing conceptual framework that groups precollege, college, and alumni variables into constructs in order to paint a picture of the nature of alumni giving. Second, the study will use more rigorous statistical analyses than are found in most previous studies. These analyses may be more capable of disentangling the many complex variables that affect alumni giving and of detecting even a small effect size; something that is particularly important given that previous studies have shown mixed results as to whether receipt of aid is a determinant of alumni giving. Third, rather than relying on self-reported data, the study will utilize data from the Office of Student Aid, the Office of the Registrar and the Division of Development and Alumni Relations. Finally, this study is being conducted at a time when public universities, including Penn State, have significantly increased the size of their

endowments and more institutional aid is available than ever before. It also comes at a time of historic lows in state funding as a percentage of overall university revenues. These two factors combine to make the study more salient to current university issues than in previous years.

Research Questions

This study will examine the following research questions:

1. Are alumni of The Pennsylvania State University who received institutional scholarships as undergraduates more likely than non-aid recipients to be donors to the University?
2. Do alumni of The Pennsylvania State University who received institutional scholarships as undergraduates give to the University in significantly higher amounts than non-scholarship recipients?
3. Does the amount of institutional scholarships received impact the likelihood of making a gift and the amount of giving?

In addition, a subsidiary research question, 3b, was posed:

3b. For those students who received scholarships, does the amount of scholarships received impact the amount of giving?

Definition of Terms

The term *alumni* refers to those who received a baccalaureate degree from Penn State's University Park campus between December 2000 and August 2003. *Alumnus* and *alumna* refer to the masculine and feminine singular versions of the term, respectively.

Unless otherwise stated, the term *scholarship* refers to non-repayable award given to a student by the University. Scholarships may be merit-based, need-based, or a combination of both. Scholarships are funded with monies from private individuals or businesses.

Financial aid refers to any type of monetary assistance, repayable or non-repayable, received by a student from any source. Financial aid may consist of any grant, scholarship, loan, work-study, or combinations of these.

Giving refers to the act of making a gift to the University or to any academic or auxiliary unit within the University.

Gift-giving behavior refers to an alumnus or alumna's likelihood of making a gift or gifts (giving) and the amount of the gift or gifts (giving level or amount).

Summary and Organization of the Study

Private giving has become increasingly important to the vitality of America's public institutions of higher education, and alumni are a strong and dependable source of giving. A number of studies have attempted to tease apart the many factors that influence alumni giving, analyzing variables such as student involvement, demographic information, income and alumni involvement. A handful of studies have included receipt

of financial aid as a predictor variable or variables. This study will further the investigation of institutional scholarships and its relationship to future alumni giving by (1) analyzing data from university databases rather than self-reported data, (2) utilizing rigorous methodologies to detect possible links between institutional aid and alumni giving and (3) emphasizing the university's land grant mission and analyzing whether the implementation of this mission through institutional aid programs can enhance outcomes such as alumni giving.

The chapters that follow will develop the theoretical and conceptual bases for the ensuing study. Chapter 2 will provide a brief history of philanthropy in American higher education. It also will review previous studies pertaining to alumni giving and delineate the many variables that have been linked to alumni giving. Chapter 3 will develop the conceptual framework underlying the study and discuss the methodologies used in the study. The results of the analysis will be presented and discussed in chapter 4, and chapter 5 will offer a summary of the study and present conclusions.

Chapter 2

Review of the Literature

Veysey states that "American colleges and universities have always been basically dependent upon philanthropy, whether public or private" (1965, p. 3). Early colleges were often the result of the philanthropy of one man or religious denomination. John Harvard left half his property and his entire library to what was soon to be called Harvard College (Morison, 2001). Elihu Yale's gift resulted in the establishment of Yale in New Haven. Most of the money used to found Princeton was from Presbyterians, while Anglicans raised funds for King's College through a lottery. Samson Occom, a Mohegan Indian, raised funds in England for what would be Dartmouth College (Curti & Nash, 1965). Many colleges raised funds through subscription drives which resulted in small gifts from many individuals (Curti & Nash, 1965). In the post-Civil War period, Ezra Cornell, the Stanfords, Johns Hopkins and others made seminal gifts to establish institutions that would become the nation's greatest research universities.

While some colleges in the 18th and 19th centuries operated through a mixture of private and public support and oversight, the Morrill Land-Grant Act of 1862 mandated a mechanism to provide state aid to public higher education (Veysey, 1965). The Morrill Act called for:

> "…the endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and mechanic arts, in such manner as the legislatures of the State may respectively prescribe, in order to promote

> the liberal and practical education of the industrial classes in the several pursuits and professions in life…" (U.S. Statutes at Large 12 (1862): 503.)

Before World War I, alumni support was scant, even at many of America's older colleges (Curti & Nash, 1965). Many did, however, benefit from alumni support, although in a less formative way than from the earlier "founding" gifts. Amherst, Dartmouth and Hamilton Colleges all benefited from gifts of at least several thousand dollars. Buildings and scholarships were popular targets of alumni dollars, but later, alumni made gifts to further scientific knowledge at their alma maters (Curti & Nash, 1965).

Even state-supported universities longed for alumni donations: James B. Angell, president of the University of Michigan, said during his 1871 inaugural address, "Let it not be thought that the aid furnished by the State leaves no room for munificence" (Curti & Nash, 1965, p.187). In the 1900s, public universities did reap the benefits of alumni donations. While premier public institutions like the University of Michigan and the University of Virginia received a great deal of alumni support, they were not the only recipients. West Virginia University, Ohio State University and the University of Wisconsin all received important gifts early in the century (Curti & Nash, 1965).

As alumni support continued to grow during the first half of the twentieth century, colleges and universities began hiring fund-raising professionals (Cook & Lasher, 1996). Then, in 1958, the Greenbriar Report was issued, essentially describing a new term, "institutional advancement," which integrated public relations, development and alumni relations under one umbrella (Cook & Lasher, 1996). The Council for Advancement and Support of Education (CASE), which was created in 1974 by the merger of the American

Alumni Council and the American College Public Relations Association, codified this new structure. While presidents remain perhaps the most public face of their colleges' fund-raising, no higher education institution today could survive without a cadre of advancement professionals.

Universities' reliance on private support and the professionalization of higher education advancement have led to a small body of research that aims to predict alumni giving. These studies analyze societal, institutional and individual characteristics that may impact whether or not alumni give to their alma mater, and also how much they give.

Societal/Institutional Characteristics

Leslie et al. (1983) examined the influence of national economic conditions on alumni and corporate giving to higher education. They found that the single best predictors of giving to higher education were Standard and Poor's 500 stock price index, bond yields, and consumer prices. When they isolated alumni giving, however, they found that increases in giving were associated with decreases in stock equities, inflation and bond yields and with increases in taxes. The authors posit that because alumni are motivated to give if they perceive an institutional need, then they will be more likely to give in difficult economic times even if they have less to give. The results were almost the opposite for corporate giving, leading the authors to conclude that corporations give for financial reasons while alumni give for personal reasons. Ehrenberg and Smith (2001)

found that increases in the capital gains tax were associated with decreases in alumni giving.

A larger body of research examines institutional characteristics that influence voluntary support. Several studies in particular have linked various measures of quality to giving. Leslie and Ramey (1988) found that expenditures per student were significantly and positively correlated with corporate giving but did not have an effect on alumni giving. Baade and Sundberg (1996) found that expenditures per student were significantly related to alumni giving for private universities and liberal arts colleges (but not for public universities) and concluded that, “Institutions that invest more heavily in the instruction of their students receive a greater return from their alumni” (p. 80). Finally, Loessin et al. (1987) and Duronio and Loessin (1990) found that expenditures per student and admissions selectivity, both measures of quality, were highly correlated with both alumni and non-alumni giving.

Closely related to quality is institutional prestige. Leslie and Ramey (1988) used the Gourman rating (a composite measure including both quality and prestige variables) and age of the institution as a proxy for alumni perceptions of prestige. The authors found these variables to be strong predictors of alumni contributions. Baade and Sundberg (1996), using the ratio of alumni to current enrollment as a measure of institutional age, found the variable to be significantly related to alumni giving at both liberal arts colleges and at public universities (but not at private universities).

Several studies examined variables related to the size, history, and effort of universities’ development offices. Harrison (1995) developed a model to predict ratios of alumni donors to total alumni at 18 institutions. A factor representing fund-raising effort

was the most highly predictive of high donation vs. low donation schools in the sample. Interestingly, alumni costs per full-time student were the strongest predictor of fund-raising success for the institutions in the sample. Such costs include alumni newsletters, reunions and other events, alumni career services and other activities in support of alumni engagement. Harris (1988) developed a model in which a university's fund-raising success was due to the additive effects of development experience, development environment and development structure. The variables comprising this model predicted 81.9 percent of the variance in total giving. Harris also found that institutional campaign experience, institutional advancement experience and development linkages were the best predictors of an institution's total giving. The latter two also were significant predictors of alumni giving.

Leslie and Ramey (1988) used the percentage of alumni solicited in an institution's annual fund drive as a proxy for institutional fund-raising efforts but found this measure to be of little utility: the percentage of alumni solicited was not significantly related to individual (alumni or non-alumni) contributions. Loessin et al. (1987), on the other hand, found fund-raising expenditures and number of fund-raising staff to be highly correlated with total voluntary support and with alumni support across all institutional types. They concluded that "alumni must be regularly prompted and encouraged to give."

The amount of an institution's endowment as it relates to voluntary support has also been examined. Leslie and Ramey (1988) used the market value of endowment per alumnus as an indicator of the institution's past success in establishing and maintaining donor-institution relationships. However, they found no significant relationship between this variable and alumni giving. Duronio and Loessin (1990) and Loessin et al. (1987)

used a three-year average market value of an institution's endowment as a measure of institutional wealth. They found this variable to be very highly correlated with alumni giving across all institutional types.

Tuition is another fiscal measure that has been examined for various reasons and with varying results. Duronio and Loessin (1990) and Loessin et al. (1987) did not find the amount of a university's tuition to be significantly related to alumni, corporate or foundation giving across institution types. Baade and Sundberg (1996) included tuition as a measure of the wealth of an institution's students. Tuition was significantly related to alumni giving only at public universities, but the authors cautioned that this variable presented multicollinearity issues with another variable, instructional expenditures per student.

Individual Characteristics

The preponderance of studies on the topic of giving to higher education focuses on the identification and examination of individual characteristics of alumni that affect giving. With nearly a third of gifts to higher education coming from alumni (Council for Aid to Education, 2006), and with alumni often being viewed as an institution's most steadfast supporters, alumni are a logical investigatory focus. The following section will group these variables into four categories: (1) Demographic variables, (2) Student variables, (3) Alumni Involvement variables, and (4) Emotional/Attitudinal variables.

Demographic variables

Most studies of alumni giving examine variables such as sex, marital status, and current income or occupation. The literature review does point to some holes in the existing research, however. For example, some studies that include sex as a predictor variable fail to control for income. In addition, few studies include race/ethnicity as a predictor variable. Finally, the literature review failed to identify any studies that examined pre-college variables such as family socioeconomic status (SES) as predictors of giving.

Sex

Nearly all of the studies reviewed included the sex/gender of alumni as a predictor variable, but the findings across studies are quite mixed. Ashcraft (1995) found that male alumni of Arizona State University were more likely to give than females. Similarly, Dietz's (1985) study of Iowa State University alumni of the classes of 1974 and 1979 found that men were more likely than women to give to the university's athletics program and academic programs. House (1987), in his study of University of Florida alumni; Odom (1995), who studied alumni of the University of Southern Mississippi; and Haddad (1986), who studied alumni of Butler University, all found that men were more likely to be donors than women. McNally's study of alumni of California State University – Sacramento found that males were slightly more likely than women to be donors to the university. Oglesby found that male alumni of Southwest Baptist University tended to give in higher amounts than women, but cautioned against the significance of the findings

because historically, if a married couple who were both alumni made a donation, the donation was recorded under the man's name.

Of the literature examined, just one study found that women were more likely to be donors. Enyard (1993) found that women who received federal grants while enrolled were more likely to give than male federal grant recipients, and that women who received institutional scholarships were more likely to be donors than men who did not receive any aid.

Most of the studies reviewed did not find sex to be a significant predictor of alumni giving. Clotfelter (2003), Dugan, Mullin and Siegfried (2000), Eldridge-Karr (1991), Korvas (1984), Martin (1993), McKee (1975), Okunade and Berl (1997), Thomas and Smart (2005) and Wunnava and Lauze (2001) all found sex to be statistically insignificant.

It should be noted that although some studies found that men were more likely to be donors, this result may simply be a reflection of their historically greater earning power and likelihood of maintaining continuous employment throughout their lives, whereas women are more likely to "stop out" of the workforce, or drop out entirely, to raise children. Indeed, Young and Fischer (1996) found that men were more likely to be donors until they controlled for income.

Age

Age has often been found to be a significant predictor of donor status. Again, however, caution should be exercised in using age as a "stand-alone" predictor of giving

because of its interaction with income (assuming that income tends to rise with age). In addition, some studies chose to use year of graduation, decade of graduation, or a similar category as a proxy for age. To do so is to accept the assumption that the majority of the college's graduates are "traditional age" students.

Most studies that use age as a predictor variable have found that older alumni, or alumni of earlier graduation years, are more likely to be donors than younger (or more recent) alumni. Ashcraft's (1995) study of alumni who made a gift between 1985 and 1990 found that alumni who graduated before 1958 were more likely to be donors than alumni who graduated later. Willemain et al. (1994), who studied the effects of both class year and reunions on alumni giving, found that older classes tended to have the best participation rates as a whole and that both gift size and participation rates increased with reunion number.

Korvas (1984) and McAlexander and Koenig (2001) found that as time since graduation increased, alumni were more likely to donate. Okunade and Berl's (1997) study of business school alumni concurred, determining that the marginal probability of giving increased by 6.9% for those who graduated between 1972 and 1981, by 18.8 percent for alumni who graduated from 1962 to 1971, and by 26.1 percent for alumni who graduated between 1955 and 1961. However, he cautioned against "life cycle" or cohort effects such as societal events, generational tastes, or other occurrences particular to an age group that might interact with the variable. Thomas and Smart (2005), who also found that giving increased with years since graduation, argued that alumni who graduated in earlier years had received more solicitations from the university and had more opportunities to accumulate income and savings. Dietz (1985) found that graduates

of the class of 1974 were more likely to be donors than graduates of the class of 1979 but that income effects were likely in play.

Two authors found that giving tends to decline among an institution's oldest alumni. McKee (1975) determined that the classes of 1942 to 1951 were the most likely to be donors and that those who graduated prior to 1931 and after 1962 were the least likely. Similarly, Wunnava and Lauze (2001) found that giving rises with graduation year until 61 years after graduation and then begins to decline.

Haddad (1986), House (1987), Hoyt (2004), Koole (1981), Odom (1995) and Oglesby (1991) all found that older alumni were more likely to be donors than younger alumni. Selig (1999) found that age was significant for both donor status and donor level. Not only were older alumni more likely to be donors, but the probability that an alumnus/alumna would be a "high" donor increased as his/her age increased. Mosser (1993), who studied both motivation to give and capacity to give as predictors of giving, found that older alumni had greater capacity to give.

Just two authors reviewed found that younger alumni, or alumni of more recent graduation years, were more likely to be donors. Enyard (1993) found that givers were more likely to be between the ages of 20 and 29, or between 30 and 39, than to be in other age groups, but because his study analyzed graduates of the classes of 1983 to 1992, most alumni of those years would presumably fall within those age ranges anyway. Beeler found that donors graduated somewhat more recently than non-donors. Eldridge-Karr (1991), Martin (1993) and McNally (1985) found that age was not a significant predictor of giving.

Marital Status

Another demographic variable that, in some studies, has been shown to impact alumni giving is marital status. Dugan et al (2000) concluded that marital status was not statistically significant but that married alumni were four percent more likely to be donors. Koole (1981) also found that married alumni were more likely to give, and Mosser (1993) found that marital status was positively related to capacity to give. Eldridge-Karr (1991) found that single alumni were more likely to make a planned gift, but this was perhaps due to the fact that single alumni had no heirs who could inherit their wealth. However, Bruggink and Siddiqui (1995) also found that single alumni were more likely to be donors than married alumni. Ashcraft (1995), Beeler (1982), Dietz (1985), Korvas (1984), Okunade and Berl (1997) and Oglesby (1991) found marital status not to be a significant predictor of giving.

Some authors examined the impact of having a spouse who is an alumnus/alumna on giving. Korvas (1984) and Oglesby (1991) did not find this to be a significant predictor, but Enyard (1993) found that among alumni who were recipients of institutional scholarships, federal grants or both, those who were married to an alumnus/alumna were more likely to be donors than those who were not married to an alumnus/alumna. Koole (1981) also found that alumni who were married to an alumnus/alumna were more likely to be donors, and Thomas and Smart (2005) found that those who were married to an alumnus or alumna gave in larger amounts than alumni who were not married to an alumnus/alumna.

Race/Ethnicity

Surprisingly, only three of the studies reviewed included race/ethnicity as a predictor variable. Ashcraft (1995) and Okunade and Berl (1997) found that race was not a significant predictor of giving. Odom (1995) found that white alumni were more likely to be donors than alumni of other races or ethnicities, but the study did not control for income.

Distance from campus

The results of using this variable as a predictor of alumni giving are mixed, perhaps because of the many different ways in which it is operationalized. Beeler (1982) and Enyard (1993) both found that alumni donors tended to live farther from campus. Dugan (2000), however, found that alumni donors who resided in Nashville, where her institution of study was located, were four percent more likely to be donors than alumni who did not live there. McKee (1975) found that alumni living in the county where his institution of study was located were more likely to be donors than alumni who did not, and Selig (1999) found that alumni who lived in "close proximity" to the institution were six times more likely to be donors than alumni who did not live in close proximity. Finally, Klostermann (1995) and Bruggink and Siddiqui (1995) found that donors were more likely to live close to campus than nondonors. Eldridge-Karr (1991), Haddad (1986), Hoyt (2004), Koole (1981), Korvas (1984), Martin (1993), Rosser (1997) and Oglesby (1991) did not find this variable to be a significant predictor of giving.

Children

Research findings on whether donor status is affected by the number of children an alumnus/alumna has are mixed. Dugan et al. (2000) found that alumni with children were five percent more likely to donate to their alma mater than alumni who did not have children. Similarly, Koole (1981) found that alumni with at least two children were more financially supportive of their alma mater than alumni with fewer than two children. Okunade and Berl's (1997) study of business school alumni, on the other hand, concluded that alumni were less likely to give if they had children at least 12 years old.

Eldridge-Karr (1991) and Mehl (1995) both found that alumni with fewer or no children were more likely to be donors, but because their studies examine planned giving, they surmised that this result was due to the fact that alumni with fewer or no heirs would be more likely to give their wealth to their alma mater.

Beeler (1982), Bruggink and Siddiqui (1995), Korvas (1984) and Martin (1993) found that the number of children was not a significant predictor of donor status among alumni.

Family Members Attending / Attended Alma Mater

A number of studies have examined the impact of family members (spouse, parents, and children) of alumni attending the institution on subsequent giving. Dietz (1985) found that alumni whose spouses were also alumni were more six percent more likely to be donors to the institution, but this finding was not significant. Enyard (1993), Koole (1981) and Okunade and Berl (1997) also concluded that alumni whose spouses

were also alumni were more likely to be donors, and Okunade and Berl found the result to be even more significant if the spouse received a graduate degree rather than a baccalaureate degree from the institution. Thomas and Smart (2005) found that alumni who were married to alumni had higher lifetime donation amounts than other alumni. Of the studies examined, only Korvas found this variable not to be significant.

Oglesby (1991) examined the impact on donations of having a spouse, parent or child who was also an alumnus/alumna of the institution. His results did not reach significance for donor status, but he did find that alumni with a spouse, parent or child who was an alumnus/alumna tended to give in higher amounts than alumni who did not have a family member who was an alumnus/alumna. Wunnava and Lauze (2001), similarly, found that having a relative who attended the institution made alumni more likely to be donors. Mosser (1993) examined the impact of having a parent, child or spouse who attended the University of Michigan on both capacity to give and motivation to give. He concluded that (1) capacity to give was positively affected by having a parent who attend the university and (2) motivation to give was positively affected by having a child who attended the university.

Income / Occupation

The two variables “income” and “occupation” are grouped together for the purpose of this literature review because occupation is used in most studies as a proxy for income level. Logically, alumni with higher incomes would be more likely to make financial contributions and to give at higher levels, and this is confirmed by the results of

numerous studies. Beeler's (1982) study found that occupation was the second most powerful discriminator between donors and non-donors, and also among donor levels. Alumni with jobs requiring greater skill and responsibility were more likely to be donors and at higher levels than alumni whose jobs required less skill and responsibility. Mehl (1995) also found that donors tended to hold upper management or executive positions and that nondonors tended to be in lower management or staff positions. House (1987), Hoyt (2004), Koole (1981) and Oglesby (1991) also concluded that occupation was related to donor status, although in McKee's (1975) study, occupation was not a significant predictor.

Using annual household or family income as a predictor variable, the following authors found higher income to be associated with greater likelihood of giving: Ashcraft (1995), Bruggink and Siddiqui (1995), House (1987), Hoyt (2004), Koole (1981), Korvas (1984), McKinney (1978), Oglesby (1991), Okunade and Berl (1997), Rosser (1997), Selig (1999) and Taylor and Martin (1993; 1995). In addition, Clotfelter (2003), Oglesby (1991), Rosser (1997) and Taylor and Martin (1993; 1995) found higher income levels to be associated with higher levels of giving.

Student Variables

The student variables explained below range from academically-oriented variables, such as grade-point average, to social or extracurricular variables such as student organization membership, to post-college variables such as other degrees received. These variables reflect the breadth of the student experience both in and out of

the classroom and the importance of measuring students' college experiences in varied ways.

Time to Degree/Graduation Status

A number of authors have examined whether the time it takes alumni to complete their degree, or whether they graduated from the institution at all, impacts the likelihood of making a donation. The results of including these types of variables are mixed, perhaps because of the many different ways in which the authors defined them.

Several studies sampled individuals who had attended the institution but had not graduated. Graduation status was not a significant predictor of giving in McNally's (1985) study, but Clotfelter (2003) found that those in the 1951 cohort who graduated from the institution gave three times as much as those who did not graduate, and that those in the 1976 cohort gave four times as much. Similarly, Dahl (1981) concluded that donors graduated at nearly twice the rate of nondonors. Hoyt (2004) found that transferring to another institution did not significantly impact subsequent giving.

Of the studies that examined "time to degree" as a predictor variable, Beeler (1982) concluded that nondonors averaged slightly longer attendance, but the result did not reach significance. Dahl (1981) found that donors completed more semesters at the institution than nondonors, but the variable "time to graduation" did not significantly impact giving. Koole (1981) concluded that alumni who spent less than four years at the institution were less supportive financially than those who spent more than four years, and in Korvas's (1984) study, the largest number of donors spent more than two but a

maximum of four years at the institution. Dugan (number of semesters), Martin (total years of attendance) and Taylor (total years of attendance, both undergraduate and undergraduate, at the institution) all found that time at the institution was not a predictor of alumni giving. Mosser (1993) found that the number of years an alumnus or alumna spent at the institution had a slightly negative effect on both capacity and motivation to give.

Number of Degrees/Other Degrees

Dugan et al. (2000) found that alumni of Vanderbilt University were more likely to be donors to their undergraduate institution if they had attended another institution for graduate or professional school rather than remaining at Vanderbilt for graduate or professional school. The authors surmised that those who remained at Vanderbilt "transferred their loyalties" to their graduate or professional school but those who attended a different institution remained loyal to Vanderbilt. Beeler (1982) found that more donors had attended another institution after receiving their bachelor's degrees than had not; however, the variable was not a strong enough predictor to be included in the final discriminant analysis. Mehl (1995) also found that more donors had additional degrees from another institution, and more had received their degrees after graduation from the University of Akron, than nondonors. Taylor and Martin (1993; 1995) and Martin (1993), however, found that the majority of nondonors and donors who gave in lower amounts had attended another institution for graduate work. Hoyt (2004) and Korvas (1984) found that earning a degree at another institution did not impact giving.

Several authors examined whether the number or type of degrees alumni receive at an institution impacts donor status. McNally (1985) found that the degree level (baccalaureate vs. master's degree) earned at California State University-Sacramento did not significantly impact giving, while McKee (1975) found that those who earned both a baccalaureate degree and a graduate degree were more likely to give than all other categories of alumni. Selig (1999) concluded that the number of degrees alumni received from the university did not impact either donor status or donor level.

Major / College

Some studies have examined whether one's major or area of study is related to giving as an alumnus/alumna. However, these results are difficult to extrapolate due to widely differing operationalizations. In addition, one's area of study is, in many cases, correlated occupation and to future earnings. Income and occupational variables were discussed earlier.

Ashcraft (1995) found that alumni of the Colleges of Business, Education and Engineering were more likely to be donors than alumni of the Colleges of Liberal Arts and Human Service. Okunade and Berl's (1997) study of business school alumni found that majoring in finance, real estate or insurance increased alumni's willingness to give by 15.5 percent compared to other majors in business and economics. Both authors surmised that these differences were income-related rather than college- or major-related. Beeler (1982), on the other hand, found that proportionally more graduates of the School of the Arts and Science were donors than graduates of the School of Management. Dietz

(1985) found that agricultural engineering and agriculture graduates gave at higher levels for the class of 1974, but graduates of the College of Sciences and Humanities and the College of Engineering gave at higher levels for the class of 1979. Finally, Dugan et al. (2000), using humanities alumni as the benchmark, found that majoring in education, human/organizational development, performing arts or sciences lowered the probability that alumni would make a gift, while majoring in economics, math/engineering, psychology and social science raised the probability of giving. Korvas (1984), Martin (1993), McNally (1985), Odom (1995), Oglesby (1991) and Young and Fischer (1996) all found these types of variables not to be significant predictors of giving.

Grade-Point Average

Grade-point average has been included as a variable in a small number of studies. All but one study concluded that grade-point average was not a predictor of subsequent giving (Beeler, 1982; Dahl, 1981; Koole, 1981; Korvas, 1984; Mehl, 1995; Mulugetta, 1999). Only Dugan et al. (2000) found that grade-point average had an overall negative impact of $30 per grade point on average gift size. However, the variable "grade point differential" (the difference between high school GPA and college GPA) had a positive impact on average gift size. Each grade point increase in the difference between a student's high school GPA and his college GPA was associated with a $28 increase in average gift size.

Extracurricular Involvement

Tinto's Theory of Institutional Departure (Tinto, 1994) shows that students who are integrated academically and socially into campus life are more likely to graduate, and numerous authors have posited that they will be more likely to donate to their institution as well. A number of authors found that alumni who had been members of student groups such as professional organizations (Dietz, 1985), Greek organizations (Bruggink & Siddiqui, 1995; Dugan et al., 2000; Martin, 1993; Mehl, 1995; Selig, 1999; Taylor & Martin, 1993, 1995), academic/honorary organizations (Dietz, 1985; Mehl, 1995; Oglesby, 1991; Thomas & Smart, 2005), campus publications (Dietz, 1985; Oglesby, 1991), student government (Dietz, 1985; Koole, 1981; Oglesby, 1991), special interest groups (Martin, 1993; McNally, 1985; Taylor & Martin, 1993, 1995) and athletic teams (Dugan et al., 2000; Koole, 1981; Oglesby, 1991; Selig, 1999; Wunnava & Lauze, 2001) were more likely to be donors than alumni who had not participated in those organizations.

Haddad (1986) concluded that alumni who had participated in two to four student activities were the most likely to be donors, and Shadoian (1989) found that the number of student organizations in which alumni had participated was positively related to giving. Similarly, Oglesby (1991) found that donors averaged 2.41 activities while nondonors averaged 1.87. Mosser (1993) found that the number of student activities in which alumni participated had a large effect on motivation to give.

Only four studies – Ashcraft (1995), Beeler (1982), Kraus (1991) and Odom (1995) – concluded that participation in extracurricular activities was not related to future

giving. Miller and Casebeer (1990) found that alumni donors to Southern Illinois University – Carbondale were less involved in extracurricular activities as students than nondonors.

Financial Aid

A number of studies have examined whether students' receipt of financial aid is linked to future giving to the college or university, with ten of the seventeen studies conducted at public universities. The results of these studies are mixed; eight of the studies (five at public institutions and three at private institutions) failed to detect a relationship between receipt of financial aid and alumni giving (Dahl, 1981; Haddad, 1986; Koole, 1981; Korvas, 1984; Martin, 1993; Odom, 1995; Rosser, 1997; Shadoian, 1989). Of the remaining studies, six (four public, two private) found a positive relationship between at least some types of aid and future giving, while four studies (one public, three private) found a negative relationship (one study was double-counted because it found both positive and negative relationships). These latter studies are described below.

Beeler (1982) surveyed alumni of a private college in New England and included "receipt of institutional scholarship or grant" as a predictor variable. His results showed that donors were more likely to have received aid than nondonors. Oglesby (1991), on the other hand, found that alumni of Southwest Baptist University who had received an academic performance scholarship donated in smaller amounts than alumni who did not. Oglesby found no relationship, however, between receipt of an academic performance

scholarship or a loan and likelihood of donating. Clotfelter's (2003) study of elite private universities showed that those who had received need-based financial aid gave 23 percent less than alumni who had not received need-based aid. Dugan et al. (2000), in a study of Vanderbilt University alumni, found that receipt of a need-based loan lowered the probability of giving among alumni, but receipt of a need-based scholarship raised the probability of giving by the same amount.

Among those who conducted studies at public universities, Dietz's (1985) survey of Iowa State University alumni found that alumni of the class of 1974 who had received no aid, a scholarship or G.I. Bill funding gave more frequently to academic programs than alumni who had received loans or combinations of aid. Enyard (1993) examined the records of alumni of a public university in the mid-west and found that alumni who had received an institutional scholarship were more likely than alumni who did not receive any aid to be donors; however, findings for other categories of aid recipients (institutional scholarship and grant, grant only) were not significant. For members of the Alumni Association, those who had received both an institutional scholarship and a federal grant were more likely to give than those who had received solely an institutional scholarship, and those who received only an institutional scholarship were more likely to give than those who had received only a federal grant or no aid. Hanson's (2000) study of alumni of the University of North Dakota concluded that scholarship recipients were more likely than alumni who had not received a scholarship to be donors, and Hoyt's (2004) study concurred, finding that those who had received a scholarship of $1000 or more were more likely to be donors. Mehl's (1995) analysis of alumni of the University of Akron, however, yielded a slightly negative relationship between receipt of aid and giving,

although the study examined planned givers only and did not distinguish between scholarships and grants.

Alumni Involvement Variables

A handful of studies have explored whether alumni involvement is related to alumni giving. Three studies examined the relationship between membership in the college or university alumni association and giving. Hunter et al. (1999) found that donors were more likely to be members of the alumni association of Livingstone College, one of the nations Historically Black Colleges and Universities (HBCUs), than nondonors. Similarly, Klostermann (1995) found that alumni of Southern Illinois University at Carbondale who were members of the alumni association were more likely to be donors. Odom found that "upper level" major donors were more likely to be members of the alumni association than donors in the two lower giving levels at a university in Mississippi.

Bruggink and Siddiqui (1995), Haddad (1986), Hoyt (2004), Koole (1981), Korvas (1984), Kraus (1991), Martin (1993), McKee (1975), Mehl (1995), O'Connor (1961), Rosser (1997), Selig (1999), Taylor (1993; 1995) and Young and Fischer (1996) all found alumni involvement such as attending alumni meetings, reading publications or visiting campus resulted in greater likelihood of giving.

Emotional/Attitudinal Variables

Studies that examine emotional or attitudinal variables can be grouped into three categories: (1) those that examine alumni perceptions of their educational experience or preparation, (2) those that examine how alumni feel about donating and (3) those that examine how alumni feel about their alma mater.

A number of studies (Ashcraft, 1995; Beeler, 1982; Clotfelter, 2003; Gallo & Hubschman, ; Hoyt, 2004; Koole, 1981; Korvas, 1984; Miller & Casebeer, 1990; Oglesby, 1991; Shadoian, 1989; Van Horn, 2002) found a link between the level of alumni satisfaction with their educational experiences or preparation and giving. In addition, Thomas and Smart (2005) and McAlexander and Koenig (2001) found that alumni who rated their personal or social growth or enjoyment highly were more likely to be donors.

Some researchers have found that alumni who perceive that their alma mater needs financial support, who feel obligated to give back, or who want to leave a legacy at their alma mater are more likely to donate than those who do not. Diamond and Kashyap (1997), House (1987), Martin (1993), Rosser (1997) and Selig (1999) all established links between perceived need and giving. Eldridge-Karr (1991), Mehl (1995), O'Connor (1961) and Simari (1995) found that alumni who expressed an obligation or gratitude toward their alma mater or who desired to leave a legacy were more likely to give than those who did not. Kraus (1991) found that alumni who felt that their alma mater deserved their support were more likely to give than those who did not feel that way.

Finally, a number of authors (Beeler, 1982; Klostermann, 1995; Koole, 1981; Korvas, 1984; McAlexander & Koenig, 2001; McKinney, 1978; Mehl, 1995; Oglesby, 1991; Rosser, 1997; Selig, 1999; Shadoian, 1989) have concluded that alumni who express emotional attachment to their alma mater or who have positive feelings about their alma mater are more likely to give.

The preceding review briefly outlined the history of higher education philanthropy in the United States, described institutional and economic variables that impact giving, and identified variables or groups of variables that have been found to be related to alumni giving. The latter variables can be grouped into four categories: (1) demographic variables, (2) student variables, (3) alumni involvement variables and (4) emotional/attitudinal variables. In the next chapter, a conceptual framework that incorporates these variables and that will guide the study will be proposed and the methodology of the study will be discussed.

Chapter 3

Methodology

Higher education institutions, both public and private, rely upon alumni gift-giving for both mission-critical and secondary activities and programs. Public universities are becoming increasingly savvy with regard to fund-raising methods and tactics, having entered into an arena that for decades was occupied solely by private colleges and universities. However, much of what is "common practice" by college and university development officers is based upon anecdotal or experiential information rather than research-driven data. This study attempts to use statistical methodologies to identify whether a number of factors, including scholarship receipt, influence alumni giving.

Conceptual Framework

The body of literature that explores factors related to alumni giving, and therefore the variables described in the previous section, largely adheres to two predictive concepts: capacity and motivation. According to Volkwein et al. (1989), these two concepts stem from the work of Paton (1986), who plotted the effects of donor predisposition (motivation) and capacity on gift revenues; and Connolly and Blanchette (1986), who conclude that "whether alumni contribute to their institution depends on their financial ability to do so, and on their willingness to part with their money" (p. 69).

According to Paton, having a large number of donors who are predisposed to give allows university development offices to generate substantial revenues with a relatively smaller expenditure of financial and human resources. In addition, motivation can be cultivated in donors through fund raising appeals that require a higher level of expenditures. In examining demographic characteristics and survey responses of Wesleyan University alumni, Connolly and Blanchette (1986) identified categories that may be "indirect measures" of motivation:

- "Support for student career planning activities
- Support for various fund-raising campaign goals
- Attitudes about ways to participate in a fund-raising campaign
- Knowledgeability [sic] of the Wesleyan Alumni Association
- Interest in the academic and culture offerings of Wesleyan
- Attitude about class reunions
- Support for Wesleyan's admissions, career planning and fund-raising efforts" (p. 80).

According to Paton, "spectacular capacity overwhelms the importance of predisposition," because, "neither predisposition nor induced motivation can secure more than modest support from prospects with limited resources" (p. 22). Connolly and Blanchette theorize that the capacity of an alumnus to donate will increase as he gets older because he will earn a higher salary as he advances in his career.

According to both Paton and Connolly and Blanchette, motivation and capacity interact with each other. Connolly and Blanchette suppose that, "On the one hand, alumni

from earlier classes are probably more able to contribute than those from more recent classes because they are more established in their careers. On the other hand, older alumni may be less willing to give than younger alumni because their interest in the school may have waned over the years" (p. 70). This hypothesis was supported by the survey and demographic data they collected, which showed that while alumni from older classes tended to give in larger amounts, the percent of alumni giving was higher for more recent classes. Paton's economic study found that institutions with similar alumni capacity were capable of raising the same amount of funds, but institutions with lower alumni capacity would have to expend much greater resources to increase motivation in order to generate the same revenues as institutions with higher alumni giving capacity.

The conceptual framework utilized in this study was developed from Volkwein's (1989) model of alumni gift-giving behavior, which incorporates both capacity and motivation to give as constructs. According to the model, one's demographic background impacts his academic and social integration while a student. It also impacts later capacity and motivation to give. The student's academic and social integration, which in part is a result of his demographic background, impacts capacity and motivation to give. Finally, his gift-giving behavior as an alumnus is impacted individually by both capacity and motivation to give, although capacity to give also exerts an influence on motivation to give.

Volkwein's full model, shown in Figure **3-1**, lists all of the variables hypothesized as comprising each of the components of the model.

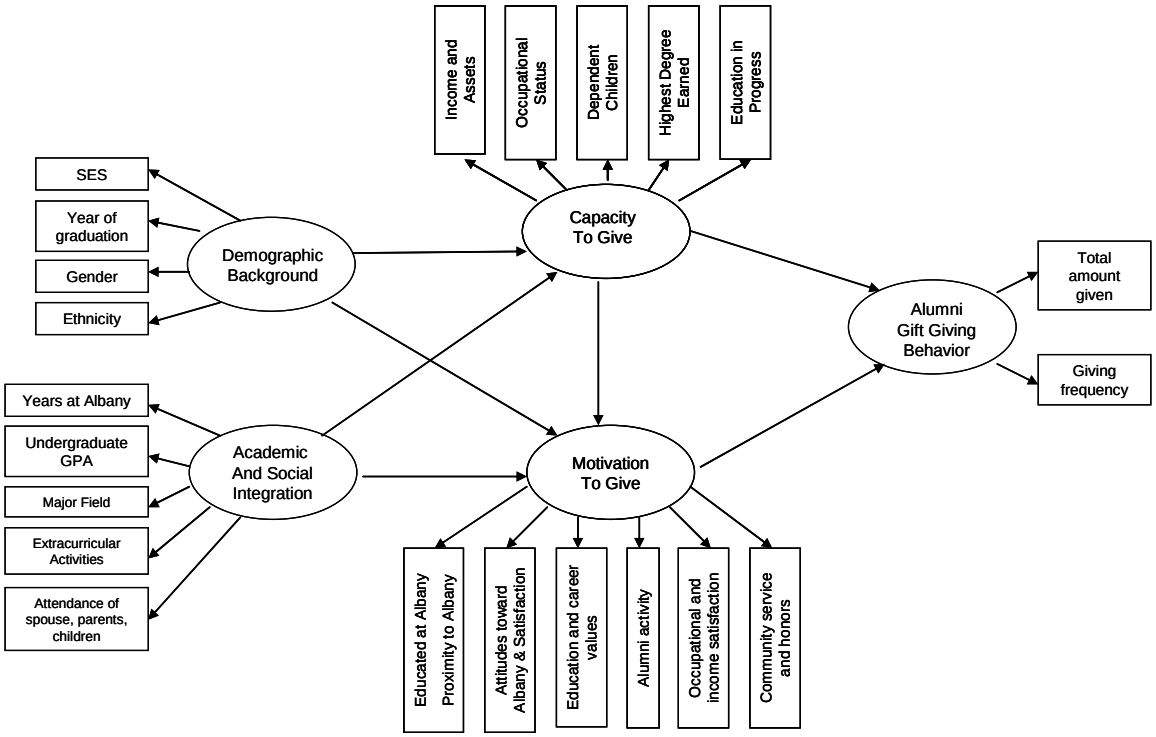

Figure **3-1**: Volkwein's Structural Model of Alumni Gift-Giving Behavior

This model is particularly useful because it accounts for factors and experiences that occur before, during, and after attendance at the college or university. The individual variables that comprise this model were discussed in Chapter 2.

Mosser (1993), in a doctoral dissertation, proposed a similar model. Mosser's desire was to enhance Volkwein's model by adding an interaction between capacity and motivation (since both Paton and Connolly and Blanchette proposed such an interaction in their work). The model also eliminates demographic background and separates academic integration from social integration. Mosser's argument for doing so was that "since the entire latent variable model is built on demographic information, the inclusion of a specific demographic construct is redundant" (p. 46). Mosser's initial model is shown in Figure **3-2.**

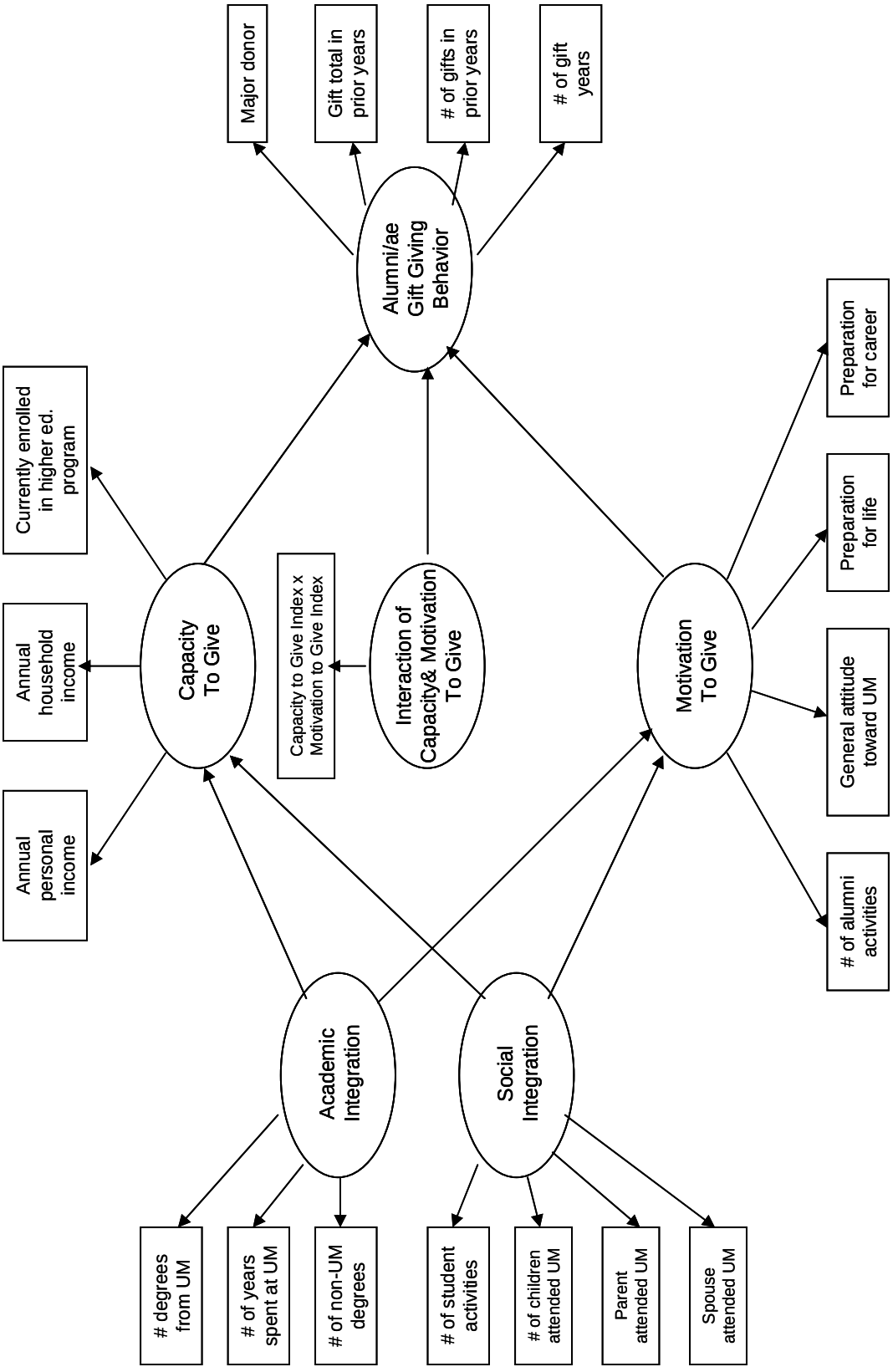

Figure **3-2**: Model of Alumni/ae Gift-Giving Behavior (Mosser, 1993)

While the results of Mosser's analysis did show that both capacity and motivation influence gift giving behavior, the interaction of capacity and motivation to give was not predictive of gift giving. In addition, academic integration and social integration failed to correlate to the extent possible to form separate constructs and therefore did not predict gift-giving behavior.

Given the failure of Mosser's model to show an interaction between motivation and capacity and to identify separate academic and social integration constructs, this study will utilize Volkwein's original model. Due to data limitations, it will eliminate some of the variables within the constructs in Volkwein's model, and it will utilize additional variables introduced in other research studies since the introduction of Volkwein's model.

The conceptual framework for this study, which is adapted from Volkwein's, is shown in Figure **3-3**.

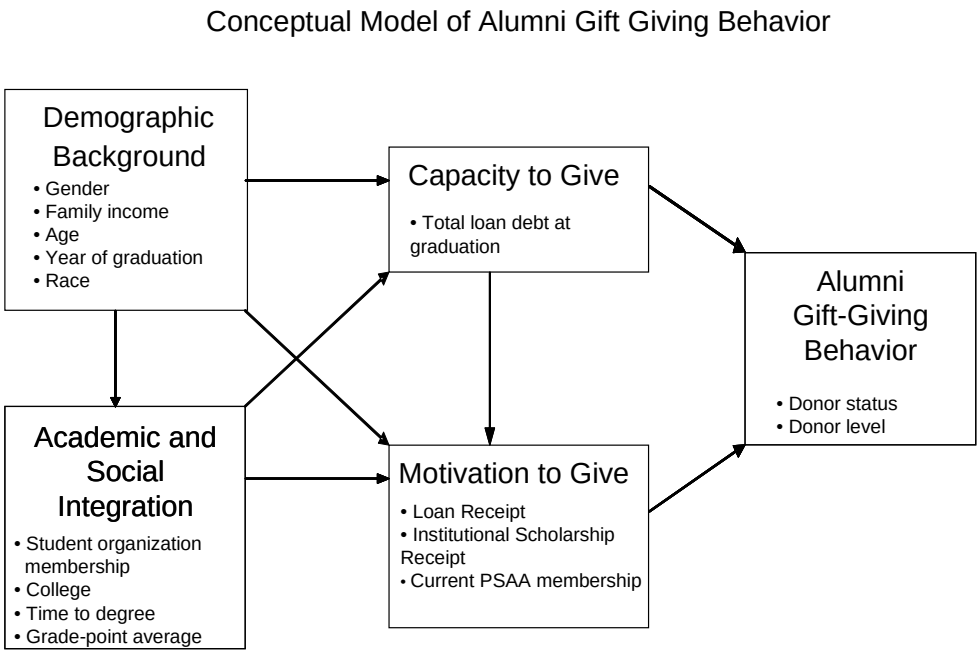

Figure **3-3**: Conceptual Model of Alumni Gift-Giving Behavior

Demographic Background

The five variables within this construct – gender, income, age, graduation year, and race – are similar to the variables in Volkwein's model (gender, SES, year of graduation, and ethnicity). Gender has, in some studies, been found to be related to giving, but these results must be interpreted cautiously because gender can be correlated with income and because at some universities, gifts from a married couple were often recorded in the husband's name only. Nonetheless, it is important to include this variable

in the model for this study because (1) income differences due to gender may not be as pronounced among recent graduates, who are just entering the workforce, as among those who graduated less recently, and (2) if a gift comes from two married alumni, the gifts are recorded under both names, eliminating the gender bias in the alumni record. It should also be noted that because Penn State students attending the University Park campus represent a largely traditional-age population, the recent graduates included in this study are less likely to be married than graduates included in many other studies of alumni giving.

Family income has rarely been included in alumni giving studies because the vast majority of such studies rely upon alumni surveys, which collect data on postcollege family income rather than precollege family income. Nonetheless, Volkwein included this variable in his model because students' socioeconomic status can influence their academic and social integration while enrolled in college (Pascarella & Terenzini, 1991).

Few studies of alumni giving have included race or ethnicity, so this variable will be used for exploratory purposes.

While Volkwein's model includes year of graduation, presumably as an approximation of age, this study will use age in addition to year of graduation. Age has been found to be related to giving in previous studies. Year of graduation can account for both effects related to cohort and the length of time an alumnus/alumna has been away from the institution, immersed in work, graduate school, and other life changes. It also stands to reason, as Thomas and Smart (2005) posited, that alumni who have been away from the institution longer have received more materials from their university's development and alumni offices.

Academic and Social Integration

The variables included within this construct are student organization membership, major, time to degree, and grade-point average. Volkwein's model, by comparison, included extracurricular activities, major field, years at Albany, undergraduate GPA, and attendance of spouse, parents, and children.

The results of a number of studies indicate that participation in extracurricular activities can positively impact alumni giving, although studies vary as to the particular type(s) of activities that may be related to giving. Past research has shown that one's major or major field affects future giving, although it has not been determined whether major is indirectly related to giving through its relationship to income or whether this is an effect of academic integration itself.

Results of including variables pertaining to the length of time spent at the institution are widely varied and inconclusive; therefore, this variable has been included for exploratory purposes. While many studies have utilized variables pertaining to attendance of family members at the same institution, this study does not include those variables because (1) data on parent attendance is sometimes missing, and (2) most recent graduates do not have children or spouses, making the results less generalizable.

Although grade-point average has not been associated with alumni giving in all but one previous study, it was included in this study because it appeared in Volkwein's model as a measure of academic integration. In addition, the variable is readily available, it is accurate because it is provided directly from records rather than self-reported, and it helps to provide a more comprehensive portrait of the student experience.

Capacity to Give

Volkwein's model included income, occupational status, dependent children, highest degree earned, and education in progress as measures of capacity to give. It is within this construct that the variables to be used in this study begin to depart from Volkwein's. Volkwein's model includes data that would be primarily available through surveys but did not include variables pertaining to financial aid. This study, in contrast, includes a single variable: loan debt at time of graduation. Some research has determined that alumni who received scholarships as students are more likely to be donors than alumni who received loans. It is presumed that recent graduates with high loan debt will be less likely to give to their alma mater, at least until their debt is reduced or eliminated in later years. Several researchers have proposed a relationship between loan debt and capacity to give, although this relationship has not been verified through research. Oglesby (1991) proposed that alumni's loan repayment status would be a factor in predicting giving – in other words, that alumni who were still repaying loans would be less likely to give – however, his findings did not support this contention. Clotfelter (2003) found that alumni of the class of 1976 in a sample of private colleges and universities who received need-based financial aid contributed 23 percent less than alumni who had not received need-based aid. He posited that loan debt has "depressing effects" on capacity to give. Finally, Dugan et al. (2000) hypothesized that young alumni who were making payments on loans would be less likely to give: "to the extent that loan payments discourage individuals from making regular contributions in the years immediately following graduation, need-based loans may reduce the pool from which

larger donations might develop subsequently" (p. 4). The authors did, in fact, find that alumni who had received loans as students were less likely to give and students who received need-based scholarships were more likely to give.

The variables within Volkwein's "capacity to give" construct were not included in this study for several reasons: (1) because undergraduate students enrolled at the University Park campus represent a "traditional age" population, most recent alumni will not have dependent children, (2) data on education in progress or highest degree earned (if from another institution) is often missing and unreliable, and (3) income and occupational status can be obtained more reliably through survey research than from the alumni database. While business information is known for many alumni, it tends to be missing or unreliable for larger percentages of young alumni than for older alumni due to the fact that young alumni are just launching their careers. Certainly this data would not be as reliable as it would be if gained through survey data. It should also be noted that income and occupational status may be less important for young alumni than for older alumni because new graduates are just beginning their careers in an entry-level capacity. Although there are certainly differences in income and occupational status among these alumni, these differences are probably less pronounced than they would be for older alumni who have advanced in their careers, left the workforce (and perhaps reentered the workforce later), and accumulated assets. In other words, recent graduates are "in the same boat," facing similar circumstances as newly-independent adults.

Motivation to Give

In Volkwein's model, six variables formed the "motivation to give" construct: (1) Albany "exclusiveness" (number of degrees received from Albany vs. number of degrees received from other institutions) and proximity to Albany, (2) attitudes toward Albany and satisfaction with Albany, (3) education and career values, (4) alumni activity, (5) occupational and income satisfaction, and (6) community service and honors. In this study, the "motivation to give" construct was formed by a single alumni variable, membership in the Penn State Alumni Association, and two student financial variables, loan receipt and institutional scholarship receipt. Although results in previous studies are mixed, research has shown that receipt of institutional aid may be positively related to alumni giving.

Aid receipt does not appear in Volkwein's model; in addition, most of the studies pertaining to alumni giving that do include financial aid as a variable do not attempt to explain the reason for its inclusion or its impact on alumni giving. Enyard (1993) proposed that recipients of institutional aid might be motivated to give by a feeling of "reciprocity" toward the institution, whether to initiate a "mutual exchange' of benefits or "to make some sort of return for something done" (p. 10). Other studies (Ashcraft, 1995; Beeler, 1982; Clotfelter, 2003; Gallo & Hubschman, ; Hoyt, 2004; Koole, 1981; Korvas, 1984; Miller & Casebeer, 1990; Oglesby, 1991; Shadoian, 1989; Van Horn, 2002) have shown that alumni who feel attached to their institution, or who express satisfaction with their experiences at the institution, are more likely to give. While most of these studies (with the exception of Ashcraft, Gallo & Hubschman, Miller & Casebeer, and Van Horn)

did include various measures of financial aid receipt, none attempted to draw a link between receipt of institutional or non-institutional financial aid and emotional attachment or satisfaction. Nonetheless, this study hypothesizes that receipt of institutional scholarships leads students to feel more attached to their alma mater as alumni and to feel inclined to "give back" to their alma mater. These feelings of "attachment" or "reciprocity," in turn, increase their motivation to give.

Alumni Gift-Giving Behavior

The four constructs—demographics, academic and social integration, capacity to give, and motivation to give—form the basis by which to predict the independent variable in the study, alumni gift-giving behavior. Volkwein's model included two measures of gift-giving: total amount given and giving frequency. This study, on the other hand, examines donor status (whether an alumnus has made a gift since graduation or not) and donor level (a continuous variable measuring the amount an alumnus has donated since graduation). These two variables are the most frequently utilized in research studies and furthermore, research has shown that some variables are related to donor status but not donor level, donor level but not donor status, or both donor status and level. Including both variables in the study engenders a more comprehensive view of the impact of the predictor variables on alumni giving.

Hypothesis

As mentioned above, few studies go as far as to hypothesize why scholarship receipt (or receipt of any type of institutional aid) might factor into future alumni giving. While the conceptual framework for this study illustrates the variables hypothesized as having an impact on alumni giving via four constructs, the conceptual framework leaves unexplained the particular reason why scholarship receipt impacts subsequent giving. The diagram below (Figure **3-4**) illustrates one possible way in which scholarship receipt can impact giving.

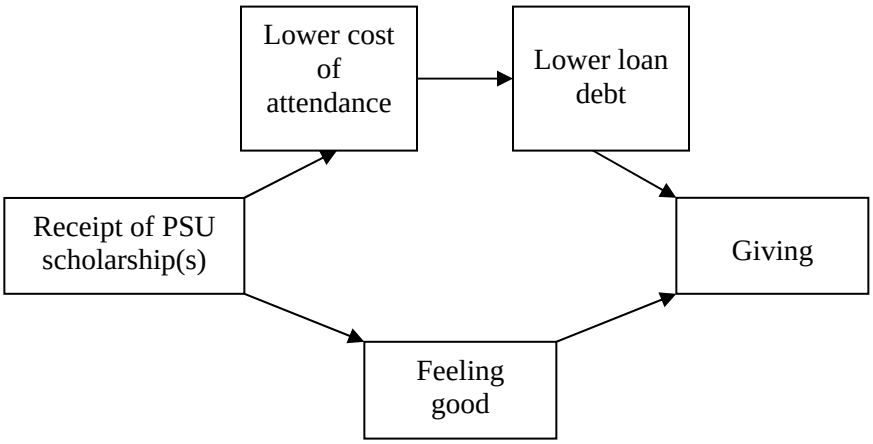

Figure **3-4**: Hypothesized Relationship Between Scholarship Receipt and Giving

The hypothesis is that receipt of institutional aid lowers a student's cost of attendance and his/her subsequent loan debt, and also makes the student feel better about his institution and his student experience. Both of these factors – lower cost of attendance and positive feelings about one's alma mater – lead to the decision to make a gift or gifts to the institution.

It should be noted that these relationships cannot be proven, or even examined, via this study. This is because the study lacks survey data that would potentially establish a relationship between receiving a scholarship and "feeling good" about the institution. In addition, students who received scholarships might actually have higher loan debt than students who did not if their overall need was higher. However, students with high loan debt who also received scholarships might actually retain a positive view of the university ("feeling good") if they perceive that their debt could have been higher were it not for the scholarships they received.

While this study cannot determine whether these relationships are at work in determining alumni giving, if scholarship receipt is, in fact, predictive of giving, the hypothesized relationships above may provide clues to what happens between point 'A' (scholarship receipt) and point 'B' (giving).

Research Questions

This study proposes three research questions in order to determine the relationships between scholarship receipt and alumni giving:

1. Are alumni of The Pennsylvania State University who received institutional scholarships as undergraduates more likely than non-aid recipients to be donors to the University?
2. Do alumni of The Pennsylvania State University who received institutional scholarships as undergraduates give to the University in significantly higher amounts than non-scholarship recipients?

3. Does the amount of institutional scholarships received impact the likelihood of making a gift and the amount of giving?

In addition, a subsidiary research question, 3b, was posed:

3b. For those students who received scholarships, does the amount of scholarships received impact the amount of giving?

Population, Sample, and Data Collection

The population for the study included all alumni who received a bachelor's degree from the University Park campus of The Pennsylvania State University between December of 2000 and August of 2003. There are three graduation dates per academic year: December, May, and August. Because the university's academic year begins with the fall semester and concludes just prior to the following fall semester, December is the first graduation date of each academic year and August is the last. Because most students matriculate at Penn State beginning with the fall semester, this allows data to be collected for each student's first semester of enrollment in the fall. The year 2000 was the first year selected for the study because in 1995, the university implemented its "data warehouse," a data management program that allows university staff in the Office of Student Aid, Office of the Bursar, Office of the Registrar, and other offices to input, view and generate reports pertaining to students' demographic, financial aid, and academic records. Students' records prior to 1995 (pre- data warehouse) are not able to be accessed in a way that makes data analysis possible. A recent study showed that 84 percent of University Park graduates completed their degrees within six years (Office of Planning and

Institutional Assessment, 2006). In addition, a sample of alumni who received their degrees in 1999, 2000, and 2001 showed that 64 percent graduated within four years of admission and an additional 28 percent within five years (Office of the University Registrar, 2002). Therefore, more than 90 percent of students who graduated from the Penn State University Park campus in December of 2000 or later enrolled at the university in 1995 or later, ensuring that complete data is available for most of the sample.

Data for the study were derived from two sources: the data warehouse as described above, and "ACS," which is the database used by the university's Division of Development and Alumni Relations. ACS contains data on all alumni of the university (regardless of membership in the Penn State Alumni Association) as well as "friends" – those who are not alumni but who have made a gift to the university, participated in university programs, and/or otherwise support the university (such as parents of students).

First, alumni data was obtained from the information systems office in the Division of Development and Alumni Relations. Data used in the study that were obtained by this office included date of graduation, student activities, sports, major, college, Alumni Association membership status, and total giving since graduation. Next, the data file was sent to the Office of Student Aid. The Office of Student Aid added the variables from the students' records. The variables provided by this office that were used in the study were gender, family income, date of birth, semester of first enrollment, race/ethnicity, cumulative grade-point average, total loan debt at graduation, and total scholarship receipt. Related variables including type of Alumni Association membership

and scholarship receipt by academic year were also provided but were not used in the study.

Data from these two files were able to be merged because students' ID numbers are transferred to the alumni database after their graduation. Even though each alumnus of the university has a unique alumni ID number, his student number remains unchanged and serves as a link between his student and alumni files.

Finally, the Office of Student Aid removed identification numbers from the file and assigned random identification numbers to each individual in the file. The file was then sent in Excel format to the researcher, and the file was then uploaded to SPSS for analysis.

The original data file contained 25,084 records. In order to ensure cross-comparison of the results for logistic and OLS regression analyses, all records that contained missing data for any of the variables to be utilized in the study were removed, leaving a new dataset of 17,540. This was done rather than attempting to fill in, or impute, missing values for several reasons. First, the new dataset of 17,540 is still significantly large enough to ensure representativeness of the sample. Second, a comparison of frequencies between the full dataset and the new dataset show few differences within variables; these are discussed in Chapter 4. Third, some types of commonly-used imputation methods, such as EM imputation, operate under the assumption that data is missing at random and not related to the dependent variable. Because of the possibility that the missing data was related to the dependent variable and because of the large dataset still available after removal of the missing cases, it was decided that use of the limited dataset was preferable to imputation of missing values,

particularly since imputation has its own disadvantages from a methodological standpoint.

Next, a small number of records that contained “anomalous cases” were deleted from the dataset. These included 76 individuals with a grade-point average of lower than 2.0 (less than the minimum required for graduation) and 27 with a grade-point average greater than 4.0. It was surmised that these entries were due to data entry error. It should be noted that a similar issue was encountered in a study by Ikenberry at the same institution (1999), and in that study the cases with anomalous GPAs were also removed. In addition, there were 17 individuals whose graduation dates were prior to the “offer semester” listed in the dataset. Because it is not possible for an individual to receive an offer of admission from the university after his graduation, these records were also attributed to data entry error and eliminated from the study. Finally, three cases contained a negative number for family income. While the researcher was informed that a “$0” is a possible entry for the family income variable, it was decided that those with a negative income represented anomalous cases and these were deleted from the study. A total of just 123 anomalous cases were deleted across the three variables, leaving a total of 17,418 cases in the final dataset. Chapter 4 contains descriptive statistics for both the full dataset and the reduced dataset to ensure comparability between the two.

Independent Variables

The following is a description of the variables used in the study.

Gender (GEND). There are two categories: male and female. Males were coded "0" and females were coded "1".

Family income (INCOM). This is a continuous variable representing total family income as listed on the FAFSA. Research shows that students' socioeconomic status can influence their college experiences and achievement; because the researcher wished to capture a portrait of students' socioeconomic status during the years in which they were dependent children living at home, the student's income as of his/her first FAFSA filing is the one used in the study. The academic year in which this FAFSA was filed was also listed. The FAFSA year captures the student's family income for the previous tax year; so, for example, income listed in the 1996-1997 academic year was for 1995.

INCOM was then converted to 2003 dollars (the last graduation year in the study) to ensure uniformity of comparison across income years. Finally, the variable was converted to thousands for the purpose of analysis.

Year of birth (YOB). This variable represents the year in which each student was born.

Graduation year (GRADYR). This variable represents the year in which each student graduated. The possible categories for this variable are 2000, 2001, 2002, and 2003. A graduation year typically represents a cohort of students. Furthermore, it was hypothesized that there are few differences between graduates of one semester versus another semester within a particular graduation year. For example, a student might graduate in August rather than May of a given year in order to complete an internship or because his major required extra course work. Therefore, the data analysis included year of graduation rather than a specific date of graduation. Graduates of the year 2000

comprise just 8 percent of the sample; this is because the sample contained only December 2000 graduates.

Race/Ethnicity (RACE). Students applying to Penn State have the option to select one of the following categories: (1a) American Indian, (1b) Alaskan Native, (2) Black American (not Hispanic), (3) Asian American/Pacific Islander, (4a) Hispanic American (not Puerto Rican), (4b) Puerto Rican, (5) White American (not Puerto Rican), and (6) Foreign (in U.S. on student or temporary visa). Because (1a) and (1b) represented less than 1 percent of the sample, they were combined into a single category. The other categories remained discrete. The new categories were coded as follows, with whites forming the reference category: (1) white, (2) American Indian/Alaskan Native, (3) Black American, (4) Asian American/Pacific Islander, (5) Hispanic, (6) Puerto Rican, and (7) Foreign.

College. Both college and major were available for study; however, it was decided that a student's college represented a suitable unit of analysis for the purposes of this study. With more than 170 baccalaureate degree majors available to students at the University Park campus, it would be neither possible nor informative to analyze each of these majors separately. There are 11 academic colleges at Penn State, and they were coded as follows: (1) Business (BUS), (2) Arts & Architecture (A&A), (3) Agricultural Sciences (AGR), (4) Communications (COM), (5) Education (EDU), (6) Earth and Mineral Sciences EMS), (7), Engineering (ENG), (8) Health and Human Development (HHD), (9) Information Sciences and Technology (IST), (10) the Liberal Arts (LIB), and (11) Science SCI). Because the Smeal College of Business enrolls the largest percentage

of students in the sample, it was coded (1) so it could be used as the reference category for the purposes of analysis.

Student activities (ACTIV). Penn State codes students who belong to 50 different student organizations, 51 fraternities, and 23 sororities. It should be noted that Penn State currently has nearly 700 registered student organizations, so the number of organizations in the database represents just a fraction of the possible student organizations to which students can belong. Nonetheless, the codes do represent some of the largest and well-known organizations, including Dance Marathon (a university-wide philanthropic event), Reserve Officer Training Corps (ROTC), several honorary organizations, student government, and a number of performing organizations, in addition to members of the university's extensive Greek system.

It was hypothesized that because the 50 non-Greek student organizations represent just a fraction of the number of organizations of their type at the university, counting the number of student organizations might be a more meaningful measure of overall engagement or involvement within the university community than the type(s) of organizations to which students belong. Therefore, all of the student organizations to which students belonged were counted and formed a new variable, ACTIV, representing the total number of activities to which students belonged.

Sports (SPORT). The number of sports, both intercollegiate and intramural, to which students belonged is counted in a separate variable, SPORT. This is because some past research (Dugan et al., 2000; Koole, 1981; Oglesby, 1991; Selig, 1999; Wunnava & Lauze, 2001) has indicated that students who participated in sports are actually less likely to be involved with the university or give to the university as alumni. Furthermore, it was

hypothesized that athletes at NCAA Division I universities such as Penn State have a different “student experience” than “typical” undergraduate students at the university. Athletes often eat some of their meals other athletes in separate areas. They sometimes receive tutoring and academic support that is provided separate from other students. Their practice and competitive schedules often mean that they are not involved in other facets of the university. Finally, many receive full or partial scholarships that eliminate or greatly reduce their cost of attendance at the university. This may create a different student environment for these students and lead to a kind of isolationism that may negatively influence their future alumni involvement.

Time to degree (TIME). This variable represents the number of months between the semester in which a student was offered admission to the university and the month in which he graduated (December, May, or August). For example, an offer semester of fall 1996 was converted to a date of September 1996, an offer semester of spring semester 1997 was converted to January 1997, and an offer semester of summer 1997 was created to June 1997. A student who was admitted in the fall of 1996 and graduated in May of 2000 would have attended for a total of 44 months. This allows various combinations of offer semesters and graduation semesters to be captured.

Grade-point average (GPA). GPA is a continuous variable that ranges from 2.0 to 4.0. As explained earlier, students cannot graduate with a GPA lower than 2.0 and it is impossible to obtain a GPA higher than 4.0 at the University.

Loan debt (DEBT). This variable measures a student’s loan debt upon his graduation. Those with no debt were coded $0. It is important to note that this measure does not include private loans incurred by students or Parent PLUS loans that might have

been incurred by the student's parents. Because loan debt is paid off over time at different interest rates, and because the span of graduation years is so small, small differences between amounts of loan debt would be relatively unimportant. Therefore, the variable was not converted to constant dollars.

Alumni Association membership (MEMB). The Penn State Alumni Association offers a number of different types of memberships. These include:

> Life Individual: life membership for one individual alumnus/alumna, paid at one time
>
> Life Partial: life membership for one individual alumnus/alumna, paid in installments
>
> Partial Joint: life membership for two individuals, paid in installments
>
> Life Joint: life membership for two individuals, paid at one time
>
> Annual Individual: annual membership for one individual
>
> Annual Joint: annual membership for two individuals
>
> Gratis: free, one-year membership given to all new graduates

It was hypothesized that the differences between non-members and members would be greater than between alumni who purchased different types of memberships. This may be particularly true for recent graduates for whom even an annual membership can be a significant commitment of financial resources. Furthermore, membership in the Alumni Association is more of a rare occurrence for graduates in the sample than for the total alumni population. Only 20 percent of graduates in the sample are members of the Alumni Association – far fewer than the approximately one-third of the total alumni population who are members. For all of these reasons, the variable "MEMB" represents membership status (0=nonmember, 1=member) rather than membership type.

"Gratis" members were included in the analysis in spite of the fact that these individuals did not purchase their membership. Gratis members comprised just 3 percent of all Alumni Association members and .6 percent of the total sample. Although gratis members, unlike all other types of members, did not specifically indicate an interest in being involved by purchasing a membership, it is hypothesized that because they receive the same benefits as regular members, including the alumni magazine, they might feel more "connected" to Penn State than nonmembers. This commonality with other members led to their inclusion in the analysis.

It is important to note that because Alumni Association members receive a "benefit" by joining the Alumni Association, membership dues are not processed as gifts to the university and are not tax deductible. Therefore, Alumni Association dues are not included in an individual's giving record.

Scholarship Receipt (SCHOL, SCHAMT). Scholarship receipt was provided for each academic year in which the student was enrolled and then totaled. Because the purpose of this research was to examine (1) scholarship receipt as a dichotomous variable and (2) total scholarship receipt as a continuous variable, only the total scholarship dollars variable was utilized in this study. The latter was converted to thousands for the purpose of analysis. The ways in which future studies may be able to tease apart the solitary and/or cumulative effects of scholarship receipt during the student's time at the university will be discussed in Chapter 5.

Scholarship receipt was used as a dichotomous predictor variable in order to answer the first two research questions:

1. Are alumni of The Pennsylvania State University who received institutional scholarships as undergraduates more likely than non-aid recipients to be donors to the University?
2. Do alumni of The Pennsylvania State University who received institutional scholarships as undergraduates give to the University in significantly higher amounts than non-scholarship recipients?

Accordingly, those who had not received a scholarship were coded ‘0’ and those who had received a scholarship were coded ‘1’.

The amount of scholarship dollars received from Penn State, a continuous predictor variable, was used to answer research question 3 and its subsidiary, 3b:

3. Does the amount of institutional scholarships received impact the likelihood of making a gift and the amount of giving?

3b. For those students who received scholarships, does the amount of scholarships received impact the amount of giving?

Dependent Variables

Similar to scholarship receipt, alumni giving was analyzed as both a dichotomous outcome (dependent) variable as well as a continuous outcome variable. For analysis as a dichotomous variable, non-givers were coded ‘0’ and givers were coded ‘1’. For analysis as a continuous variable, those who had not made a gift were coded as having contributed $0 in order to be included in the analysis.

Giving was analyzed as a dichotomous variable in order to examine research questions 1 and 3. It was then analyzed as a continuous variable in order to examine research questions 2, 3, and 3b (question 3 inquires about both giving status and amount).

Analytical Procedures

Regression analysis is a commonly-used tool in higher education research that allows the researcher to determine the simultaneous impact of multiple predictor variables on an outcome variable. The research questions in this study suggest the use of two types of regression functions: multiple regression and logistic regression.

Multiple regression employs the principles of ordinary least squares, whereby the addition of a variable to the model tells the researcher whether that variable significantly alters the proportion of variance in the dependent (outcome) variable (Cabrera, 1994). The best fitting regression line is the one that minimizes the sum of squared deviations of the outcome variable from its predicted value (Neter, Kutner, Nachtsheim, & Wasserman, 1996).

Multiple regression was employed in order to examine alumni giving – the outcome, or dependent, variable – as a continuous variable. Therefore, it was employed in the analysis of research questions 2 (the impact of scholarship receipt on amount of giving), 3 (the impact of amount of scholarship receipt on amount of giving, and 3b (for scholarship recipients only, the impact of amount of scholarship receipt on amount of giving).

Logistic regression has been identified as a common and rigorous method of analyzing a dichotomous dependent variable (Pampel, 2000). According to Cabrera (1994), logistic regression can be particularly useful in higher education research, where many college outcomes are dichotomous.

Rather than ordinary least squares, the estimation of the regression function in logistic regression relies upon the maximum likelihood function, which estimates which regression parameters yield the greatest likelihood of the outcome occurring (in this case, of an alumnus making a gift). Further, Cabrera describes the use of what are called Delta-p statistics, which predict the probability by which an independent or predictor variable changes the likelihood of the dependent variable occurring.

For research questions 1 and 3, logistic regression models were run and then the regression coefficients were use to calculate the Delta-p statistics using the following equation:

$$Delta - P = \exp(L_1) \Big/ [1 + \exp(L_1)] - P_0$$

where

$$L_0 = \ln\left[P_0 \Big/ (1 - P_0) \right]$$

and

$$L_1 = L_0 + B_x$$

P_0 is the sample mean of the dependent variable. B_x is the beta coefficient for the dependent variable for which the Delta-p statistic is being calculated.

The Delta-p statistics indicate the probability of being in the target group (e.g. givers) per unit change in the independent variable (or the change in the log of the odds per unit change in the independent variable). In this research study, the Delta-p statistics enable each of the independent variables to be compared in terms of the extent to which each impacts the likelihood of alumni giving.

Regression Models

For both the OLS and logistic regression models, the variables were added to the model in four blocks representing the four constructs in the conceptual framework as follows:

Block 1: Demographic Variables

- Gender
- Income
- Year of Birth
- Year of Graduation
- Race

Block 2: Academic and Social Integration Variables

- Number of Student Activities
- Number of Sports
- College
- Time to Degree
- Grade-point Average

Block 3: Capacity to Give Variable

- Loan Debt

Block 4: Motivation to Give Variables

- Scholarship Receipt/Scholarship Amount

- Alumni Association Membership Status

The equation for ordinary least squares regression can be expressed as:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2$$

where Y is the value of the outcome, or dependent, variable; β_1 and β_2 are coefficients of the variables in the model for given values of X_1 and X_2 (β_0 is the intercept, or the value of the regression function if X is equal to 0; and X_1 and X_2 are the values of the predictor variables.

The equation for the logistic regression function is expressed as:

$$\log\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2$$

where P is the probability of being in the target group (e.g., givers). The other coefficients can be interpreted in the same way as for OLS regression.

Chapter 4

Results

This study examines the relationship between students' receipt of institutional scholarships and subsequent giving to the university as alumni. Student and alumni records were obtained for the population of students who graduated from the Penn State University Park campus from December 2000 to August 2003, for a total of 25,084 cases. Subsequently, the number of cases for study was reduced to 17,418 by the elimination of all cases that contained missing data for the variables under study and "anomalous" cases that indicated data errors.

Table **4-1** displays frequencies for each of the demographic variables that are included in the conceptual framework and the regression models. Income is expressed in constant, 2003 dollars.

Table **4-1**: Frequencies – Demographic Background Variables

Variable	**N**	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**
Gender	17418	0	1	0.4983	0.5
	8739 (50.2%)	*male*			
	8679 (49.8%)	*female*			
Income	17418	$0.00	$1,156,276.00	$82,287.23	54728.56
Year of Birth	17418	1947	1984	1978.93	2.147
Graduation Year	17418	2000	2003	2001.77	0.921
	1398 (8.0%)	*2000*			
	5661 (32.5%)	*2001*			
	5907 (33.9%)	*2002*			
	4452 (25.5%)	*2003*			
Race	17418	1	7	n/a	n/a
	15160 (87.0%)	*1 (White)*			
	1 (0%)	*2 (Amer. In.)*			
	758 (4.4%)	*3 (Black)*			
	944 (5.4%)	*4 (Asian)*			
	305 (1.8%)	*5 (Hispanic)*			
	209 (1.2%)	*6 (Puerto Rican)*			

The sample contains nearly an equal proportion of male and female students. All of the students were born between 1947 and 1984, but the mean year of birth for the sample is 1979 with a low standard deviation. This indicates that most of the sample is comprised of “traditional-age” students who were in their early 20s upon graduation.

Eighty-seven percent of the sample is white. African-American students and Asian students comprise 4 and 5 percent of the sample, respectively. Other races and ethnicities are only 3 percent of the sample total.

The next table, Table **4-2**, shows frequencies for the academic and social integration variables contained in the conceptual framework and the regression models.

Table **4-2**: Frequencies – Academic and Social Integration Variables

Variable	N	Minimum	Maximum	Mean	Standard Dev.
# student_activities	17418	0	5	0.1848	0.47442
	14747 (84.7%)	*0*			
	2207 (12.7%)	*1*			
	394 (2.3%)	*2*			
	58 (0.3%)	*3*			
	10 (0.1%)	*4*			
	2 (0%)	*5*			
# sports	17418	0	4	0.0387	0.21296
	16808 (96.5%)	*0*			
	552 (3.2%)	*1*			
	53 (0.3%)	*2*			
	4 (0%)	*3*			
	1 (0%)	*4*			
	0 (0%)	*5*			
College	17418	1	11	n/a	n/a
	3487 (20.0%)	*1 (BUS)*			
	670 (3.8%)	*2 (A&A)*			
	926 (5.3%)	*3 (AGR)*			
	1500 (8.6%)	*4 (COM)*			
	1302 (7.5%)	*5 (EDU)*			
	420 (2.4%)	*6 (EMS)*			
	2538 (14.6%)	*7 (ENG)*			
	2387 (13.7%)	*8 (HHD)*			
	113 (0.6%)	*9 (IST)*			
	2865 (16.4%)	*10 (LIB)*			
	1210 (6.9%)	*11 (SCI)*			
Time to Degree (mths)	17418	3	83	47.9404	8.35383
GPA	17418	2	4	3.1595	0.46978

Nearly 85 percent of the sample did not participate in any student activities. As stated earlier, this is somewhat misleading because only a handful of the nearly 700 registered student organizations have codes in the alumni database for the classes of 2000 to 2003. Therefore, data on extracurricular participation do not tell the full story of student engagement at Penn State. This limitation will be discussed further in Chapter 5. In addition, more than 96 percent of the sample did not participate in any sports.

Nearly one in five alumni were enrolled in a major in the College of Business; the next largest colleges are Liberal Arts, Engineering, and Health and Human Development, in descending order. The smallest college in terms of undergraduate enrollment is Arts and Architecture, representing less than 4 percent of the sample.

The mean final cumulative grade-point average for all students is 3.15, or slightly higher than a B average, and the mean time to degree (which is expressed in months in the table) is 48 months, or four years. The shortest time to degree is just three months; it is probable that those who graduated in such a short period of time actually transferred to Penn State from another institution during their final semester of study.

The next table, Table **4-3**, displays the frequencies for the capacity to give (loan debt) and motivation to give variables in the conceptual framework and the regression model.

Table **4-3**: Frequencies – Capacity and Motivation to Give Variables

Variable	**N**	**Minimum**	**Maximum**	**Mean**	**Standard Dev.**
Loan Debt	17418	0	$110,779	$14,625.28	$11,092.78
Scholarship	17418	0	1	0.3604	0.48014
(dichotomous)	*11140 (64.0%)*	*0 (no schol.)*			
	6278 (36.0%)	*1 (schol.)*			
Scholarship Amt.	17418	0	$140,106	$2,580.75	8246.169
Membership Status	17418	0	1	0.2019	0.4014
	13902 (79.8%)	*0 (nonmember)*			
	3516 (20.2%)	*1 (member)*			

The mean amount of loan debt carried by the alumni in the sample was approximately $14,600; 21 percent of the students in the sample graduated with no loan debt. While nearly 80 percent of the students had loans, just 36 percent received scholarships from Penn State. The amount of scholarship aid received by students ranged

from $0 to an astonishing $140,106, but this should not be misleading because the 95th percentile of scholarship dollars was just $12,500 and the mean amount of scholarship dollars received was approximately $2,500. Just 22 students in the sample received more than $100,000 in scholarship dollars.

Approximately 80 percent of alumni in the sample were not members of the Penn State Alumni Association.

The next table, Table **4-4**, shows the frequencies for the two dependent variables, SUM01 (giving), and SUMOFGIFT (amount of giving). 56.3 percent of the sample, or 9,803 individuals, had not made a gift, and 43.7 percent, or 7,615 individuals, had made a gift. The mean gift was $54.55.

Table **4-4**: Frequencies – Dependent Variables

Variable	N	Minimum	Maximum	Mean	Standard Dev.
SUMOFGIFT	17418	0	$35,041.88	$54.55	359.5374
SUM01	17418	0	1	.4372	0.49605
(dichotomous)	*9803 (56.3%)*	*0 (no gift)*			
	7615 (43.7%)	*1 (gift)*			

Because just 36 percent of the sample received scholarships, frequencies were run for only students who received scholarships. The results are displayed in Table **4-5.** There are several notable differences between the frequencies of the dataset noted above and the frequencies for scholarship recipients only. First, while the proportion of males and females are nearly equal in the primary dataset, a greater percentage of women than men received scholarships (53 percent vs. 47 percent). Second, the mean income for the scholarship recipients is lower ($75,088.26) than the mean income for the primary dataset ($82,287.23). A greater proportion of students from later graduation years (2002 and

2003) received scholarships than are represented in the primary dataset. This is most likely due to the ever-increasing availability of scholarships for students at Penn State.

While white students comprise 87 percent of the primary dataset, just 78 percent of scholarship recipients are white, and a greater proportion of students of other races and ethnicities are scholarship recipients.

For the academic and social integration variables, scholarship recipients participated in slightly more student activities and sports than students in the primary dataset. Students in the College of Business were underrepresented among scholarship recipients, while students in the Colleges of Arts & Architecture, Agricultural Sciences, Earth and Mineral Sciences, Engineering, Information Sciences & Technology, and Science were overrepresented. Students in the scholarship recipient dataset had higher average grade-point averages than students in the primary dataset – 3.38 as opposed to 3.16.

For the capacity and motivation to give variables, scholarship recipients carried a similar average loan debt to students in the primary dataset – $14,542 as opposed to $14,625. Because the scholarship recipient dataset included only scholarship recipients, the average scholarship amount rose significantly, to $7,160 as opposed to $2,580 for the primary dataset. Finally, a lower percentage of scholarship recipients – 78.4 – were members of the Alumni Association than in the primary dataset – 79.8.

Table **4-5**: Frequencies – Scholarship Recipients Only

Variable	N	Minimum	Maximum	Mean	Standard Dev.
Gender	6278	0	1	0.5299	0.49914
	2951 (47.0%)	*male*			
	3327 (53.0%)	*female*			
Income	6278	$0	$1,156,276	$75,088.26	57833.70
Year of Birth	6278	1951	1983	1978.96	2.469
grad_year	6278	2000	2003	2001.81	0.917
	461 (7.3%)	*2000*			
	1973 (31.4%)	*2001*			
	2151 (34.3%)	*2002*			
	1693 (27.0%)	*2003*			
Race	6278	1	7	n/a	n/a
	4895 (78.0%)	*1 (white)*			
	0 (0%)	*2 (Amer. In.)*			
	608 (9.7%)	*3 (Black)*			
	315 (5.0%)	*4 (Asian)*			
	269 (4.3%)	*5 (Hispanic)*			
	175 (2.8%)	*6 (Puerto Rican)*			
	16 (0.3%)	*7 (Foreign)*			
# student activities	6278	0	5	0.2187	0.52721
	5179 (82.5%)	*0*			
	877 (14.0%)	*1*			
	179 (2.9%)	*2*			
	35 (0.6%)	*3*			
	7 (0.1%)	*4*			
	1 (0%)	*5*			
# sports	6278	0	5	0.0529	0.24293
	5972 (95.1%)	*0*			
	282 (4.5%)	*1*			
	22 (0.4%)	*2*			
	2 (0%)	*3*			
	0 (0%)	*4*			
	0 (0%)	*5*			
College	6278	1	11	n/a	n/a
	915 (14.6%)	*1 (BUS)*			
	288 (4.6%)	*2 (A&A)*			
	506 (8.1%)	*3 (AGR)*			
	509 (8.1%)	*4 (COM)*			
	458 (7.3%)	*5 (EDU)*			
	260 (4.1%)	*6 (EMS)*			
	1120 (17.8%)	*7 (ENG)*			
	610 (9.7%)	*8 (HHD)*			
	48 (0.8%)	*9 (IST)*			
	1007 (16.0%)	*10 (LIB)*			
	557 (8.9%)	*11 (SCI)*			
Time to Degree	6278	8	83	47.4146	7.88416
GPA	6278	0	4.0	3.3781	.42875
Loan Debt	6278	0	$87,282.00	$14,542.75	11399.01
Scholarship Amt.		0	$140,106.00	$7,160.17	12485.40
Membership Status	6278	0	1	0.2155	0.41121
	4925 (78.4%)	*0 (nonmember)*			
	1353 (21.6%)	*1 (member)*			

The next table, Table **4-6**, shows the frequencies for the full dataset prior to any cases being removed. None of the frequencies differ a great deal from those of the limited dataset, and the limited dataset probably provides more accurate data for reasons described in Chapter 3. For example, the mean income for the full dataset is $81,047.55 and mean income for the limited dataset is $82,287.23. The income for the full dataset is most likely lower because some cases in that dataset listed a negative income, thereby dragging down the mean income. Interestingly, the limited dataset does contain a lower proportion of females – 50.2 versus 51.8. Other variables, such as year of birth, graduation year, race/ethnicity, number of student activities, college, and Alumni Association membership were relatively unchanged. Grade-point average was lower for the full dataset – 3.13 vs. 3.15 for the limited dataset – probably because in the full dataset, more than sixty cases had a GPA of less than 2.0, which is lower than that which is required for graduation. Interestingly, changes were seen between the full dataset and the limited dataset for both loan debt and scholarship receipt. The mean loan debt rose from $11,751.26 in the full dataset to $14,625.28 in the limited dataset. In the limited dataset, 64 percent had not received a scholarship, but in the full dataset, more than 67 percent had not received a scholarship. While these changes should be noted, the substantial size of the limited dataset (still more than 17,000 cases) and the benefits of running the regression models without any missing cases outweigh any concern.

Table **4-6**: Frequencies, Full Dataset

Variable	N	Minimum	Maximum	Mean	Standard Dev.
Gender	25083	0	1	0.4818	0.49968
	12999 (51.8%)	*0 (male)*			
	12084 (48.2%)	*(1) female*			
Income	19932	-$3,197.34	$1,211,745	$81,047.55	55241.44
Year of Birth	25078	1913	1984	1978.63	2.776
grad_year	25065	2000	2003	2001.72	0.94
	2439 (9.7%)	*2000*			
	8342 (33.3%)	*2001*			
	8202 (32.7%)	*2002*			
	6082 24.3%)	*2003*			
Race	23844	1	7	n/a	n/a
	20734 (87.0%)	*1 (white)*			
	2 (0%)	*2 (Amer. In.)*			
	899 (3.8%)	*3 (Black)*			
	1244 (5.2%)	*4 (Asian)*			
	391 (1.6%)	*5 (Hispanic)*			
	233 (1.0%)	*6 (Puerto Rican)*			
	341 (1.4%)	*7 (Foreign)*			
# student activities	25084	0	5	0.1916	0.48307
	21110 (84.2%)	*0*			
	3265 (13.0%)	*1*			
	610 (2.4%)	*2*			
	80 (.3%)	*3*			
	14 (0.1%)	*4*			
	5 (0%)	*5*			
# sports	25084	0	5	0.0404	0.21819
	24164 (96.3%)	*0*			
	841 (3.4%)	*1*			
	68 (0.3%)	*2*			
	9 (0%)	*3*			
	1 (0%)	*4*			
	1 (0%)	*5*			
College	25051	1	11	n/a	n/a
	5153 (20.6%)	*1 (BUS)*			
	1031 (4.1%)	*2 (A&A)*			
	1279 (5.1%)	*3 (AGR)*			
	2104 (8.4%)	*4 (COM)*			
	1713 (6.8%)	*5 (EDU)*			
	617 (2.5%)	*6 (EMS)*			
	3607 (14.4%)	*7 (ENG)*			
	3384 (13.5%)	*8 (HHD)*			
	157 (0.6%)	*9 (IST)*			
	4199 (16.8%)	*10 (LIB)*			
	1807 (7.2%)	*11 (SCI)*			
Time to Degree	23154	-25	83	47.5545	8.69
GPA	25078	0	8.59	3.137	0.54779
Loan Debt	25084	0	$110,779	$11,751.26	$11,726.06
Scholarship	25084	0	1	0.3244	0.46816
	16947 (67.6%)	*0 (no schol.)*			
	8137 (32.4%)	*1 (schol.)*			
Scholarship Amt.		0	$140,106.00	$2463.199	8600.908
Membership Status	25071	0	1	0.2013	0.40096
	20025 (79.8%)	*0 (nonmember)*			
	5046 (20.1%)	*1 (member)*			

Correlations

Table **4-7**, Table **4-8**, and Table **4-9** show the correlations among all of the variables.

Table **4-7**: Correlations

	gender	income	YOB	Grad yr.	White	AmInd	Blck	Asian	Hisp	PR	For
GEND	1	.002	.100**	.009	-.055**	.008	.069**	-.002	.018*	.022**	-.001
INCOM	.002	1	.189**	.065**	.124**	.002	-.096**	-.071**	-.013	-.036**	-.006
YOB	.100**	.189**	1	.400**	-.014	.007	.021**	.003	.006	-.003	-.016*
GRADYR	.009	.065**	.400**	1	-.007	.010	.020**	-.010	.000	.004	-.003
WHITE	-.055**	.124**	-.014	-.007	1	-.020**	-.553**	-.620**	-.346**	-.286**	-.126**
AMIND	.008	.002	.007	.010	-.020**	1	-.002	-.002	-.001	-.001	.000
BLCK	.069**	-.096**	.021**	.020**	-.553**	-.002	1	-.051**	-.028**	-.024**	-.010
ASIAN	-.002	-.071**	.003	-.010	-.620**	-.002	-.051**	1	-.032**	-.026**	-.012
HISP	.018*	-.013	.006	.000	-.346**	-.001	-.028**	-.032**	1	-.015	-.006
PR	.022**	-.036**	-.003	.004	-.286**	-.001	-.024**	-.026**	-.015	1	-.005
FOR	-.001	-.006	-.016*	-.003	-.126**	.000	-.010	-.012	-.006	-.005	1
BUS	-.084**	.058**	.034**	-.022**	-.085**	.015*	.014	.104**	.012	-.001	.011
A&A	.024**	.018*	-.012	.022**	.011	-.002	-.005	-.006	.001	-.014	-.004
AGR	-.035**	-.058**	-.046**	-.019*	.062**	-.002	-.030**	-.050**	-.022**	-.003	-.001
COM	.052**	.030**	.051**	.042**	-.011	-.002	.038**	-.026**	.012	.006	-.006
EDU	.155**	-.030**	-.044**	-.046**	.064**	-.002	-.030**	-.052**	-.021**	-.003	-.014
EMS	-.072**	-.002	-.008	-.005	.026**	-.001	-.015*	-.021**	-.007	.000	.000
ENG	-.251**	.010	-.029**	-.010	.031**	-.003	-.051**	.020**	-.020**	-.013	-.013
HHD	.163**	-.041**	-.027**	-.025**	.020**	-.003	.017*	-.047**	-.002	.004	.008
IST	-.030**	.030**	.041**	.101**	-.016*	-.001	-.007	.025**	.006	.004	-.004
LIB	.059**	-.041**	.011	.031**	-.023**	-.003	.050**	-.036**	.031**	.017*	.004
SCI	.022**	.035**	.038**	.009	-.031**	-.002	-.016*	.060**	-.002	-.001	.010
ACTIV	.025**	.127**	.079**	.027**	.002	-.003	-.001	-.016*	.019*	.004	.009
SPORT	-.068**	.018*	.026**	.049**	-.025**	-.001	.056**	-.023**	.017*	-.003	.002
TIME	-.133**	-.031**	-.062**	.017*	-.051**	-.001	.026**	.037**	.006	.025**	.003
GPA	.172**	.114**	.094**	.020**	.134**	.014	-.114**	-.051**	-.033**	-.051**	-.010
DEBT	-.006	-.298**	-.187**	.027**	-.075**	-.006	.108**	-.017*	.013	.051**	-.007
SCHOL	.048**	-.099**	.008	.031**	-.203**	-.006	.196**	-.013	.145**	.109**	.003
SCHAMT	.022**	-.030**	.028**	.029**	-.272**	-.002	.321**	-.015	.135**	.108**	-.003
MEMB	-.019*	.065**	.032**	.006	.097**	-.004	-.054**	-.070**	-.025**	-.020**	-.004

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table **4-8**: Correlations, continued

	Bus	A&A	AGR	COM	EDU	EMS	ENG	HHD	IST	LIB	SCI
GEND	-.084**	.024**	-.035**	.052**	.155**	-.072**	-.251**	.163**	-.030**	.059**	.022**
INCOM	.058**	.018*	-.058**	.030**	-.030**	-.002	.010	-.041**	.030**	-.041**	.035**
YOB	.034**	-.012	-.046**	.051**	-.044**	-.008	-.029**	-.027**	.041**	.011	.038**
GRADYR	-.022**	.022**	-.019*	.042**	-.046**	-.005	-.010	-.025**	.101**	.031**	.009
WHITE	-.085**	.011	.062**	-.011	.064**	.026**	.031**	.020**	-.016*	-.023**	-.031**
AMIND	.015*	-.002	-.002	-.002	-.002	-.001	-.003	-.003	-.001	-.003	-.002
BLCK	.014	-.005	-.030**	.038**	-.030**	-.015*	-.051**	.017*	-.007	.050**	-.016*
ASIAN	.104**	-.006	-.050**	-.026**	-.052**	-.021**	.020**	-.047**	.025**	-.036**	.060**
HISP	.012	.001	-.022**	.012	-.021**	-.007	-.020**	-.002	.006	.031**	-.002
PR	-.001	-.014	-.003	.006	-.003	.000	-.013	.004	.004	.017*	-.001
FOR	.011	-.004	-.001	-.006	-.014	.000	-.013	.008	-.004	.004	.010
BUS	1	-.100**	-.119**	-.154**	-.142**	-.079**	-.207**	-.199**	-.040**	-.222**	-.137**
A&A	-.100**	1	-.047**	-.061**	-.057**	-.031**	-.083**	-.080**	-.016*	-.089**	-.055**
AGR	-.119**	-.047**	1	-.073**	-.067**	-.037**	-.098**	-.094**	-.019*	-.105**	-.065**
COM	-.154**	-.061**	-.073**	1	-.087**	-.048**	-.127**	-.122**	-.025**	-.136**	-.084**
EDU	-.142**	-.057**	-.067**	-.087**	1	-.045**	-.117**	-.113**	-.023**	-.126**	-.078**
EMS	-.079**	-.031**	-.037**	-.048**	-.045**	1	-.065**	-.063**	-.013	-.070**	-.043**
ENG	-.207**	-.083**	-.098**	-.127**	-.117**	-.065**	1	-.165**	-.033**	-.183**	-.113**
HHD	-.199**	-.080**	-.094**	-.122**	-.113**	-.063**	-.165**	1	-.032**	-.177**	-.109**
IST	-.040**	-.016*	-.019*	-.025**	-.023**	-.013	-.033**	-.032**	1	-.036**	-.022**
LIB	-.222**	-.089**	-.105**	-.136**	-.126**	-.070**	-.183**	-.177**	-.036**	1	-.121**
SCI	-.137**	-.055**	-.065**	-.084**	-.078**	-.043**	-.113**	-.109**	-.022**	-.121**	1
ACTIV	.030**	.010	-.013	.106**	-.045**	.020**	-.035**	-.052**	.015*	-.007	-.002
SPORT	.014	-.014	-.019*	-.005	-.001	.014	-.012	.039**	.005	-.009	-.021**
TIME	.018*	.085**	-.003	-.050**	-.019*	.004	.133**	.018*	-.041**	-.138**	-.010
GPA	-.069**	.010	-.070**	-.025**	.195**	-.024**	.013	-.053**	.038**	-.022**	.077**
DEBT	-.034**	.017*	-.012	-.010	.029**	.017*	-.018*	.050**	-.015	.026**	-.055**
SCHOL	-.102**	.029**	.092**	-.013	-.005	.085**	.070**	-.087**	.011	-.008	.057**
SCHOLAMT	-.036**	.007	.019*	.004	-.025**	.060**	.029**	-.024**	.008	-.016*	.034**
MEMB	.021**	-.033**	-.010	-.033**	-.007	.033**	.076**	-.032**	.023**	-.034**	.005

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Table **4-9**: Correlations, continued

	#activ.	#sport	timetodeg	gpa	loandebt	Schol.	Schol. $	Member
GEND	.025**	-.068**	-.133**	.172**	-.006	.048**	.022**	-.019*
INCOM	.127**	.018*	-.031**	.114**	-.298**	-.099**	-.030**	.065**
YOB	.079**	.026**	-.062**	.094**	-.187**	.008	.028**	.032**
GRADYR	.027**	.049**	.017*	.020**	.027**	.031**	.029**	.006
WHITE	.002	-.025**	-.051**	.134**	-.075**	-.203**	-.272**	.097**
AMIND	-.003	-.001	-.001	.014	-.006	-.006	-.002	-.004
BLCK	-.001	.056**	.026**	-.114**	.108**	.196**	.321**	-.054**
ASIAN	-.016*	-.023**	.037**	-.051**	-.017*	-.013	-.015	-.070**
HISP	.019*	.017*	.006	-.033**	.013	.145**	.135**	-.025**
PR	.004	-.003	.025**	-.051**	.051**	.109**	.108**	-.020**
FOR	.009	.002	.003	-.010	-.007	.003	-.003	-.004
BUS	.030**	.014	.018*	-.069**	-.034**	-.102**	-.036**	.021**
A&A	.010	-.014	.085**	.010	.017*	.029**	.007	-.033**
AGR	-.013	-.019*	-.003	-.070**	-.012	.092**	.019*	-.010
COM	.106**	-.005	-.050**	-.025**	-.010	-.013	.004	-.033**
EDU	-.045**	-.001	-.019*	.195**	.029**	-.005	-.025**	-.007
EMS	.020**	.014	.004	-.024**	.017*	.085**	.060**	.033**
ENG	-.035**	-.012	.133**	.013	-.018*	.070**	.029**	.076**
HHD	-.052**	.039**	.018*	-.053**	.050**	-.087**	-.024**	-.032**
IST	.015*	.005	-.041**	.038**	-.015	.011	.008	.023**
LIB	-.007	-.009	-.138**	-.022**	.026**	-.008	-.016*	-.034**
SCI	-.002	-.021**	-.010	.077**	-.055**	.057**	.034**	.005
ACTIV	1	-.024**	-.013	.076**	-.078**	.054**	.047**	.100**
SPORT	-.024**	1	.039**	-.061**	-.010	.050**	.237**	-.001
TIME	-.013	.039**	1	-.296**	.097**	-.047**	.031**	-.003
GPA	.076**	-.061**	-.296**	1	-.208**	.349**	.143**	.072**
DEBT	-.078**	-.010	.097**	-.208**	1	-.006	-.099**	-.052**
SCHOL	.054**	.050**	-.047**	.349**	-.006	1	.417**	.026**
SCHOLAMT	.047**	.237**	.031**	.143**	-.099**	.417**	1	.013
MEMB	.100**	-.001	-.003	.072**	-.052**	.026**	.013	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

While many of the correlations were statistically significant, none of the correlations were so high as to raise concern about multicollinearity among the variables in the model (all were below .400 for variables included in a single model). For conditions of multicollinearity to be satisfied, the correlations must be so high that the standard errors become unstable, and this generally occurs above .900. Further, the OLS regression models show tolerance and variance inflation factor (VIF) diagnostics. None of these diagnostics show areas of concern based on commonly-cited thresholds.

According to Field (2005), some researchers have found that a VIF above 10, or a tolerance of less than .1, is cause for concern about multicollinearity. Regardless, some of the correlations were of interest.

Family income, for example, was positively associated with being white, while being African American had a slightly negative association with income. The same is true for loan debt, receipt of a scholarship, and scholarship amount; these three variables were positively associated with being African American but had a slightly negative association with being white.

Gender was correlated with a number of variables. First, gender was positively associated with grade-point average (.172), meaning that women had higher grade-point averages than men. The strongest associations between gender and college were for the College of Health and Human Development (.163) and the College of Education (.155); both had positive associations with gender, meaning that students in these colleges are more likely to be women. Gender was also positively associated with number of student activities, but slightly negatively associated with number of sports (-.068). Gender was negatively associated with time to degree (-.133), meaning that women tended to graduate in less time than men. Finally, being female was positively associated with receipt of a scholarship (.048) and with scholarship amount (.022).

Interestingly, the correlation matrix shows a positive association between the number of student activities and family income (.127). In other words, increases in income were associated with increases in the number of student activities in which students participated. Grade-point average was also positively associated with income

(.114). Of course, income was negatively associated with loan debt (-.298), receipt of a scholarship (-.099), and scholarship amount (-.030).

The variable “time to degree” had a positive association with the variable “College of Engineering” (.133) and a negative association with the variable “College of the Liberal Arts” (-.138), meaning that students in the College of the Liberal Arts took less time to graduate than students in the College of Engineering. Grade-point average was positively associated with being the College of Education (.195).

The strongest positive correlations for grade-point average, however, were for receipt of a scholarship (.349), and scholarship amount (.143). This is intuitively appropriate because many of the scholarships offered by Penn State are merit-based or have a merit component (Office of Student Aid, 2007). Grade-point average was negatively associated with time to degree (-.296), meaning that students with higher grade-point averages took less time to graduate than students with lower grade-point averages.

There were statistically positive associations between the colleges of Business (.021), Earth and Mineral Sciences (.033), Engineering (.076), and Information Sciences and Technology (.023) and membership in the Alumni Association. However, all of these were quite small. Alumni Association membership was also positively associated with number of student activities (.100) and grade-point average (.072). Membership was positively associated (.097) with being white and negatively associated with being African American (-.054) or Asian (-.070). This may be due to both lack of academic and social integration among students from underrepresented populations at Penn State.

Those who feel less connected to Penn State as students may be less likely to formalize their affinity for Penn State as alumni by joining the Alumni Association.

Overall, all of the correlations are relatively low. The strongest correlation is between receipt of a scholarship and scholarship amount (.417), but these two variables are not included in the regression models at the same time. Graduation year and year of birth are also highly correlated (.400), but this correlation is not high enough to generate concern.

Regression Models

This study utilizes both logistic and ordinary least squares (OLS) regression in order to uncover the relationship between scholarship receipt and alumni giving. Research question 1 and research question 3 require logistic regression because the dependent variable, alumni giving, is dichotomous. Research question 2 and research question 3b require the use of OLS regression models because the dependent variable, amount of giving, is continuous. The logistic regression models are presented first, followed by the OLS regression models.

Logistic regression was used to test the following research questions:

1. Are alumni of The Pennsylvania State University who received institutional scholarships as undergraduates more likely than non-scholarship recipients to be donors to the University?

3. Does the amount of institutional scholarships received impact the likelihood of making a gift?

For each of the logistic regression models, the independent variables were added to the models in four blocks according to the conceptual framework. Therefore, demographic variables comprised the first block, academic and social integration variables comprised the second block, the single capacity to give variable comprised the third block, and the motivation to give variables, including the variable of primary interest – scholarship receipt/amount – comprised the fourth and final block. Goodness of fit statistics are presented for all of the models. These statistics show the extent to which the addition of the variables in each of the four blocks improve the model – an important part of the diagnostic process for regression models (Neter et al., 1996)

Logistic Regression – Research Question 1

The following table, Table **4-10**, shows the beta values and delta-P statistics for the first regression model, which tests research question 1.

Table **4-10**: Logistic Regression – Research Question 1

	Model 1		Model 2		Model 3		Model 4	
Variable	B	Delta-P	B	Delta-P	B	Delta-P	B	Delta-P
GEND	0.057*	0.014	0.126*	0.031	0.125*	0.031	0.127*	0.031
INCOM	.002*	.000	.001*	0	.001*	0	.001*	0
YOB	0.023*	0.006	0.009		0.01		0.007	
GRADYR	-0.091*	-0.022	-0.087*	-0.021	-0.088*	-0.022	-0.093*	-0.023
AMIND	-20.993		-21.166		-21.161		-20.745	
BLCK	-0.572*	-0.133	-0.503*	-0.117	-0.506*	-0.188	-0.465*	-0.109
ASIAN	-0.392*	-0.093	-0.426*	-0.101	-0.425*	-0.1	-0.259*	-0.063
HISP	-0.059		-0.049		-0.05		-0.003	
PR	-0.059		-0.014		-0.017		0.015	
FOR	0.084		0.084		0.086		0.142	
ACTIV			0.523*	0.249	0.524*	0.13	0.454*	0.113
SPORT			0.033		0.034		0.009	
A&A			-0.31*	-0.075	-0.311*	-0.075	-0.208*	-0.05
AGR			-0.197*	-0.048	-0.195*	-0.047	-0.191*	-0.047
COM			-0.17*	-0.041	-0.17*	-0.041	-0.081	
EDU			-0.179*	-0.044	-0.181*	-0.044	-0.119	
EMS			0.472*	0.117	0.47*	0.117	0.394*	0.098
ENG			0.256*	0.064	0.256*	0.064	0.188*	0.047
HHD			-0.246*	-0.059	-0.247*	-0.059	-0.191*	-0.047
IST			0.32		0.32		0.225	
LIB			-0.243*	-0.059	-0.244*	-0.059	-0.197*	-0.048
SCI			-0.045		-0.044		-0.036	
TIME			-0.002		-0.002		-0.003	
GPA			0.24*	0.06	0.244*	0.061	0.154*	0.038
DEBT					0		0	
SCHOL							0.102*	0.025
MEMB							1.345*	0.312
	Chi-sq	**Sig.**	**Chi-sq**	**Sig.**	**Chi-sq**	**Sig.**	**Chi-sq**	**Sig.**
Step	176.509	.000	460.078	.000	.470	.493	1123.783	.000
Block	176.509	.000	460.078	.000	.470	.493	1123.783	.000
Model	176.509	.000	636.587	.000	637.057	.000	1760.840	.000
	-2 LL	23694.388	**-2 LL**	23234.310	**-2LL**	23233.84	**-2LL**	22110.057
	Predicted		**Predicted**		**Predicted**		**Predicted**	
Observed	0 1	% correct	0 1	% correct	0 1	% correct	0 1	% correct
0	9384 419	95.7	8206 1597	83.7	8212 1591	83.8	8439 1364	86.1
1	7188 427	5.6	5477 2138	28.1	5480 2135	28.0	4678 2937	38.6
Overall %		56.3		59.4		59.4		65.3

The results show that the addition of each block of the model improves the model's predictability. Adding the academic and social integration variables to the model resulted in a slightly improved ability to classify givers and non-givers – from 56.3 percent to 59.4 percent. The model is greatly improved the addition of the "motivation to

give" variables, scholarship receipt and membership status. A number of variables were significant in the full model, and these are described below.

Demographic Variables

Several of the demographic variables in the model, GEND, INCOM, GRADYR, BLCK, and ASIAN, yielded significant results in the full model. The delta-p statistics allow for meaningful interpretation of these significant results. For gender, for example, the delta-p statistic is .031. This means that females (who are coded '1' in this study) are 3.1 percent more likely than males to make a gift to Penn State. The delta-p statistic for GRADYR is -.023. This means that as graduation year increases by an increment of one year (from 2000 to 2001, for example), individuals are 2.3 percent less likely to make a gift. More recent graduates are less likely to make a gift than earlier graduates.

Although INCOM is significant, the delta-p statistic is 0, meaning that an increase in family income does not affect the likelihood of subsequent giving. This is because the coefficient for INCOM is so small that its delta-P statistic is just .0001, meaning that each increase of $1000 in family income increases the likelihood of making a gift by 0.01 percent. The variables BLCK (African American) and ASIAN had negative delta-p statistics, meaning that African American alumni are 10.9 percent less likely, and Asian alumni are 6.3 percent less likely, to make a gift than white alumni (the reference group).

Academic and Social Integration Variables

Several of the academic and social integration variables remain significant in the full model. ACTIV is the most significant predictor of giving among these variables with a delta-p statistic of 11.3. This means that as the number of student activities in which a student participates increases by an increment of one, he or she is 11.3 percent more likely to make a gift as an alumnus or alumna.

Six of the college variables yielded significant results. Alumni of the College of Arts and Architecture are 5 percent less likely to make a gift than alumni of the College of Business, and alumni of the College of Agricultural Sciences and the College of Health and Human Development were both 4.7 percent less likely to make a gift. Alumni of the College of the Liberal Arts were 4.8 percent less likely to make a gift. However, alumni of the College of Engineering were 4.7 percent more likely to make a gift than alumni of the College of Business, and alumni of the College of Earth and Mineral Sciences were 9.8 percent more likely to make a gift than alumni of the College of Business. Results were not significant for the remaining colleges.

The final variable among the academic and social integration variables to achieve significance was GPA. Its delta-p statistic of .038 reveals that with every grade-point average increase of one point, alumni were 3.8 percent more likely to make gift.

Capacity to Give Variable

The single capacity to give variable, loan debt, was not significant in the full model.

Motivation to Give Variables

Both of the motivation to give variables in the study, scholarship receipt and membership status, were significant in the full model. The delta-p statistics show that scholarship recipients were 2.5 percent more likely than non-recipients to make a gift to Penn State. The strongest variable in the entire model is membership status: the delta-p statistic shows that Alumni Association members were 31.2 percent more likely than non-members to make a gift to Penn State after graduation.

Summary – Research Question 1

As noted by Cabrera (1994), the -2 Log Likelihood statistic shows the goodness of fit of a given logistic regression model. The best-fitting model is that which has the lowest -2 Log Likelihood statistic. The full model for Model 1 has the lowest -2 Log Likelihood (22110.057). It also has the strongest ability to correctly classify givers and non-givers, although the overall ability of the model to do so it still fairly low, at 65.3 percent. It is clear that the addition of the two motivation to give variables, scholarship receipt and membership, increase the model's predictive ability. However, the results make clear that the variables in the model are just a few of the many factors that determine alumni giving.

Logistic Regression – Research Question 3

The second logistic regression model uses the same dependent variable and changes only a single variable. Instead of analyzing the impact of scholarship receipt on giving, this model shows the impact of the amount of scholarships received on giving. In doing so, it answers research question 3, “Does the amount of institutional scholarships received impact the likelihood of making a gift?”

The first table, Table **4-11**, shows the beta values, delta-P values, goodness of fit statistics, and classification tables for each block of Model 2.

Table **4-11**: Logistic Regression – Research Question 3

	Model 1		Model 2		Model 3		Model 4	
Variable	B	Delta-P	B	Delta-P	B	Delta-P	B	Delta-P
GEND	0.057		0.126*	0.031	0.125*	0.031	0.127*	0.031
INCOM	.002*	0	.001*	0	.001*	0	.001*	0
YOB	0.023*	0.006	0.009		0.01		0.007	
GRADYR	-0.091*	-0.022	-0.087*	-0.021	-0.088*	-0.101	-0.092*	-0.023
AMIND	-20.993		-21.166		-21.161		-20.779	
BLCK	-0.572*	-0.133	-0.503*	-0.117	-0.506*	-0.118	-0.491*	-0.115
ASIAN	-0.392*	-0.093	-0.426*	-0.101	-0.425*	-0.1	-0.257*	-0.062
HISP	-0.059		-0.049		-0.05		0.005	
PR	-0.059		-0.014		-0.017		0.019	
FOR	0.084		0.084		0.086		0.15	
ACTIV			0.523*	0.249	0.524*	0.013	0.455*	0.113
SPORT			0.033		0.034		-0.027	
A&A			-0.31*	-0.075	-0.311*	-0.075	-0.199*	-0.048
AGR			-0.197*	-0.048	-0.195*	-0.047	-0.169*	-0.041
COM			-0.17*	-0.041	-0.17*	-0.041	-0.078	
EDU			-0.179*	-0.044	-0.181*	-0.044	-0.121	
EMS			0.472*	0.117	0.47*	0.117	0.408*	0.102
ENG			0.256*	0.064	0.256*	0.064	0.197*	0.049
HHD			-0.246*	-0.059	-0.247*	-0.059	-0.194*	-0.047
IST			0.32		0.32		0.226	
LIB			-0.243*	-0.059	-0.244*	-0.059	-0.192*	-0.047
SCI			-0.045		-0.044		-0.03	
TIME			-0.002		-0.002		-0.003	
GPA			0.24*	0.06	0.244*	0.061	0.178*	0.044
DEBT					0		0	
SCHAMT							.006*	.001
MEMB							1.344*	0.311
	Chi-sq	**Sig.**	**Chi-sq**	**Sig.**	**Chi-sq**	**Sig.**	**Chi-sq**	**Sig.**
Step	176.509	.000	460.078	.000	.470	.493	1123.592	.000
Block	176.509	.000	460.078	.000	.470	.493	1123.592	.000
Model	176.509	.000	636.587	.000	637.057	.000	1760.649	.000
	-2 LL	23694.388	**-2 LL**	23234.310	**-2LL**	23233.84	**-2LL**	22110.249
	Predicted		**Predicted**		**Predicted**		**Predicted**	
Observed	0 1	% correct	0 1	% correct	0 1	% correct	0 1	% correct
0	9384 419	95.7	8206 1597	83.7	8212 1591	83.8	8445 1358	86.1
1	7188 427	5.6	5477 2138	28.1	5480 2135	28.0	4687 2928	38.5
Overall %		56.3		59.4		59.4		65.3

As with the first logistic regression model, the addition of academic and social integration variables results in the model's improved ability – from 56.3 percent to 59.4 percent – to classify givers and non-givers. After the addition of the single capacity to give variable, loan debt, there is no change to the ability of the model to predict givers and nongivers. The final block of the model, which includes the main variable of interest

—amount of scholarships received—and Alumni Association membership, improves the model's predictability from 59.4 percent to 65.3 percent. The significance of variables in each block of the model is discussed below.

Demographic Variables

Several demographic variables retained significance in the full model and delta-p statistics were computed for these. There is very little difference between this model and the previous model. Women are 3.1 percent more likely to make a gift than men. As graduation year increases by an increment of one (from 2000 to 2001, for example), alumni are 2.3 percent less likely to make a gift. African Americans are even less likely than in the previous model to make a gift; they are 11.5 percent less likely than whites to make a gift in this model. Asian alumni are 6.2 percent less likely than whites to make a gift.

Academic and Social Integration Variables

As in the first model, an increase of one in the number of student activities in which students participated results in an 11.3 percent increase in the likelihood of making a gift. Alumni of the Colleges of Arts and Architecture, Agricultural Sciences, Health and Human Development, and the Liberal Arts are 4.8 percent, 4.1 percent, 4.7 percent, and 4.7 percent less likely, respectively, to make a gift than alumni of the College of Business. Alumni of the Colleges of Earth and Mineral Sciences and Engineering are

10.2 percent and 4.9 percent more likely, respectively, to make a gift than alumni of the College of Business. An increase of one point in grade-point average increases the likelihood of making a gift by 4.4 percent.

Capacity to Give Variable

As in the previous model, the amount of loan debt is not a significant predictor of alumni giving.

Motivation to Give Variables

While the amount of scholarships received is significant, its delta-p statistic is just .001. Because scholarship receipt is expressed in thousands, this means that an increase of $1,000 in scholarships received results in just a .1 percent greater likelihood of giving. As in the previous model, membership status is a very strong predictor of giving. Alumni who are members of the Alumni Association are 31.1 percent more likely to make a gift than nonmembers.

Summary – Research Question 3

The -2 Log Likelihood statistic for the full model in Model 2, 22110.249, is lower than for Block 1, Block 2, or Block 3 of the model, meaning that the full model is the best fit. While the full model is clearly the most predictive, it still correctly classifies givers and non-givers only 65.3 percent of the time.

The most predictive of the variables in the model are Alumni Association membership and number of student activities. While a number of other variables are significant, their impact on giving as represented by the delta-p statistics is small. The primary variable of interest, amount of scholarship dollars received, does not increase the likelihood of making a gift by a measurable amount.

OLS Regression Models

Ordinary least squares regression was employed in order to analyze the following research questions:

2. Do alumni of The Pennsylvania State University who received scholarships as undergraduates give to the University in significantly higher amounts than non-aid recipients?
3. Does the amount of institutional scholarships received impact the amount of giving?

OLS Regression – Research Question 2

The first model analyzes Research Question 2, determining whether alumni who received scholarships give in significantly higher amounts than those who did not receive scholarships. As in the logistic regression models, the variables were added to the model in four blocks: demographic variables first, academic and social integration variables second, the capacity to give variable third, and the motivation to give variables fourth.

The first table, Table **4-12**, shows the change in R^2 for each of the four blocks in the model. The R^2 statistic shows whether the addition of a variable or variables accounts for changes in the variance of the dependent variable – in other words, whether the addition of each block of variables results in a significant change in the amount of giving.

Table **4-12**: R^2 change – OLS Regression, Research Question 2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.039(a)	.002	.001	359.36740	.002	2.648	10	17407	.003
2	.087(b)	.008	.006	358.42298	.006	7.561	14	17393	.000
3	.088(c)	.008	.006	358.39070	.000	4.133	1	17392	.042
4	.154(d)	.024	.022	355.50349	.016	142.822	2	17390	.000

The change in R^2 for each successive block of the model is significant at the .05 level, revealing that the addition of each of the four blocks of variables did result in a significant change in the dependent variable.

The next table, Table **4-13,** shows both the unstandardized and standardized regression coefficients and significance levels for the full model with all variables added. SPSS standardizes the variables using z-scores and assuming a mean of 0 and a standard deviation of 1. The results for blocks 1, 2, and 3 of the model are shown in Tables A-1, A-2, and A-3 of the Appendix.

Table **4-13**: OLS Regression – Research Question 2, Full Model

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
4	(Constant)	17191.820	5938.010		2.895	.004		
	GEND	-8.021	5.896	-.011	-1.361	.174	.835	1.198
	INCOM	.003	.053	.001	.062	.950	.849	1.179
	YOB	-.930	1.430	-.006	-.650	.515	.770	1.299
	GRADYR	-7.688	3.242	-.020	-2.371	.018	.813	1.229
	AMIND	-41.059	355.660	-.001	-.115	.908	.999	1.001
	BLCK	7.435	14.109	.004	.527	.598	.876	1.142
	ASIAN	-15.822	12.195	-.010	-1.297	.195	.952	1.051
	HISP	-11.824	21.046	-.004	-.562	.574	.952	1.050
	PR	-9.284	25.187	-.003	-.369	.712	.965	1.036
	FOR	-21.396	55.642	-.003	-.385	.701	.998	1.002
	ACTIV	34.582	5.829	.046	5.933	.000	.949	1.054
	SPORT	13.057	12.816	.008	1.019	.308	.974	1.027
	A&A	-21.733	15.167	-.012	-1.433	.152	.853	1.173
	AGR	-2.705	13.481	-.002	-.201	.841	.793	1.261
	COM	-23.275	11.119	-.018	-2.093	.036	.746	1.341
	EDU	-29.246	12.077	-.021	-2.422	.015	.719	1.390
	EMS	-6.390	18.592	-.003	-.344	.731	.892	1.121
	ENG	-5.960	9.535	-.006	-.625	.532	.641	1.560
	HHD	-17.679	9.705	-.017	-1.822	.069	.651	1.535
	IST	9.096	34.249	.002	.266	.791	.960	1.042
	LIB	-16.260	9.138	-.017	-1.779	.075	.632	1.582
	SCI	-24.525	11.974	-.017	-2.048	.041	.783	1.277
	TIME	.508	.349	.012	1.456	.146	.855	1.170
	GPA	19.112	7.126	.025	2.682	.007	.647	1.545
	DEBT	.000	.000	-.015	-1.813	.070	.839	1.192
	SCHOL	4.966	6.679	.007	.743	.457	.706	1.417
	MEMB	115.307	6.835	.129	16.871	.000	.964	1.037

a Dependent Variable: amount of giving

Demographic Variables

The single variable that is significant in the full model is graduation year. Its unstandardized coefficient of -7.688 means that as graduation year increases by an increment of one (from 2000 to 2001, for example), giving drops by $7.69.

Academic and Social Integration Variables

Five of these variables are significant. Number of student activities is the second strongest predictor of amount of giving with a standardized coefficient of .046. Its unstandardized coefficient, 34.582, means that for each increase in the number of student activities, giving increases by nearly $35.

Graduates of the Colleges of Communications, Education, and Science are less likely to give as much as graduates of the College of Business. Being a graduate of these colleges reduces the amount of giving by $23.28, $29.25, and $24.53, respectively. Results for the other colleges were not significant.

Grade-point average was significant, with an unstandardized coefficient of 19.112. Each increase of one point in GPA results in an increase in giving of $19.11.

Capacity to Give Variable

The single capacity to give variable, loan debt, was not significant.

The main variable of interest in the study, scholarship receipt, was not significant. Membership status, however, was the strongest predictor of amount of giving, with a standardized coefficient of .129. Being a member of the Alumni Association results in an increase of $115.31 in giving to Penn State.

OLS Regression – Research Question 3

The second ordinary least squares regression model, which answers Research Question 3, has only one difference from the first: the replacement of SCHOL (scholarship receipt) with SCHAMT (amount of scholarship dollars received). Table **4-14** shows the R^2 statistics for the model.

Table **4-14**: R^2 change – OLS Regression, Research Question 3

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.039(a)	.002	.001	359.36740	.002	2.648	10	17407	.003
2	.087(b)	.008	.006	358.42298	.006	7.561	14	17393	.000
3	.088(c)	.008	.006	358.39070	.000	4.133	1	17392	.042
4	.161 (d)	.026	.025	355.09750	.018	163.043	2	17390	.000

The change in R^2 for each of the four blocks is significant but small. The greatest change in R^2 is for the final block, which contains SCHAMT and MEMB.

The next table, Table **4-15**, shows the unstandardized and standardized regression coefficients for the full model. The results for blocks 1, 2, and 3 of the model are shown in Tables A-4, A-5, and A-6 of the Appendix.

Table **4-15**: OLS Regression, Research Question 3

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
4	(Constant)	17515.817	5930.367		2.954	.003		
	GEND	-8.138	5.889	-.011	-1.382	.167	.835	1.198
	INCOM	.017	.053	.003	.319	.749	.858	1.165
	YOB	-.735	1.428	-.004	-.514	.607	.770	1.299
	GRADYR	-8.030	3.238	-.021	-2.480	.013	.814	1.229
	AMIND	-33.297	355.237	-.001	-.094	.925	.999	1.001
	BLCK	-24.069	14.586	-.014	-1.650	.099	.818	1.223
	ASIAN	-17.479	12.179	-.011	-1.435	.151	.952	1.050
	HISP	-31.991	20.930	-.012	-1.529	.126	.961	1.041
	PR	-30.742	25.132	-.009	-1.223	.221	.967	1.034
	FOR	-22.004	55.573	-.003	-.396	.692	.998	1.002
	ACTIV	33.528	5.821	.044	5.760	.000	.949	1.053
	SPORT	-7.458	13.193	-.004	-.565	.572	.917	1.090
	A&A	-23.206	15.128	-.012	-1.534	.125	.855	1.169
	AGR	-6.579	13.305	-.004	-.494	.621	.812	1.231
	COM	-24.220	11.102	-.019	-2.182	.029	.746	1.340
	EDU	-27.600	12.060	-.020	-2.289	.022	.720	1.390
	EMS	-14.722	18.473	-.006	-.797	.426	.901	1.109
	ENG	-8.481	9.477	-.008	-.895	.371	.648	1.544
	HHD	-18.057	9.693	-.017	-1.863	.063	.651	1.535
	IST	7.824	34.209	.002	.229	.819	.960	1.042
	LIB	-16.406	9.121	-.017	-1.799	.072	.633	1.579
	SCI	-26.952	11.939	-.019	-2.257	.024	.786	1.273
	TIME	.346	.349	.008	.991	.322	.852	1.174
	GPA	12.089	6.625	.016	1.825	.068	.747	1.338
	DEBT	.000	.000	-.008	-.989	.323	.826	1.211
	SCHAMT	2.409	.379	.055	6.352	.000	.740	1.352
	MEMB	114.653	6.827	.128	16.794	.000	.964	1.037

a Dependent Variable: amount of giving

Demographic Variables

Interestingly, gender is not significant in this model. The only demographic variable that is significant is graduation year. For each increase in year of graduation (from 2000 to 2001, for example), the amount of giving drops by $8.03.

Academic and Social Integration Variables

Number of student activities continues to be a strong predictor. Each increase of the number of student activities in which alumni participated as students results in an increase in giving of $33.53. As with the previous model, graduates of the Colleges of Communications, Education, and Science are less likely to give than graduates of the College of Business. Being a graduate of these colleges reduces the amount of giving by $24.22, $27.60, and $26.95, respectively.

Capacity to Give Variable

Loan debt was not significant in the full model.

Motivation to Give Variables

In this model, both of the motivation to give variables were significant. Membership status, with a standardized coefficient of .128, remains the strongest

predictor of giving. Being a member of the Alumni Association results in an increase of $114 in alumni giving.

While the variable SCHAMT is significant, its effect on the dependent variable remains small, with an unstandardized coefficient of just 2.409. Because this variable is already expressed in thousands, an increase of $1,000 in the amount of scholarships received results in an increase of $2.40 in giving.

OLS Regression – Research Question 3b (Scholarship Recipients Only)

Because the variable SCHAMT includes all of those individuals who received $0 in scholarships, the researcher decided to run a final regression model containing only those individuals who received a scholarship. To do this, the same regression was run, this time with the variable SCHOL as the selection variable. Only those with a '1' for SCHOL (i.e. those who received a scholarship) were selected for the regression.

The table below, Table **4-16**, shows the change in R^2 for each block of the model.

Table **4-16**: R^2 change – OLS Regression, Research Question 3b

Model Summary

Model	R				Change Statistics				
	totalusch_01 = 1.00 (Selected)	R square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.047(a)	.002	.001	351.66805	.002	1.523	9	6268	.133
2	.113(b)	.013	.009	350.20702	.010	4.743	14	6254	.000
3	.114(c)	.013	.009	350.18012	.000	1.961	1	6253	.161
4	.218(d)	.048	.044	344.02218	.035	113.929	2	6251	.000

The table reveals a significant R^2 change for only block 2 and block 4 of the model (academic and social integration variables and motivation to give variables).

Table **4-17** shows the unstandardized and standardized regression coefficients and significance levels for the full model. The results for blocks 1, 2, and 3 of the model are shown in Tables A-7, A-8, and A-9 of the Appendix.

Table **4-17**: OLS Regression, Research Question 3b

Coefficients(a,b)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
4	(Constant)	9955.109	9601.755		1.037	.300		
	GEND	-2.850	9.415	-.004	-.303	.762	.854	1.171
	INCOM	-.008	.080	-.001	-.105	.916	.873	1.145
	YOB	.546	1.962	.004	.278	.781	.803	1.245
	GRADYR	-5.501	5.137	-.014	-1.071	.284	.849	1.177
	BLCK	-32.289	17.277	-.027	-1.869	.062	.722	1.385
	ASIAN	-22.647	20.563	-.014	-1.101	.271	.936	1.069
	HISP	-33.914	22.404	-.020	-1.514	.130	.916	1.092
	PR	-37.275	27.392	-.017	-1.361	.174	.927	1.079
	FOR	-27.016	86.346	-.004	-.313	.754	.995	1.005
	ACTIV	42.853	8.489	.064	5.048	.000	.941	1.062
	SPORT	-18.916	19.778	-.013	-.956	.339	.817	1.224
	A&A	-4.013	23.560	-.002	-.170	.865	.776	1.289
	AGR	21.601	19.599	.017	1.102	.270	.662	1.510
	COM	-24.803	19.292	-.019	-1.286	.199	.680	1.471
	EDU	-2.127	20.433	-.002	-.104	.917	.668	1.498
	EMS	-1.759	24.501	-.001	-.072	.943	.791	1.264
	ENG	8.162	15.777	.009	.517	.605	.517	1.935
	HHD	-2.995	18.315	-.003	-.164	.870	.641	1.561
	IST	-5.713	51.425	-.001	-.111	.912	.940	1.064
	LIB	-.404	16.018	.000	-.025	.980	.546	1.833
	SCI	-14.654	18.692	-.012	-.784	.433	.667	1.499
	TIME	.164	.594	.004	.276	.783	.859	1.164
	GPA	-5.103	12.132	-.006	-.421	.674	.697	1.435
	DEBT	-3.82E-005	.000	-.001	-.089	.929	.787	1.271
	SCHAMT	2.736	.414	.097	6.586	.000	.701	1.427
	MEMB	145.772	10.842	.170	13.445	.000	.949	1.054

a Dependent Variable: sumofnew_gift_amount
b Selecting only cases for which totalusch_01 = 1.00

It should be noted that the variable AMIND was eliminated from the model because there were no American Indian students who received a scholarship.

In this model, only three variables are significant: ACTIV, SCHAMT, and MEMB. ACTIV is an even stronger predictor in this model than the previous model: each

increase in the number of student activities results in an additional $42.85 in giving. Amount of scholarship dollars received is also significant, but still, an increase of $1000 in scholarship dollars results in a less than $3 increase in giving. Membership status is still the strongest predictor of amount of giving. Being a member of the Alumni Association results in increased giving of $145.77.

Summary

The following table, Table **4-18**, provides a summary of all of the variables that were included in the regression models.

Table **4-18**: Significance of Variables in the Regression Models

variable	Logistic 1	Logistic 2	OLS 1	OLS 2	OLS 3
GEND	+	+			
INCOM	+	+			
YOB					
GRADYR	-	-	-	-	
AMIND					
BLCK	-	-			
ASIAN	-	-			
HISP					
PR					
FOR					
ACTIV	+	+	+	+	+
SPORT					
A&A	-	-			
AGR	-	-			
COM			-	-	
EDU			-	-	
EMS	+	+			
ENG	+	+			
HHD	-	-			
IST					
LIB	-	-			
SCI			-	-	
TIME					
GPA	+	+	+		
DEBT					
SCHOL	+	n/a		n/a	n/a
SCHAMT	n/a	+	n/a	+	+
MEMB	+	+	+	+	+

The only two variables that were significant in all of the models were ACTIV (number of student activities) and MEMB (Alumni Association membership status). SCHAMT (amount of scholarship dollars received) was also significant in all of the models in which it was included.

Gender

Of the demographic variables, gender was significant in both of the logistic regression models, which tested giving status, but in none of the OLS regression models, which tested giving amount. While gender does play a role in the decision to give, it does not play a role in the amount of giving.

Income

Income was also significant in both of the logistic regression models but none of the OLS models, revealing that income impacts the decision to make a gift but not the amount of giving.

Graduation Year

Graduation year is a significant predictor and had a negative relationship with both giving status and amount of giving. Those who graduated more recently tend to give less, and to give in smaller amounts, than those who graduated in earlier years.

Race/Ethnicity

Of all of the racial and ethnic categories, only BLCK (African American) and ASIAN were significant, and these were significant only in the logistic regression

models. As with gender and income, African Americans and Asians are less likely to make a gift, but do not give in significantly different amounts than whites.

Number of Student Activities

ACTIV, number of student activities, was significant across all five of the models. Interestingly, SPORT (number of sports) was not significant for any of the models. As the number of activities in which a student participates increases, the likelihood of making a gift and the amount of that gift both increase.

Academic College

The models revealed interesting results for academic college. In the logistic regression models, graduates of the Colleges of Earth and Mineral Sciences and Engineering were more likely to make a gift than graduates of the College of Business, and graduates of the Colleges of Arts and Architecture, Agricultural Sciences, Health and Human Development, and the Liberal Arts were less likely to make a gift. However, none of these colleges achieved significance in the OLS models, but three of the four colleges that were not significant in the logistic regression models were significant in the OLS models. In the OLS models, graduates of the Colleges of Communications, Education, and Science gave in smaller amounts than graduates of the College of Business. Although not significant, the regression coefficients for all other colleges (except IST, which was

not significant in any of the models) were negative for the OLS models. None of the colleges was significant in the final OLS model containing scholarship recipients only.

Time to Degree

Time to degree was not significant in any of the models; the time it takes for students to graduate does not influence either the decision to make a gift or the amount of giving.

Grade-point Average

Grade-point average was significant in both of the logistic regression models but in only one of the OLS models. GPA, then, impacts both the decision to make a gift and the amount of giving. Alumni who had higher GPAs as students are more likely to make a gift than alumni with lower GPAs.

Loan Debt

Loan debt, the only capacity to give variable in the model, was not significant in any of the regression models.

Scholarship Receipt

Receipt of a scholarship was significant for the logistic regression model in which it was included, but not for the OLS model. Receipt of a scholarship does influence the decision to make a gift but does not appear to influence the amount of giving.

Amount of Scholarship Dollars Received

Amount of scholarship dollars received was significant for all of the models in which it was included. The amount of scholarship dollars received positively affects the decision to make a gift and the amount of giving.

Membership Status

Membership status was consistently the strongest predictor and was significant for all of the models. Members of the Penn State Alumni Association are significantly more likely to make a gift, and significantly more likely to give in higher amounts, than alumni who are not members of the Alumni Association.

Chapter 5

Summary, Discussion and Conclusions

This chapter offers a brief summary of the purpose and organization of the study, followed by a discussion of the results. Finally, this chapter will discuss the limitations of the study and the implications of the study for future research.

Summary of the Study

As public higher education institutions receive less state funding as a percentage of their overall budgets, and as they face pressure from various constituencies to minimize tuition increases, private support of higher education is playing a more central role in institutional vitality. Penn State, a public, land-grant institution, is no stranger to funding challenges. In 1984, tuition replaced state funding as Penn State's largest source of revenue. Penn State is now one of the nation's most expensive public universities, with undergraduate tuition at the University Park campus totaling $11,646 (for lower-division, in-state students) for the 2006-2007 academic year.

Like many other universities, both public and private, Penn State is struggling to find ways to help students fund their educations without graduating with unmanageable debt. While loans are an important part of most students' financial aid packages, the University tries to appeal to prospective students by offering scholarship support, both need-based and merit-based. The need to increase the amount of scholarship dollars

available to students underscores the importance of obtaining private support from the University's constituents, many of whom are alumni. Of equal importance, then, is the ability of the University's development staff to understand the many factors – economic, emotional, social, psychological, etc. – that comprise the decision to make a gift.

Many research studies have sought to understand why alumni do or do not make gifts to their alma maters. While this study includes many of the variables analyzed in previous studies, such as academic, social, and demographic variables, it sought to understand whether, in essence, scholarship receipt could be somewhat of a self-perpetuating function for the University. In other words, it sought to determine whether students who receive scholarships as undergraduates are more likely to make a gift to their alma mater as alumni.

To explore this idea, this study employed a model similar to Volkwein's (1989) Model of Alumni Gift-Giving Behavior. According to the model, four broad factors impact the decision to make a gift: demographic, academic and social integration, capacity to give, and motivation to give. Specifically, the model employed the following variables:

<u>Demographic Background:</u>
Gender
Family Income
Age
Year of Graduation
Race/Ethnicity

<u>Academic and Social Integration:</u>
# of Student Activities
# of Sports
College
Time to Degree
Grade-point Average

Capacity to Give:
Total Loan Debt at Graduation

Motivation to Give:
Scholarship Receipt/Amount of Scholarship Receipt
Current Alumni Association Membership

The study employed the following research questions in order to determine which factors impact alumni giving:

1. Are alumni of The Pennsylvania State University who received institutional scholarships as undergraduates more likely than non-aid recipients to be donors to the University?
2. Do alumni of The Pennsylvania State University who received institutional scholarships as undergraduates give to the University in significantly higher amounts than non-scholarship recipients?
3. Does the amount of institutional scholarships received impact the likelihood of making a gift and the amount of giving?

In addition, a subsidiary research question, 3b, was posed:

3b. For those students who received scholarships, does the amount of scholarships received impact the amount of giving?

The sample for this study consisted of 17,418 members of alumni who received a baccalaureate degree from Penn State's University Park campus between (and including) December 2000 and August 2003. Alumni data were obtained from the Division of Development and Alumni Relations and were merged with student data from the Office of Student Aid. Both logistic and ordinary least squares (OLS) regression were utilized in the data analysis.

Summary of the Results

First, the results of this study will be summarized for each research question. Next, the conceptual framework will be reviewed and the results summarized in terms of the components of the framework.

Research Question 1

The first research question is "Are alumni of The Pennsylvania State University who received institutional scholarships as undergraduates more likely than non-aid recipients to be donors to the University?"

This question can be answered affirmatively: scholarship recipients were, in fact, 2.5 percent more likely to make a gift than those who did not receive a scholarship. While significant, however, this variable was not one of the strongest predictors of giving. Alumni Association membership proved to be the strongest single predictor of giving; members were 31.2 percent more likely to be donors to the University than non-members.

Several demographic variables – gender, family income, graduation year, and two racial categories – were significant. Females were slightly (3.1 percent) more likely to make a gift than males. Graduates of earlier years were more likely to make a gift (2.3 percent per graduation year) than more recent graduates. African American and Asian students were 10.9 percent and 6.3 percent less likely, respectively, to make a gift than their white counterparts.

The number of student activities in which students participated was the strongest predictor of the academic and social integration variables, with each student activity increasing the likelihood of making a gift by 11.3 percent. Alumni of the Colleges of Arts and Architecture (5 percent), Agricultural Sciences (4.7 percent), Health and Human Development (4.7 percent), and the Liberal Arts (4.8 percent) were less likely to make a gift than alumni of the College of Business, and alumni of the College of Engineering (4.7 percent) and Earth and Mineral Sciences (9.8 percent) were more likely to make a gift than alumni of the College of Business.

Research Question 2

The second research question was, "Do alumni of The Pennsylvania State University who received scholarships as undergraduates give to the University in significantly higher amounts than non-aid recipients?"

The results of the data analysis indicate that scholarship recipients do not give in significantly higher amounts than those who did not receive a scholarship. As with the first research question, however, the other "motivation to give" variable, Alumni Association membership, was the strongest single predictor of giving. Being a member of the Alumni Association results in an increase of $115.31 in giving to Penn State.

Just one demographic variable – graduation year – was significant in the full regression model. The results indicated that as graduation year becomes more recent (from 2000 to 2001, for example), giving drops by $7.69.

Five of the "academic and social integration" variables were significant. As with the first research question, number of student activities was the strongest predictor among these variables, meaning that each additional student activity in which an alumnus/alumna participated as a student results in increased giving of nearly $35. Grade-point average was also significant – each increase of one point in GPA resulted in an increase in giving of $19.11. Finally, graduates of the Colleges of Communications, Education, and Science gave in smaller amounts ($23.28, $29.25, and $24.53, respectively) than graduates of the College of Business.

Research Question 3

The third research question was, "Does the amount of scholarships received impact the likelihood of making a gift and the amount of giving?"

The results of the logistic regression analysis indicate that an increase in the amount of scholarship dollars received does increase the likelihood of making a gift; however, the delta-P statistic yielded just a .1 percent increase in the likelihood of giving. Similar to the previous research questions, however, the other "motivation to give" variable, Alumni Association membership, was a very strong predictor of giving. Alumni Association members were 31.1 percent more likely to make a gift than non-members. Similar to the results of the first research question, women were more (3.1 percent) likely than men to make a gift. Recent graduates were less likely (2.3 percent per graduation year) to make a gift, and African American and Asian alumni were less (11.5 percent and 6.2 percent) likely to make a gift than white alumni.

Number of student activities was once again a strong predictor of giving: each additional student activity resulted in an 11.3 percent increase in the likelihood of giving. Similar to the results of the first research question, alumni of the Colleges of Arts & Architecture, Agricultural Sciences, Health and Human Development, and the Liberal Arts were less likely (4.8 percent, 4.1 percent, 4.7 percent, and 4.7 percent, respectively) to make a gift than alumni of the College of Business. However, alumni of the Colleges of Earth and Mineral Sciences and Engineering were more likely than alumni of the College of Business (10.2 percent and 4.9 percent, respectively) to make a gift.

The results of the OLS regression analysis indicate that scholarship receipt does impact the amount of giving, but minimally: an increase of $1000 in scholarships results in an increase of just $2.40 in giving. The other motivation to give variable, membership status, was the strongest predictor of amount of giving in the model.

Among the demographic variables in this model, graduation year was significant; graduates of earlier graduation years gave in higher amounts than graduates of later years. Of the academic and social integration variables, number of student activities was a strong predictor of amount of giving, and graduates of the Colleges of Communications, Education, and Science gave in smaller amounts than graduates of the College of Business ($24.22, $27.60, and $26.95, respectively). The single capacity to give variable, loan debt, was not significant in the model.

Research Question 3b

The final research question, 3b, asked, "For those who received scholarships, does the amount of scholarships received impact the amount of giving?"

Indeed, the amount of scholarship dollars received does positively impact the amount of giving, but the actual impact in terms of dollars is quite low. An increase of $1000 in the amount of scholarships received results in an increase of just $2 in giving. The other "motivation to give" variable, Alumni Association membership, was once again a strong predictor of the amount of giving: being a member of the Alumni Association results in an increase of $114 in giving.

The single demographic variable that was significant in the model was graduation year. Each increase in the year of graduation (from 2000 to 2001, for example) lowers the amount of giving by $8.03, meaning that more recent graduates give in smaller amounts than less recent graduates.

Number of student activities was the strongest predictor among the "academic and social integration" variables. Each additional student activity results in an increase in the dollar amount of giving of $33.53. As with research question 2, graduates of the Colleges of Communications, Education, and Science give in smaller amounts than graduates of the College of Business ($24.22, $27.60, and $26.95, respectively).

Conceptual Model of Alumni Gift-Giving Behavior

The results of the data analysis will now be explored in terms of the conceptual model of alumni gift-giving behavior. The model, which was presented in chapter 3,

posits that four overarching factors impact alumni gift-giving behavior: demographic background, academic and social integration, capacity to give, and motivation to give. These factors interact with each other. For example, demographic background impacts academic and social integration, capacity to give and motivation to give. Academic and social integration impacts both capacity to give and motivation to give. Capacity to give impacts motivation to give and both capacity to give and motivation to give impact the outcome of interest in this study – alumni gift-giving behavior.

It should be noted that this model is not a structural model and the results of the analysis do not indicate the ways in which these four main factors interact with each other. The model should simply be viewed as a hypothesis regarding the nature of alumni giving behavior.

Demographic Background

Demographic background remains an important construct within the overall model. Women and students with higher family incomes were more likely to make a gift but these variables did not influence the amount of giving. Those from earlier graduation years were more likely to make a gift and to make a gift in higher amounts, as year of graduation was significant in all but one of the five regression models. African American and Asian students were less likely to make a gift but race/ethnicity did not influence the amount of giving. Four of the race/ethnicity variables – American Indian, Hispanic, Puerto Rican, and Foreign – were not significant in any of the models. Age was not significant in any of the five regression models.

Overall, several key aspects of one's demographic background do influence subsequent giving, making it an important component of the model.

Academic and Social Integration

The academic and social integration construct is comprised of several measures of students' experiences while enrolled as undergraduates and thus comprise an important part of the model. Of these variables, the number of student activities in which students participated was an important predictor of both the fact of giving and the amount of giving and was significant in all five regression models. As the number of student activities in which a student participated increases, so does the likelihood of making a gift and the amount of giving. The number of sports in which students participated, however, was not significant in any of the models.

Grade-point average was a predictor of both giving and the amount of giving. Students with higher GPAs were more likely to make a gift and tended to give in higher amounts. The time to degree variable was not significant in any of the models; the amount of time a student spent as an undergraduate prior to receiving his degree did not impact the decision to make a gift or the amount of the give. Academic college was a predictor of both giving and the amount of giving.

Overall, various aspects of the student experience – social experiences such as student organization membership and academic experiences such as college of attendance and grade-point average – do contribute to the model and strengthen the overall understanding of gift-giving behavior among alumni.

Capacity to Give

This study utilized a single "capacity to give" variable – the amount of loan debt with which a student graduated. This variable did not achieve significance in any of the regression models; however, it would be a mistake to assume that capacity to give is not an important factor in determining alumni giving. The limited ability of this study to measure capacity to give will be discussed in greater depth in the "Limitations" section below.

Motivation to Give

The central purpose of this study was to determine whether students who received scholarships were more likely to make a gift, and to give in higher amounts, than students who did not receive scholarships. Scholarship receipt was one of two variables comprising the "motivation to give" construct. Each of the five regression models utilized either scholarship receipt or scholarship amount. Scholarship recipients were more likely than non-recipients to make a gift, but were not more likely to give in higher amounts. The amount of scholarships received impacts both giving and the amount of giving – the higher the dollar amount of scholarships received, the greater likelihood of both making a gift and giving in higher amounts.

The second variable within the "motivation to give" construct proved to be the strongest predictor of alumni gift-giving behavior. Alumni Association members were more likely to make a gift and to give in higher amounts than non-members. It should be noted that this relationship potentially could work in both directions – in other words,

Alumni Association membership may make an individual more likely to make a gift, and making a gift may make an individual more likely to join the Alumni Association. Alumni Association members receive more information about the university by virtue of their membership that may, in turn, create in them a desire to make a gift, either to support the university in general or a particular program about which they have heard. On the other hand, making a gift may make an individual want to become more involved with the university or receive further information about the university, resulting in the purchase of an Alumni Association membership.

Revisiting the Hypothesis

Figure **3-4** in Chapter 3 depicted the hypothesis for the relationship between receipt of scholarships and giving. According to the figure, receipt of scholarships would impact giving through two mechanisms: 1) lower cost of attendance and, subsequently, lower loan debt, and 2) "feeling good" about the institution. First, it appears that receipt of a scholarship does not lower the cost of attendance and subsequent loan debt – scholarship recipients had a mean loan debt of $14,542.75 compared to $14,625.28 for non-scholarship recipients. The second part of the hypothesis could not be tested because it pertains to emotional or attitudinal variables not available for study. Nonetheless, it is unlikely that the relationship between scholarship receipt and giving is as direct or clear-cut as hypothesized. It is possible, for example, that scholarship receipt influences a student's academic and social integration. Perhaps receipt of a scholarship means that a student can join a student organization rather than working, or perhaps he feels more

supported by the university than his peers who did not receive scholarships. Perhaps there is something about scholarship recipients that was not measured in this study that makes them more likely to be donors as alumni. Because students have to apply for many of the available scholarships, perhaps students who take the initiative to apply for a scholarship have something in common – an attitude, belief, or circumstance, for example – that cannot be directly measured.

As mentioned above, it is likely that rather than directly influencing giving, receipt of a scholarship creates attitudes or feelings that may result in giving. These may be attitudes about the university ("I'm glad I went to Penn State because they helped support my education") or attitudes about giving back ("I give to Penn State because I want to give back what was given to me"). Teasing apart these attitudes, motivations, and feelings is a complex task, and determining how or whether those attitudes, motivations, and feelings arose from having received a scholarship would be quite difficult. However, if it is true that receiving a scholarship results in particular attitudes, motivations, or feelings, it is possible that similar feelings could arise under different conditions (i.e. conditions other than receiving a scholarship). Perhaps assigning a student a faculty mentor would result in similar positive feelings about the university and a desire to "give back." In other words, it is possible that the emotional/attitudinal outcomes that result from the receipt of a scholarship can be created under other experiential conditions while the student is enrolled at the university.

The hypothesis, then, is still in question. Future research will need to determine the complex ways in which scholarship receipt interacts with other variables or creates certain conditions under which giving to one's alma mater arises.

Comparisons to Previous Research

This section compares the results of the analysis for each variable with research findings for similar variables in other studies in order to determine how the results of this study differ, or are similar to, other studies that explore alumni giving.

Gender

In this study, females were more likely to make a gift than males, but gender was not a determinant of the amount of giving. This finding is contrary to previous studies pertaining to alumni giving, most of which found either no relationship between gender and giving or found that males were more likely to give than females. As noted in the literature review, however, linking gender to giving has historically been challenging because (1) it is possible that gender and income are correlated, (2) in many cases, if a married couple made a gift, the donation was recorded in the man's name only. It may also be the case that because this study focuses on recent graduates, there may be less time for salary disparities between men and women to develop and subsequently impact giving.

In addition, it is possible that there is something about women's student experience that makes them more likely to make a gift as alumni. Perhaps they created stronger and more lasting attachments with peers or faculty members, or perhaps they were more likely to be highly involved in a student organization. Perhaps they felt particularly supported by the university, either as a result of particular services for

women students offered by the university or by programs addressing women's issues or concerns.

Income

Family income was a significant predictor in both of the logistic regression models but none of the OLS models, revealing that income impacts the decision to make a gift but not the amount of giving. Previous studies that included income as a variable examined income after graduation rather than before matriculation, so this finding cannot be compared with others. The fact that family income is linked to giving but not the amount of giving may mean that income does not depress the amount of giving but that alumni with lower family incomes have different attitudes about the university or had particular collegiate experiences that impacted their decision to make a gift.

Year of Birth

Year of birth was not significant in any of the regression models in the study. Most studies that included age as a predictor variable found that older alumni were more likely to be donors than younger alumni, and one study also found that older alumni had a greater probability of being "high" donors (Selig, 1999). Just two studies (Beeler, 1982; Enyard, 1993) found that younger alumni were more likely to be donors.

Graduation Year

Graduation year is a significant predictor and had a negative relationship with both giving status and amount of giving. Those who graduated more recently tend to give less, and to give in smaller amounts, than those who graduated in earlier years. The majority of previous studies pertaining to alumni giving found similar results for this variable.

Race/Ethnicity

Of all of the racial and ethnic categories, only BLCK (African American) and ASIAN were significant, and these were significant only in the logistic regression models. As with gender and income, African Americans and Asians are less likely to make a gift, but do not give in significantly different amounts than whites. Only three previous studies reviewed included race and/or ethnicity as a predictor variable; two of these concluded that it was not a significant predictor of giving, while one found that white alumni were more likely to be donors. To determine whether African American and Asian students were less likely to make a gift because they are less engaged as students, a crosstabulation was run for race and number of student activities. The results showed that 84.7 percent of white students were not members of any organization as compared to 83.9 percent of African American students and 87.2 percent of Asian students. While Asian students may be less engaged as measured by student organization membership, this was clearly not the case for African American students. Of course, the student activity variable has limited usefulness in interpreting student engagement, as discussed in the

Limitations section. However, it is possible that other factors are at play. In the spring of 2001, racial tensions flared on campus as protestors, led by members of Black Caucus, a student organization, pressed administrators for improved diversity initiatives. This may have adversely impacted these students' experience and sense of integration on campus, potentially negatively influencing their attitudes or opinions about the university as alumni.

Number of Student Activities

ACTIV, number of student activities, was significant across all five of the models. As the number of activities in which a student participates increases, the likelihood of making a gift and the amount of that gift both increase. Interestingly, SPORT (number of sports) was not significant for any of the models. The former finding is similar to the findings of previous research on alumni giving, the majority of which found that student organization participants were more likely to be donors. However, the latter finding pertaining to sport participation is contrary to a number of studies that found that members of athletic teams were more likely to be donors than students who were not members of those teams.

Academic College

The models revealed interesting results for academic college. In the logistic regression models pertaining to the act of giving, graduates of the Colleges of Earth and

Mineral Sciences and Engineering were more likely to make a gift than graduates of the College of Business, and graduates of the Colleges of Arts and Architecture, Agricultural Sciences, Health and Human Development, and the Liberal Arts were less likely to make a gift.

In the OLS regression models pertaining to the amount of giving, none of these colleges achieved significance, but graduates of the Colleges of Communications, Education, and Science gave in smaller amounts than graduates of the College of Business. None of the colleges was significant in the final OLS model containing scholarship recipients only.

These findings are difficult to compare with the findings of previous studies because of the numerous ways in which students' academic programs were operationalized and the many different ways in which academic units at colleges and universities are organized. Furthermore, findings of previous studies were widely varied, and some found no relationship between academic unit and giving.

Time to Degree

Time to degree (TIME) was not significant in any of the models; the time it takes for students to graduate did not influence either the decision to make a gift or the amount of giving. Previous research in this area yielded mixed results, but the majority of the relevant research found that the time it takes students to graduate is not a significant predictor of giving.

Grade-point Average

Grade-point average (GPA) was significant in both of the logistic regression models but in only one of the OLS models. GPA, then, is a factor in both the decision to make a gift and the amount of giving. Alumni who had higher GPAs as students are more likely to make a gift than alumni with lower GPAs. Interestingly, just one previous study found GPA to be a significant predictor of giving, although most studies on alumni giving to date do not include GPA as a variable.

Loan Debt

Loan debt (DEBT), the only capacity to give variable in the model, was not significant in any of the regression models. Several studies utilized receipt of a loan as a predictor variable, and all of these found a negative relationship between loan receipt and giving. Dugan, Mullin, and Siegfried (2000) found that receipt of a need-based loan lowered the probability of giving. Clotfelter (2003), similarly, found that alumni who received need-based financial aid as undergraduates gave less than alumni who had not received need-based aid, but it was unclear how much of that aid was composed of loans. Dietz (1985) found that loan recipients gave less frequently than those who received no aid, a scholarship, or G.I. Bill funding as students. Two studies that included loan amount received (Koole, 1981; Korvas, 1984) failed to detect a relationship between that variable and giving.

Scholarship Receipt

Receipt of a scholarship (SCHOL) was significant for the logistic regression model in which it was included, but not for the OLS model. Receipt of a scholarship does influence the decision to make a gift but does not appear to influence the amount of giving. A number of previous studies found a positive relationship between receipt of a scholarship and giving (Dugan et al., 2000; Enyard, 1993; Hanson, 2000; Hoyt, 2004). Just one study (Oglesby, 1991) examined the relationship between scholarship receipt and amount of giving, finding a negative relationship. A number of studies failed to detect a relationship between receipt of a scholarship and alumni giving.

Amount of Scholarship Dollars Received

Amount of scholarship dollars received (SCHAMT) was significant for all of the models in which it was included. The amount of scholarship dollars received positively affects the decision to make a gift and the amount of giving. Just one study (Hoyt, 2004) analyzed considered amount of scholarship dollars received as a predictor of giving, finding that those who received a scholarship of $1000 or more were more likely to be donors.

Membership Status

Membership status (MEMB) was consistently the strongest predictor and was significant for all of the models. Members of the Penn State Alumni Association are

significantly more likely to make a gift, and significantly more likely to give in higher amounts, than alumni who are not members of the Alumni Association. While a number of studies found various measures of alumni involvement to be predictors of giving, just two of the studies reviewed included Alumni Association membership as a predictor of giving, and in both studies it was a significant predictor (Hunter et al., 1999; Klostermann, 1995).

Limitations of the Study

A number of factors introduced limitation to this study. These include limitations pertaining to data availability and limitations pertaining to the subject matter itself. First, data on student receipt of grants was unavailable for study. These grants include federal grants such as the Pell grant and the Supplemental Educational Opportunity Grant (SEOG); state grants such as Pennsylvania Higher Education Assistance Agency (PHEAA) grants; and institutional grants such as the Penn State Tuition Assistance Grant, a university-funded grant to students with high financial need who are working on their first bachelor's degree. Grants are an important component of the overall student aid picture and could potentially influence the Conceptual Model of Alumni Gift-Giving at several points. First, they could play a role in students' academic and social integration while enrolled at the university, possibly promoting retention of students who without grants might not have been able to attend college or preventing students from dropping out or stopping out. Second, they could play a role in future capacity to give if receipt of grants reduces overall loan debt. Third, they could influence motivation to give,

particularly in the case of institutional grants. For the same reason that scholarship receipt was included as a "motivation to give" variable, grant receipt could positively influence students' attitudes about the university and their desire to "give back" to the university.

Second, data on receipt of scholarships received from non-university sources was not available. Again, private scholarships provide another "piece of the puzzle" in terms of overall financial aid receipt and its impact on academic and social integration, capacity to give, and motivation to give.

Third, this study analyzed data from relatively recent graduates only. This was out of necessity since student data prior to 1995 was not available. However, young alumni generally have less capacity to give, and they also have less time to establish a record or pattern of giving over time. In addition, they are more likely than alumni who graduated less recently to be attending graduate or professional school – a factor that could influence capacity to give. For this reason, having data for alumni from a wide variety of graduation years is desirable. This would allow the researcher to determine which factors are important in determining giving among alumni of particular ages, graduation years, or other populations and how these factors differ or change for different alumni populations.

Fourth, this study relied upon quantitative, previously-existing data rather than survey analysis. A survey could potentially have revealed more information about the alumni in the sample in terms of the constructs in the Conceptual Model of Alumni Gift-Giving Behavior. For example, it could have revealed demographic data pertaining to where those in the sample grew up and whether their parents went to college. It could have revealed more in-depth information about students' academic and social integration,

such as frequency of contact with faculty, depth of involvement in student organizations, and attitudes about the overall student experience.

Survey data could potentially have been most valuable, however, in obtaining more information pertaining to capacity to give and motivation to give. Information on alumni occupation and income, which have been shown to be strong predictors of giving in previous research, were unavailable for this study, but could be gleaned from survey research. The number of children an alumnus/alumna has can also influence capacity to give and could have been determined via a survey. As mentioned above, attendance at graduate or professional school could adversely impact giving, and this information could also have been determined via a survey. Motivation to give is perhaps the most elusive of the four constructs in the model, but a survey could have attempted to learn more about alumni attitudes, beliefs, attachments, etc. Making a gift has an inherently emotional/attitudinal component – a component that cannot be understood from the data available in a database.

Fifth, this study did not analyze the types of student activities in which students participated. This would have provided a more in-depth understanding of student involvement as a component of academic and social integration. In addition, the data on sport participation did not distinguished between intramural and intercollegiate sports participation, although these are two fundamentally different types of participation that can result in two dramatically different types of integration as a student. Intercollegiate athletics participation can often be more demanding than intramural participation in terms of practice time, travel requirements, and duration of the season. In addition, many intercollegiate athletes were recruited to play and/or receive full or partial scholarships

for their participation. For these reasons, it might be logical to classify intramural sports participation within the overall category of student activity participation and to isolate intercollegiate sports participation in future analyses.

Additionally, data were available for only a fraction of the nearly 700 registered student organizations. The lack of such data results in an incomplete portrait of the student experience. It is possible that data regarding membership in all student organizations would result in a weaker relationship between student organization membership and giving; this is because the organizations represented in the database from which the data were gathered tend to be "involvement-intensive" organizations such as fraternities and sororities or university-wide organizations created at least partially around feelings of school pride or spirit. Smaller organizations or organizations with a more narrow purpose are not included in the database. Perhaps the finding that student organization membership was a strong predictor of giving holds only for the particular types of organizations included in the study. Future research could attempt to determine whether this is true and if so, what it is about these particular organizations that may influence their members' gift-giving decisions as alumni.

Sixth, information about the source and amount of individual scholarships was not available from the Office of Student Aid for this study. This information would have been helpful in determining whether the type of scholarship impacts the decision to make a gift, the amount of the gift, or where the gift was directed.

Seventh, as explained in chapter 3, this study analyzed scholarship receipt in its entirety rather than scholarship receipt by year, and was thus unable to distinguish between solitary and cumulative effects of scholarship receipt. For example, future

research might be able to determine whether receiving a scholarship earlier or later during one's college career might impact the likelihood of giving or the amount of giving.

Finally, this study did not analyze where gifts were directed; in other words, whether students who received a scholarship were more likely to direct a gift to a particular unit. It would also have determined whether students from a particular academic college are more likely to give to their college or whether student activity participation influences the type of giving, for example. This could potentially have broadened the understanding of the motivation to give construct in the Conceptual Model of Alumni Gift-Giving Behavior.

Directions for Future Research

The findings of this study, combined with the limitations noted above, suggest a number of possible directions of further research pertaining to alumni giving.

Refinement of the Financial Aid Picture

Previous studies have included various aspects of financial aid receipt as predictors of alumni giving, although few have examined all types of financial aid, and none were found that examined the amount of each type of aid received as predictors of giving. It is recommended that future research be directed at developing a comprehensive portrait of aid receipt among various alumni populations. This could include analysis of

the type and amount of each scholarship received; whether each scholarship was merit-based, need-based, or both; and the amount of other types of aid, including grants and loans and the source of each.

Additional study could utilize qualitative methods to attempt to identify and understand the attitudes of alumni regarding the aid they received. This could potentially strengthen the "motivation to give" construct by uncovering the extent to which aid receipt (and, in particular, institutional aid receipt) is a motivational factor in decision-making pertaining to giving.

All of these measures have potential for enhancing the usefulness of various types of financial aid, particularly scholarships, as predictors of subsequent giving.

If colleges and universities could, in fact, develop predictive models of alumni giving based on scholarship receipt, should universities give more scholarships in the hope of increasing the donor base of their alumni? Certainly, providing more scholarships for students is a worthy goal, and one that most universities are presumably already undertaking. And certainly it is worth exploring whether universities can influence subsequent giving among scholarship recipients by, for example, providing them with information about the donors or organizations that made their scholarships possible and by instituting programs or activities that create or enhance a culture of "giving back" among future alumni. However, decisions about the types of scholarships that are created (e.g. merit-based vs. need-based) should continue to be based on policies that address the institutions goals regarding access and affordability. If, for example, future research were to determine that recipients of merit-based scholarships were more likely to make a gift to the university than recipients of need-based scholarships, but the university was

committed to creating additional need-based scholarships to attract low-income students, this commitment should clearly not be trumped in the hope of increasing gift receipts. Instead, further research could attempt to identify the factors in play with regard to the relationship between merit-based scholarships and giving in an attempt to create similar conditions for need-based scholarship recipients that might increase the rate and amount of giving.

Refinement of the Giving Picture

It is also recommended that future research focus on giving not simply from the standpoint of donation status or amount but from a standpoint that establishes a portrait of giving for each giver. Collecting data on where donors direct their gifts – whether to a university's general fund, to an academic college, to athletics, or to another unit altogether – can help to determine whether the direction of gifts can be predicted by traits, factors, or characteristics specific to the giver.

Of course, the challenge for development professionals at higher education institutions is to better understand how individual factors influence the act of giving, the amount of giving, and the type of giving. This requires the development of a predictive model of gift-giving behavior such as the one that formed the conceptual backbone of this study.

Refinement of the Conceptual Model of Alumni Gift-Giving Behavior

The conceptual model for this study, which was based upon Volkwein's (1989) model, was intended to aid in the identification of variables, the organization of variables into constructs, and the interaction of these constructs to predict giving. However, the results of the data analysis showed that the regression models predict only a portion of giving behavior. Future research, therefore, could be aimed in several possible directions (1) adding variables to, or deleting variables from, the model, or (2) refining the constructs within the model, or (3) attempting to develop a structural model from the conceptual model.

First, adding or deleting variables may improve the model's usefulness, as the model does not contain all of the possible predictors of alumni gift-giving, and it may contain variables that are not useful in predicting giving. For example, Volkwein's model contained a "giving frequency" variable that was not included in the model for this study. Second, it may be that the constructs that comprise the model could be refined, additional constructs added, or the position of the constructs in the model altered to better reflect the factors that determine giving and the way those factors interact. Finally, it may be that the model could be reconfigured into a structural model. This would allow researchers to determine statistically the extent to which each construct contributes to the overall model and whether the direction of the interactions among the constructs are accurate.

Generalizability to Other Institutions

Particularly because this was a single-institution study, future research should seek to build upon the results of this study by examining alumni giving at other institutions. This research could take two directions. First, it could test the generalizability of this study to other, similar institutions by conducting similar studies at other large, public, research-intensive institutions and/or land-grant institutions. Second, it could test whether the study is generalizable to other institutions of varying size, mission, location, and other factors. It is possible, for example, that the overall portrait of giving to private institutions is fundamentally different from that of public institutions because private institutions are historically dependent upon private gifts whereas public institutions are historically dependent upon state appropriations. It is also possible, for example, that a study of alumni giving on campuses with different student demographics, such as high populations of nontraditional, commuter, or underrepresented groups; or on campuses with different cultures or missions, such as religious colleges; would yield varying results.

Conclusion

This study was an attempt to refine and enhance existing knowledge of alumni giving and, in particular, the extent to which receipt of an institutional scholarship as a student impacts later gift-giving behavior as an alumnus/alumna. The results of the study demonstrate that scholarship receipt does have a statistically significant, but limited, impact on giving behavior. It also confirmed the results of previous research that found

that a variety of factors – demographic, collegiate, and post-collegiate – play a role in determining giving.

The results also shed light on the difficulty of understanding and predicting giving. There is no simple formula that can predict whether an alumnus will make a gift, when he will make a gift, how much he will give, or why he gave. Research in this area must continue to examine the multiplicity of factors that play a role in giving and how these factors interact with each other in order to continually improve knowledge in this area. The next steps are for development professionals to translate this knowledge into practical ways to predict giving, to cultivate and steward alumni as donors, and to cultivate future donors. These functions will be increasingly critical as public universities face increasing financial struggles related to decreases in state appropriations and escalating tuition.

Increases in tuition make it even more critical that public universities offer financial support to students, including scholarship support. Scholarship support must be solicited from donors, many of whom received scholarships when they were students. Although the results of this study show that scholarship receipt has a minimal impact on subsequent giving, the fact that it is a statistically significant predictor makes it a promising area of both research and practice. Can researchers develop methods for determining if some scholarship recipients are more likely to make a gift, and why? Can universities inculcate in students the need to "give back" to their alma mater after graduation? Can development professionals develop ways of cultivating scholarship recipients as potential givers, or of utilizing predictive models of giving behavior?

These are some of the challenges ahead.

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Appendix

OLS Regression

Table **A-1** shows the results for block 1 of the OLS regression for Research Question 2.

Table **A-1**: OLS Regression – Research Question 2, Block 1

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	15582.396	5936.193		2.625	.009		
	GEND	-12.458	5.492	-.017	-2.268	.023	.983	1.017
	INCOM	.121	.051	.018	2.359	.018	.946	1.057
	YOB	.893	1.416	.005	.631	.528	.803	1.246
	GRADYR	-8.640	3.228	-.022	-2.677	.007	.838	1.193
	AMIND	-44.085	359.410	-.001	-.123	.902	1.000	1.000
	BLCK	-7.419	13.488	-.004	-.550	.582	.979	1.021
	ASIAN	-28.355	12.096	-.018	-2.344	.019	.989	1.011
	HISP	-18.444	20.793	-.007	-.887	.375	.997	1.003
	PR	-19.709	25.058	-.006	-.787	.432	.996	1.004
	FOR	-21.212	56.208	-.003	-.377	.706	.999	1.001

a Dependent Variable: amount of giving

The next table, Table **A-2**, shows the results for block 2 of the regression for Research Question 2.

Table **A-2**: OLS Regression – Research Question 2, Block 2

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
2	(Constant)	17400.467	5979.431		2.910	.004		
	GEND	-7.808	5.943	-.011	-1.314	.189	.835	1.197
	INCOM	.047	.052	.007	.912	.362	.917	1.090
	YOB	-.150	1.422	-.001	-.105	.916	.791	1.264
	GRADYR	-8.571	3.247	-.022	-2.640	.008	.824	1.213
	AMIND	-72.782	358.552	-.002	-.203	.839	.999	1.001
	BLCK	-1.673	13.624	-.001	-.123	.902	.955	1.048
	ASIAN	-30.267	12.245	-.019	-2.472	.013	.960	1.042
	HISP	-18.498	20.791	-.007	-.890	.374	.992	1.008
	PR	-16.172	25.048	-.005	-.646	.519	.992	1.008
	FOR	-24.314	56.088	-.003	-.433	.665	.998	1.002
	ACTIV	44.167	5.845	.058	7.556	.000	.959	1.043
	SPORT	15.335	12.877	.009	1.191	.234	.981	1.020
	A&A	-32.727	15.248	-.018	-2.146	.032	.858	1.166
	AGR	-4.525	13.392	-.003	-.338	.735	.817	1.224
	COM	-32.121	11.191	-.025	-2.870	.004	.748	1.336
	EDU	-36.168	12.150	-.026	-2.977	.003	.722	1.384
	EMS	1.067	18.568	.000	.057	.954	.909	1.100
	ENG	.806	9.544	.001	.084	.933	.650	1.537
	HHD	-24.019	9.774	-.023	-2.457	.014	.653	1.532
	IST	18.956	34.524	.004	.549	.583	.960	1.042
	LIB	-21.881	9.198	-.023	-2.379	.017	.634	1.577
	SCI	-25.618	12.039	-.018	-2.128	.033	.787	1.270
	TIME	.560	.351	.013	1.596	.111	.858	1.165
	GPA	28.312	6.437	.037	4.398	.000	.807	1.240

Finally, Table **A-3** shows the results for block 3 of the OLS regression for Research Question 3.

Table **A-3**: OLS Regression – Research Question 2, Block 3

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
3	(Constant)	16851.550	5984.986		2.816	.005		
	GEND	-7.550	5.943	-.010	-1.270	.204	.835	1.198
	INCOM	.020	.053	.003	.382	.703	.861	1.161
	YOB	-.621	1.441	-.004	-.431	.666	.771	1.298
	GRADYR	-7.823	3.267	-.020	-2.394	.017	.814	1.229
	AMIND	-75.396	358.522	-.002	-.210	.833	.999	1.001
	BLCK	.230	13.655	.000	.017	.987	.950	1.052
	ASIAN	-31.157	12.252	-.020	-2.543	.011	.958	1.043
	HISP	-18.186	20.790	-.007	-.875	.382	.992	1.008
	PR	-14.353	25.061	-.004	-.573	.567	.990	1.010
	FOR	-25.676	56.087	-.003	-.458	.647	.998	1.002
	ACTIV	43.868	5.847	.058	7.503	.000	.959	1.043
	SPORT	14.678	12.879	.009	1.140	.254	.980	1.020
	A&A	-32.028	15.250	-.017	-2.100	.036	.857	1.166
	AGR	-5.389	13.397	-.003	-.402	.688	.816	1.225
	COM	-31.971	11.190	-.025	-2.857	.004	.748	1.336
	EDU	-34.942	12.164	-.026	-2.873	.004	.721	1.388
	EMS	1.823	18.570	.001	.098	.922	.909	1.100
	ENG	.834	9.543	.001	.087	.930	.650	1.537
	HHD	-23.455	9.777	-.022	-2.399	.016	.652	1.533
	IST	19.006	34.521	.004	.551	.582	.960	1.042
	LIB	-21.551	9.199	-.022	-2.343	.019	.634	1.577
	SCI	-25.981	12.040	-.018	-2.158	.031	.787	1.271
	TIME	.584	.351	.014	1.663	.096	.857	1.166
	GPA	26.243	6.517	.034	4.027	.000	.787	1.271
	DEBT	-.001	.000	-.017	-2.033	.042	.839	1.192

a Dependent Variable: amount of giving

The next table, Table **A-4**, shows the OLS regression results for block 1 of the model, which tested Research Question 3.

Table **A-4**: OLS Regression – Research Question 3, Block 1

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	15582.396	5936.193		2.625	.009		
	GEND	-12.458	5.492	-.017	-2.268	.023	.983	1.017
	INCOM	.121	.051	.018	2.359	.018	.946	1.057
	YOB	.893	1.416	.005	.631	.528	.803	1.246
	GRADYR	-8.640	3.228	-.022	-2.677	.007	.838	1.193
	AMIND	-44.085	359.410	-.001	-.123	.902	1.000	1.000
	BLCK	-7.419	13.488	-.004	-.550	.582	.979	1.021
	ASIAN	-28.355	12.096	-.018	-2.344	.019	.989	1.011
	HISP	-18.444	20.793	-.007	-.887	.375	.997	1.003
	PR	-19.709	25.058	-.006	-.787	.432	.996	1.004
	FOR	-21.212	56.208	-.003	-.377	.706	.999	1.001

a Dependent Variable: amount of giving

Table **A-5** shows the results for block 2 of the model.

Table **A-5**: OLS Regression – Research Question 3, Block 2

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
2	(Constant)	17400.467	5979.431		2.910	.004		
	GEND	-7.808	5.943	-.011	-1.314	.189	.835	1.197
	INCOM	.047	.052	.007	.912	.362	.917	1.090
	YOB	-.150	1.422	-.001	-.105	.916	.791	1.264
	GRADYR	-8.571	3.247	-.022	-2.640	.008	.824	1.213
	AMIND	-72.782	358.552	-.002	-.203	.839	.999	1.001
	BLCK	-1.673	13.624	-.001	-.123	.902	.955	1.048
	ASIAN	-30.267	12.245	-.019	-2.472	.013	.960	1.042
	HISP	-18.498	20.791	-.007	-.890	.374	.992	1.008
	PR	-16.172	25.048	-.005	-.646	.519	.992	1.008
	FOR	-24.314	56.088	-.003	-.433	.665	.998	1.002
	ACTIV	44.167	5.845	.058	7.556	.000	.959	1.043
	SPORT	15.335	12.877	.009	1.191	.234	.981	1.020
	A&A	-32.727	15.248	-.018	-2.146	.032	.858	1.166
	AGR	-4.525	13.392	-.003	-.338	.735	.817	1.224
	COM	-32.121	11.191	-.025	-2.870	.004	.748	1.336
	EDU	-36.168	12.150	-.026	-2.977	.003	.722	1.384
	EMS	1.067	18.568	.000	.057	.954	.909	1.100
	ENG	.806	9.544	.001	.084	.933	.650	1.537
	HHD	-24.019	9.774	-.023	-2.457	.014	.653	1.532
	IST	18.956	34.524	.004	.549	.583	.960	1.042
	LIB	-21.881	9.198	-.023	-2.379	.017	.634	1.577
	SCI	-25.618	12.039	-.018	-2.128	.033	.787	1.270
	TIME	.560	.351	.013	1.596	.111	.858	1.165
	GPA	28.312	6.437	.037	4.398	.000	.807	1.240

a Dependent Variable: amount of giving

Finally, Table **A-6** shows the results for block 3 of the regression model.

Table **A-6**: OLS Regression – Research Question 3, Block 3

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
3	(Constant)	16851.550	5984.986		2.816	.005		
	GEND	-7.550	5.943	-.010	-1.270	.204	.835	1.198
	INCOM	.020	.053	.003	.382	.703	.861	1.161
	YOB	-.621	1.441	-.004	-.431	.666	.771	1.298
	GRADYR	-7.823	3.267	-.020	-2.394	.017	.814	1.229
	AMIND	-75.396	358.522	-.002	-.210	.833	.999	1.001
	BLCK	.230	13.655	.000	.017	.987	.950	1.052
	ASIAN	-31.157	12.252	-.020	-2.543	.011	.958	1.043
	HISP	-18.186	20.790	-.007	-.875	.382	.992	1.008
	PR	-14.353	25.061	-.004	-.573	.567	.990	1.010
	FOR	-25.676	56.087	-.003	-.458	.647	.998	1.002
	ACTIV	43.868	5.847	.058	7.503	.000	.959	1.043
	SPORT	14.678	12.879	.009	1.140	.254	.980	1.020
	A&A	-32.028	15.250	-.017	-2.100	.036	.857	1.166
	AGR	-5.389	13.397	-.003	-.402	.688	.816	1.225
	COM	-31.971	11.190	-.025	-2.857	.004	.748	1.336
	EDU	-34.942	12.164	-.026	-2.873	.004	.721	1.388
	EMS	1.823	18.570	.001	.098	.922	.909	1.100
	ENG	.834	9.543	.001	.087	.930	.650	1.537
	HHD	-23.455	9.777	-.022	-2.399	.016	.652	1.533
	IST	19.006	34.521	.004	.551	.582	.960	1.042
	LIB	-21.551	9.199	-.022	-2.343	.019	.634	1.577
	SCI	-25.981	12.040	-.018	-2.158	.031	.787	1.271
	TIME	.584	.351	.014	1.663	.096	.857	1.166
	GPA	26.243	6.517	.034	4.027	.000	.787	1.271
	DEBT	-.001	.000	-.017	-2.033	.042	.839	1.192

a Dependent Variable: amount of giving

Table **A-7** shows the results for block 1 of the OLS regression model for Research Question 3b (scholarship recipients only).

Table **A-7**: OLS Regression – Research Question 3b, Block 1

Coefficients(a,b)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	8399.422	9713.247		.865	.387		
	GEND	-10.594	8.975	-.015	-1.180	.238	.982	1.019
	INCOM	.110	.078	.018	1.396	.163	.957	1.045
	YOB	1.990	1.955	.014	1.018	.309	.845	1.183
	GRADYR	-6.130	5.183	-.016	-1.183	.237	.872	1.147
	BLCK	-14.868	15.296	-.013	-.972	.331	.963	1.039
	ASIAN	-41.208	20.517	-.026	-2.008	.045	.982	1.018
	HISP	-29.888	22.037	-.017	-1.356	.175	.989	1.011
	PR	-31.657	27.092	-.015	-1.169	.243	.990	1.010
	FOR	-13.884	88.097	-.002	-.158	.875	.998	1.002

a Dependent Variable: sumofnew_gift_amount

b Selecting only cases for which totalusch_01 = 1.00

The next table, Table **A-8**, shows the results for block 2 of the model.

Table **A-8**: OLS Regression – Research Question 3b, Block 2

Coefficients(a,b)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
2	(Constant)	9460.364	9765.118		.969	.333		
	GEND	-1.217	9.582	-.002	-.127	.899	.854	1.171
	INCOM	.028	.080	.005	.354	.724	.919	1.088
	YOB	1.267	1.964	.009	.645	.519	.831	1.203
	GRADYR	-5.996	5.197	-.016	-1.154	.249	.860	1.163
	BLCK	-4.643	16.216	-.004	-.286	.775	.849	1.177
	ASIAN	-40.783	20.814	-.025	-1.959	.050	.946	1.057
	HISP	-23.209	22.455	-.013	-1.034	.301	.945	1.059
	PR	-21.864	27.492	-.010	-.795	.426	.954	1.048
	FOR	-24.845	87.893	-.004	-.283	.777	.995	1.005
	ACTIV	60.232	8.558	.090	7.038	.000	.960	1.042
	SPORT	35.255	18.650	.024	1.890	.059	.952	1.051
	A&A	-12.312	23.962	-.007	-.514	.607	.777	1.286
	AGR	25.422	19.868	.020	1.279	.201	.668	1.497
	COM	-35.761	19.613	-.028	-1.823	.068	.682	1.467
	EDU	-16.461	20.773	-.012	-.792	.428	.669	1.494
	EMS	19.513	24.860	.011	.785	.433	.796	1.256
	ENG	20.763	16.021	.023	1.296	.195	.519	1.926
	HHD	-9.889	18.636	-.008	-.531	.596	.641	1.559
	IST	21.530	52.314	.005	.412	.681	.941	1.063
	LIB	-10.267	16.292	-.011	-.630	.529	.547	1.830
	SCI	-16.155	18.990	-.013	-.851	.395	.670	1.493
	TIME	.649	.600	.015	1.082	.279	.874	1.145
	GPA	17.200	11.904	.021	1.445	.149	.750	1.333

a Dependent Variable: sumofnew_gift_amount

b Selecting only cases for which totalusch_01 = 1.00

Finally, Table **A-9** shows the results for block 3 of the regression model.

Table **A-9**: OLS Regression – Research Question 3b, Block 3

Coefficients(a,b)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
3	(Constant)	8890.497	9772.845		.910	.363		
	GEND	-.998	9.583	-.001	-.104	.917	.854	1.171
	INCOM	.003	.082	.001	.041	.967	.875	1.142
	YOB	.765	1.996	.005	.383	.701	.805	1.243
	GRADYR	-5.205	5.228	-.014	-.996	.319	.850	1.177
	BLCK	-3.828	16.225	-.003	-.236	.813	.848	1.179
	ASIAN	-42.464	20.847	-.026	-2.037	.042	.943	1.060
	HISP	-23.328	22.454	-.013	-1.039	.299	.945	1.059
	PR	-20.866	27.499	-.010	-.759	.448	.953	1.049
	FOR	-26.156	87.891	-.004	-.298	.766	.995	1.005
	ACTIV	59.748	8.564	.090	6.976	.000	.958	1.044
	SPORT	32.703	18.738	.023	1.745	.081	.943	1.061
	A&A	-11.948	23.962	-.007	-.499	.618	.777	1.287
	AGR	23.274	19.926	.018	1.168	.243	.664	1.506
	COM	-35.537	19.612	-.028	-1.812	.070	.682	1.467
	EDU	-15.739	20.778	-.012	-.757	.449	.669	1.495
	EMS	18.934	24.861	.011	.762	.446	.796	1.256
	ENG	19.731	16.037	.021	1.230	.219	.518	1.930
	HHD	-9.635	18.635	-.008	-.517	.605	.641	1.560
	IST	22.149	52.311	.005	.423	.672	.941	1.063
	LIB	-10.182	16.291	-.011	-.625	.532	.546	1.830
	SCI	-17.366	19.009	-.014	-.914	.361	.669	1.496
	TIME	.679	.600	.015	1.131	.258	.873	1.146
	GPA	13.720	12.159	.017	1.128	.259	.719	1.391
	DEBT	-.001	.000	-.019	-1.400	.161	.817	1.224

a Dependent Variable: sumofnew_gift_amount

b Selecting only cases for which totalusch_01 = 1.00

VITA

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