

## ASSESSING THE LINK BETWEEN A PUBLIC UNIVERSITY'S BRAND-BUILDING ACTIVITIES AND ALUMNI GIFT-GIVING

*YOUNG HAN BAE, Penn State Greater Allegheny*  
*MICHELLE HOUGH, Penn State Greater Allegheny*  
*SANG-UK JUNG, Hankuk University of Foreign Studies*

---

*This study examines individualized alumnus gift-giving behaviors. It explores the link between alumnus traits such as age, gender, participation in fraternities or sororities, and college major with a university's brand-building activities and alumnus gift donations by utilizing an ordered logit model. This research also investigates how the link varies across different alumnus segments. The results indicate that a university's brand-building activities, including athletic success and academic prestige, impact alumnus gift-giving behaviors. Age and gender also influence giving behaviors, with older and male alumni more likely to give than their younger and female counterparts. While membership in fraternities or sororities does not impact giving, college major does. Graduates of medical and dental school give the most, followed by graduates of law school, business school, liberal arts, and science. These results provide important managerial insights towards the design and implementation of targeted marketing campaigns for attracting and retaining donors in nonprofit educational institutions.*

---

### INTRODUCTION

Attracting and retaining donors is a vital activity for nonprofit public colleges and universities because charitable giving comprises a significant portion of the institution's revenue stream. In 2013, for example, 18% of the University of Virginia's income stemmed from charitable giving, contrasted with 31% derived from student tuition (University of Virginia, 2013). A 2013 report from the *Council for Aid to Education* shows that alumni donations account for 26.6% of the total gifts to colleges and universities, and giving from alumni increased by 16.9%, a greater increase than from any other source of support (Council for Aid to Education, 2013). According to Holmes (2009), approximately 7.1% of total expenditures for college institutions are covered by alumni donations. As evidenced by these figures, alumni gift-giving is vital to the survival of nonprofit universities.

Responding to the criticality of alumni gift-giving behaviors on fundraising efforts, this study explores the link between university

brand building activities (such as university athletic success and academic prestige) and university alumnus gift-giving behaviors at the individual level. The aim is to identify key factors influencing individual donor gift-giving decisions and how these key factors impact decisions across different donor segments with distinct demographics and psychographics.

University's brand building activity factors have been identified in previous studies in economics, higher education, and sociology literature (e.g., Baade & Sundberg, 1996; Clotfelter, 2003; Coughlin & Erikson, 1984; Holmes, 2009; Rhoads & Gerking, 2000; Stinson & Howard, 2007; Tucker, 2004; Turner, Meserve, & Bowen, 2001). Although there is some disparity across findings, it is generally agreed that athletic success positively impacts alumni donations. Regarding an association between academic success and alumni giving, there is no general consensus among findings: Holmes (2009) found a negative association between academic prestige and alumni giving while Clotfelter (2003) found no association. Additionally, there are gaps in the existing research: 1) most empirical research in the literature has examined the impact of either major college sports or academic prestige on alumni giving, 2) most research has focused on the effects of these factors on alumni giving

behavior at the annually aggregated university level as opposed to the individual donor level, diluting the usefulness to university marketers in recognizing which individual donors or donor segments within a university give more than other individual donors or donor segments, and 3) the research generally has employed a simple Ordinary Least Squares (OLS) regression model in analyzing alumni-giving behavior. Because alumni giving amounts typically are non-negative and often show clustering phenomena on common whole dollar giving amounts, this results in biased OLS estimates of results.

To deal with these substantive and methodological issues, our study analyzes the effects of university's brand building activities on the university's alumnus gift-giving behaviors at the individual level by employing an ordered logit model. To address university marketers' Customer Relationship Management (CRM) desire to customize marketing plans, this study also examines a variety of covariates, such as alumnus demographic covariates including age and gender and alumnus psychographic covariates including fraternity membership and graduated school, in addition to the focal variables, such as university's branding building activities including athletic (especially, football) success and academic prestige as measured by *US News and World Report* rankings.

By analyzing the different effects of both athletic and academic performances on individual donor gift-giving behaviors across different donor segments through utilization of an empirical model which effectively addresses gift characteristics, this paper aims to provide insights into the link between a university's brand-building activities and alumnus gift-giving decisions at the individual level, and the role of heterogeneous segments by demographic and psychographic variables such as gender, age, fraternity, and type of school. By doing so, we add substantially to the existing research in the economics, higher education, and sociology literature, offering specific actionable insights to university marketers.

## LITERATURE REVIEW

### University Brand Building Activities and Alumni Giving

Maximizing alumni donations is an especially critical component of fundraising efforts for nonprofit universities (Holmes, 2009). Substantial research efforts have attempted to identify which factors most influence alumni giving to universities.

Accordingly, the link between university branding building activities and alumni contributions to the university academic endowment has been well-explored. First among the university brand building activities is the level of athletic success. Within this context lies the relationship between successful athletic performance and alumni giving. Early research found no association between athletic success and alumni donation behavior (Cutlip, 1965). Additional research (Harrison, Mitchell, & Peterson, 1995; Sigelman & Bookheimer, 1983; Sigelman & Carter, 1979) supported this conclusion. More recent studies, however, have found evidence of a positive link between college sports success and alumni donation behaviors (Baade & Sundberg, 1996; Coughlin & Erekson, 1984; Gaski & Etzel, 1984; Goff 2000; Grimes & Chressanthi, 1994; McCormick & Tinsley, 1990; Rhoads & Gerking, 2000).

Although the link between university sports success and alumni contributions has been explored, most research has focused on identifying a positive association between a university's football team success and alumni giving (Bergmann, 1991; Brooker & Klastorin, 1981; Caudill & Mixon, 1996; Coughlin & Erekson, 1984; Gaski & Etzel, 1984; Holmes, Meditz, & Sommers, 2008; Meer & Rosen, 2009; Stinson & Howard, 2007; Tucker, 2004; Turner et al., 2001). This body of research identifies a positive impact of football team success and little impact of success stemming from other college sports on alumni giving (Tucker, 2004). Regarding specific measures of football team success, Turner et al. (2001) finds that football winning percentage positively influences alumni giving behavior.

Second among brand building activities are university academic success and the association between successful academic performance and alumni contributions. However, efforts to identify this link have received less attention than efforts to identify the link between athletic success and alumni giving. Clotfelter (2003) explored the association between academic prestige and alumni donations and finds no association between SAT scores (as a proxy of academic prestige) and alumni giving. However, through use of *US News and World Report* rankings to measure academic prestige (Fisher, 2009; Stinson & Howard, 2007), Holmes (2009) finds a negative correlation between academic success and alumni donations. This likely is due to alumni giving more to increase and protect institutional academic reputation when academic prestige decreases.

#### Alumni Demographics and Psychographics

In addition to examining university brand building activities such as athletic success and academic excellence, several studies have incorporated demographic and/or psychographic variables of alumni. Most of this research explored the effects of only these demographics and psychographics on alumni giving, with little or no examination of the impacts of athletic success and academic excellence on alumni giving (e.g., Bruggink & Siddiqui, 1995; Clotfelter, 2003; Eckel & Grossman, 1998; Holmes, 2009; Lindahl & Winship, 1992; Monks, 2003; Okunade, 1996).

The most popular traits examined in the literature include alumni demographics such as age and gender and psychographics such as fraternity or sorority membership status and graduated college status. In modeling alumni giving behavior, researchers (Bruggink and Siddiqui, 1995; Monks 2003) used age to identify young alumni giving patterns. Bruggink and Siddiqui (1995) found that age positively affects alumni giving, with older alumni giving more.

Some studies (Clotfelter, 2003; Cunningham & Cochi-Ficano, 2002; Eckel & Grossman, 1998; Holmes, 2009; Lindahl & Winship, 1992; Monks, 2003; Okunade, 1996) examined the effects of gender on donor behavior. There is no

clear consensus regarding the impact of gender. Research (Okunade, 1996; Holmes, 2009; Lindahl & Winship, 1992) finds that male donors give more than female donors, while Eckel and Grossman (1998) find the opposite. Other studies (Clotfelter, 2003; Cunningham & Cochi-Ficano, 2002) find no impact of gender on alumni giving.

Regarding psychographics, Monks (2003) and Harrison, Mitchell, & Peterson (1995) included fraternity/sorority membership status in analyzing alumni giving, and find fraternity/sorority status impacts giving. Finally, several studies (Bruggink & Siddiqui, 1995; Hueston, 1992; Okunade, Wunnava, & Walsh, 1994; Weerts & Ronca, 2009) included a variable such as "college graduated from" in alumni giving modeling. No consensus was reached regarding giving across graduates of various majors/colleges.

### EMPIRICAL FRAMEWORK

#### Extension of Existing Research

Most existing empirical research in the literature has examined the impact of either major sports or academic prestige on alumni giving. It will, however, be crucial to explore the effects of both athletic success and academic prestige on alumni giving because it is more likely that alumni giving behaviors tend to be influenced by both a university's athletic success and academic prestige.

Additionally, most current research in the literature has focused on the effects of these factors on alumni giving behavior at the annually aggregated university/institution level instead of at the individual alumnus level. This approach raises several issues. In a substantive point-of-view, at this aggregated institutional level analysis, it is difficult for university marketers to recognize which individual alumnus or alumnus segments within a university give more than others. They can only identify if the total donor gift amount has increased and by how much, in accordance with university athletic or academic success. For example, athletic success may effectively lead to an increase in donor gift giving amounts for males, while academic prestige may be effective in increasing donor giving amounts

for females. In addition, the giving amount behavior of graduates of one school may be different from that of other school graduates (e.g., medical and dental schools, school of liberal arts and science, law school). Therefore, the existing aggregated university level analysis, as found in prior studies, does not allow university marketers to address the CRM concern of how to implement a customized marketing plan (such as segmentation and targeting their marketing mix into appropriate segments) for increasing fundraising. This weakness can be overcome by analyzing individual level gift giving behavior as a function of university's brand building activities and examining heterogeneity in the effects of these activities on the donor giving behavior across different segments. This is because only the study of individual level responses can allow for the analysis of segment level giving for the customization implications.

Further, some research using survey data has examined how demographics and psychographics such as the age, gender, fraternity participation, and graduated college status of individual alumni, influence their giving behavior (e.g., Clotfelter, 2003; Monks, 2003; Okunade & Berl, 1997). However, this research evaluated alumni willingness to give as opposed to real giving decisions. While an intention may lead to a real giving behavior, intention is not always followed by action. Thus, a study modeling alumni real giving behaviors as a function of these demographics and psychographics is needed.

Finally regarding methodology, most empirical research to date on the association between athletic success and/or academic prestige and alumni giving is conducted at the university level by employing simple ordinary least squares (OLS) approach (Baade & Sundberg, 1996; Brooker & Klastorin, 1981; Grimes & Chressanthi, 1994). OLS regression contains several problems in analyzing alumni giving amount data. As Wooldridge (2002) indicates, the giving amount, the dependent variable, is always positive and often shows clustering phenomena on common whole dollar giving amounts (such as \$50, \$100, \$250, \$500, and so on), but the normal distribution assumed by OLS regression analysis is continuous and is supported on the entire real line of a dependent

variable. Accordingly, the estimates of results in OLS analyses may be biased. Specifically, the association generally has been investigated by employing a simple correlation analysis (Sigelman & Bookheimer, 1983) or a simple Ordinary Least Squares (OLS) regression model (e.g., Baade & Sundberg, 1996; Brooker & Klastorin, 1981; Clotfelter, 2001; Cunningham & Cochi-Ficano, 2002; Goff, 2000; Grimes & Chressanthi, 1994; Sigelman & Carter, 1979; Tucker, 2004). A few recent studies (Homes, Meditz, & Sommers, 2008; Monks, 2003) have employed a Tobit model to control for the non-negative characteristic of alumni giving amounts and a probit model to analyze alumni giving incidences as a function of athletic success and academic prestige and alumni demographics and psychographics. Other research (Hueston, 1992; Okunade, 1993; Okunade, 1996; Okunade & Berl, 1997; Lindahl & Winship, 1992) modeled alumni giving decision behavior instead of giving amount behavior by utilizing a binary logistic or binary probit model. University marketers may be more interested in real giving amount behavior rather than giving decision behavior (e.g., giving or not giving which can be analyzed by a binary logit or probit model). More importantly, the previously-used approaches cannot effectively handle clustering phenomena on common whole dollar giving amounts. These drawbacks can be overcome with the use of our ordered logit model analyzing alumni real giving amounts.

### Data and Variables

Our individual level empirical analysis of alumnus gift-giving behaviors according to a university's brand building activities aims at addressing university marketers' CRM concern of their customized marketing plans. Since the information about the different effects of a university's brand building efforts on individual donor gift-giving behaviors across different donor segments can greatly help university marketers to implement their customized marketing plans, our study attempts to explore these different effects.

For this analysis, our study considers a variety of variables, including the dependent variable such as the individual alumnus gift-giving amount variable and the controlling

independent covariates such as individual alumnus demographic variables (i.e., age and gender) and their psychographic variables (i.e., fraternity membership and graduated college status) in addition to the focal independent covariates (i.e., university's branding building activities such as athletic success and academic performance).

Accordingly, we collected our data from various sources to contain all of these variables. Specifically, we first utilized a unique individual level alumnus gift-giving amount dataset, recording an individual donor's gift-giving amount behavior with the corresponding gift year and gift amount (serving as the dependent variable of this study), to collect data on our dependent variable such as the gift-giving amount. The time frame for the datasets is 1991 through 2003. In addition, we utilized another individual level dataset for a large United States (U.S.) public university, containing data on an individual donor's demographic and psychographic information such as their age, gender, fraternity membership, and graduated college status. These datasets were obtained from the fundraising office of the one university, an NCAA Division I institution in the Southern U.S. which ranks in the *US News and World Report* best colleges and whose enrollment is larger than 30,000.

We then merged the datasets by the individual alumnus identification variable. The combined individual level alumnus dataset contains the dependent variable and the demographic and psychographic covariates. In the combined dataset, we created binary indicator variables to represent an individual donor's demographic and psychographic information in an empirical analysis utilizing a regression model. Specifically, we created a demographic gender binary indicator (male equal to one) along with psychographic binary indicators such as fraternity membership (membership equal to one) and five college dummies for business (business graduate equal to one), law (law graduate equal to one), medical and dental (medical and dental graduate equal to one), engineering (engineering graduate equal to one), and liberal arts and science (liberal arts and science graduate equal to one) graduates. These five college dummies represent all the

colleges in the dataset, such as the five above-mentioned colleges and an "other" category which includes all the other colleges. Therefore, the "other" college category is the basis for these college dummies.

To account for inflation between 1991 and 2003, we collected Consumer Price Index (CPI) information from the Bureau of Labor statistics website, and adjusted the gift-giving amount variable in the combined dataset by these CPIs.

We further supplemented the combined dataset by adding athletic success and academic performance variables. Athletic success was measured using the winning percentage of the men's football team of the university (e.g., Baade & Sundberg, 1996) since empirical research in the literature finds that the performance of the men's football team represents a university's athletic success well. Academic success was measured using the *US News and World Report* ranking of the university's undergraduate program (Fisher, 2009; Holmes, 2009; Stinson & Howard, 2007).

Regarding the athletic success measure, we collected year-by-year data on the number of winning and the number of losing for the football team from the college football information website, and computed the football team's yearly winning percentage for the data time frame (from 1991 to 2003) by dividing the number of winning by the number of the total games. With regard to the academic prestige measure, we collected information on yearly *US News and World Report* ranking of the university's undergraduate program from 1991 to 2003 from the *US News and World Reports* best college magazine website<sup>2</sup>. We multiplied the academic ranking by -1 to create the academic success variable since there is a negative association between this ranking and academic success in that if the ranking increases by number, the academic success decreases.

To fairly compare between the estimates of the covariates, we standardized the age variable as well as the athletic and academic success variables since the scales of these variables are different from the scale of the dummy variables such as gender, fraternity, and five college dummies. The standardization was not

implemented on binary indicators because these are dummy variables with values of either zero or one.

After this data handling, our final dataset contains 16,178 observations with eleven variables, including the gift-giving dependent variable and the above ten covariates. This final dataset comprises the information on individual alumnus gift-giving amount behavior and their demographics and psychographics, athletic success measured by the football team's winning percentage, and academic prestige. Utilizing these covariates enables us to analyze the effects of the university's athletic and academic success on the individual alumnus gift-giving behaviors and to identify heterogeneity on these effects across different alumnus segments. The description of each of these covariates is presented in Table 1.

Additionally, the summary statistics of the covariates are provided in Table 2, while correlations of the covariates are presented in Table 3. As can be observed from these tables, there seem to be no issues for statistical analysis regarding our covariates. Specifically, the minimum and maximum of all the binary indicators are zero and one, respectively. This demonstrates that the dummies were appropriately coded. Further, the mean and standard deviation of the standardized variables are zero and one respectively, indicating that the standardization process was successfully implemented. Finally, there are no significantly high correlations between the covariates, implying that multicollinearity does not seem to be a concern.

### Empirical Model

To effectively deal with clustering on non-negative focal gift-giving amounts, we employ an Ordered Logit Regression (OLR) model. In the model,  $Y$  denotes the observed ordinal gift amount, and  $Y^*$  indicates a continuous, unmeasured latent real gift amount whose values decide what the observed ordinal variable  $Y$  equals.  $Y^*$  contains numerous threshold points representing clustering on common whole dollar gift-giving amounts such as \$50, \$100, \$250, \$500, \$1,000, \$5,000, \$10,000, \$25,000, \$50,000, and \$100,000 (Weerts & Ronca, 2009). The value on the

observed ordinal variable  $Y$  depends on these threshold points. To reflect the actual clustering on these non-negative focal gift-giving amounts, for individual donor  $i$ , the values of  $Y_i$  and the cutoff points are defined as follows:

$$\begin{aligned} Y_i &= 1 \text{ if } Y_i^* \leq 50, \\ Y_i &= 2 \text{ if } 50 < Y_i^* \leq 100, \\ Y_i &= 3 \text{ if } 100 < Y_i^* \leq 250, \\ Y_i &= 4 \text{ if } 250 < Y_i^* \leq 500, \\ Y_i &= 5 \text{ if } 500 < Y_i^* \leq 1,000, \\ Y_i &= 6 \text{ if } 1,000 < Y_i^* \leq 5,000, \\ Y_i &= 7 \text{ if } 5,000 < Y_i^* \leq 10,000, \\ Y_i &= 8 \text{ if } 10,000 < Y_i^* \leq 25,000, \\ Y_i &= 9 \text{ if } 25,000 < Y_i^* \leq 50,000, \\ Y_i &= 10 \text{ if } 50,000 < Y_i^* \leq 100,000, \\ Y_i &= 11 \text{ if } Y_i^* > 100,000. \end{aligned} \quad (1)$$

Then, the probability that  $Y_i$  takes on a particular value is:

$$\begin{aligned} P(Y_i=1) &= \frac{1}{1 + \exp(\alpha_1 + \beta'X_i - 50)}, \\ P(Y_i=2) &= \frac{1}{1 + \exp(\alpha_2 + \beta'X_i - 100)} - \frac{1}{1 + \exp(\alpha_2 + \beta'X_i - 50)}, \\ P(Y_i=3) &= \frac{1}{1 + \exp(\alpha_3 + \beta'X_i - 250)} - \frac{1}{1 + \exp(\alpha_3 + \beta'X_i - 100)}, \\ &\dots \\ P(Y_i=11) &= 1 - \frac{1}{1 + \exp(\alpha_{11} + \beta'X_i - 100,000)}, \end{aligned} \quad (2)$$

where  $X$  denotes a vector of the covariates,  $\alpha_1, \alpha_2, \alpha_3, \dots, \alpha_{11}$  are intercepts, and  $\beta$  denotes the vector of the corresponding coefficient estimates for individual donor  $i$ .

## RESULTS

### Empirical Analysis

We estimated our OLR model using the SAS software package with maximum likelihood estimation. Table 4 summarizes the maximum likelihood estimation results from a series of model specifications of our OLR model, from

**TABLE 1:  
Description of the Covariates**

Categories		Covariates	Definition
University’s Brand Building Activities		Athletic Success	Men football team’s winning percentage.
		Academic Success	<i>US News and World Report</i> ranking of the undergraduate school × -1.
Individual Donor’ Demographics and Psycho- graphics	Demographics	Age	Donor’s age.
		Gender	Binary indicator equal to one if donor is male and zero otherwise.
	Psychographics	Fraternity	Binary indicator equal to one if donor joined the fraternity and sorority club and zero otherwise.
	Psychographics - College Dummies	Business	Binary indicator equal to one if donor is a graduate of engineering school and zero otherwise.
		Law	Binary indicator equal to one if donor is a business school graduate and zero otherwise.
		Medical & Dental	Binary indicator equal to one if donor is a medical or dental school graduate and zero otherwise.
		Engineering	Binary indicator equal to one if donor is an engineering school graduate and zero otherwise.
		Liberal Arts & Science	Binary indicator equal to one if donor is a graduate of liberal arts and science and zero otherwise.

Notes:

1. Athletic success is measured by the winning percentage of University’s men football team, and academic success is measured by the *US News and World Report* ranking of University’s undergraduate program × -1.
2. All the colleges are represented by the five above-specified college dummies and the “other” college category dummy. Therefore, the “other” college category is the basis for these college dummies.

**TABLE 2:  
Descriptive Statistics**

Covariates	Mean	Std. Deviation	Minimum	Maximum
Sports Success	0.000	1.000	-2.131	1.369
Academic Success	0.000	1.000	-0.765	1.532
Age	0.000	1.000	-2.588	4.023
Gender (Male)	0.584	0.493	0.000	1.000
Fraternity	0.154	0.361	0.000	1.000
Business	0.177	0.381	0.000	1.000
Law	0.051	0.219	0.000	1.000
Medical & Dental	0.088	0.283	0.000	1.000
Engineering	0.128	0.334	0.000	1.000
Liberal Arts and Science	0.131	0.338	0.000	1.000

Note. 1:

The number of observations is 16,178.

**TABLE 3:  
Correlations**

Covariates	1	2	3	4	5	6	7	8	9	10
1. Athletic Success	1.000									
2. Academic Success	0.039**	1.000								
3. Age	-0.039**	0.061**	1.000							
4. Gender (Male)	-0.014	0.023*	0.163**	1.000						
5. Fraternity	-0.007	0.005	0.037**	0.058**	1.000					
6. Business	0.006	0.001	-0.101**	0.085**	0.096**	1.000				
7. Law	-0.007	0.007	0.064**	0.096**	-0.023*	-0.107**	1.000			
8. Medical & Dental	0.002	0.001	0.055**	-0.083**	-0.081**	-0.144**	-0.072**	1.000		
9. Engineering	-0.012	0.018*	0.047**	0.242**	-0.018*	-0.178**	-0.089**	-0.119**	1.000	
10. Liberal Arts & Science	0.015	-0.024*	-0.235**	-0.037**	0.018*	-0.180**	-0.090**	-0.121**	-0.149**	1.000

Notes.:

1. The number of observations is 16,178.

2. \*\* =  $p < 0.01$ , \* =  $p < 0.05$ .

the simplest one with only the university's brand-building covariates (Model 1), to more complex specifications with these brand-building covariates and individual donor demographic and psychographic covariates (Models 2 and 3), to the full model specification (Model 4) with interaction terms between brand building and gender and fraternity.

Regarding the goodness of fit of the four specifications of the OLR model, Model 4 (the full specification) fits best over the other models according to Akaike Information Criterion (AIC) since Model 4 yields the smallest AIC. These goodness of fit results suggest that the inclusion of individual donor's demographic and psychographic variables and the interaction terms (investigating the effects of university's brand building activities on alumnus gift-giving behaviors across different gender and fraternity groups) in addition to university's brand building variables in the full model significantly improves the fit over the other models. As such, we affirm the stability of our empirical findings and gain insights into the empirical results based on the full specification.

## Empirical Results

Based on the reliability of the empirical results, we analyze how university's brand building activities and individual donor demographics and psychographics influence individual alumnus gift-giving amount behaviors, and how the effects of the brand building activities on alumnus giving behavior vary across different gender and fraternity segments of the alumni.

Regarding the University's brand building covariates, both the athletic success and academic success variables are statistically significant at the one percent level, as shown in the maximum likelihood estimates of the covariates obtained from the full model in Table 4. The coefficient of athletic success is positive, but that of academic success is negative, which indicates that the university's athletic (especially football) success increases alumni giving, while academic prestige decreases alumni giving. In terms of magnitude, the effect of academic success is larger than that of athletic success on alumni giving amounts because the coefficient estimate of academic success is larger than that of athletic success.

**TABLE 4:**  
**Maximum Likelihood Estimation Results for the Four Specifications of the OLR model**

Covariates	Coefficient	Specification 1	Specification 2	Specification 3	Specification 4
<b>University's Brand Building Activity</b>					
Athletic Success (Football team's winning %)	$\beta_1$	0.066**	0.084**	0.084**	0.043**
Academic Success (Ranking $\times$ -1)	$\beta_2$	-0.078**	-0.097**	-0.098**	-0.016**
<b>Donor Demographics and Psychographics</b>					
Age	$\beta_3$		0.193**	0.196**	0.194**
Gender (Male)	$\beta_4$		0.740**	0.757**	0.174*
Fraternity	$\beta_5$		0.284**	0.299**	-0.143
Business	$\beta_6$			0.226**	0.227**
Law	$\beta_7$			0.465**	0.468**
Medical & Dental	$\beta_8$			0.561**	0.562**
Engineering	$\beta_9$			-0.100	-0.098
Liberal Arts & Science	$\beta_{10}$			0.07891*	0.078*
<b>Interaction Terms</b>					
Sports Success $\cdot$ Gender (Male)	$\beta_{11}$				0.668**
Academic Success $\cdot$ Gender (Male)	$\beta_{12}$				-0.007**
Sports Success $\cdot$ Fraternity	$\beta_{13}$				0.500
Academic Success $\cdot$ Fraternity	$\beta_{14}$				-0.005*
<b>AIC</b>		49,504.29	48,533.640	48,366.85	48,349.29

*Notes:*

1. \*\* =  $p < 0.01$ , \* =  $p < 0.05$ .

2. AIC denotes Akaike Information Criterion whose value is computed via  $-2\ln L + 2k$ , where  $L$  denotes Likelihood function of the OLR model and  $k$  denotes the number of parameters to be estimated.

In regard to the effects of individual alumnus demographic traits on their giving behavior, age is statistically significant and its estimate is positive, which implies that the effects of age increase alumni gift giving amounts. Thus, older alumni are likely to give more to the university than younger alumni. Regarding gender, there is a statistically significant impact and positive estimate of gender on alumni gift giving amounts. This means that male donors tend to give more to the university than female donors. Between these demographics, the impact of gender on alumni giving tends to be larger than that of age, as shown in Table 4.

With respect to individual alumnus psychographic traits, the fraternity variable is statistically insignificant. The variable is statistically significant and its coefficient estimate is positive in Model Specification 3, the one without the interaction terms. However, this variable turns out to be insignificant after including the interaction terms between

fraternity and each of the brand building variables in the full model. Likewise, the main fraternity effect becomes insignificant after including the interaction terms.

Regarding another psychographic trait, the donor's graduated college status, variables such as business, law, medical and dental, and liberal arts and science are statistically significant and their coefficient estimates are positive. The estimation results of graduated college major indicate that graduates of the colleges of business, law, medical and dental, and liberal arts and science give more than graduates of other colleges. Compared to other colleges, graduates of medical dental school give the most, followed by law school graduates; business school and liberal arts and science graduates place third and fourth, respectively.

To investigate the effects of the university's brand building activities on individual alumnus gift-giving amounts across different alumnus

segments defined by their different demographics and psychographics (such as their gender and fraternity), the full specification model included the interaction terms between each of the brand building variables and gender and the interaction terms between each of the brand building variables and fraternity. The inclusion of these interaction terms enables us to examine how the effects of the university's brand building activities on donor donation amounts vary across different donor segments defined by alumni demographic and psychographic traits.

Regarding the interaction terms between each of the brand building variables and gender on alumni giving amounts, both the interaction terms are statistically significant. The coefficient of the interaction between athletic success and gender is positive, whereas that of the interaction between academic success and gender is negative. The estimate of the athletic success and gender interaction term is larger than that of the academic success and gender interaction term, implying that male alumni are likely to give more than female alumni for athletic success, but female alumni tend to give more for academic success. Additionally, male alumni giving for athletic success is larger than that in female alumni giving for academic success.

With regard to fraternity segmentation, only the interaction term between academic success and fraternity is statistically significant and its coefficient estimate is negative. Based on the result, we find that alumni who joined a university fraternity group are likely to be interested in academic success rather than athletic success, and are likely to give more when the university academic reputation decreases, apparently as a reputation protection mechanism (Holmes, 2009). In other words, this segment of the alumni responds to only the academic success. Athletic success does not increase their giving amounts.

## DISCUSSION

### Theoretical and Practical Implications

Responding to the need to comprehend the critical role of individual alumnus gift-giving behavior for nonprofit universities, this study

examined which factors influence a university's individual alumnus gift-giving amounts. In the examination, we identified key factors in individual alumnus donation decisions. Through a series of empirical analyses, these key factors shed light on university brand building efforts to achieve athletic success and academic prestige.

The modeling techniques used in our analysis are likely to be applicable to many other CRM contexts, especially for nonprofit organizations including universities. The substantive results related to the effects of athletic success and academic prestige on gift-giving are particularly noteworthy. In contrast to previous research, we examine this relationship at the individual level for customization insights enabling us to make segment level judgments via an OLR model. This model accounts for the characteristics of alumnus gift-giving amounts – often exhibiting common whole dollar giving amounts.

When these giving amount characteristics are controlled for, we find that athletic success positively contributes to the increase of alumni giving, and academic success negatively influences alumni giving amounts. The negative link between academic success and alumni giving is like to occur because alumni tend to increase their donations to improve or protect their institution's academic reputation when academic prestige decreases (Holmes, 2009). Among the effects of these two, academic prestige has a larger effect than athletic success. Alumni giving amounts increase as they become older, and males are more likely to give than females. An alumni's major also plays a significant role in giving amount decisions. Compared to other majors, graduates of medical and dental schools give the most, followed by law school graduates; business school and liberal arts and science graduates place third and fourth, respectively.

For university marketers' customized marketing plans for individual donors, we also explored how the brand building activities, such as athletic and academic performance, influence different alumnus segments defined by their demographics and psychographics. To do so, we included the interaction terms between athletic and academic performance and gender

and fraternity membership in our full model. The inclusion of these interaction terms allowed us to examine how the effects of a university's brand-building activities on alumni giving vary across different segments, defined by their demographic and psychographic traits.

Regarding gender segmentation, we find that male alumni tend to give more than female alumni when the university achieves athletic success, but female alumni tend to give more when the university achieves academic excellence. Regarding the increased effects of these different gender groups according to athletic success or academic prestige, an increase in male alumni giving for athletic success tends to be larger than that of female alumni giving for academic success. With regard to fraternity segmentation, we find that academic success is only significant in the giving amount decisions of alumni who have been fraternity members, and athletic success has no impact on the giving amount decisions of alumni with fraternity membership. We also find that alumni with fraternity membership tend to give more when the university's academic prestige decreases. This affirms Holmes (2009) findings that these alumni are likely to give more to increase or protect the university's academic reputation when academic prestige decreases.

These findings suggest that fundraising can be improved by better utilizing information about alumni. First, it appears that investments in athletic programs can increase general alumni giving amounts. When university academic prestige decreases, it will be effective to contact alumni to give more towards protecting or improving their university's academic reputation. Among the two brand building efforts, academic prestige is likely to attract more giving than athletic success.

Second, university fundraising managers need to pay attention to heterogeneity between alumnus demographic and psychographic traits. Although they need to focus on male alumni since male alumni generally are likely to give more than female alumni, they should focus on male alumni when the university achieves athletic success, but focus on female alumni when the university achieves academic excellence. In addition, the university marketers

should focus on alumni with fraternity membership when the university is experiencing its decrease in academic prestige because these alumni will increase giving. Further, university marketers need to focus respectively on alumni graduated from medical and dental, law, business, and liberal arts and science. Marketing efforts will be more efficient and effective when appropriately targeted.

Since athletic success increases male alumni giving much more than female alumni giving and academic success results in female alumni giving much more than male alumni giving, it may be beneficial to customize promotional appeals based on gender. For example, if the football team has a good performance in a given year, it may be useful to increase contacts to male alumni. Likewise, it may be beneficial to increase contacts to female alumni when academic excellence increases in a given year. Because alumni who joined university fraternities or sororities respond significantly to a decrease in academic excellence, it may also be beneficial to increase promotion efforts to these alumni when academic prestige declines. These empirical findings can provide university marketing managers with significant customization insights and implications for the CRM concerns of their marketing plans.

### **Limitations and Recommendations for Future Research**

While our empirical findings provide evidence that universities influence gift-giving amounts for certain classes of alumni, there are several caveats to our research that can be addressed in our future research. These limitations stem mainly from the datasets utilized in this study. Most importantly, our research focuses on gifts from alumni who graduated from one US public university, but gifts come not only from alumni but also from faculty, staff, volunteers, supporters, and students (Borden, Shaker, & Kienker, 2014; Bruggink & Siddiqui, 1995; Weerts & Ronca, 2007). Extending our study to a broader dataset including gifts from these people would give us more generalizable results.

In addition, analyzing individual alumnus gift-giving behaviors for a private university in a

future study would yield further insights since their giving behaviors may differ from the behaviors for a public university (Baade & Sundberg, 1996). Since our analysis focuses on the effects of academic and athletic (especially) successes on alumni giving behaviors of one public NCAA Division I university, it will be also beneficial in the future to analyze alumni giving behaviors for a university that does not have its football team, a university that does not have a medical or dental program, or a university in the NCAA Division II or Division III.

Next, the fraternity membership variable includes both a fraternity or sorority membership. Although the effect of joining a fraternity membership during campus on giving behavior might be different from that of joining a sorority membership, we could not analyze these different effects mainly due to data limitation. Specifically, we could not separate the effects of alumni who joined a fraternity membership and a sorority membership. Also, the liberal arts and science variable includes alumni from both the colleges. Therefore, we could not separate the effects on graduates of the college of liberal arts from those of the college of sciences. Our future research may address these issues.

Furthermore, while the database is fairly rich and we have supplemented the individual alumnus data with information on athletic and academic success, the income variable is missing in our dataset. Since income might be correlated with age, it might be difficult to examine whether age impacts alumni-gift giving or income impacts their giving if there is a correlation between age and income. Likewise, income might be associated with the major from which the alumnus graduated. If so, it might be difficult to investigate whether income is the main driver or major is the main driver of alumni giving. As such, it will be beneficial if we collect information on additional demographics such as income in our future study, which will enable us to explore exact effects of age, major, and income on alumni giving behavior. Also, information on the marital status, the spouse status, and the family size is missing in the dataset. Since the effects on alumni giving behavior vary depending on these variables, it will be

interesting to incorporate these variables in a future study.

Next, our empirical results indicate that since male alumni generally give more than female alumni, university fundraising managers should focus on those male alumni. Yet this result may be unclear because family giving typically is aggregated under a single name, which may be the name of the male. Our future research will be enhanced by collecting data to further examine this relationship. However, the fact that male alumni give more than female alumni in general may suggest an opportunity for fundraising managers to develop marketing plans to better target and encourage female alumni to give.

Next, it will be beneficial if we analyze the effects of academic and athletic successes on giving behaviors of alumni who did not complete their undergraduate or completed their degree less than 4 years. Also, analyzing if the donor was a legacy will be interesting. Moreover, we will draw better customization implications if we divide an alumni population into several segments based on a finite-mixture model framework (Durango-Cohen & Balasubramanian, 2015) or a segmentation approach (McAlexander, Koenig, & DuFault, 2016) and generate segment-level estimates.

Finally, our study could not incorporate promotional variables that the university marketers have adopted as university brand building activities into our empirical analysis due to a data limitation. We could extend the current study to examine how different types of promotion and promotional timing impact alumni giving. In particular, the development of an individual-level model can be of great value, since it would enable managers to use customized marketing interventions that consider individual giving histories and responsiveness to promotions, as well as higher-level factors, such as athletic success. Also, we focused on the two university's branding building activities such as athletic success and academic prestige in this empirical study. However, another building activity such as building affinity needs to be considered because marketing activities in building affinity may impact alumni giving (McAlexander, Koenig, & DuFault, 2014).

## CONCLUSION

This study examines the link between a university's brand-building activities and alumnus gift-giving amounts at the individual level by employing an ordered logit model that accounts for clustering on non-negative gift-giving amounts. This research also takes into account heterogeneity in the effects of the university brand-building efforts on individual alumnus gift-giving behaviors across different alumnus segments based on their demographics and psychographics by including these demographic and psychographic traits and the interaction terms between the branding building variables and these traits.

This study finds that the effects of a university's brand-building activities, such as athletic success and academic prestige, on alumni gift-giving behaviors are significant, but the effects vary across different alumnus segments with their demographics and psychographics. In other words, the study is able to identify how different alumnus segments with different demographic and psychographic traits respond to a university's brand-building efforts. The empirical results based on this individual level analysis provide significant customization insights and implications to university marketing managers. University marketers can more accurately conduct customized marketing plans for fundraising by better understanding the significant associations described in our research.

## REFERENCES

- Baade, R. A., & Sundberg, J. O. (1996). Fourth down and gold to go? Assessing the link between athletics and alumni giving. *Social Science Quarterly*, 77(4), 789-803.
- Bergmann, B. R. (1991). Do sports really make money for the university?. *Academe*, 77(1), 28-30.
- Borden, V. M., Shaker, G. G., & Kienker, B. L. (2014). The impact of alumni status on institutional giving by faculty and staff. *Research in Higher Education*, 55(2), 196-217.
- Brooker, G. W., & Klastorin, T. D. (1981). College Athletics and Alumni Giving. *Social Science Quarterly*, 62(4), 744.
- Bruggink, T. H., & Siddiqui, K. (1995). An econometric model of alumni giving: A case study for a liberal arts college. *The American Economist*, 39(2), 53-60.
- Caudill, S. B., & Mixon, F. G. (1996). Winning and ticket allotments in college football. *The Social Science Journal*, 33(4), 451-457.
- Clotfelter, C. T. (2001). Who are the alumni donors? Giving by two generations of alumni from selective colleges. *Nonprofit Management and Leadership*, 12(2), 119-138.
- Clotfelter, C. T. (2003). Alumni giving to elite private colleges and universities. *Economics of Education review*, 22(2), 109-120.
- Coughlin, C. C., & Erikson, O. H. (1984). An examination of contributions to support intercollegiate athletics. *Southern Economic Journal*, 51(1), 180-195.
- Council for Aid to Education. (2013). Colleges and universities raise \$33.80 billion in 2013. Retrieved from <http://cae.org/images/uploads/pdf/VSE-2013-Press-Release.pdf>
- Cunningham, B. M., & Cochi-Ficano, C. K. (2002). The determinants of donative revenue flows from alumni of higher education: An empirical inquiry. *Journal of Human Resources*, 37(3), 540-569.
- Cutlip, S. M. (1965). *Fund raising in the United States: Its role in America's philanthropy*. New Brunswick: Transaction Publishers.
- Durango-Cohen, E. J., & Balasubramanian, S. K. (2015). Effective Segmentation of University Alumni: Mining Contribution Data with Finite-Mixture Models. *Research in Higher Education*, 56(1), 78-104.
- Eckel, C. C., & Grossman, P. J. (1998). Are women less selfish than men?: Evidence from dictator experiments. *The Economic Journal*, 108(448), 726-735.
- Fisher, B. (2009). Athletics success and institutional rankings. *New Directions for Higher Education*, 2009(148), 45-53.
- Gaski, J. F., & Etzel, M. J. (1984). Collegiate athletic success and alumni generosity: Dispelling the myth. *Social Behavior and Personality: an international journal*, 12(1), 29-38.
- Goff, B. (2000). Effects of university athletics on the university: A review and extension of empirical assessment. *Journal of Sport Management*, 14(2), 85-104.

- Grimes, P. W., & Chressanthis, G. A. (1994). Alumni contributions to academics. *American Journal of Economics and Sociology*, 53(1), 27-40.
- Harrison, W. B., Mitchell, S. K., & Peterson, S. P. (1995). Alumni donations and colleges' development expenditures: Does spending matter?. *American Journal of Economics and Sociology*, 54(4), 397-412.
- Holmes, J. (2009). Prestige, charitable deductions and other determinants of alumni giving: Evidence from a highly selective liberal arts college. *Economics of Education Review*, 28(1), 18-28.
- Holmes, J. A., Meditz, J. A., & Sommers, P. M. (2008). Athletics and alumni giving evidence from a highly selective liberal arts college. *Journal of Sports Economics*, 9(5), 538-552.
- Hueston, F. R. (1992). Predicting alumni giving: A donor analysis test. *Fund Raising Management*, 23(5), 19-22.
- Lindahl, W. E., & Winship, C. (1992). Predictive models for annual fundraising and major gift fundraising. *Nonprofit Management and Leadership*, 3(1), 43-64.
- McAlexander, J. H., Koenig, H. F., & DuFault, B. (2014). Advancement in higher education: the role of marketing in building philanthropic giving. *Journal of Marketing for Higher Education*, 24(2), 243-256.
- McAlexander, J. H., Koenig, H. F., & DuFault, B. (2016). Millennials and Boomers: increasing alumni affinity and intent to give by target market segmentation. *International Journal of Nonprofit and Voluntary Sector Marketing*, 21(2), 82-95.
- McCormick, R. E., & Tinsley, M. (1987). Athletics versus academics? Evidence from SAT scores. *Journal of Political Economy*, 95(5), 1103-1116.
- Meer, J., & Rosen, H. S. (2009). The impact of athletic performance on alumni giving: An analysis of microdata. *Economics of Education Review*, 28(3), 287-294.
- Monks, J. (2003). Patterns of giving to one's alma mater among young graduates from selective institutions. *Economics of Education Review*, 22(2), 121-130.
- Okunade, A. A. (1993). Logistic regression and probability of business school alumni donations: Micro-data evidence. *Education Economics*, 1(3), 243-258.
- Okunade, A. A. (1996). Graduate school alumni donations to academic funds: Micro-data evidence. *American Journal of Economics and Sociology*, 55(2), 213-229.
- Okunade, A. A., & Berl, R. L. (1997). Determinants of charitable giving of business school alumni. *Research in Higher Education*, 38(2), 201-214.
- Okunade, A., Wunnava, P. V., & Walsh Jr, R. (1994). Charitable giving of alumni: micro-data evidence from a large public university. *American Journal of Economics and Sociology*, 53(1), 73-84.
- Rhoads, T. A., & Gerking, S. (2000). Educational contributions, academic quality, and athletic success. *Contemporary Economic Policy*, 18(2), 248-258.
- Sigelman, L., & Bookheimer, S. (1983). Is it whether you win or lose? Monetary contributions to big-time college athletic programs. *Social Science Quarterly*, 64(2), 347.
- Sigelman, L., & Carter, R. (1979). Win one for the giver? Alumni giving and big-time college sports. *Social Science Quarterly*, 60(2), 284-294.
- Stinson, J. L., & Howard, D. R. (2007). Athletic success and private giving to athletic and academic programs at NCAA institutions. *Journal of Sport Management*, 21(2), 235.
- Tucker, I. B. (2004). A reexamination of the effect of big-time football and basketball success on graduation rates and alumni giving rates. *Economics of Education Review*, 23(6), 655-661.
- Turner, S. E., Meserve, L. A., & Bowen, W. G. (2001). Winning and giving: Football results and alumni giving at selective private colleges and universities. *Social Science Quarterly*, 82(4), 812-826.
- University of Virginia. (2013). Financial report 2013-14. Retrieved from [http://www.virginia.edu/execvp/files/UVA\\_FR\\_2013\\_2014.pdf](http://www.virginia.edu/execvp/files/UVA_FR_2013_2014.pdf)
- Weerts, D. J., & Ronca, J. M. (2007). Profiles of supportive alumni: Donors, volunteers, and those who "do it all". *International Journal of Educational Advancement*, 7(1), 20-34.
- Weerts, D. J., & Ronca, J. M. (2009). Using classification trees to predict alumni giving for higher education. *Education Economics*, 17(1), 95-122.

<sup>1</sup><http://www.bls.gov/cpi/>

<sup>2</sup><http://www.usnews.com/rankings>

This research was partially supported by Hankuk University of Foreign Studies.