Are Women More Generous Than Men?
Evidence from Alumni Donations

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Abstract

The explicit hierarchy of recognition in alumni giving offers a useful context in which to examine the nature of gender differences regarding charitable giving. Using 31 years of alumni giving records at a small liberal arts college we find that women are more likely to be donors. Among donors, women tend to give more frequently but generally make smaller donations than men. These results hold even after controlling for age, income and participation in Greek organizations. The results are consistent with the hypotheses that the drive for recognition of charitable giving is stronger in men than women, and that women are more reciprocal than men.

1. Introduction

This paper examines the nature of gender differences in alumni giving at a small selective liberal arts college. Understanding gender differences in this context is important for two reasons. First, different levels of giving are associated with different levels of explicit recognition. Small donations earn the donor the rather plain title of a "donor," while larger donations qualify the donor for membership in various "clubs," "societies" or "partnerships." The institution we study has over ten different giving levels. Particularly large donors become part of the "President's Circle", give speeches, become college trustees, or have buildings named after them. The listing of donors *at each level* is published in an annual "Thank you" volume – thus making the recognition public. An important feature of this hierarchy is that the recognition is proportional to the *size* of a gift but not to the *frequency* of giving.

The second reason the context of alumni giving is useful is that it is, in part, an act of reciprocity. Falk and Fischbacher (2006) define people as reciprocal if "they reward kind actions and punish unkind ones" (p. 293). Education at the college we study is heavily subsidized by alumni donations. Approximately one quarter of the cost is covered by annual donations and income from the endowment. A number of experimental studies find that women tend to reciprocate more than men (see for example Buchman et al. (2008) or Ben-Ner et al., 2004). Studying gender differences in alumni giving can tell us whether these results hold outside of the laboratory setting.

We hypothesize that men will seek the explicit recognition associated with higher levels of giving. In the terms of Harbaugh's (1998) model of charitable giving, we hypothesize that men have a greater taste for "prestige." Thus, conditional on being a donor, we hypothesize that men give less frequently but in larger amounts, while women give more frequently in smaller

amounts. This is consistent with the hypothesis that women give for selfless reasons whereas men's motivation includes the need for recognition/prestige.

As data we use 31 years of alumni giving records. We differentiate between the decision to donate and the decision about the size and frequency of donations. We first examine whether women are more likely to be donors. Then we take the sample of donors and ask if the size and frequency of donations is different between men and women. If women give for selfless reasons and men seek recognition, the pattern of men's giving will be irregular with few large infrequent gifts, whereas the pattern of women's giving will include smaller but more frequent gifts.

Whether women are more generous than men is a subject of much research. It turns out that the answer to the question is rather complicated. Experimental studies, recently surveyed by Croson and Gneezy (2009), offer mixed results. Sometimes women appear to be more altruistic, sometimes they don't. Croson and Gneezy conclude that the relative generosity of men and women depend on the specific context of the experiment, with women much more sensitive to the specific setting than men. Empirical studies, recently surveyed by Bekkers and Wiepking (2007) offer similarly mixed results. In some contexts women appear more generous while in others they don't (e.g. Andreoni et al. (2003), Brown and Ferris (2007) and Yoruk, 2010).

The literature on the determinants of alumni giving is extensive. Bruggink and Siddiqui (1995) and Clotfelter (2001 and 2003) examine the impact of Greek life, the state of the economy, alumni income, age and marital status. Baade and Sundberg (1996) look at the effect of alumni wealth. Wunnava and Lauze (2001) focus on the impact of the field of study. Marr et al. (2005) focus on financial aid; Ade et al. (1994) on satisfaction; Meer and Rosen (2009a) and Holmes et al. (2008) on athletic performance of the alma mater; and Meer and Rosen (2009b) on the age of the donors' children.

When studies explore the effect of gender on alumni donations, they find conflicting results. Wunnava and Lauze (2001) found that although males are more likely than females to occasionally donate to their alma mater, for consistent donations, gender is statistically insignificant. Okunade (1996) finds that males give more. In contrast, Bruggink and Siddiqui (1995) and Holmes et al. (2008) find that males tend to donate less. Interestingly, we found only two studies that, like ours, differentiate between the decision to donate and the size of donations. Belfield and Beney (2000) use data from the United Kingdom and find that women are more likely to be donors but that they give smaller amounts than men. Holmes et al. (2008) find similar results using data from a highly selective liberal arts college.

2. Data

We use data from a small liberal arts college in upstate New York. The data has information on 23,760 living alumni ranging from the Class of 1936 through the Class of 2007. The college began recording alumni donations in 1976. The record includes both restricted and unrestricted donations. The individuals' names were stripped from the records to ensure the anonymity of each alumnus/alumna. The variables on giving include the total dollar value of gifts since graduation, the number of years in which an alumnus/alumna gave a gift. Unfortunately, we don't have data on each donation or even each year's worth of donations – only aggregate amount and the number of donations since graduation, and the aggregate amount and the number of donations in the last 10 years. The characteristics of the individuals include graduation year, gender, zip code of their current address and whether or not they were members of a Greek organization while in college. We use graduation year to estimate the alumni age in 2008 by subtracting the graduation year from 2008+22 (a typical age at graduation). We use the zip code to estimate the alumni current income using median household income in their zip code

area according to 2000 Census Summary File 3. We acknowledge that this is a fairly crude measure of individual income but as shown in Geronimus et al. (1996, p. 533), zipcode income is a fairly good proxy for the overall socio-economic status of the individual. We don't have information on marital status. Since the decision to donate is usually made in the context of the household rather than individual income, it may be difficult to differentiate between the generosity of the donor (say female) and his or her spouse (male). We believe that this biases our results towards not finding any gender differences.

Table 1 shows descriptive statistics. Of the nearly 24 thousand alumni, approximately 80% are donors, meaning they donated at least once since graduation. The first panel shows the descriptive statistics for the full sample. We see that only 30% of alumnae are women. This is because the college began admitting women only in 1970. The average age of an alumnus/alumna is over 47 years. About 47% of alumni were members of Greek organizations. The 1999 median income in the zip codes where alumni reside is over 60 thousand dollars – quite a bit higher than the 1999 median household income of 42 thousand for the nation. The second panel shows descriptive statistics of the donors. The share of women among donors is slightly lower than among non-donors - most likely due to the fact that many donors are older, and that there are no older women alumnae. The donors are also more likely to be members of Greek organizations - 48% of donors participated in Greek organizations while only 33% of non-donors did so.

The average frequency of giving is about ten times over the 31 years of data. The maximum is 31 which means that at least one alumnus/alumna donated in every. The average amount given since graduation is about $5,700. This is much higher than the median of $305,

which indicates that the distribution of giving is skewed to the right with few very large gifts. The maximum amount given since graduation is over 20 million.

3. Empirical Analysis

3.1. Are women more likely to be donors?

In this subsection we estimate probit regressions where the dependent variable is whether the alumnus/alumna is a donor or not. In the first set of regressions, the dependent variable is whether or not an alumnus/alumna has *ever* given money to the college. In the second set, the dependent variable is whether or not an alumnus/alumna has given to the college in the last 10 years. The empirical model can be written as follows:

$$P(giving_i) = \alpha + \beta female_i + \gamma X_i$$

It estimates the probability of that an alumnus/alumna *i* is a donor as a function of gender and a vector of controls X_i. The vector of controls includes age, income in the alumnus/alumna's zip code and whether or not alumnus/alumna participated in Greek organizations. Controlling for age, Greek participation and income is important because all of these variables are correlated with gender and likely affect giving. For example, participation in Greek organizations is higher among males than females. If Greek organization engender more giving, failing to control for Greek participation would bias the coefficient on female downward.

The results are shown in Table 2, which reports the marginal effects of each variable on the probability of being a donor when all independent variables are at their mean. The results show that controlling for age, women are about five percentage points more likely to be donors than men. The effect is highly statistically significant and becomes even larger when controlling for whether or not the alumnus/alumnae was a member of a Greek organization, and controlling

for the median income in their zip code. When focusing on whether or not alumni gave in the last 10 years, women are again more likely to be donors than men.

The other independent variables also affect the probability of whether or not an alumnus/alumna is a donor. In particular, age is a strong predictor of whether or not someone is a donor. As expected, the older the alumni, the more likely they gave money. Similarly, members of Greek organizations are about seven percent more likely to be donors than those who were not. This result is consistent with the hypothesis that membership in Greek organization generate a stronger sense of loyalty with the college. Finally, the higher the zip code income, the higher the probability of giving.

3.2. Among donors, do women give more frequently?

The behavioral model behind our empirical specification treats the decision to be a donor separate from that of how much or how frequently one donates. In this subsection we focus on the decision of how frequently to donate *once* the decision to become a donor has been made. As Belfield and Beney (2000) argue, there may be interesting variation in the pattern of giving among donors that is masked if donors and non-donors are combined. Therefore, we consider the sample of alumni who gave at least once. We ask whether, conditional on having given at least once, women give more frequently than men. Since men are less likely to become a donor, focusing only on donors biases our results against finding that women more generous. For example, even if we find that among donors there is no gender difference, the fact that men are less likely to be a donor in the first place implies that men are less generous.

The dependent variable is the number of years in which an alumnus/alumna gave since graduation. The model can be written as follows

$$number\ of\ years_i = \alpha + \beta female_i + \gamma X_i$$

where *X* is a vector of controls identical to that in section 3.1.

The results, shown in Table 3, indicate that controlling for age, women give roughly 0.7 years more frequently than men. The effect is highly statistically significant. Given that the average number of years among donors is about ten, the effect is economically significant. The results are similar – although the magnitude is somewhat smaller – when we consider the number of times alumni gave in the last ten years: women again appear to donate more frequently than men.

As expected, the older alumni gave more times than younger alumni. Similarly, alumni living in zip codes with higher median incomes donate more frequently. Members of Greek organizations give more frequently than non-members.

3.3. Among donors, do women give larger total dollar amount?

The previous two subsections found that women are more likely to be donors and that conditional on being a donor, women give more frequently than men. This subsection examines the *size* of alumni donations. We ask whether conditional on having given at least once, the total amount given since graduation (or in the last ten years) is larger for women than men. The dependent variable is the logarithm of the value of all donations since graduation. Note that since we are focusing only on donors, the value of donations is always positive and therefore it is possible to take its logarithm. The model can be written as follows:

$$\ln\left(amount\ given_i\right) = \alpha + \beta female_i + \gamma X_i$$

The results are shown in Table 4. The coefficient on the female dummy in the first specification is positive and statistically significant at the 5% level. The coefficient becomes

significant only at the 10% level once we control for membership in Greek organization and median income in the zip code of the alumnus/alumna. When considering the size of donations in the last ten years – and focusing only on those who gave at least once in the last ten years, we find that women give no more than men. In summary, the evidence that women give greater total amount is rather weak. When we control for income and Greek participation it is significant only at the 10% level and when we consider donations in the last 10-years it is always insignificant. If women give more frequently but in the aggregate don't give any more than men, their typical gift must be smaller than that of men.[1]

We again find that older alumni have given more than younger alumni. In addition, members of Greek organizations give 19 percent more than non-members. Finally, those in richer zip codes give higher amounts. The elasticity of giving with respect to income is about 0.7.

3.4 Robustness checks

3.4.1 Dropping large donors

As the descriptive statistics table shows, the distribution of donations across alumni is skewed with a few very large donations. In this subsection we re-estimate some of the regressions from the previous three subsections while excluding these large donations. Specifically, we exclude the approximately two thousand alumni that have given more than one hundred thousand dollars since graduation. We are interested in whether the results we found in the previous two subsections hold with this smaller sample.

[1] Indeed, we re-estimated the regressions in Table 4 replacing the total amount given with the log of the average gift. We find that the average gift of women is about 10% smaller than that of men. The difference is statistically significant.

The first column in Table 5 shows the results from re-estimating the probit regression where the dependent variable is whether or not an alumnus/alumna is a donor. The coefficient on female is again positive and highly statistically significant, indicating that controlling for age, Greek membership and zip code income, women are about 6 percent more likely to be donors than men. In the second column, the dependent variable is the number of years an alumnus/alumna gave in since graduation. We see that again women give more frequently than men. Finally, in the third column the dependent variable is the logarithm of the value of donations. The coefficient on female is significant at the 10 percent level once again suggesting only weak evidence that women give more in total amount than men.

3.4.2 Quantile regressions

As an alternative way for dealing with large outliers in the dependent variable we estimate quantile regressions. The model estimates the median (rather than the mean) of the dependent variable conditional on independent variables. We use this method to estimate the effect of gender on median number of times an alumnus/alumna gave, and the effect of gender on total dollar amount given. We again use the sample of donors. The results, shown in Table 6 columns (1) and (2), show that women give more frequently confirming the results form Table 3. Columns (3) and (4) in Table 6 show that there is no statistically significant difference between the total dollar amount given by men and women.

3.4.3 Tobit estimation

Since alumni cannot donate negative amounts, the observed values of donations are censored at zero. Therefore, to analyze the determinants of donations for the entire sample

(donors and non-donors) a tobit model is appropriate. The model *combines* the decision of whether or not to be a donor and the decision of how much or frequently to donate. We estimate this as an alternative to our baseline analysis that differentiates between donors and non-donors.

The results are shown in Table 7. The coefficient on female is significant across all specifications indicating that women donate more frequently *and* higher total dollar amount than men. These results confirm that women appear more generous than men. This is not surprising given the earlier findings (women are more likely to donate; among donors women donate more frequently; and, if anything, among women give greater total dollar amount).

4. Conclusion

We find that women alumnae are more likely to be donors than their male counterparts. There is also strong evidence that among donors, women alumnae give more frequently than men. The evidence that women give more in total dollar amount is much weaker. Given the explicit hierarchy of recognition associated with the size of annual gifts but not with their frequency, the balance of evidence is consistent with the hypothesis that men's drive for recognition is stronger in men than women. It is also possible that women more easily form a long-term attachment to the college that manifests itself in regular small donations, whereas men act more on impulse and concentrate their giving in a few large gifts.[2]

Our results complement those in the existing experimental and empirical literature. They confirm outside of a laboratory setting that at least when it comes to the decision to donate, women tend to be more reciprocal than men. They also confirm that there is no simple answer as to which gender is more generous. It appears that each gender is altruistic in different ways and

[2] This interpretation is consistent with the psychology literature that finds women more helping and nurturing, and men more heroic and chivalrous (see Eagly and Crowley, 1986).

that each gender responds to cues and context in different ways. The nature of these differences seems to point to women donating smaller amounts but giving either more frequently or to more charities. For example, Belfield and Beney (2000) also find that women are more likely to donate but tend to give in smaller amounts. Andreoni et al. (2003) find that women prefer to give to *more* charities but to give *less* to each. To the extent that recognition can be thought of a lowering the price of giving, our results that men give more when there is more recognition is consistent with Andreoni and Vesterlund's (2001) result that men tend to give more when giving is cheap.

It is not clear how much the results from one small liberal arts college can be generalized to other contexts. Less than half of American population has college degrees and only a tiny fraction attends small liberal arts colleges. We see the significance of our work in that it complements the experimental work. It also adds to the body of empirical evidence by focusing on the difference between frequency and size of donations among donors. Moreover, the need for recognition and impulsiveness of giving by men, suggests different fundraising strategies for men and women. For example, given the results, it would appear that annual requests for donations may be more effective with women, while "special campaigns" may be more effective with men.

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Table 1: Descriptive statistics

The data comes from 31 years of alumni giving records at a small liberal arts college. Female is a dummy indicating gender of the alumnus/alumnae. Age is age in 2008 estimated as 2008 minus the graduation year plus 22. Greek equals one if the alumnus/alumnae participated in a Greek organization while in college. Zip code income is the 1999 median household in the zip code of the alumnus/alumnae's current address. # of years alumni gave is the number of years in which alumnus/alumnae gave since graduation. Total amount given is the dollar value of alumnus/alumna 's gifts since graduation.

	Panel a: Full Sample (n=23,760)				
	Mean	Median	St. Dev.	Min	Max
Female	0.30	0	0.46	0	1
Age	47.58	46	16.04	23	94
Greek	0.45	0	0.5	0	1
Zip code Income ('000)	62.58	58.52	25.31	0	200
	Panel b: Donors (n=19,316)				
	Mean	Median	St. Dev.	Min	Max
Female	0.29	0	0.45	0	1
Age	49.16	48	16.25	23	94
Greek	0.48	0	0.5	0	1
Zip code Income ('000)	63.47	59.87	25.62	0	200
# of Years Alumni Gave	9.88	6	9.16	1	31
Total Amount Given	5722.7	305	166798.7	1	21,160,000
	Panel c: Non-donors (n=4,444)				
	Mean	Median	St. Dev.	Min	Max
Female	0.31	1	0.46	0	1
Age	40.68	39	13.03	23	94
Greek	0.33	0	0.47	0	1
Zip code Income ('000)	58.44	54.54	23.37	12.31	185.47

Table 2: Are women more likely to be donors?

The Table shows results from probit regressions. Marginal effects evaluated at means of independent variables are shown. Z-statistics are in parentheses. ***, **, * indicate significance at 1, 5 and 10 percent respectively.

	Dependent variable: whether or not alumni ever gave		Dependent variable: whether or not alumni gave in the last 10 years	
	(1)	(2)	(3)	(4)
Age	0.01***	0.01***	0.00***	0.00***
	(34.30)	(36.19)	(7.08)	(9.90)
Female	0.05***	0.06***	0.07***	0.09***
	(10.08)	(11.99)	(10.07)	(11.85)
Greek		0.07***		0.09***
		(14.24)		(14.35)
Log of median income		0.06***		0.08***
		(9.03)		(10.08)
Observations	23,760	22,085	23,760	22,085

Table 3: Among donors, do women give more frequently?

In columns 1 and 2 the sample includes alumni who gave at least once since graduation. In columns 3 and 4 the sample includes alumni who gave at least once in the last 10 years. Robust t-statistics are in parentheses. ***, **, * indicate significance at 1, 5 and 10 percent respectively.

	Dependent variable: number of years in which alumni gave since graduation		Dependent variable: number of years in which alumni gave in the last 10 years	
	(1)	(2)	(3)	(4)
Age	0.34***	0.36***	0.12***	0.12***
	(95.19)	(98.19)	(75.65)	(74.42)
Female	0.72***	0.68***	0.39***	0.31***
	(5.62)	(4.44)	(6.56)	(5.13)
Greek		-0.15		-0.21***
		(-1.34)		(-4.07)
Log of median income		1.78***		0.67***
		(12.92)		(10.32)
Constant	-7.12***	-14.74***	-0.96***	-3.57***
	(-35.28)	(-24.79)	(-10.61)	(-12.85)
Observations	19,316	18,194	19,316	18,194
R-squared	0.35	0.38	0.11	0.14

Table 4: Among donors, do women give greater dollar amount?

In columns 1 and 2 the sample includes alumni who gave at least once since graduation. In columns 3 and 4 the sample includes alumni who gave at least once in the last 10 years. Robust t-statistics are in parentheses. ***, **, * indicate significance at 1, 5 and 10 percent respectively.

	Dependent variable: log of total donations		Dependent variable: log of total donations in the last 10 years	
	(1)	(2)	(3)	(4)
Age	0.08***	0.08***	0.07***	0.07***
	(82.57)	(86.61)	(77.45)	(75.57)
Female	0.07**	0.06*	-0.03	-0.05
	(2.00)	(1.78)	(-1.01)	(-1.49)
Greek		0.20***		0.12***
		(6.89)		(4.09)
Log of median income		0.73***		0.64***
		(20.56)		(17.96)
Constant	1.76***	-1.41***	2.04***	-0.59***
	(33.12)	(-9.18)	(40.66)	(-3.84)
Observations	19,316	18,192	14,803	14,224
R-squared	0.29	0.34	0.33	0.34

Table 5: Robustness checks: results without large donors

The first column is a probit regression. Marginal effects evaluated at means of independent variables are shown. Z-statistics are in parentheses. The first column uses the full sample (donors and non-donors). Columns 2 and 3 use only alumni/ea who gave at least once since graduation. In columns 2 and 3 robust t-statistics are in parentheses. ***, **, * indicate significance at 1, 5 and 10 percent respectively.

	Dependent variable: whether or not alumnus/alumnae ever gave (1)	Dependent variable: number of years an alumnus/alumnae gave since graduation (2)	Dependent variable: logarithm of total value of gifts since graduation (3)
Age	0.01***	0.36***	0.08***
	(36.19)	(98.19)	(86.61)
Female	0.06***	0.58***	0.06*
	(11.99)	(4.44)	(1.78)
Greek	0.07***	-0.15	0.20***
	(14.24)	(-1.34)	(6.89)
Log of median income	0.06***	1.78***	0.73***
	(9.03)	(12.92)	(20.56)
Constant		-14.74***	-1.41***
		(-24.79)	(-9.18)
Observations	22,083	18,192	18,194
R-squared		0.38	0.34

Table 6: Robustness check: Quantile regressions

In columns 1 and 2 the sample includes alumni who gave at least once since graduation. In columns 3 and 4 the sample includes alumni who gave at least once in the last 10 years. Quantile regressions estimate the median of the dependent variable conditional on the independent variable. ***, **, * indicate significance at 1, 5 and 10 percent respectively.

	(1)	(2)	(3)	(4)
	Dep. var: # of times given		Dep. var: Total amount given	
VARIABLES	ever	last 10 years	ever	last 10 years
Age	0.39***	0.11***	28.42***	7.61***
	(108.85)	(83.73)	(103.79)	(68.30)
Female	0.30**	0.17***	-5.60	3.42
	(2.29)	(3.41)	(-0.57)	(0.85)
Greek	0.11	0.12***	73.36***	22.06***
	(1.02)	(2.94)	(8.85)	(6.54)
Log of median income	0.99***	0.35***	85.67***	39.28***
	(7.29)	(6.82)	(8.23)	(9.27)
Constant	-13.37***	-3.41***	-1,137.87***	-345.01***
	(-22.79)	(-15.42)	(-25.37)	(-18.89)
Observations	18,192	18,192	18,192	18,192

Table 7: Robustness check: Tobit

Using full sample (donors and non-donors), the Tobit model estimates the effects of independent variables on the latent dependent variable because the observed dependent variable is censored at zero. ***, **, * indicate significance at 1, 5 and 10 percent respectively.

	(1)	(3)	(5)	(7)
	Dep. var: # of times given		Dep. var: Total amount given	
VARIABLES	ever	last 10 years	ever	last 10 years
Age	0.40***	0.11***	147.83***	57.28***
	(101.74)	(47.72)	(46.75)	(26.05)
Female	1.38***	1.00***	429.89***	341.50***
	(10.02)	(11.92)	(3.86)	(4.37)
Greek	0.80***	0.67***	1,087.47***	742.17***
	(6.81)	(9.32)	(11.42)	(11.06)
Log of median income	2.30***	1.26***	1,532.26***	1,060.17***
	(15.47)	(13.88)	(12.79)	(12.57)
Constant	-21.70***	-9.01***	-13,055.00***	-8,013.16***
	(-34.18)	(-23.27)	(-25.45)	(-22.21)
Observations	22,085	22,085	22,085	22,085