

THE HABIT OF GIVING

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Many charitable organizations believe it is worthwhile to solicit very small donations, particularly from young people, because these gifts form a habit of giving which leads to larger donations in the future. Indeed, there is some evidence of a positive correlation between giving when young and giving when old. However, such a correlation, by itself, does not constitute evidence of habit formation. Using data on alumni contributions to a university, we assess whether the correlation is due to habit formation—true state dependence—or to unobservable factors such as affinity to the school. We further examine whether habits form by the mere act of giving or based on the amount given. We implement an instrumental variables approach using the fact that performance of the school’s athletic teams and solicitation by one’s former roommates generate shocks to giving while young that are plausibly uncorrelated with giving when older. There is strong evidence of habit formation on the extensive margin, but not in the amount given. This finding has important implications for fundraising strategies, charities’ accounting practices, and tax policy. (JEL D64, D91, D12)

I. INTRODUCTION

Habit formation is thought to exert great influence on behavior. It has been proffered as a potential answer to questions as disparate as the size of the equity premium (Abel 1990), optimal purchases of insurance (Ben-Arab, Briys, and Schlesinger 1996), labor force participation (Woittiez and Kapteyn 1998), the relationship between savings and growth rates (Carroll, Overland, and Weil 2000), responsiveness to monetary policy (Fuhrer 2000), the importance of brand loyalty (Gupta, Chintagunta, and Wittink 1997), and the existence of a “gateway” effect between alcohol and illegal drug use (Pacula 1998). Yet there is scant discussion in the economics literature about long-term habit forming. Most studies focus on shorter-term intertemporal relationships, like changes in

annual consumption (see, *inter alia*, Naik and Moore 1996; Dynan 2002; Carrasco, Labeaga, and López-Salido 2005). The importance of early influences on later risk taking (Malmendier and Nagel 2007) and motivations for purchasing different goods (Portolese-Dias 2004) has been hypothesized. Yet there is little direct evidence on the long-term impact of shocks to behavior early in life, particularly in the way that preferences form and evolve. One recent exception is the study of Bronnenberg, Dube, and Gentzkow (2010), who use variation in consumers’ previous states of residence to show that early exposure to particular brands of package goods affects purchasing behavior decades later.

Charities, in particular, care about building relationships with their donors and expend a great deal of effort in the pursuit of small gifts, with the expectation that they may lead to larger gifts in the future. Universities seem to be convinced that this strategy is effective, and with \$8.7 billion raised from alumni in 2008, the stakes are high (Council for Aid to Education 2009). The dean of alumni affairs at Columbia University stated that “it isn’t about

*I am grateful to Nicole Arshan, B. Douglas Bernheim, Kevin Cotter, William Hardt, Han Hong, Caroline Hoxby, Liam Morton, Sriniketh Nagavarapu, Kyle Pubols, David Roodman, Harvey Rosen, Andres Santos, Jeffrey Yellin, and seminar participants at Rice University, the University of Houston, the American Economic Association, and Texas A&M University. I am especially indebted to Edward Van Wesep. This research was supported in part by the Stanford Institute for Economic Policy Research and by the Koret Foundation.

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ABBREVIATION

Anon U: Anonymous University

2002

the dollars,” and that the purpose of getting young alumni to donate is to create a habit of giving (Durkin 2005). Fundraising professionals agree—one consultant explained, “I would never say that a small gift is not important because it’s building that relationship. If you don’t build those relationships today, you may not have their interest when the day comes that they can give those \$101 million donations” (Westmoreland 2008). This sentiment was echoed by an expert on senior class giving at the Council for Advancement and Support of Education, who explained that “the goal [of these programs] is not to raise money, but to begin a pattern of behavior” (Ensign 2010).

There is scant evidence that this belief is justified. While a number of studies have documented a positive correlation between giving when young and giving when older (see Monks 2003; Turner, Meserve, and Bowen 2001), this may be driven by a number of factors that have nothing to do with building a relationship. This correlation may actually represent spurious state dependence that arises from unobserved heterogeneity—like the alumnus’s affinity for the school. This is contrasted with true state dependence, in which a donation in one period affects preferences for donating in a later period.

While participation rates are a factor in university rankings, it seems evident that development officials assume that habit-forming in charitable contributions exists and justifies the pursuit of small gifts when alumni are young, with the expectation that this will lead to larger gifts in the future. These beliefs hinge on the idea that a habit can form by the simple act of making a gift, and that the amount given is possibly irrelevant. In essence, the proponents of this idea believe that giving regularly when young will cause the individual to be in a state of “focus” for giving when older—willing to make a larger gift, perhaps because they are accustomed to giving to the charity in each year. Standard models of habit forming, in which the amount given in an earlier period affects a stock variable and the individual incurs disutility from deviating from this level, do not account for this phenomenon. Those models imply that individuals are in the habit of giving a certain amount of money per year, not that they are in the habit of giving in general.

This article proposes a simple model that predicts habit forming from both the amount of giving and whether a gift is made, and uses a

unique data set to measure the relative importance of these effects. We study alumni contributions to an anonymous private selective research university, henceforth referred to as Anon U. The proprietary data provided by Anon U contain detailed information about donations made by alumni as well as a variety of their economic and demographic characteristics. Using information about athletic performance and solicitation by peers allows us to estimate measures of habit forming in charitable giving untainted by unobserved heterogeneity.

As with all studies that focus on usefully unusual settings, generalizability is an open question. It is quite possible that these estimates cannot be directly applied to other types of charities, let alone to the development of habits in brand preferences or drug use, among other applications. However, the detail and scope of the data are particularly well suited to answer questions about habits in this particular context. At minimum, one expects that other universities considering a fundraising program oriented toward young alumni may take these findings as strongly suggestive. More importantly, the results provide insight into the formation of preferences that more representative data cannot, and future work using other distinct cases can establish a case for generalizability.

Section II discusses prior work. Section III describes the Anon U data set, while Section IV presents an empirical model of habit formation in charitable giving and describes the identification strategy. Section V presents the results, which show that persistence in charitable giving is mostly driven by frequent giving when young, not the amount of giving when young. Section VI concludes and provides suggestions for future research.

II. PREVIOUS RESEARCH

Perhaps due to the difficulties of separating true state dependence from spurious correlation, there is little research that directly addresses persistence in donations. In a paper analyzing panel data from income tax returns, Auten, Sieg, and Clotfelter (2002) note that “habit formation is probably not very important in charitable behavior,” as they fail to find significantly positive autocorrelations of donations over time. Monks (2003) mentions, in passing, that “[i]dentifying young alumni who are more likely to give and encouraging them to do so, even in modest dollar amounts, may have significant lifetime giving

effects.” Turner, Meserve, and Bowen (2001) concur, explaining that “participation rates are often thought to be... important precursors of giving patterns later in life. In this regard, young alumni are sometimes encouraged to make token gifts... so that they may begin a habit of giving back.” Lindahl and Winship (1994), in an effort to identify large donors, model giving to Northwestern University between 1988 and 1990 as a function of earlier giving and other predictors. As their purpose is solely to identify these large donors, they admit that causality is unclear and go as far as to say that they “would not be at all surprised to find that past giving had little or no ‘true’ effect on current giving.” Smith, Kehoe, and Cremer (1995) look at how a household’s “altruistic history” affects its probability of making a donation to a local health clinic, using indicators for donations to other charities in the previous year. They find that prior donations to non-religious charities are associated with a higher likelihood of donation, but this relationship is taken as a proxy for attitudes toward altruism rather than a causal relationship. Finally, Rosen and Sims (2011) use a series of cross-sections of the Survey of Giving and Volunteering that include retrospective questions on volunteering as a child. They find that childhood volunteering is strongly correlated with contemporaneous giving and volunteering behavior. They proxy for family attitudes toward altruism by including volunteering by the respondent’s parents when the respondent was a child as a control and conclude that their results are “consistent with the notion that altruistic behavior is habit forming.” The study is hampered, however, by the use of retrospective questions rather than panel data and, importantly, an inability to examine the dimensions on which habits form.

III. DATA

Our primary data source is the administrative archives of Anon U’s Development Office, which contain information on all alumni donations from 1983 to 2009. The data are proprietary and sensitive, and individuals’ names were stripped from the records before being made available to us. Our unit of observation is the individual. We define giving when young as the log of the average gift made between graduation and the end of the alumnus’s fifth year since graduation, that is, through the first major reunion. Frequent givers when young are those

who gave in each of the first 5 years after graduation, irrespective of amount. Giving when older is defined in two ways: first, as the log of the average gift made between the alumnus’s 20th year since graduation and 2009. Second, large gifts when older are defined using an indicator equaling one if the alumnus was in the top 10% in his or her class in total giving between the 20th year since graduation and 2009. An alternate specification redefines both of these measures using the gifts made between 15 years after graduation and 2009 for classes with at least 20 years of data in the sample.

The Development Office data also include information on academic major and minor, extracurricular activities when the alumnus was an undergraduate, several variables that can be considered as proxies for affinity (such as payment of class dues), post-graduate education, residence, whether he or she is married to another graduate of Anon U, and location in a given year. Anon U’s Registrar supplemented these data with information on SAT scores, academic honors, ethnicity, type of high school, summary evaluations made by the Admissions Office during the application process, and college grade point average.

In addition, we have information regarding varsity athletic teams on which the alumnus participated as an undergraduate, as well as the team’s conference finish in each year. This provides a valuable source of exogenous variation. As discussed below, variables indicating whether the varsity team on which the alumnus participated as an undergraduate—if any—won its conference championship have a transitory effect on giving. The data also contain information about the volunteering activities of alumni. Variables indicating whether an alumnus’s former freshman year roommate is a solicitor in that year also provide exogenous shocks to giving. Further discussion of these measures and their use as instrumental variables is in Section IV; see Meer and Rosen (2009) for a more complete discussion of the role of athletics in alumni giving and Meer (2011) for more details on the effects of peer influence on charitable giving.

Since we need to observe the first 5 years of an alumnus’s giving history, the oldest class that can be included in the sample is the class of 1982, for which the first giving opportunity was 1983. This limitation is not ideal, since the alumnus’s giving histories do not extend through the entirety of peak earnings years; members of the class of 1982 are about 49 years old at the end

of our sample. Moreover, a relatively limited amount of data is available past the 20 years-since-graduation mark—the class of 1982 has 8 years of data comprising their measure of giving when older. However, the richness of our data should enable us to examine the mechanisms by which habits form in charitable giving.

Freshman year roommate information was not recorded for the class of 1983. Focusing on alumni from classes of 1982 to 1989, excluding 1983, the sample includes 7,324 alumni giving histories. Dropping those with missing covariates and those who died prior to 2009 leaves 7,113 individuals; 71.3% of these individuals made gifts of any size between their 20th year since graduation and 2009, with a mean positive average gift, in 2009 dollars, of \$2,039.14, and a median of \$119.79.¹ Examining their giving when young, in the first 5 years since graduation, 80.1% made any gift, and 26.3% of individuals gave in each of those first 5 years. This latter category is our definition of frequent givers when young. The mean positive average gift in this period in 2009 dollars, is \$51.02, with a median of \$25.37. It is clear that giving is characterized by large outliers; in our estimates, therefore, we take logs of the amount of giving.²

The raw data indicate that there is a relationship between giving when young and giving when older. The correlation between the log of the average gift in the first 5 years and the log of the average gifts from the 20th year after graduation onward is 0.50. Among those who were not frequent givers when young, 63.3% gave at least once when older, while the giving rate when older is 93.5% among those who were frequent givers when young. The mean gift when older, conditional on giving, for those who were not frequent givers when young is \$1,203.99 with a median of \$100.07, while for those who were frequent givers, the respective figures are \$3,626.26 and \$189.76. However, one cannot

ascribe a causal relationship to these differences—unobserved affinity drives both giving when young and giving when older.

Unfortunately, the data include no direct information on income, which is clearly an important determinant of giving. However, for a large subset of these alumni, 5,599 individuals, we have information that is closely related to permanent income: field and occupation. The start- and stop-dates for these variables are unreliable; we therefore create a series of indicators for whether the alumnus was ever employed in that field or at that occupation. We estimate the model with this subsample, including the field and occupation data, in order to see whether our results are sensitive to their inclusion.³

Table A1 contains summary statistics and definitions of the variables used in this study, including field and occupation variables.

IV. MODEL AND EMPIRICAL APPROACH

A. Model

We begin with the outline of a model that allows for habit formation based on both the amount given when young, in period 1 (g_1), and whether the individual gave when young. Individuals can either be in a non-giving state when young or a giving state. That is,

$$(1) \quad g_1 = \begin{cases} 0 & w/\text{prob.} \quad 1 - P_1(m_1) \\ \arg \max_{g'_1 \geq 0} u_1(g'_1, R_1 - g'_1; n_1) & \\ w/\text{prob.} \quad P_1(m_1) & \end{cases}$$

where R_1 is resources when young, m_1 is fundraising effort by the charity in the pursuit of small gifts (that is, in convincing potential donors to make any gift at all, perhaps by making potential donors aware of the charity and its needs), and n_1 is fundraising effort by the charity in the pursuit of larger gifts (for example, through more intense solicitation). $P_1(m_1)$ is increasing in m_1 , so an individual is more likely to be in the giving state if the charity pursues small gifts. Conditional on being in the giving state, the individual maximizes a utility function that is differentiable and increasing in each argument.

3. Estimating the model without field and occupation covariates, but using the field and occupation sample, shows no qualitative differences with the results from the full sample.

1. Examining the sum of gifts made from the 15th year since graduation onward by these individuals, 79.3% made a gift of any size, with a mean positive average gift of \$1,100.85 and a median of \$98.44.

2. A logarithmic transformation presents problems for observations that take a value of 0; 66 individuals have an average gift greater than 0 but less than or equal to \$1.00 when young, along with 17 such observations when older. We set these equal to \$1.01. Therefore, observations for which there is no giving are associated with \$1, whose logarithm is 0.

Period 2 resources are random, reflecting the university's uncertainty about which of its alumni will have high incomes in the future. Once again, individuals can be in either a non-giving state or a giving state

$$(2) \quad E[g_2] = \begin{cases} 0 & w/\text{prob. } 1 - P_2 \quad (m_2, I(g_1 > 0)) \\ \arg \max_{g'_2 \geq 0} u_2(g'_2, R_2 - g'_2, g_1; n_2) & \\ w/\text{prob. } P_2(m_2, I(g_1 > 0)) & \end{cases}$$

where R_2 are realized resources in the second period, m_2 is fundraising effort by the charity in the pursuit of small gifts, and n_2 is fundraising effort by the charity in the pursuit of large gifts. The probability of being in the giving state is now determined by both fundraising effort on the extensive margin and whether the individual was a giver in the first period, with the probability increasing on both dimensions.

Assumption 1: The marginal utility from giving in both periods is increasing in the charity's contemporaneous solicitation efforts.

Assumption 2: The discount factor between the two periods is very small.

Assumption 3: The marginal utility from giving in period 2 is not decreasing in period 1 giving.

The increasing marginal utility in Assumption 1 may stem from a variety of sources, including benefits from additional recognition, warm glow, or the alleviation of increased social pressure from additional solicitation.⁴ Assumption 2 prevents agents in the early period from being forward looking, which is consistent with the time lapse between the early and later periods in our data and allows the two functions to be maximized separately. Assumption 3 requires that those who give earlier not feel decreased satisfaction from continuing to give, which seems reasonable.

To show that gifts in period 1 are increasing in resources and the charity's efforts, we show that u_1 is supermodular in g_1 and the

parameters R_1 and n_1 . Given the differentiability assumption, it is sufficient to show that the mixed partial derivatives between the choice of gift and parameters are weakly positive. Concavity assures this for financial resources, while Assumption 1 assures it for solicitation intensity.

$$(3) \quad [\partial u_1 / (\partial g_1 \partial R_1)] > 0$$

$$(4) \quad [\partial u_1 / (\partial g_1 \partial n_1)] > 0$$

From Equations (3) and (4), and Topkis's theorem, we have

$$(5) \quad [(\partial g_1(R_1, n_1)) / \partial R_1] \geq 0$$

$$(6) \quad [(\partial g_1(R_1, n_1)) / \partial n_1] \geq 0$$

Gifts in period 1 are increasing in resources and the charity's solicitation efforts in the pursuit of larger gifts.

Next, we show that $E[g_2]$ is weakly increasing in $I(g_1 > 0)$, R_2 , n_2 , and g_1 . Note that $g_2 = 0$ in the nongiving state and is constant with respect to $I(g_1 > 0)$ in the giving state; $I(g_1 > 0)$ only affects the probability of being in the giving state. Since $P_2(m_2, 1) > P_2(m_2, 0)$, $E[g_2]$ is weakly increasing in $I(g_1 > 0)$. It is also the case that

$$(7) \quad [\partial u_2 / (\partial g_2 \partial R_2)] > 0$$

$$(8) \quad [\partial u_2 / (\partial g_2 \partial n_2)] > 0$$

$$(9) \quad [\partial u_2 / (\partial g_2 \partial g_1)] \geq 0$$

The arguments behind Equations (7) and (8) are equivalent to those behind Equations (3) and (4), while Assumption 3 implies Equation (9). Therefore, we see that

$$(10) \quad [\Delta E[g_2(R_2, n_2, g_1)] / \Delta I(g_1 > 0)] \geq 0$$

$$(11) \quad [\partial E[g_2(R_2, n_2, g_1)] / \partial g_1] \geq 0$$

Thus, giving in the second period will be higher both if the individual gave at all when young and if the individual gave a larger amount when young.

Do habits form as a result of the size of the gift, or from the act of giving a gift when young irrespective of the size, or both? Merely estimating a model of giving in period 2 as a function of giving in period 1 and being a frequent giver in period 1 will not yield estimates with a causal interpretation. After all, giving when both young and old could be driven by some unobservable variables, such as affinity for the school. Equations (12) to (14) show a

4. For a discussion of social pressure in charitable giving, see Meer (2011). It is also possible that increased solicitation results in lower marginal utility. Diamond and Noble (2001), using results from a small survey, find that donors may develop defense mechanisms in response to frequent or aggressive solicitation. We assume that Equation (3) holds in the region with which we are concerned.

specification that is consistent with the model described above

$$(12) \quad \begin{aligned} Y_{2i} &= \max(0, \beta_1 Y_{1i} + \beta_2 D_{1i} + \mathbf{X}_i \gamma + v_{2i}) \\ v_{2i} &= \mu_i + \varepsilon_{2i} \end{aligned}$$

$$(13) \quad \begin{aligned} Y_{1i} &= \max(0, \phi_1 Z_{1i} + \mathbf{X}_i \delta + v_{1i}) \\ v_{1i} &= \mu_i + \varepsilon_{1i} \end{aligned}$$

$$(14) \quad \begin{aligned} P(D_{1i} = 1) &= F(\phi_1 Z_{1i} + \mathbf{X}_i \lambda + \eta_{1i}) \\ \eta_{1i} &= \mu_i + \omega_{1i} \end{aligned}$$

Y_{2i} is the log of the average gift in the 20th year after graduation and onward, Y_{1i} is the log of the average gift in the first 5 years after graduation, D_{1i} is an indicator for being a frequent giver in period 1—making a gift in each of the first 5 years after graduation—while \mathbf{X}_i is a vector of covariates described in Table A1.⁵ β_1 and β_2 represent true state dependence, that is, the actual effect of giving behavior in period 1 on giving in period 2. But spurious state dependence can be present as well—note that the error term consists both of a period 2 specific shock and a time-invariant effect. The latter, μ_i , represents unobserved affinity, which is related to giving behavior in both periods. Higher levels of μ_i are associated with higher Y_{1i} , a higher probability that D_{1i} equals one, and higher Y_{2i} , leading to spurious state dependence. Since μ_i affects both Y_{1i} and D_{1i} , estimating Equation (12) without accounting for this correlation results in biased estimates.

B. Identification

An instrumental variables approach is required in order to identify the causal effect of giving when young on giving when older. In particular, we require a set of variables Z_{1i} that plausibly affect Y_{1i} and D_{1i} , but are uncorrelated with μ_i and ε_{2i} . The athletic performance and roommate solicitation variables mentioned in Section II meet these requirements and are described below.

Athletic Performance. We construct an indicator taking a value of 1 if the varsity athletic

team on which the alumnus participated as an undergraduate, if any, won its conference championship in any of the first 5 years after graduation. Previous research has documented that alumni who participated on an athletic team have an increased propensity to donate in years in which their former team does particularly well, fulfilling the relevance criterion (Meer and Rosen 2009). Lack of correlation between athletic performance and ε_{2i} also seems fairly evident. There is no reason to think that an alumnus's former team's performance in the first few years after graduation will be correlated with a shock to giving 15 to 20 years later.

The possibility of correlation between athletic performance and μ_i is more worrisome. First, it is likely that there is correlation between the performance of the alumnus's team *while* he or she was an undergraduate and his or her affinity, as measured by μ_i . If there is also correlation between a team's performance from year to year, this may lead to correlation between Z_{1i} and μ_i . We account for this possibility by including, in \mathbf{X} , a set of indicators taking a value of 1 if the alumnus's team, if any, won a conference championship in his or her freshman, sophomore, junior, or senior year.⁶ A second possible problem is that if affinity is a stock variable and shocks to it do not dissipate from year to year, then the athletic performance variables may have long-lasting effects and may not be excluded from Equation (12). The long period of time between periods 1 and 2 in our data, though, make this scenario very unlikely. For this mechanism to be operative, one would have to believe that giving between 2002 and 2009 for an alumnus who graduated in 1982 is substantially directly affected by whether his or her former team won a conference championship in, say, 1985.⁷ Evidence from Meer and Rosen (2009) also shows there is still a strong effect of winning on giving in specifications with individual fixed effects. As such, we do not believe that this problem afflicts our results.

Slightly more than a third of individuals in our sample participated in varsity athletics. Conditional on being an athlete, 57.6% of individuals' former teams won a championship during

5. Means of time-varying variables—specifically, the location effects—for each alumnus are used in \mathbf{X} . Graduating class-year effects are also included, which account for any cohort-specific shocks during those individuals' time at the university, as well as the number of years since their graduation.

6. Including sets of indicators for second, third, and other finishes in each undergraduate year does not affect the results, alleviating concern about intertemporal correlation in team performance introducing bias.

7. An indicator for the performance of the alumnus's team in the 20th year after graduation and onward is also included in the model.

TABLE 1
First Stage Estimates^a

	(1) Log Average Giving when Young	(2) Frequent Giver when Young
Freshman roommate was solicitor in the first 5 years	0.0709* (0.0379)	0.0189** (0.0089)
Team championship in the first 5 years	0.139** (0.0634)	0.0268* (0.0150)
Joint probability of significance in equation	0.0136	0.0128
Joint probability of significance across equations	0.0272	

^aResults in this table are based on 7,113 observations on alumni graduating in the classes of 1982 through 1989, excluding the class of 1983. Column (1) reports unconditional marginal effects on the log of giving when young based on results from the conditional recursive mixed-process estimator (Roodman 2009) corresponding to Column (1) in Table 3. Column (2) reports marginal effects on the probability of being a frequent giver when young, based on results from a conditional recursive mixed-process estimator corresponding to Column (1) in Table 3. Robust standard errors are reported in parentheses. In addition to the variables listed above, models include cohort effects, the covariates listed in Table A1, and location effects (averaged over each alumnus's post-graduation history). Full results are available on request.

*Significant at the 10% level; **significant at the 5% level.

the relevant period; this corresponds to an overall rate of 20.3%. Table 1 shows the coefficients for the team championship variable, drawn from estimates of Equations (13) and (14) above and described in Section III.C. Winning the conference championship in the first 5 years after graduation is associated with approximately 14% (SE = 6.3%) higher giving in the first 5 years after graduation and a 2.7 percentage points (SE = 1.5 percentage points) higher likelihood of being a frequent giver when young.

Roommate Solicitation. Turning to the solicitation variables, we construct an indicator taking a value of 1 if the individual's former freshman year roommate is a solicitor at any point in the first 5 years after graduation.⁸ Approximately

8. Start and stop dates for volunteers are not reliable prior to 1992. Therefore, this variable measures whether an individual's freshman year roommate is listed as having been a solicitor in 1991 or earlier. Clearly, for younger classes this is quite close or identical to whether the alumnus's roommate was a solicitor in the first 5 years after graduation. For older classes, the variable is merely measured with some noise.

30% of the sample satisfies this definition.⁹ Meer (2011) shows that the presence of such a relationship affects giving in the years in which an individual has a roommate solicitor. Correlation with the error terms when older seems unlikely for same reason as athletics; there is no reason to believe that having a former freshman year roommate who is a solicitor in the first few years after graduation is correlated with shocks to giving 20 years later.

Correlation with unobserved affinity is potentially more problematic. An individual's affinity for the school (and therefore giving) is likely to be correlated with his or her roommate's; if both have high affinity due to common experiences, there may be a spurious correlation between an alumnus's giving and his or her roommate's volunteering. Meer (2011) analyzes whether the relationship between the alumnus's giving and his or her former roommate's volunteering is because of joint affinity shocks. Freshman roommates at Anon U are conditionally randomly assigned and thus do not represent potentially endogenous sorting. However, common shocks to affinity might still drive the relationship between one alumnus's donations and another's volunteering as a solicitor. Several diagnostics are used to evaluate this question. First, there is no correlation between nonsolicitation types of volunteering, which should also be related to unobserved affinity, and former roommates' giving. Second, the timing of these personal solicitations is such that a peer effect should only be observed toward the end of the fiscal year; this is the case. Finally, and most powerfully, fixed effects estimates, controlling for all time-invariant affinity, show an increase in giving in years when an alumnus's former freshman year roommate is a solicitor. Thus, the results of that work strongly indicate that this peer influence on charitable giving is not due to spurious correlation. Rather, it represents a transitory shock to giving behavior.¹⁰

9. A total of 6.8% of individuals had both a former freshman roommate who was a solicitor and a former team that won a conference championship in the first 5 years; thus, approximately 44% of individuals fall into at least one category.

10. It is certainly possible that alumni who volunteer as solicitors when young also do so when older, influencing their former roommates' giving in both periods and introducing spurious correlation. An indicator for whether the individual's freshman year roommate is a solicitor in the later period is included to account for this possibility.

Table 1, again drawing on the estimates described in Section III.C, shows that having a former freshman year roommate who is a solicitor in the first 5 years after graduation is associated with 7.1% (SE = 3.8%) higher giving when young and 1.9 percentage points (SE = 0.89 percentage points) higher likelihood of being a frequent giver. Coupled with the results in first subsection of III.B, the instruments are jointly significant in both equations separately and across both equations.

Other Potential Issues. There are several additional possible concerns about these instruments. It is possible that β_1 and β_2 are measuring a selection effect rather than habit forming. It may be that the Development Office targets individuals in period 2 who were large or frequent donors in period 1, and this increased solicitation is responsible for the correlation between giving in the two periods. We have no way of definitively proving or disproving this hypothesis. However, it is important to note that at Anon U, all alumni are solicited in essentially the same way, with the exception of a small number of extremely large givers. This is especially true when the alumni are young; indeed, an Anon U development officer explained that this is a deliberate practice, precisely to foster the habit of giving and avoid crowding out small donations with large gifts from a few alumni within a class. Thus, this mechanism is unlikely to be driving the estimates of β_1 and β_2 . Furthermore, if this effect were actually driving the results, then estimates that drop large givers would be very different from the main specifications. Dropping the top 1% of givers in the young period has little qualitative effect on the

results presented in Section IV; we therefore conclude that the possibility of increased solicitation based on earlier giving is unlikely to be affecting the results.

C. Estimation

We estimate Y_{1i} and D_{1i} with, respectively, a Tobit and a probit, as a function of Z_{1i} and \mathbf{X}_i . These models are shown in Equations (13) and (14), where F is the cumulative normal distribution function. We estimate Equations (12), (13), and (14) jointly using Roodman's (2009) conditional recursive mixed-process estimator. Roodman's method is appropriate for models with clearly defined stages in which endogenous variables appear as observed, that is, not as latent variables. Given that the model above posits that habits form through actual choices, and not an underlying desire to give, the specification meets these criteria. With the assumption of joint normality of the errors, Roodman shows that numerical estimation provides consistent estimates of the parameters of interest, β_1 and β_2 . If the amount given when young truly has an effect on giving when older, then β_1 will be positive; if focus mechanism is operative, then β_2 will be positive. See Roodman (2009) for a full description of this approach, as well as a guide to implementation.

V. RESULTS

A. Amount of Giving

We begin by examining whether habit forming has an effect on the average gift given when older. Table 2 presents unconditional marginal

TABLE 2
Uninstrumented Estimates—Amount of Gifts^a

	(1) Twenty Years On	(2) Fifteen Years On	(3) Field and Occupation
Log average giving when young	0.298** (0.0217)	0.343** (0.0173)	0.303** (0.0253)
Frequent giver when young	0.0499 (0.0532)	-0.0559 (0.0467)	0.0256 (0.0604)

^aColumns (1) and (2) are based on 7,113 observations on alumni graduating in the classes of 1982 through 1989, excluding the class of 1983. Column (3) is based on 5,599 observations with complete data on field and occupations. This table reports unconditional marginal effects on the amount of giving when older, generated by a Tobit model without instrumenting for the log of giving when young and the frequent giver when young indicator. Robust standard errors are reported in parentheses. In addition to the variables listed above, models include cohort effects, the covariates listed in Table A1, and location effects (averaged over each alumnus's post-graduation history). Column (3) includes the field and occupation variables listed in Table A1. Full results are available on request.

*Significant at the 10% level; **significant at the 5% level.

effects from a Tobit model without instrumental variables—that is, estimating Equation (4) above. Column (1) shows marginal effects for the average gift given from the alumnus's 20th year since graduation through 2009. The elasticity of giving between young and old is about 0.30, meaning that a 10% increase in giving when young is associated with a 3% increase in giving when old. Given the means of giving, this implies that an approximately \$4 increase in the average amount given when young is associated with an approximately \$44 increase in the average amount given when older. Being a frequent giver when young is associated with a statistically insignificant 5.0% higher average giving when older.

As mentioned above, limiting the sample to the 20th year after graduation and later leaves relatively few giving opportunities for each alumnus. Taking the average gift from the 15th year after graduation through 2009 for those who, by 2009, graduated more than 20 years previously reduces the likelihood that the results are not being driven by those alumni who give smaller gifts more frequently. Those results, in Column (2), show similar results to Column (1). Including proxies for income, like field and occupation, do not affect the results either (see Column (3)). These variables are related to permanent income, which will obviously be a driving factor in an individual's ability to give. These uninstrumented results imply that universities' policies of pursuing frequent small gifts when alumni are young in an effort to create a habit may not pay large dividends. In essence, being a frequent giver when young does not

seem to exert influence on the amount given when older; one possible explanation for this result is that the amount given when young proxies for true affinity, while frequent givers either fail to form habits, form habits that lead to small gifts, or give small amounts often to avoid social pressure. Other explanations cannot be discounted, and one cannot draw causal conclusions from these results, as they do not correct for the fact that giving when both young and old is likely to be driven by unobserved affinity.

Results that account for this endogeneity are presented in Table 3, calculated as per the discussion in Section IV. The results are radically different from those in Table 2. The results for the average gift from 20 years onward, in Column (1), indicate that the amount given when young has little effect on the amount given when old, though the estimates are not precise (-0.14 , $SE = 0.18$). On the other hand, the coefficient for the frequent giver when young indicator is very large and significant (1.89 , $SE = 0.16$). This implies that, *ceteris paribus*, an alumnus who gave frequently when young gives, on average, 5.6 times more when older than an alumnus who did not give. It is important to note that this holds the amount given when young fixed—that is, if two alumni give the same amount when young, but one gives in each year and the other does not, the frequent giver is expected to give much more when older. These results are consistent across specifications. Defining giving when older as beginning in the 15th year after graduation, the elasticity of giving when older with respect to giving when young is -0.17 ($SE = 0.12$), while the frequent giver

TABLE 3
Instrumented Estimates—Amount of Gift^a

	(1) Twenty Years On	(2) Fifteen Years On	(3) Field and Occupation
Log average giving when young	-0.135 (0.183)	-0.167 (0.117)	-0.0108 (0.266)
Frequent giver when young	1.89** (0.159)	1.59** (0.156)	1.95** (0.187)

^aColumns (1) and (2) are based on 7,113 observations on alumni graduating in the classes of 1982 through 1989, excluding the class of 1983. Column (3) is based on 5,599 observations with complete data on field and occupations. This table reports unconditional marginal effects on the amount of giving when older based on results from a conditional recursive mixed-process estimator (Roodman 2009), instrumenting for the log of giving when young and the frequent giver when young indicator using the *won5* and *solicitor5* variables described in Table A1. Robust standard errors are reported in parentheses. In addition to the variables listed above, models include cohort effects, the covariates listed in Table A1, and location effects (averaged over each alumnus's post-graduation history). Column (3) includes the field and occupation variables listed in Table A1. Full results are available on request.

*Significant at the 10% level; **significant at the 5% level.

TABLE 4
Uninstrumented Estimates—Class Leaders^a

	(1) Twenty Years On	(2) Fifteen Years On	(3) Field and Occupation
Log of giving when young	0.0215** (0.0021)	0.0206** (0.0021)	0.0252** (0.0026)
Frequent giver when young	-0.0072* (0.0039)	-0.0051 (0.0032)	-0.0119** (0.0051)

^aColumns (1) and (2) are based on 6,862 and 6,915 observations, respectively, on alumni graduating in the classes of 1982 through 1989, excluding the class of 1983. Column (3) is based on 5,422 observations with complete data on field and occupations. This table report marginal effects on the probability of being in the top 10% of givers in one's class, generated by a probit model without instrumenting for the log of giving when young and the frequent giver when young indicator. Robust standard errors are reported in parentheses. In addition to the variables listed above, models include cohort effects, the covariates listed in Table A1, and location effects (averaged over each alumnus's post-graduation history). Column (3) includes the field and occupation variables listed in Table A1. Full results are available on request.

*Significant at the 10% level; **significant at the 5% level.

effect is 1.59 (SE = 0.16). Including field and occupation variables yields similar results, with an elasticity of giving of -0.011 (SE = 0.27) and a frequent giver effect of 1.95 (SE = 0.19). Without drawing too much inference from the exact magnitudes, it seem evident that the pursuit of frequent gifts from young alumni, even if the university suffers a small loss in the process, is justified. These results suggest that the mere act of giving frequently affects giving behavior in later years.¹¹

It is also important to clarify the interpretation of the instrumental variables estimates of β_1 and β_2 . They measure the average change in the size of a gift when older for those whose giving patterns when younger were affected by a combination of the presence of a solicitor who was a freshman year roommate and their athletic team's performance. That this local average treatment effect yields such dramatic results provides strong evidence for habit formation, in that those who were induced into giving by arguably exogenous variables representing social pressure and positive affinity shocks increase their giving later in life.

We now turn to habit forming effects for large givers, whose donations make up the bulk of the money raised in each year.

11. An interesting additional approach is to limit the focus on individuals who give in both the early and late period. There are 4,486 observations in this sample, and the results are not qualitatively different from those using the full sample. The effect of the amount given is relatively small and noisily estimated (0.35, SE = 1.55), while the effect of being a frequent giver is large and significant (0.94, SE = 0.19). The point estimates for frequent givers in Table 3 are larger, but it is important to note that the comparison group in this case is different.

B. Class Leaders

Given that the university's desire is to cultivate large givers, it stands to reason that we should examine the probability that an alumnus is a large giver relative to his or her class as a function of giving when young. To that end, we define a "class leader" as being an individual whose gift when older is in the top 10% of his or her class.¹² Column (1) of Table 4 presents uninstrumented results for the probability of being a class leader, defining giving when old as being the sum of gifts in the 20th year after graduation and onward.¹³ The coefficient on the log of giving when young (0.022, SE = 0.002), implies that a 10% increase in the size of the gift when young increases the probability of being a class leader when older by 0.22 percentage points. While this result is statistically significant, it is relatively small. The frequent giver effect in this specification is significant at $p = .09$, but is even smaller in absolute value (-0.007 , SE = 0.004) and economically insignificant—in essence, a precisely estimated 0. The results in Columns (2) and (3) are similar. The conclusion drawn from these uninstrumented estimates is that giving when young has little predictive power on an individual's likelihood of being a big giver, relative to his or her class, when older.

Turning to the instrumented estimates, in Table 5, we find a different story. The log of

12. The threshold for being a class leader varies by cohort from an average gift of \$8,375 to a maximum \$19,573 for the 20th year and onward. For the 15th year onward, the threshold varies from \$5,158 to \$10,944.

13. Sample sizes differ slightly because of variable collinearity.

TABLE 5
Instrumented Estimates—Class Leaders^a

	(1) Twenty Years On	(2) Fifteen Years On	(3) Field and Occupation
Log of giving when young	0.115** (0.0180)	0.136** (0.0232)	0.108** (0.0322)
Frequent giver when young	0.212** (0.0520)	0.168** (0.0703)	0.255** (0.0646)

^aColumns (1) and (2) are based on 6,862 and 6,915 observations, respectively, on alumni graduating in the classes of 1982 through 1989, excluding the class of 1983. Column (3) is based on 5,422 observations with complete data on field and occupations. This table reports unconditional marginal effects on the probability of being in the top 10% of givers in one's class, based on results from a conditional recursive mixed-process estimator (Roodman 2009), instrumenting for the log of giving when young and the frequent giver when young indicator using the *won5* and *solicitor5* variables described in Table A1. Robust standard errors are reported in parentheses. In addition to the variables listed above, models include cohort effects, the covariates listed in Table A1, and location effects (averaged over each alumnus's post-graduation history). Column (3) includes the field and occupation variables listed in Table A1. Full results are available on request.

*Significant at the 10% level; **significant at the 5% level.

giving when young has a positive and statistically significant effect on the probability of being a class leader (0.12, SE = 0.018). This effect seems quite large—a 10% increase in giving when young is associated with an increase in the probability of being a class leader of about 1 percentage point, with the baseline probability of being a class leader being, by definition, 10%. The effect is similar for the 15 years onward specification in Column (2) and the field and occupation specification in Column (3). Turning to the effect of being a frequent giver when young, we see large and significant effects. In Column (1), this effect is 0.21 (SE = 0.052). This is a very large effect given that a randomly chosen alumnus has a 10% probability of being a class leader. The coefficient's magnitude can be explained by the relatively small number of frequent givers¹⁴ and the local nature of the marginal effect. Results in Columns (2) and (3) are of somewhat different magnitudes, but similarly large and significant. Regardless, it seems that once endogeneity is accounted for, frequent givers when young are far more likely to be class leaders when older.

VI. CONCLUSIONS

Using a unique and relatively long panel of data on alumni giving, we have examined how giving patterns when young affect giving when older. The intuition of professional fundraisers,

who believe that building a habit of giving among young alumni leads to larger gifts when older, seems justified. Because this case study examines behavior at a single university, one must, of course, take great care in generalizing the findings. The estimates in this article are based on those induced into giving by the effects of freshman year roommate solicitors and former athletic team success. It may be tempting for practitioners to argue, based on these results, that any tactic which induces young alumni to give should be used. Ensign (2010) documents fundraising drives at two elite universities that used strong-arm techniques to shame students into participating. While the use of the roommate solicitor instrument indicates that giving induced by some social pressure can result in large effects in the future, it seems unlikely that those who are essentially bullied into giving will respond in the same way. That said, the large magnitude of the effect of being a frequent giver when young suggests that nonprofit organizations in general and universities in particular should give serious consideration to devoting additional resources to raising participation rates among young potential donors. Even if the benefits are far in the future, the effects are large enough to justify incurring some losses in the pursuit of gifts in the present.¹⁵ These results also have implications for the accounting practices of charities, which are often required to

14. Of the frequent givers when young (who comprise about 26% of the sample), 19.2% are class leaders when older, while only 7.4% of those who were not frequent givers when young are class leaders when older.

15. This presumes, of course, that the costs of solicitation are relatively low. While the addition of another solicitation for an individual may be relatively inexpensive, setting up an entire program for the aggressive solicitation of new donors may be much more costly.

report fundraising expenses, with the ratio of donations to expenses being used as a measure of the charity's efficiency. But in the presence of substantial long-term habit formation, these ratios will understate the true benefits of fundraising and perhaps even unfairly penalize charities that focus on building relationships that lead to large gifts in the future.

Habit forming also has implications for assessing the impact of the charitable deduction in the personal income tax. Lowering the cost of giving may induce much larger lifetime effects than those typically estimated using short panels or cross-sectional data. The charitable deduction is, of course, available to all who itemize. An important topic for future research is to determine whether these sorts of long-term

effects can arise in older individuals. On the other hand, while this article examines habit formation over a relatively long period, there may also be shorter-term effects. For instance, giving in one year may affect giving in the next by providing a reference amount or simply the routine of giving a certain amount.

These results also have significance for models of habit forming in other contexts. The findings in this article are not inconsistent with those in Bronnenberg, Dube, and Gentzkow (2010), who find that exposure to particular brands when younger affect purchasing behavior for decades. Early experiences and habits that form through a "focus" margin may have large impacts late in life and should be considered in the design of models of behavior.

TABLE A1
Variable Definitions and Summary Statistics^a

Variable	Description	Mean	Standard Deviation
Gave20	Gave at all from the 20th year after graduation on	0.712	0.453
Gave15	Gave at all from the 15th year after graduation on	0.793	0.404
Gave5	Gave at all in the first 5 years after graduation	0.801	0.399
Average20	Average of gifts, in 2009 dollars, from the 20th year after graduation on, conditional on giving	2,039.14	24,737.63
Average15	Average of gifts, in 2009 dollars, from the 15th year after graduation on, conditional on giving	1,100.85	8,409.77
Average5	Average of gifts, in 2009 dollars, in the first 5 years after graduation, conditional on giving	51.02	180.39
First5	1 if the alumnus made gifts in each of the first 5 years after graduation	0.263	0.440
Won20	1 if the alumnus's own former team won the conference championship from the 20th year after graduation on	0.226	0.418
Solicitor20	1 if the alumnus's freshman year roommate was a solicitor from the 20th year after graduation on	0.224	0.458
Won15	1 if the alumnus's own former team won the conference championship from the 20th year after graduation on	0.302	0.459
Solicitor15	1 if the alumnus's freshman year roommate was a solicitor from the 20th year after graduation on	0.248	0.432
Won5	1 if the alumnus's own former team won the conference championship in any of the first 5 years after graduation	0.203	0.402
Solicitor5	1 if the alumnus's freshman year roommate was a solicitor in any of the first 5 years after graduation	0.299	0.458
FreshmanRec	1 if the alumnus's team won the conference championship during the alumnus's freshman year	0.0853	0.279
SophomoreRec	1 if the alumnus's team won the conference championship during the alumnus's sophomore year	0.0734	0.261
JuniorRec	1 if the alumnus's team won the conference championship during the alumnus's junior year	0.0713	0.257
SeniorRec	1 if the alumnus's team won the conference championship during the alumnus's senior year	0.0703	0.256
Spouseisalum	1 if the spouse is an alumnus	0.147	0.354
Male	1 if the alumnus is male	0.622	0.485
<i>Race/Ethnicity</i>			
White	Omitted Category: 1 if the alumnus is White	0.822	0.382
American	1 if the alumnus is a Native American	0.0027	0.0516
Black	1 if the alumnus is Black	0.0662	0.249

TABLE A1
Continued

Variable	Description	Mean	Standard Deviation
Hispanic	1 if the alumnus is Hispanic	0.0420	0.201
Asian	1 if the alumnus is Asian	0.0673	0.251
<i>Secondary Schooling</i>			
Public	Omitted Category: 1 if the alumnus attended public school	0.581	0.493
Boarding	1 if the alumnus attended boarding school	0.138	0.345
Private	1 if the alumnus attended private school	0.264	0.441
School—Other	1 if the alumnus attended another type of school	0.0164	0.127
SATmath	SAT math score. Scores prior to 1996 are adjusted to reflect recentering of the scoring scale	695	76.9
SATverbal	SAT verbal score. Scores prior to 1996 are adjusted to reflect recentering of the scoring scale	694	77.2
<i>Admissions Office “Nonacademic” Ranking</i>			
A	Omitted Category: 1 if the alumnus received the highest nonacademic ranking from the admissions office	0.0195	0.138
B	1 if the alumnus received the second highest nonacademic ranking from the admissions office	0.606	0.489
C	1 if the alumnus received the third highest nonacademic ranking from the admissions office	0.364	0.481
D	1 if the alumnus received the fourth highest nonacademic ranking from the admissions office	0.0101	0.100
E	1 if the alumnus received the fifth highest nonacademic ranking from the admissions office	—	—
<i>Admissions Office “Academic” Ranking</i>			
A	Omitted Category: 1 if the alumnus received the highest academic ranking from the admissions office	0.137	0.383
B	1 if the alumnus received the second highest academic ranking from the admissions office	0.422	0.493
C	1 if the alumnus received the third highest academic ranking from the admissions office	0.285	0.451
D	1 if the alumnus received the fourth highest academic ranking from the admissions office	0.154	0.361
E	1 if the alumnus received the fifth highest academic ranking from the admissions office	0.0018	0.0427
Clubsport	1 if the alumnus played on a club team	0.141	0.348
Honors	1 if the alumnus graduated <i>magna, summa, or cum laude</i>	0.454	0.498
GPA	Alumnus’s GPA	3.19	0.457
Greek	1 if the alumnus was a member of a fraternity or sorority	0.723	0.445
Athlete	1 if the alumnus played a varsity sport	0.352	0.478
<i>Major</i>			
Molbio	Omitted Category: 1 if the alumnus majored in Molecular Biology	0.0291	0.168
Small Social Science	1 if the alumnus majored in Anthropology, Urban Studies, or Sociology.	0.0204	0.141
English	1 if the alumnus majored in English	0.108	0.310
Economics	1 if the alumnus majored in Economics	0.0839	0.277
Public Policy	1 if the alumnus majored in Public Policy	0.0547	0.227
Political Science	1 if the alumnus majored in Political Science	0.0952	0.293
Psychology	1 if the alumnus majored in Psychology	0.0430	0.203
History	1 if the alumnus majored in History	0.126	0.331
MAE	1 if the alumnus majored in Mechanical and Aerospace Engineering	0.0419	0.200
EE/CS	1 if the alumnus majored in Electrical Engineering or Computer Science	0.0727	0.259
Arch & Civ	1 if the alumnus majored in Architecture or Civil Engineering	0.0731	0.260
Small Humanities	1 if the alumnus majored in Art, Art History, Classics, East Asian Studies, Linguistics, Music, Near Eastern Studies, Philosophy, Religion, or Languages and Literature departments	0.111	0.315

TABLE A1
Continued

Variable	Description	Mean	Standard Deviation
Small Engineering	1 if the alumnus majored in "Engineering," Operations Research and Financial Engineering, or Chemical Engineering	0.0208	0.143
Small Sciences	1 if the alumnus majored in Applied Mathematics, Astrophysics, Biochemistry, Biology, Chemistry, Ecology and Evolutionary Biology, Geology, Mathematics, Physics, or Statistics	0.120	0.325
<i>Minor</i>			
No Minor	Omitted Category: 1 if the alumnus received no minor	0.811	0.391
African/African-American Studies	1 if the alumnus received a minor in African or African-American Studies	0.0231	0.150
American Studies	1 if the alumnus received a minor in American Studies	0.0245	0.154
Theater	1 if the alumnus received a minor in Theater	0.0153	0.123
Public Policy	1 if the alumnus received a minor in Public Policy	0.0401	0.196
Other Engineering	1 if the alumnus received a minor in Architecture, Basic Engineering, Bioengineering, Electrical Engineering, Geological Engineering, Management, Materials Sciences, or Robotics.	0.0180	0.132
Other Sciences	1 if the alumnus received a minor in Applied and Computational Mathematics, Biophysics, Cognitive Studies, Environmental Studies, Science in Human Affairs, or Neuroscience.	0.0188	0.136
Other Humanities	1 if the alumnus received a minor in a humanities field	0.0468	0.211
Teaching	1 if the alumnus received a teaching certificate	0.0080	0.0892
UnivAward	1 if the alumnus received a university service award	0.0143	0.119
GradScholarship	1 if the alumnus received a graduate scholarship from the university	0.0522	0.222
AcadAward	1 if the alumnus received an academic award	0.182	0.386
DeptAward	1 if the alumnus received a department award	0.129	0.336
AthleteAward	1 if the alumnus received an athletic award	0.0335	0.180
MiscAward	1 if the alumnus received a miscellaneous award	0.0143	0.119
Magazine	1 if the alumnus receives the alumni magazine	0.933	0.250
AC Mailable	1 if the alumnus is on the alumni council mailing list	0.991	0.0944
AG Mailable	1 if the alumnus is on the alumni giving mailing list	0.604	0.489
AG Phonable	1 if the alumnus is on the alumni giving call list	0.873	0.333
No Solicit	1 if the alumnus is on a no-solicit list	0.0723	0.258
Reduce Solicit	1 if the alumnus is on a reduced solicitation list	0.204	0.403
SP Participant	1 if the alumnus was a participant in the senior class gift	0.547	0.498
No Dues	1 if the alumnus has never paid class dues	0.279	0.449
Current Dues	1 if the alumnus is current on class dues in 2009	0.213	0.409
<i>Post Baccalaureate Education</i>			
No Advanced	Omitted Category: 1 if the alumnus has no advanced degree	0.559	0.497
PhD	1 if the alumnus has a Ph.D. or equivalent degree	0.0755	0.264
Masters	1 if the alumnus has a masters	0.153	0.360
JD	1 if the alumnus has a JD	0.109	0.312
MD/DDS	1 if the alumnus has a medical degree	0.0620	0.241
MBA	1 if the alumnus has an MBA	0.110	0.313
<i>Field^b</i>			
Arts	1 if the alumnus ever worked in the Arts field	0.0718	0.258
Agriculture	1 if the alumnus ever worked in the Agriculture field	0.0030	0.0550
Architecture	1 if the alumnus ever worked in the Architecture field	0.0279	0.165
Pharmaceuticals	1 if the alumnus ever worked in the Pharmaceuticals field	0.0293	0.169
Communications	1 if the alumnus ever worked in the Communications field	0.106	0.308
Consulting	1 if the alumnus ever worked in the Consulting field	0.105	0.307
Education	1 if the alumnus ever worked in the Education field	0.138	0.345
Finance	1 if the alumnus ever worked in the Finance field	0.201	0.401

TABLE A1
Continued

Variable	Description	Mean	Standard Deviation
Health Care (Business/Industry)	1 if the alumnus ever worked in the Health Care field	0.177	0.382
Hospitality	1 if the alumnus ever worked in the Hospitality field	0.0075	0.0863
Information Technology	1 if the alumnus ever worked in the IT field	0.123	0.329
Law	1 if the alumnus ever worked in the Law field	0.196	0.397
Manufacturing	1 if the alumnus ever worked in the Manufacturing field	0.0797	0.271
Retail	1 if the alumnus ever worked in the Retail field	0.0243	0.154
Transportation	1 if the alumnus ever worked in the Transportation field	0.0102	0.100
Federal Government	1 if the alumnus ever worked for the Federal Government	0.0493	0.217
State Government	1 if the alumnus ever worked for a State Government	0.0334	0.179
Foreign Government	1 if the alumnus ever worked for a Foreign Government	0.0038	0.0611
Nongovernmental Organization	1 if the alumnus ever worked in the NGO field	0.0345	0.182
Religion	1 if the alumnus ever worked in the Religion field	0.0102	0.100
Other	1 if the alumnus ever worked in another field	0.316	0.465
Multilateral Organization	1 if the alumnus ever worked in the Multilateral Organization field	0.0080	0.0499
Military	1 if the alumnus ever worked for the Military	0.0080	0.0893
<i>Occupation^b</i>			
Government Worker	1 if the alumnus ever worked as a government worker	0.0113	0.105
Miscellaneous Worker	1 if the alumnus ever worked in some miscellaneous occupation	0.0802	0.272
Physician/Dentist	1 if the alumnus ever worked as a physician or dentist	0.131	0.338
White Collar	1 if the alumnus ever worked in a white collar occupation	0.312	0.463
Attorney	1 if the alumnus ever worked as an attorney	0.280	0.449
Executive	1 if the alumnus ever worked as an executive	0.525	0.499
Academic Worker	1 if the alumnus ever worked as an academic	0.0836	0.277

^aExcept where noted, figures are based on 7,113 observations on alumni who graduated between 1982 and 1989, excluding the class of 1983. No alumni remaining in this sample received the lowest nonacademic rating from the admissions office.

^bBased on 5,599 observations with complete information on field and occupation.

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