Donative Behavior at the End of Life

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## ABSTRACT

A general finding in the empirical literature on charitable giving is that among older individuals, both the probability of giving and the conditional amount of donations decrease with age, ceteris paribus. In this paper, we use data on giving by alumni at an anonymous university to investigate end-of-life giving patterns. Our main finding is that taking into account the approach of death substantially changes the age-giving profile for the elderly—in one segment of the age distribution, the independent effect of an increase in age on giving actually changes from negative to positive.

We examine how the decline in giving as death approaches varies with the length of time that a given condition is likely to bring about death, and the individual's age when he died. We find that for individuals who died from conditions that bring about death fairly quickly, there is little decline in giving as death approaches compared to those who died from other causes. Further, the decline in giving as death approaches is steeper for the elderly (for whom death is less likely to be a surprise) than for the relatively young. These findings suggest that our primary result, that failing to take into account the approach of death leads to biased inferences with respect to the age-giving profile, is not merely an artifact of some kind of nonlinearity in the relationship between age and giving.

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## 1. Introduction

A general finding in the empirical literature on charitable giving is that among older individuals, both the probability of giving and the conditional amount of donations decrease with age, *ceteris paribus*. As Bekkers and Wiepking (2011) note in their comprehensive summary of the literature, the exact age at which the relationship between age and giving becomes negative varies from study to study, but it tends to be between 65 and 75 (Wiepking and James, 2012, p. 2). Why should giving fall at advanced ages? The answer is not at all clear. In this paper, we argue that the documented decline in giving with age is, to a large extent, a result of approaching death, rather than aging *per se*.

When we look for other possible explanations, a natural one is that the fall in giving is due to typical life-cycle considerations: income declines after retirement, and because charitable giving is a normal good,[1] it falls. However, the negative slope of the age-giving profile for the elderly is generally present even when income is taken into account (Bekkers and Wiepking, 2011, p. 351). Aging might also make one more aware of the financial needs of spouses and children. To the extent that, as they approach death, people believe that they are spending their heirs' money, there will be a tendency to accelerate *inter vivos* transfers or saving for bequests. The effect would be to reduce charitable giving.

Another set of explanations centers around the health status of the elderly. To the extent that the elderly are ill, they may be too distracted to think about charitable giving, or the resources that they might have devoted to philanthropy are used to meet the costs of health care. Relatedly, Wiepking and James (2012, p. 10) note that people who are ill are less likely to attend church and to participate in other activities that might expose them to direct personal solicitations for charitable donations. Illness can also affect people's cognitive abilities, a potentially important consideration given the evidence in the psychology literature of a positive relationship between cognitive skills and the ability to empathize with other people (Wiepking and James, 2012, p. 6).

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[1] See the studies surveyed in Andreoni (2006, 1235–1240).

Wiepking and James (2012) examine these various explanations for the decline in giving among the very old in a regression framework using data from the Health and Retirement Study. Using an indicator for giving more than $500 in a given year as a response variable, they find that only church attendance has a substantial effect on the shape of the age-giving profile. The proportion of income spent on health care, the number of children, income, assets, a measure of cognitive ability, standard demographic variables, and, most importantly, a variety of self-reported measures of health status, do not influence the age-giving profile.

Another approach to thinking about giving patterns among the elderly begins with the notion that the contemplation of death *per se* affects donative behavior. Psychologists refer to this idea as "terror management theory" (TMT). As explained by Hirschberger (2010, p. 205), "People cherish life but are aware that life is transient and temporary. Inability to escape this fate could render humans helpless and consumed with terror. But they have devised elaborate symbolic defense mechanisms that remove thoughts of death from consciousness." Specifically, "to defend and protect themselves against existential anxiety, people create and cling to cultural world views—collective understandings of reality that …render existence meaningful, coherent, and permanent" (Grant and Wage-Benzoni, 2009, p. 603). Prosocial behavior is one such way to render existence meaningful and reduce the terror of death. As Hirschberger notes, this idea is consistent with many cultural and religious beliefs. The implication of this line of reasoning for the shape of the age-giving profile seems to be clear: death awareness increases with age; hence, so should philanthropic behavior, other things being the same. If so, the only way to explain the decrease in giving with age among the elderly is that some other effect or effects that work in the opposite direction dominate the TMT effect.

The tests of TMT in the psychology literature consist primarily of giving experimental subjects death primes, such as asking them open-ended questions about death or physical pain, and then asking the subjects a series of questions about whether they would be willing to donate money or time to a given charitable organization (Grant and Wage-Benzoni, 2009). The findings are not always consistent with the notion that salience of death increases prosocial behavior, a result that can be squared with TMT if the particular prosocial behavior itself rekindles thoughts

of death. "In such cases, observers shift their gaze, feel less compassionate, attribute more blame, and ultimately refuse to help" (Hirschberger, 2010, p. 216). In any case, as far as we can tell, none of the empirical research relies on observational data. That is, it does not look at the donative behavior of people who are actually approaching death.

Members of the baby boom generation are now beginning to enter retirement age. As this trend accelerates, it is of considerable importance to understand how their philanthropic behavior will change. In particular, predictions based on age *per se* could be wrong if the variable that is really driving giving is the approach of death. In this paper, we use data on charitable giving by alumni at an anonymous university (referred to hereinafter as "Anon U") to investigate end-of-life giving patterns. The key issue is the extent to which the decline of giving in old age is due to the approach of death *per se*. Section 2 describes the data, and Section 3 discusses the econometric strategy and presents the main results. Our main finding is that taking into account the approach of death substantially changes the age-giving profile for the elderly. For example, when the approach of death is not taken into account, the probability of giving with respect to age for a 75 year old is, on average, 5.3 percentage points lower than a 65 year old. In contrast, when the approach of death is taken into account, this difference is actually positive 2.4 percentage points.[2]

Section 4 examines possible heterogeneity in the response of giving to the approach of death. We show that the decline in giving as death approaches varies with the length of time that a given condition takes to bring about death and the individual's age when he dies. We find that individuals who died from conditions that bring about death fairly quickly exhibit little decline in giving in the years before death compared to those who died from other causes. Further, the decline in giving as death approaches is steeper for the elderly (for whom death is less likely to be a surprise) than for the relatively young. These findings suggest that our primary result, which is that ignoring the approach of death leads to misleading inferences about the shape of the age-giving profile, is not merely an artifact of some kind of nonlinearity in the relationship between

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[2] Note that our "age" variable is actually years since graduation, since exact birth dates are missing for some members of older cohorts. For ease of interpretation and brevity, we define age as years-since-graduation plus 22.

age and giving. We also speculate on possible links between end-of-life giving and bequest behavior. At least on the basis of simple correlations in the data, we find no evidence that the decline in giving toward the end of life is associated with a substitution toward bequests, nor that those who leave bequests have different end-of-life giving patterns than those who do not. A final section provides a summary and conclusion.

## 2. Data

Our data are drawn from the anonymous university's administrative archives. Anon U's data are proprietary and sensitive, and individuals' names were stripped from the records before being made available to us. Our sample consists of all individuals who were alive at the beginning of fiscal year 1983 and have a date of death recorded between 1983 and August 2012. These individuals span the classes of 1905 through 2006.[3] We have each individual's giving history from the year after graduation until 2009. Our unit of observation is a yearly giving opportunity. For example, if an individual has been an alumnus for 5 years, he accounts for 5 giving opportunities, starting in the first fiscal year after graduation. Multiple gifts in the same year are summed together. We begin with 177,885 observations, representing 10,982 alumni.[4] Of these observations, 65.4 percent are associated with a gift, with a mean gift conditional on giving of $4,501 in 2009 dollars (the median is $177). The average age at death in our sample is 77. We also have data on the alumnus's marital status at the time of death and his state or country of residence in each year.[5] In addition to the extraordinary level of detail about individuals' lifetime giving histories, another advantage of this dataset is that it does not depend on individuals' recollections of their donations—these are the actual amounts received by the University.

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[3] One individual from the class of 2008 is present for one observation, but is dropped from the sample for reasons of collinearity.

[4] Note that our panel is somewhat incomplete; that is, we have dates of death through the middle of 2012 and giving behavior through the end of fiscal year 2009. We therefore have an incomplete set of observations for individuals who died after 2009. Our substantive results are unchanged if we restrict the sample to alumni who died during or before 2009.

[5] Anon U began admitting women only about four decades ago. Hence, all but 116 individuals who died during our sample period were male.

Anon U's alumni magazine regularly publishes alumni obituaries. It obtains the information from a variety of sources: a service called Obituary Registry, the *New York Times*, family members, and other University departments. The material is passed onto memorialists associated with each graduating class, who do the actual writing. We employed these obituaries to obtain information, when available, on cause of death and whether the death came after a long or short illness. There is also information on whether the decedent had a surviving wife and children, which we used to supplement the information in the administrative data. We found 11,274 obituaries, and matched them with our anonymized data using the exact date of death, graduating class, and gender. 7,613 individuals (69.3 percent) had a unique match, and we were able to attribute a cause of death to 3,533 of them (32.3 percent), representing 55,968 observations.[6]

We have information on whether the duration of the condition that brought about death was likely relatively long or short for 3,061 individuals representing 48,209 observations. This duration information came from several sources. The obituaries themselves sometimes explicitly mention whether an illness was short or long. Some causes of death, such as accidents, homicides, and suicides, evidently belong in the short category. In certain cases, we did Internet-based research and consulted physicians to determine whether a given cause of death was likely to be associated with a long or short duration. Clearly, there is some arbitrariness to this procedure, if for no other reason than the obituaries are written by the decedents' classmates, not health care practitioners. That said, we characterized the duration of an individual's condition as being long or short only when we felt we could do so with some confidence.

Summary statistics are provided in Table 1.

## 3. Econometric strategy and basic results

We begin by estimating a series of linear probability models for the likelihood that an alumnus makes a donation to Anon U in a given year. Specifically, the left-hand side variable is

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[6] Those with obituaries are somewhat more likely to make a gift than those without (67.8 percent vs. 59.7 percent), but the size of the gift does not differ significantly (p = 0.47). Those with obituaries die 1.1 years later than those without; this difference is statistically significant but does not seem consequential.

one if the individual made a donation in a given year, and zero otherwise. On the right-hand side, we have years since graduation, its square, and a cubic term. In addition, the model has year effects and indicator variables for the state or country of residence and for whether the year is a major reunion for the alumnus (50, 55, 60, etc., years after graduation). Unfortunately, the data include no direct information on income, an important determinant of giving (Shulman and Bowen, 2001, p. 404). However, if we are willing to think of an alumnus's *permanent* income as an unchanging attribute (at least during our sample period), then we can model it as an individual fixed effect. Indeed, a fixed effects model takes into account any time-invariant unobservable variables that might affect giving, such as affinity to Anon U, quality of undergraduate experience, religion, and so on.[7,8] Estimating fixed effects in nonlinear models is difficult at best, due to the incidental parameters problem (Wooldridge, 2002, p. 484), which is why we use a linear probability model. Our data do not permit us to model bequests, which presumably are determined simultaneously with *inter vivos* gifts. However, Section 4 below contains a brief discussion of possible interactions between *inter vivos* and bequest decisions.

The age-giving profile with a conventional model that does not take into account the approach of death is shown in column 1 of Table 2. The linear and cubic terms are negative, while the quadratic term is positive. The easiest way to interpret these coefficients is to graph them. The black line in Figure 1 shows the evolution of the effect of age on the implied probability of giving for each year from roughly 32 to 92 years of age. To generate the graph, we begin by defining Yearssince as years since graduation. We then compute for each value of Yearssince the expression $b_1*Yearssince + b_2*Yearssince^2 + b_3*Yearssince^3$, where each b denotes the corresponding coefficient in Table 2. For ease of interpretation, instead of putting Yearssince on the horizontal axis, we put Age, which we approximate as Yearssince plus 22 (the typical age at graduation). Thus, the graph shows the effect of age on the probability of making a gift compared to the probability for a newly-graduated alumnus. Because there are relatively few

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[7] See Clotfelter (2003) on the role that an alumnus's affinity to an institution plays in his or her donative decisions.
[8] The fixed effects model also takes into account unchanging aspects of family structure, but will not control for such changes as the recent death of a spouse or a child.

alumni in our sample who died within 10 years of graduation, the graph does not start until the age of 32. A 95 percent confidence interval is shown with dashed lines.

The graph indicates that the probability of making a gift declines until about age 40, is fairly flat between 40 and 70 years of age, and then declines relatively steeply thereafter. The relationship between age and giving is often characterized in terms of the marginal effect of age on the probability of giving, i.e., the slope of the black line in Figure 1. For convenience, the marginal effects are graphed in Figure 2. They begin fairly negative when individuals are relatively young, about −1.5 percentage points, increasing to a level statistically indistinguishable from zero around age 56, before turning negative again as individuals get older.

The next step is to incorporate into the model variables pertaining to the approach of death. We include dichotomous variables for whether the date of a given observation is 5, 4, 3, 2, or 1 year before death; the omitted category is 6 or more years. Given that the model includes individual fixed effects, this means that the coefficient on the nth year before death variable is comparing an individual's giving in that year relative to his giving six or more years before death (holding age constant).

Modeling donative behavior in the year in which an individual dies raises some complications. Anon U's fundraising year begins on July 1. In general, very few alumni make gifts during the first few months of the fundraising year, mostly because few solicitations are made during that time. For example, just 8.4 percent of the individuals in our sample who ultimately make a gift in a given fundraising year do so within the first 3 months. Hence, if an individual dies in July, his giving for the fundraising year is likely to be very low, but this probably has nothing to do with his imminent death or anything other than the fact that he has yet to be asked.[9] We therefore include dichotomous variables equal to one for the month of the year in which death occurs.[10] Recall that the omitted category in the regression is 6 or more years before death.

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[9] As Andreoni (2006, p. 1257) notes, the "iron law of fundraising" is that individuals don't donate unless they are asked to do so.

[10] For brevity, we do not report these coefficients; they are available on request. In general, they are difficult to interpret because they measure the probability of giving in a given month in the year of death, relative to giving over

The results are reported in column 2 of Table 2, and the implied age-giving profile is graphed as the light gray line in Figure 1. When the year-before-death variables are included, the age-giving profile is much flatter, and, indeed, upward sloping for part of its range. This is reflected in Figure 2, which shows a positive marginal effect between 41 and 74 years of age. Hence, much of the decline in giving that one might attribute to age *per se* appears to be due to approaching death. Turning to the year-before-death coefficients themselves, we see a decrease in the probability of giving with each year before death. Relative to six or more years before death, individuals who are five years before death are 1.1 percentage points less likely to make a gift, while those who are four years before death are 2.5 percentage points less likely to give. The effect increases in absolute value to 3.5 percentage points, then 5.3 and finally 8.4 percentage points the year before death.[11] The basic conclusion is clear—ignoring the impact of approaching death leads to misleading inferences about the effects of age on the probability of giving, and the differences are substantial.

## 4. Additional results

### 4.1. Amount given

We have focused primarily on the probability of giving rather than the amount given because the probability is less likely to be affected by any reductions in resources associated with aging. After all, one can always scale back the amount of one's donations or give a token amount. It follows that the change in the profile of the probability of giving depicted in Figure 1 is less likely due to changes in income and more likely to reflect the impact of poor health, changes in priorities, or terror management. Nevertheless, it is of some interest to see whether the approach of death affects the pattern of amounts given as well as the probability of making a gift at all. Columns 3 and 4 of Table 2 show the results when we re-estimate our models with the log of the amount given, conditional on making a gift, as the dependent variable. The age

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an entire year for six-or-more years before death. We compared the coefficients on the month-of-death variables to the average probabilities of giving in the corresponding months for six or more years before death; this allowed us to benchmark whether giving patterns in the year of death differed greatly from a baseline. No consistent results emerged; relatively small sample sizes for each month of death make drawing conclusions difficult.

[11] The coefficient on each year-of-death variable differs from the next one at the one percent level.

profiles differ somewhat from those for the probability of giving. When the model is estimated without the approaching death variables (column 3), the coefficients on the cubic in age imply that the conditional amount given peaks at about 59 years of age. This differs from the probability of giving in column 1, which is always declining in age. When the approaching death variables are included (column 4), the implied peak is at about 61 years of age. In contrast, the probability of giving in column 2 does not change much between the middle 60s and early 80s. However, even though the shape of the age-giving profile differs from that in column 2, the coefficients on the approaching death variables follow a similar qualitative pattern, becoming increasingly negative as death approaches. All else equal—including age—alumni who make a gift and are in the year before death give about 10 percent less than those who are six or more years away from death. The fact that the amount given declines more rapidly with age than the probability of giving provides some evidence for the conjecture that the fall in resources associated with age has a greater effect on the intensive than the extensive margin of giving.

*4.2. Bequests*

A natural question is whether individuals' giving behavior in the years before they die is linked to their bequest decisions. Are the patterns in *inter vivos* giving that we have isolated different for those who leave bequests, perhaps because they view the two forms of giving as substitutes? In our data, bequests are not explicitly labeled; we define bequests as gifts that arrive 30 or more days after individuals die. About 7.0 percent of alumni leave bequests, a small but non-negligible proportion. [12] The mean bequest conditional on giving one is $1.73 million. This figure is dominated by a few very large gifts, as illustrated by the fact that the median bequest is only $13,741.

A possible strategy for investigating whether the end-of-life giving patterns differ between the two groups would be to estimate our model separately for alumni who do and do not leave bequests. Unfortunately, the results from such an exercise would not be compelling. Bequests are likely correlated with the error in the *inter vivos* giving regression, because they

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[12] This figure is about 7.3 percent when a bequest is defined as a gift arriving 10 or more days after death.

could both be driven in part by the same unobservables, particularly by affinity to Anon U. If so, then stratifying on bequest behavior would lead to inconsistent parameter estimates. Further, in our data, we have no exogenous variable that is correlated with the bequest decision and excluded from our model of *inter vivos* charitable giving.

With all these caveats in mind, we mention a few suggestive summary statistics. First, alumni who leave a bequest are much more likely to make a donation in a given year, taking 85.8 percent of giving opportunities versus 64.1 percent for those who do not leave a bequest. Second, in the six years before death, those who leave bequests make gifts about 77.5 percent of the time (down from 91.3 percent before that time), compared to 56.4 percent for those who do not leave bequests (down from 67.8 percent before that time); the propensity to give falls proportionally for the two groups. Third, the conditional mean gift in the six years before death is higher for those who leave bequests than for those who do not: $17,689 for the former versus $3,238 for the latter. In short, those who leave bequests are more likely to make gifts in the years leading up to their deaths, and these gifts are larger. Without making too much of this positive relationship because of the aforementioned reasons, we note that nothing in these summary statistics suggests a strong substitution between *inter vivos* charitable giving and bequests in our sample. This result is consistent with James (2009), who finds that individuals who cease making charitable gifts during life also tend to be less likely to make charitable bequests.

In the same spirit, to explore in a preliminary fashion whether there are differences between alumni who do and do not leave bequests with respect to the effects of age and approaching death on the probability of making a gift, we estimated our basic model separately for alumni who did and did not leave bequests. The results, reported in columns 1 and 2 of Table 3, do not suggest any meaningful differences, although once again, one must exercise caution in interpreting these results.

*4.3. Heterogeneous approach-of-death effects*

We have argued that the coefficients on our year-before-death variables reflect the impact of approaching death on giving. Perhaps, though, these variables are only picking up a nonlinear effect of age. To address this possibility, note that our basic specification assumes that the impact

of approaching death on giving is the same for each individual. Suppose that, instead, we expect the pattern of giving in the years before death to differ across various groups in particular ways. If we estimate the basic model separately for these different subgroups and the patterns are consistent with these expectations, then this lends credence to the notion that the end-of-life variables are doing more than reflecting additional nonlinearities in the age-giving profile. In short, we can gain further insights by estimating the model separately for various subgroups in the sample.[13]

### 4.3.1. Duration of final illness

We can think of certain fatal conditions as causing death in a short time and others in a long time. In our framework, the decline of giving in the years approaching death should be more pronounced for individuals who die of long illnesses, because the longer the expected interval until death, the more time the individual has to adjust his behavior. However, within the broad disease classifications that are available to us, there is considerable heterogeneity with respect to the length of time between the onset of a disease and when death occurs.[14] For some of our decedents, we can sidestep this problem because the obituaries explicitly indicate whether death was followed by a "long" or "short" illness. Obviously, the obituary writers are not given precise instructions about how to define "long" and "short," so there are likely inconsistencies in the way that individuals are classified. Still, it seemed worthwhile to estimate our basic model separately for the two groups. The results are in columns 3 and 4 of Table 3, with column 3 showing the estimates for decedents with conditions that led to death in a relatively long time, and column 4 for those with conditions that led to death in a relatively short time. A comparison of the point estimates in the two columns indicates that, in line with our framework, the decline in giving as death approaches is more substantial for those who died after long illnesses.[15] In fact, those with

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[13] An alternative strategy would be to estimate a model that includes a full set of interactions among the various demographic characteristics and the years-before-death variables. However, for some specifications, many of the cells have relatively few observations. The estimates therefore tend to be unstable.

[14] For example, there is substantial variation in survival rates for both neurological diseases (Kurtzke and Wallin, 2001) and heart diseases (Hunt et al., 2009).

[15] As noted above, we have some information about the cause of death—accidents, heart disease, neurological diseases, cancer, and others. We estimated the model separately for each group of diseases, and found no statistically significant differences in the coefficients on the approach-of-death variables, with the exception of diseases of the

short-duration causes of death do not have a statistically significant decline in the probability of giving. The differences between those with shorter- and longer-duration causes are fairly substantial and these variables are jointly significantly different from each other at $p = 0.09$, with most pairs of coefficients around the traditional threshold for statistical significance.

It is interesting to note the implications of this finding for terror management theory. The fact that the negative years-to-death effect is stronger the longer the duration of the final illness would seem to be inconsistent with a TMT explanation of end-of-life altruistic behavior. This is because a longer illness provides a longer period of time to contemplate death and to engage in more prosocial behavior as death approaches. Hence, while our findings do not rule out TMT as a factor in explaining end-of-life altruistic behavior, in our data it does not seem to be the dominant consideration.

*4.3.2. Age*

Other things being the same, we expect death to be more of a surprise for younger than older individuals. Hence, the decline in giving as death approaches should be less steep for younger than older individuals, *ceteris paribus.* We divided our sample into two groups, below and above the median age at time of death (about 80 years old), and estimated the model separately for each group. The years-before-death coefficients for the two groups are reported in columns 5 and 6 of Table 3,[16] and they are consistent with the interpretation suggested by our framework: the decline in giving is considerably steeper for the sample of relatively old alumni. The coefficients on the respective year-before-death variables are significantly different for those who died younger and older than the median age. Further, one can reject the hypothesis that the entire set of coefficients is the same at the 1 percent level.

*4.3.3. Family composition*

As noted in the introduction, it is plausible that the effect of the approach of death depends on the individual's family situation. Specifically, as individuals approach death, they

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nervous system, which had a markedly steeper decline in giving with the approach of death. Both relatively small sample sizes and probable errors in the assignment of decedents to the various categories did not allow us to estimate the coefficients more precisely.

[16] The entire set of results is available upon request.

might believe that charitable donations are made at the expense of their surviving spouse or children.[17] We have information about marital status and number of children at the time of death for nearly all members of our sample (we assume that the lack of information about spouses or children in the data implies their absence). When we estimated our basic model separately for individuals with and without children at the time of death, we found that, indeed, there was a steeper and earlier decline in giving for those with children, other things being the same. However, the coefficients were not jointly significantly different from those for alumni without children. In the same way, we were able to find no consistent or statistically significant differences when we estimated the model separately by marital status (married, single, divorced, widowed). Finally, we divided the sample between decedents who had *any* surviving family member (spouse or child), and found no statistically significant difference between the coefficients on the years-to-death variables for the two groups, though the decline is earlier and steeper for those with surviving family members. While these results are suggestive of the possibility that, as they approach death, donors pay particular attention to resources remaining for their family the lack of statistical significance and potential confounding factors make it difficult to draw conclusions.

## 5. Summary and conclusions

We have used data on alumni donations to an anonymous university to investigate end-of-life giving patterns. Our main finding is that taking into account the approach of death substantially changes the age-giving profile for the elderly—at certain ages, the independent effect of an increase in age on giving actually changes from negative to positive. We examine how the decline in giving as death approaches varies with the length of time that a given terminal condition is likely to bring about death, the cause of death, the individual's age when he died, and the individual's family circumstances. We find that for individuals who died from conditions that bring about death fairly quickly, there is little decline in giving as death approaches

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[17] Using data from the Health and Retirement Study, McGarry and Schoeni (1995) show that the probability of making a gift of over $500 to a child increases with the parent's age, *ceteris paribus,* but there is no statistically significant relationship between the parent's age and the amount of the gift.

compared to those who died from conditions that had a relatively long duration. Further, the decline in giving as death approaches is steeper for the elderly (for whom death is less likely to be a surprise) than for the relatively young. These findings suggest that our primary result, which is that failing to take into account the approach of death leads to biased inferences with respect to the age-giving profile, is not merely an artifact of some kind of nonlinearity in the relationship between age and giving.

Our unique and detailed panel data set allows us, through the use of individual effects models, to control for unobserved characteristics of the members of our sample, including permanent income. However, the fact that our data are drawn from a single selective research university raises two concerns. First, we do not know whether our findings would generalize to other types of charitable giving. Second, it might be the case that with the approach of death the individuals in our sample simply substituted away from giving to Anon U and donated to other institutions, so that *total* giving did not change. For example, Hrung (2004) finds that giving shifts toward religious causes as people age. That said, other studies which focus on total charitable giving have found age-related decreases that are qualitatively similar to the ones in our data (Wiepking and James, 2012). It would be useful to replicate our findings with data from other institutions, and data that include giving to more than a single cause.

Our data allow us to explore only in a preliminary way just why the approach of death exerts a negative effect on giving. Because approaching death affects the dichotomous decision whether or not to make a gift, we are inclined to discount the notion that the reason is diminished resources. Even if an individual is (say) spending more money on health care than before, he can still make a smaller or token donation. If so, then diminished capacity, the distractions associated with a final illness, or the psychologists' terror management theory are more likely causes. Disentangling the various possibilities is an important topic for future research.

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**Table 1:** Summary statistics

|  | N | Mean | Standard Deviation |
|---|---|---|---|
| Gave in Year | 177,885 | 0.654 | 0.476 |
| Amount Given (conditional on giving) | 116,329 | 4501 | 111,964 |
| Years Since Graduation | 177,885 | 46.9 | 13.6 |
| Years Since Graduation at Death* | 10,983 | 55.0 | 13.3 |
| Reunion Year | 177,885 | 0.198 | 0.398 |
| Six or More Years Before Death | 177,885 | 0.671 | 0.470 |
| Five Years Before Death | 177,885 | 0.053 | 0.224 |
| Four Years Before Death | 177,885 | 0.055 | 0.228 |
| Three Years Before Death | 177,885 | 0.057 | 0.231 |
| Two Years Before Death | 177,885 | 0.056 | 0.229 |
| One Year Before Death | 177,885 | 0.055 | 0.228 |
| Year of Death | 177,885 | 0.054 | 0.226 |
| Short Duration Illness* | 3,061 | 0.376 | 0.484 |
| Cause of Death: Cancer* | 3,533 | 0.337 | 0.473 |
| Cause of Death: Accident* | 3,533 | 0.046 | 0.204 |
| Cause of Death: Heart* | 3,533 | 0.197 | 0.398 |
| Cause of Death: Nervous System* | 3,533 | 0.143 | 0.350 |
| Cause of Death: Other* | 3,533 | 0.329 | 0.470 |
| Left Bequest* | 10,983 | 0.073 | 0.260 |
| Married at Time of Death* | 10,983 | 0.687 | 0.464 |
| Widowed at Time of Death* | 10,983 | 0.210 | 0.407 |
| Divorced at Time of Death* | 10,983 | 0.032 | 0.177 |
| Single at Time of Death* | 10,983 | 0.135 | 0.342 |
| Any Children at Time of Death* | 10,983 | 0.766 | 0.423 |

*The unit of observation is an individual rather than individual-year.

**Table 2:** Basic results

| | (1) Probability of Giving | (2) Probability of Giving | (3) Log of Amount Given (Conditional) | (4) Log of Amount Given (Conditional) |
|---|---|---|---|---|
| | Baseline Specification | Including Years Before Death | Baseline Specification | Including Years Before Death |
| Years Since Graduation | −0.0317*** (0.00253) | −0.0164*** (0.00248) | 0.0710*** (0.0104) | 0.0793*** (0.0105) |
| Years Since Graduation Square | 0.000881*** $(5.98 \times 10^{-5})$ | 0.000587*** $(5.81 \times 10^{-5})$ | −0.00115*** (0.000243) | −0.00129*** (0.000243) |
| Years Since Graduation Cubic | $-8.39 \times 10^{-6}$*** $(4.60 \times 10^{-7})$ | $-5.42 \times 10^{-6}$*** $(4.49 \times 10^{-7})$ | $3.46 \times 10^{-6}$* $(1.84 \times 10^{-6})$ | $4.97 \times 10^{-6}$*** $(1.85 \times 10^{-6})$ |
| 1 Year Before Death | | −0.0839*** (0.00563) | | −0.104*** (0.0206) |
| 2 Years Before Death | | −0.0530*** (0.00507) | | −0.0838*** (0.0182) |
| 3 Years Before Death | | −0.0354*** (0.00452) | | −0.0568*** (0.0168) |
| 4 Years Before Death | | −0.0248*** (0.00405) | | −0.0609*** (0.0145) |
| 5 Years Before Death | | −0.0111*** (0.00361) | | −0.0319** (0.0134) |
| Observations | 177,885 | | 116,329 | |
| Individuals | 10,983 | | 9,441 | |

*Notes:* Columns 1 and 2 show the results for linear probability models in which the left-hand side variable is one if the individual made a donation in a given year, and zero otherwise. In columns 3 and 4 the left-hand side variable is the log of the amount of giving; estimation is by ordinary least squares using only observations in which giving is greater than zero. The models in each column include indicators for a reunion year, indicators for state or country of residence in that year, and individual fixed effects. Columns 2 and 4 also include the indicators for month of death in the year that death occurs. Standard errors, which are robust and clustered at the individual level, are in parentheses. A (***) indicates that the variable is statistically significant at the 1 percent level, a (**) at the 5 percent level, and a (*) at the 10 percent level.

**Table 3**: Additional results

| | (1)<br>Probability of Giving<br><br>No Bequest | (2)<br>Probability of Giving<br><br>Left Bequest | (3)<br>Probability of Giving<br><br>Longer Duration | (4)<br>Probability of Giving<br><br>Shorter Duration | (5)<br>Probability of Giving<br><br>Below Median Age | (6)<br>Probability of Giving<br><br>Above Median Age |
|---|---|---|---|---|---|---|
| Years Since Graduation | −0.0165***<br>(0.00254) | −0.0174*<br>(0.00903) | −0.0116***<br>(0.00633) | −0.0224***<br>(0.00637) | −0.00606*<br>(0.00345) | −0.0388**<br>(0.0165) |
| Years Since Graduation Square | 0.000589***<br>($5.99\times10^{-5}$) | 0.000446**<br>(0.000199) | 0.000417**<br>(0.000165) | 0.000624***<br>(0.000155) | 0.00019*<br>(0.00011) | 0.00106**<br>(0.000310) |
| Years Since Graduation Cubic | $−5.42\times10^{-6}$***<br>($4.67\times10^{-7}$) | $−4.58\times10^{-6}$**<br>($1.48\times10^{-6}$) | $−3.67\times10^{-6}$**<br>($1.42\times10^{-6}$) | $−5.42\times10^{-6}$***<br>($1.24\times10^{-6}$) | $−1.41\times10^{-6}$<br>($1.08\times10^{-6}$) | $−8.47\times10^{-6}$***<br>($1.91\times10^{-6}$) |
| 1 Year Before Death | −0.0868***<br>(0.00590) | −0.0512**<br>(0.0161) | −0.0259<br>(0.0155) | −0.0839***<br>(0.00563) | −0.0463***<br>(0.00839) | −0.121***<br>(0.00874) |
| 2 Years Before Death | −0.0537***<br>(0.00532) | −0.0469**<br>(0.00145) | −0.0191<br>(0.0155) | −0.0530***<br>(0.00507) | −0.0245**<br>(0.00758) | −0.0804***<br>(0.00766) |
| 3 Years Before Death | −0.0373***<br>(0.00475) | −0.0145<br>(0.0125) | −0.0138<br>(0.0141) | −0.0354***<br>(0.00452) | −0.0142**<br>(0.00683) | −0.0554***<br>(0.00660) |
| 4 Years Before Death | −0.0262***<br>(0.00426) | −0.00899<br>(0.0117) | −0.00638<br>(0.0131) | −0.0248***<br>(0.00405) | −0.0119*<br>(0.00613) | −0.0360***<br>(0.00572) |
| 5 Years Before Death | −0.0125**<br>(0.00381) | 0.00765<br>(0.00966) | −0.00251<br>(0.0119) | −0.0111***<br>(0.00361) | 0.00178<br>(0.00550) | −0.0224***<br>(0.00492) |
| Observations | 166,751 | 11,134 | 16,925 | 31,284 | 80,588 | 95,688 |
| Individuals | 10,178 | 805 | 1,150 | 1,911 | 5,733 | 5250 |

Each column shows the results for linear probability models in which the left-hand side variable is one if the individual made a donation in a given year, and zero otherwise. Specifications include indicators for a reunion year, indicators for state or country of residence in that year, and individual fixed effects, along with the indicators for month of death in the year that death occurs. Standard errors, which are robust and clustered at the individual level, are in parentheses. A (***) indicates that the variable is statistically significant at the 1 percent level, a (**) at the 5 percent level, and a (*) at the 10 percent level.

**Figure 1:** Total effect of age on the probability of giving
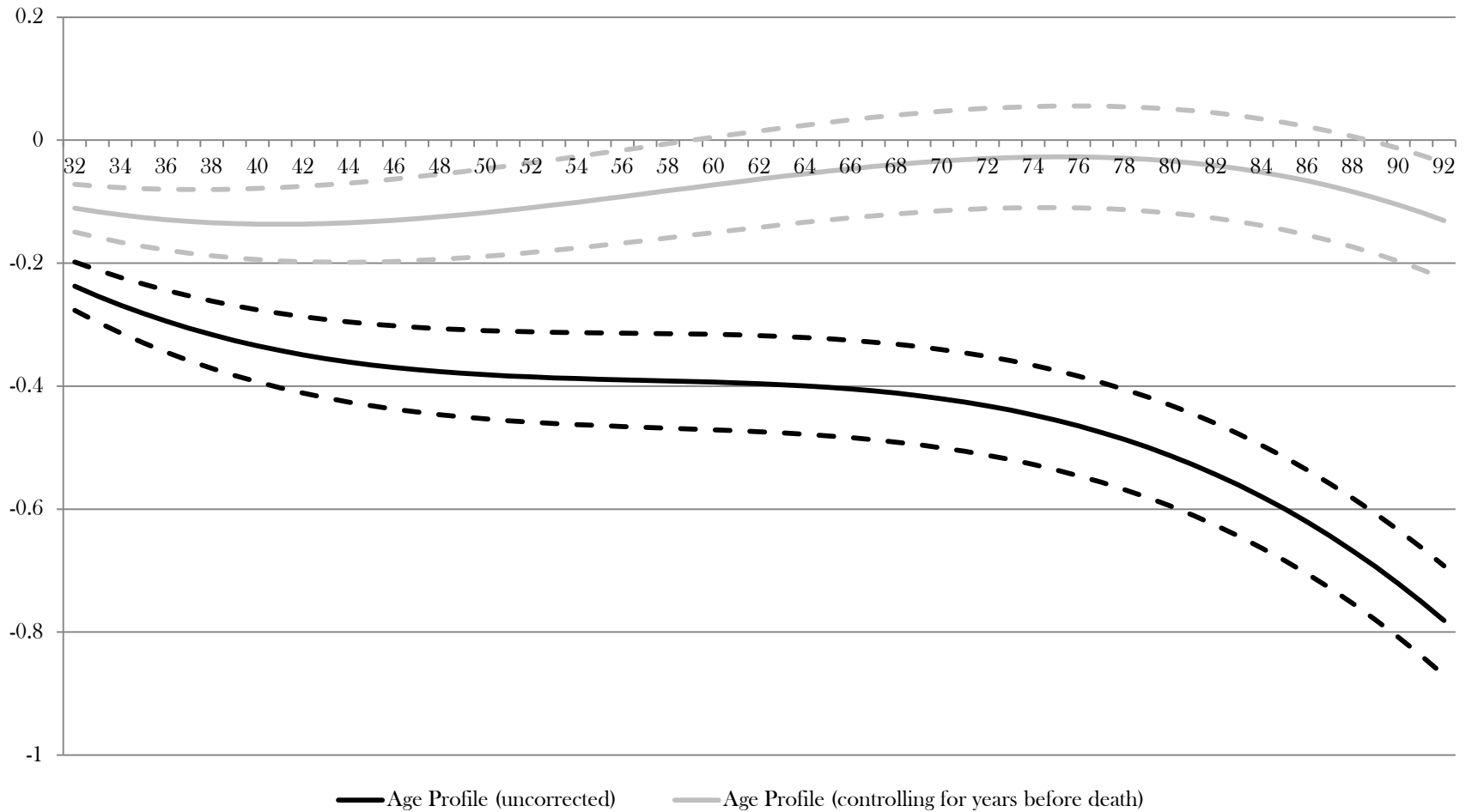


This graph shows the relationship between the probability of making a gift and the age of the alumnus. To generate the graph, we begin by defining Yearssince as years since graduation. We then compute for each value of Yearssince the expression $b_1*Yearssince + b_2*Yearssince^2 + b_3*Yearssince^3$, where each b denotes the corresponding coefficient in Table 2. For ease of interpretation, instead of putting Yearssince on the horizontal axis, we put Age, which we approximate as Yearssince plus 22 (the typical age at graduation). Thus, the graph shows the effect of age on the probability of making a gift compared to the probability for a newly-graduated alumnus. The dashed lines indicate 95 percent confidence intervals.

# Figure 2: Marginal effect of age on the probability of giving



Marginal Effect of Age (uncorrected)      Marginal Effect of Age (controlling for years before death)
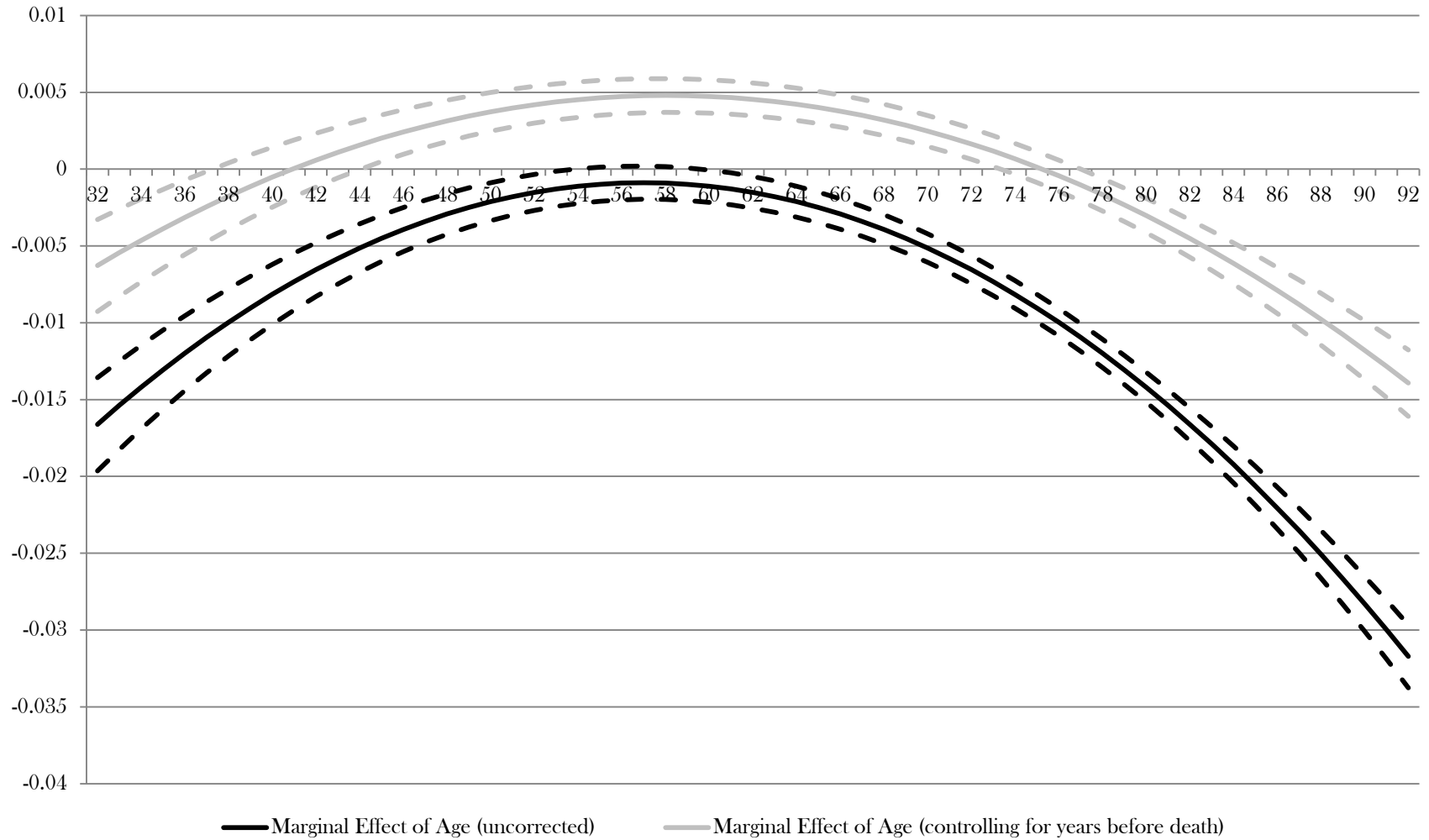
The line labeled "Marginal Effect of Age (uncorrected)" shows the slope at each age of the uncorrected age profile from Figure 1. The line labeled "Marginal Effect of Age (controlling for years before death)" shows the slope at each age of the corrected age profile from Figure 1.