The Intergenerational Transmission of Generosity

Mark O. Wilhelm, Eleanor Brown, Patrick M. Rooney and Richard Steinberg*

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Affiliations: Wilhelm, Rooney, and Steinberg–Department of Economics, IUPUI and Center on Philanthropy at Indiana University; Brown–Department of Economics, Pomona College. Corresponding author: Mark Wilhelm, Department of Economics, IUPUI, 425 University Boulevard, Indianapolis, Indiana 46202 (mowilhel@iupui.edu).

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Abstract

This paper estimates the correlation between the generosity of parents and the generosity of their adult children using regression models of adult children's charitable giving. New charitable giving data are collected in the *Panel Study of Income Dynamics* and used to estimate the regression models. The regression models are estimated using a wide variety of techniques and specification tests, and the strength of the intergenerational giving correlations are compared with intergenerational correlations in income, wealth, and consumption expenditure from the same sample using the same set of controls. We find the religious giving of parents and children to be strongly correlated, as strongly correlated as are their income and wealth. The correlation in the secular giving (e.g., giving to the United Way, educational institutions, for poverty relief) of parents and children is smaller, similar in magnitude to the intergenerational correlation in consumption. Parents' religious giving is positively associated with children's secular giving, but in a more limited sense. Overall, the results are consistent with generosity emerging at least in part from the influence of parental charitable behavior. In contrast to intergenerational models in which parental generosity towards their children can undo government transfer policy (Ricardian equivalence), these results suggest that parental generosity towards charitable organizations might reinforce government policies, such as tax incentives aimed at encouraging voluntary transfers.

Keywords: public goods; warm glow; charitable giving; donations; preference formation; socialization; cultural transmission; prosocial behavior.

JEL Classification: H41, D64, Z13, C80, C24.

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I. Introduction

Economics, based in assumptions of rational self-interested behavior consistent with stable utility functions, has tried different approaches to explaining why otherwise self-regarding Americans collectively give away more than $200 billion annually (*Giving USA*). Because widespread giving is not consistent with the predictions of models based on utility derived from the available stock of a charitably funded public good (Warr 1982; Bergstrom et al. 1986), the discipline has embraced the notion of "warm glow" giving (Andreoni 1989), in which people find pleasure in the act of giving itself. This raises the question, however, of how generally self-interested persons come to find pleasure in generosity. The importance of this question has been recognized for a long time; it is, for example, central to Adam Smith's *Theory of Moral Sentiments*. Smith's thesis is that we are social beings, and that "beneficence" and other forms of pro-social fellow-feeling are socially inculcated as we seek to be liked and admired:

> Were it possible that a human creature could grow up to manhood in some solitary place, without any communication with his own species, he could no more think of his own character, of the propriety or demerit of his own sentiments and conduct, of the beauty or deformity of his own mind, than of the beauty or deformity of his own face… Bring him into society, and he is immediately provided with the mirror which he wanted before. It is placed in the countenance and behaviour of those he lives with, which always mark when they enter into, and when they disapprove of his sentiments; and it is here that he first views the propriety and impropriety of his own passions… (Smith 1759 [1976], p.110)

We suspect that the family plays an integral part in cultivating in impressionable children a sense of the pleasure of giving, and that parents' giving behavior is an important part of that socialization process. This perspective is in line with research on preference formation for time-preference, consumption expenditure, and labor hours (Becker and Mulligan 1997; Waldkirch, Ng and Cox. 2004; Toledo 2006). In this paper, we present evidence in support of a related but more modest claim, that generosity is positively correlated within families across generations. This is a useful first step in investigating the strength of a causal relationship between parents' and children's charitable giving; if the correlation is small, the strength of causal links is likely to be modest as well. We find substantial correlations, suggesting that the possibility of strong causal links is worth further investigation. The larger project is important to the design of policy: for example, tax policy that encourages charitable donations from one generation may not only habituate members of that generation to giving (Barrett et al. 1997) but may also stimulate increased generosity of future adults who, when young, observed their parents' attitudes and behaviors. More generally, economists have focused on intergenerational models in which parental giving to children can undo government policy—Ricardian equivalence (e.g. Barro 1974); the possibility that intergenerationally transmitted generosity might amplify rather than mitigate government policy provides a notable contrast to Ricardian equivalence.

In addition to providing a first look at the intergenerational transmission of generosity, our paper offers two methodological advances. First, and most important, is our design of a new *Panel Study of Income Dynamics* (*PSID*) module to collect data on the charitable giving of parents and their adult children; our design effort is collaborative with Michigan's Survey

Research Center.[1] Second is our use of a wide variety of econometric techniques and specification tests (e.g., Hausman tests) to handle the censoring of charitable giving at zero. The Hausman tests for semiparametric regression models are almost never used in applied research, perhaps because the tests' finite sample properties have been clarified only recently (see Wilhelm 2007a).

Using these data and econometric techniques we estimate regression models of adult children's charitable giving as a function of their parents' giving. We treat children's secular giving (e.g., giving to the United Way, educational institutions, for poverty relief) and religious giving (e.g., giving to churches, synagogues, and mosques) separately because the transmission of religiosity likely plays a stronger role in the transmission of religious giving than in the transmission of secular giving, and because it is well-known that the determinants of secular giving and of religious giving differ (e.g., see Brown and Ferris 2007). The results are that (i) the transmission of secular giving is similar in magnitude to the intergenerational transmission of consumption expenditure; (ii) the transmission of religious giving from parents to children is even stronger—similar in magnitude to the intergenerational transmission of income and wealth; and (iii) there is a positive "cross-over" association between whether a parent does any religious giving and her child's secular giving, although the positive association is not an increasing function of the parent's religious giving amount. While the data do not speak directly to the question of causality, we run specifications of the model that address several competing hypotheses that would explain the correlations, and find little support for these competing hypotheses.

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[1]Collaborators from Michigan's Survey Research Center include Tom Gonzales, Kate McGonagle, James Morgan, Robert Schoeni, and Frank Stafford.

II. Previous literature on the intergenerational transmission of generosity

While few may doubt that parents transmit a preference for generosity to their children, little is known about the strength of transmission. The only econometric evidence is from Indonesia: the elasticity of (adult) children's contributions to village health, irrigation, security, and social organizations with respect to parents' contributions is statistically significant, but small (Deb et al. 2005). Survey evidence from the U.S. indicates a correlation between making (any) charitable contributions and the respondent's recollection that a family member helped others in the past: 74 percent of those so recalling make charitable contributions compared to only 50 percent of those with no such recollection (Hodgkinson and Weitzman 1996)—but it is not known how much of the 24 percentage point difference is due to parent–child similarity in other characteristics such as income. Finally, Ünür and Peters (2002) ran an experiment in which 23 parent–child pairs could give to the Red Cross and Public Broadcasting and found a moderate correlation in giving, but like the survey evidence, the experimental correlation is not *ceteris paribus*.

A substantial body of evidence in the experimental psychology literature suggests that the transmission of generosity to children is not simply a passive phenomenon akin to, say, intergenerational correlations in height. Mechanisms underlying the transmission of generosity have been identified in research on the development of prosocial behavior. This research explores a range of actions that increase children's generosity (see the reviews by Eisenberg and Fabes 1998 and Grusec 1991). The most effective action is role-modeling the desired prosocial behavior. Other transmission actions—such as empathy-based induction and dispositional

praise—can also increase children's prosocial behavior.[2] All of these actions are available to a parent who wishes to instill generosity in her children; in other words, they provide mechanisms with which to understand a purposive, causal link between parents' and children's giving.

III. The empirical model and econometric methods

Our empirical model is similar to models estimated in the literature on the intergenerational transmission of income, wealth, and consumption:

$$c_{2,t} = \rho\, c_{1,t} + \delta_2\, y_{2,t} + \boldsymbol{X}_{2,t}\boldsymbol{\beta}_2 + \varepsilon_{2,t} \qquad (1)$$

where $c_{2,t}$ is the log charitable giving of the adult child (generation 2), $c_{1,t}$ is the contemporaneous log charitable giving of the parent (generation 1), $y_{2,t}$ is the child's economic resources (e.g., log income), $\boldsymbol{X}_{2,t}$ is a vector of the child's other observable characteristics that influence giving, and $\varepsilon_{2,t}$ represents unobservable influences on the child's giving. The subscript t indicates that the child's giving and the parent's giving are measured in the same year. The target of estimation is ρ—the intergenerational elasticity of giving.

Ideally, we would estimate this model using data on the parents' charitable giving from a time in the past ($c_{1,t-1}$) when their children were in their formative years. Lacking such data, we rely on contemporaneous parental giving $c_{1,t}$, proceeding under the maintained assumptions that

[2] Empathy-based induction is motivating children to help by using reasoned explanations that direct attention toward the benefits their help will generate in the lives of others (see Eisenberg-Berg and Geisheker 1979; McGrath et al. 1995). Dispositional praise is responding to a child's helping behavior by making positive comments about the child's helpful character rather than the child's helpful act (see Grusec and Redler 1980).

a parent's preference for instilling generosity varies directly with her own generosity and that a parent's giving later in life is a good indication of parental generosity during the child-rearing years. To the extent that $c_{1,t}$ is a poor proxy for earlier parent giving $c_{1,t-1}$, estimators of ρ based on using $c_{1,t}$ in (1) are potentially subject to measurement error, likely pushing estimates of ρ toward zero.[3] Such measurement error is mitigated to the extent that $c_{1,t}$ and $c_{1,t-1}$ are more strongly correlated—this suggests that measurement error may be less problematic for the subsample of younger children, because for younger children current parent giving is a better signal of the (recent) past giving that produced the role model effect.[4]

A second informal check for the presence of measurement error arising from a mis-match between the parent's current giving and past giving ($c_{1,t}$ and $c_{1,t-1}$) is whether current and past observable characteristics of parents (other than parental giving) are associated with the child's giving. Evidence of an association between the parent's current and past observable characteristics and child giving increases concern about measurement error because: if there is no mis-match between $c_{1,t}$ and $c_{1,t-1}$ then parent's current and past observable characteristics should not enter (1), once parent giving is included in (1). If there a mis-match between $c_{1,t}$ and $c_{1,t-1}$, however, then parent's current and past observable characteristics will enter (1) through the mis-match, even after parent giving is included in (1). Hence, if a mis-match between $c_{1,t}$ and $c_{1,t-1}$ has consequences for the observables, then one would have increased concern that the mis-match also may be having consequences for the unobservables (and that would result in measurement

[3]Assuming, of course, that the direct effects of the measurement error on $c_{1,t}$ dominate effects working through cross-correlations among the other independent variables.

[4]A detailed discussion of these modeling issues is contained in Appendix R1, available upon request from Mark Wilhelm. The equation we would ideally like to estimate is (R.4).

error bias). We offer a precise development of this argument in Appendix R1, available upon request.

In addition there may be a genetic predisposition to generosity that a parent transmits without taking action. The parameter ρ captures the combined effect of parental actions and genetic transmission. Of course, ρ would also pick up any unobservable correlated influences on parents and children, such as influences from extended family members or common cotemporaneous unobservables (e.g., a shock to the need for the charitable output) that influence the giving of both parents and children.

The intergenerational income transmission literature (Solon 1999) informs us about other potential sources of measurement error pushing estimates of ρ toward zero: attenuation bias and life-cycle bias. Attenuation bias arises if the single-year measure of $c_{1,t}$ is a noisy measure of parent permanent giving. Life-cycle bias is likely to be severe when $c_{2,t}$ is measured when the children are in their twenties as opposed to "well into their thirties (Solon p. 1780)." In the results section we will do some back-of-the-envelope calculations to gauge the potential attenuation bias and separately consider the subsample of younger children to gauge the life-cycle bias. Finally, the earnings transmission literature informs us that estimates can be very sensitive to the inclusion of parents who report zero earnings (Solon footnote 14). In light of this, and because parents with $c_{1,t} = 0$ are a frequent occurrence, all of our models include dummy variables for whether parents give at all.

Finally, censoring of $c_{2,t}$ suggests that the OLS estimator of ρ is potentially biased toward zero. Tobit estimation is the standard approach to handling zero $c_{2,t}$ in the charitable giving literature, but departures from homoskedasticity and normality in other literatures have shown that the Tobit inconsistency can be substantial (e.g., see Chay and Honoré 1998, p.20). Therefore

we check for departures from homoskedasticity and normality using conditional moment tests (Pagan and Vella 1989; Drukker 2002) and for the severity of any departures on the estimates using Hausman tests (Newey 1987; Horowitz and Neuman 1987; Wilhelm 2007a). We estimate ρ using several alternatives to Tobit—OLS, nonlinear least squares estimation of exponential models (NLS), symmetrically-censored least squares (SCLS), and censored least absolute deviations (CLAD).[5] The NLS-exponential model is a regression of $c_{2,t}$ in levels (not logs) on $\exp(\rho\, c_{1,t} + \delta_2\, y_{2,t} + \boldsymbol{X}_{2,t}\, \boldsymbol{\beta}_2)$, where the independent variables inside the parentheses are the same as the right-hand side variables in the other specifications (e.g., log parent giving, log child income, etc.). This model allows $c_{2,t}$ to converge to zero for small values of $\rho\, c_{1,t} + \delta_2\, y_{2,t} + \boldsymbol{X}_{2,t}\, \boldsymbol{\beta}_2$ (unlike OLS) without requiring a distributional assumption (unlike Tobit). In principle we prefer either the NLS or CLAD estimators because they are consistent under fewer assumptions. In almost all cases these approaches yield estimates that do not substantially differ from the Tobits.

IV. The *Center on Philanthropy Panel Study* and the *PSID*

The *Center on Philanthropy Panel Study* (*COPPS*; the name of the philanthropy module within the *PSID*) has several advantages relative to other recent giving surveys: high response rate, extremely low occurrence of missing data on giving, and reliable representation of the distribution of giving up to the ninetieth percentile (Wilhelm 2007b). In addition, the *PSID* contains high-quality data on income and wealth, both current and past. With the exception of the 1974 *National Study of Philanthropy*, other surveys of giving have low-quality income data,

[5] We use STATA programs written by Jolliffe et al. (2001) and Moreira (see Chay and Powell 2001) to estimate the CLAD and SCLS models.

no wealth data, and no data about past income and wealth.

COPPS queries a respondent about her family's "donations specifically for religious purposes or spiritual development, for example to a church, synagogue, mosque, TV or radio ministry;" responses to this question form our religious giving variable. Respondents are directed to "not include donations to schools, hospitals, and other charities run by religious organizations" because donations for these other purposes will be asked about later. We combine the amounts given to all these other purposes in our "secular" giving variable—the other purposes are poverty relief, health, education, combined purpose organizations (e.g., the United Way, Catholic Charities, the United Jewish Appeal, etc.), the arts, environmental protection, neighborhood and community organizations, international relief, and open-ended, respondent-defined categories. The term "secular" reminds us that the primary purpose of this giving is something other than "spiritual development," but the term is not meant to overlook that some of the giving to these secular purposes is likely motivated by religious values.

Our sample starts with the 3,175 heads and spouses in the 2001 wave who were children in the original 1968 family units or were subsequently born into the *PSID*'s nationally representative subsample (the *SRC* sample). We drop 590 (19 percent) whose parents are no longer responding to the survey. Among the matched parent–child pairs 54 percent are matched with both parents; 271 had parents no longer residing together and in these cases we combine the giving from both parental family units. For the remaining pairs, matches with mothers are more prevalent than matches with fathers.[6] The results are not sensitive to dropping the 271 children

[6] This is likely due to (i) *PSID* tracking rules that before 1993 tracked sample children 17 and younger following their parents' separation only if the children stayed with the sample parent, and (ii) lower mortality among women.

whose parents no longer reside together, nor the children who could be matched with only one parent.

The main differences between the matched and unmatched children are in age (the averages are 37 and 44) and at the top of the wealth distribution (the 75th percentiles are $82,100 and $135,000). Both are indications that the matched sample is disproportionally representative of children early in their life-cycles, and this must be kept in mind when interpreting the results in light of the previously discussed potential life-cycle bias. Indeed, matched children are slightly less likely to make charitable contributions than are unmatched children (65 versus 69 percent), and among those who do give, the amounts are somewhat less ($1,805 versus $1,968).

We next drop 201 children who have missing data on independent variables we intend to use in our regression. Table 1 presents giving statistics for the remaining 2,384 (Appendix A contains descriptive statistics for all the variables). The first column lists statistics for the entire sample and indicates that adult children are less likely to give to religious than to secular purposes (43 versus 55 percent). However, amounts given to religious purposes (among children who give to religious purposes) are higher than amounts given to secular purposes (among children who give to secular purposes; averages: $1,783 versus $795). Columns 2 and 3 split the sample into those whose parents do not give to religious purposes and those whose parents do. Children whose parents give to religious purposes are more likely to give to both religious and secular purposes; they give substantially higher amounts to religion and modestly higher amounts to secular purposes. Columns 4 and 5 split the sample by parents' secular giving. Children whose parents give to secular purposes are themselves more likely to give to secular purposes, and the amounts given are modestly higher. These children are only slightly more likely to give to religious purposes; there is no difference in amounts given.

Although not shown in the table, children's income, wealth, education, and religious affiliation also vary by whether parents give, indicating the importance of using regressions to net out these influences. Skewness in the distribution of giving is also seen in the table (the medians in square brackets are much smaller than averages), justifying our use of NLS and CLAD estimation techniques that remain consistent even if the underlying errors are asymmetric.

V. Results

A. Main results

Table 2 presents results from models where the dependent variables are the amounts children give to religious and secular purposes. The rows contain results from different specifications. The dependent variables are in logarithms in all seven rows except for the NLS specifications (rows 3 and 4) where the dependent variables are in levels. The two main independent variables are the log amounts parents give to religious and secular purposes. There are numerous independent variables not displayed: dummy variables for whether the parent gives to religious purposes and whether the parent gives to secular purposes, children's current income, income averaged over the recent past (up to five years if available), wealth excluding home equity, home equity, two dummy variables to indicate when the wealth variables are zero or negative (in which case the corresponding log wealth variables are set to log($10)), education, religious affiliation, and other demographic variables (all dollar amount variables are in natural logs). Variables capturing children's income averaged over the recent past and children's wealth are intended control for (otherwise) omitted child permanent income characteristics, and hence mitigate concern that parent giving is primarily standing in for omitted child permanent income. Coefficient estimates for all the independent variables not displayed are available upon request

(Appendix R2).

For each dependent variable (a double-width column) and each specification (row) Table 2 lists the coefficients on the two main independent variables; each pair of coefficients comes from one regression. Coefficients from models of children's religious giving are in the first double-width column. Row 1 presents the Tobit estimates of $\partial E(y|\boldsymbol{x})/\partial x_j$—the marginal effect on the observable outcome evaluated at the means. The elasticity of children's religious giving with respect to parents' religious giving is .259; the cross-elasticity of children's religious giving with respect to parents' secular giving is –.068 (to ease discussion we will refer to these elasticities as the religious elasticity and the religious-with-respect-to-secular elasticity). The comparable OLS elasticities in row 2 are slightly larger. The NLS-exponential elasticities in row 3 are much larger, but this difference goes away when we re-estimate after dropping the top parent giver and the top child giver (row 4), suggesting NLS sensitivity to outliers.[7]

Table 2 continues with specifications that examine the sensitivity of the results to homoskedastic and normal error assumptions. Row 5 contains the same specification already discussed in row 1, but presents the Tobit coefficients describing elasticities of the latent dependent variable; these are the estimates comparable to SCLS and CLAD. Row 6 presents the SCLS estimates (SCLS consistency requires symmetry of the errors but not homoskedasticity). The estimated elasticities (.528 and –.223) are fairly close to those from Tobit. Row 7 presents CLAD estimates for the median (CLAD relaxes the requirement of symmetric errors). The religious elasticity appears similar to the Tobit, while the religious-with-respect-to-secular elasticity is more negative.

[7] Drop the same observations in the Tobit and OLS models and the results hardly change. We select these observations to drop based on breaks in the data.

Turning to the secular giving models in the second double-width column, the Tobit elasticity of children's secular giving with respect to parents' secular giving (the secular elasticity) in row 1 is .084. The OLS elasticity in row 2 is slightly larger. In the NLS-exponential model, the secular elasticity is smaller and insignificant, whereas the cross-elasticity of children's secular giving with respect to parents' religious giving (the secular-with-respect-to-religious elasticity) is significantly negative. Row 4 drops the top parent and two top child givers (again based on breaks in the data); the secular elasticity returns to Tobit-OLS levels, but the significantly negative secular-with-respect-to-religious elasticity remains. The Tobit, SCLS, and CLAD estimates (rows 5-7) are similar: .119 to .130 for the secular elasticity and −.050 to −.079 for the secular-with-respect-to-religious elasticity. Only the secular elasticities are statistically significant.

In both the religious and secular giving models elasticity estimates are similar for Tobit, SCLS, and CLAD specifications (perhaps except for the religious-with-respect-to-secular elasticity) despite the rejections of normality and homoskedasticity by zero conditional moment tests (rows 8 and 9). Hausman tests (rows 10 and 11) indicate that the departures from normality and homoskedasticity are for the most part inconsequential in terms of the slope estimates: there is no significant difference between SCLS or CLAD and Tobit in the religious giving model, or between CLAD and Tobit in the secular giving model. There is a significant difference between SCLS and Tobit in the secular model but even here χ^2_1 tests (not shown) separately comparing the two secular elasticities and the two secular-with-respect-to-religious elasticities fail to reject equality. This pattern of test results is consistent with Monte Carlo experiments illustrating that conditional moment tests have power to detect departures from normality and homoskedasticity

even when those departures cause very minor biases (Wilhelm 2007a).[8]

Recall that in addition to the elasticity estimates on parents' religious and secular giving, each model contains two dummy variables (not shown in Table 2) indicating whether parents give at all to religious and secular purposes. For three of the four intergenerational associations, the dummy variables make no qualitative difference in the interpretation of the elasticities. However, for the religious-to-secular cross association, the dummy variable does make a qualitative difference: the Tobit latent coefficient on whether the parent gives something to religious purposes is .462 (std. dev. = .279); combining it with the −.050 (though insignificant) secular-with-respect-to-religious elasticity estimate indicates a positive association between parents' religious giving and children's secular giving for parents who give something to religious purposes but less than $10,300 (98 percent of the parents in the sample who give to religion give less than $10,300). In short, children whose parents give to religious purposes give more to secular purposes (about one-third more in terms of the marginal effect on observable secular giving), but the children's secular amount does not increase with the parents' religious amount—in this sense, parents' religious giving has a limited "cross-over" association with their children's secular giving.[9]

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[8]The sampling distributions for these and all the other test statistics in the table are bootstrapped; Monte Carlo experiments from Wilhelm (2007a) indicate the necessity of bootstrapping the tests. Also, Wilhelm's experiments indicate that when the errors are mildly asymmetric SCLS can produce worse bias than Tobit. Indeed, the distribution of the secular model's CLAD residuals relative to normal (Handcock and Morris 1999) shows a mild asymmetry and this may explain the Hausman test rejection in the SCLS vs. Tobit comparison.

[9] As suspected from the earnings mobility literature, the use of dummies for zero parental giving is important: without the dummies the religious elasticity estimate is much lower (the Tobit latent elasticity is .385 instead of .558), the secular elasticity is a little higher (.172 instead of .130), and, most important to note, the positive religious-to-secular association would have been missed altogether.

B. Additional sensitivity checks and other results

Our first check is to re-estimate the models for the subsample of younger children (age 30 and younger). For the younger children we expect any measurement error from the mis-match between $c_{1,t}$ and $c_{1,t-1}$ to be less problematic but, at the same time, any life-cycle bias from $c_{2,t}$ to be more severe. If both measurement error and life-cycle bias are occurring they would be offsetting each other, making it hard to detect their presence in the younger subsample (happily in this situation measurement error and life-cycle bias would also be offsetting each other in the full sample of adult children). However, there is evidence suggesting that religious giving may be less subject to life-cycle bias than secular giving because religious giving in young adulthood is closer to its eventual level in middle adulthood.[10] If religious giving is less subject to life-cycle bias, then a larger religious elasticity in the young subsample is a better check for the presence of measurement error. Consistent with this argument, the religious elasticity is much larger when estimated on the young subsample (.81), but the secular elasticity barely changes (.129).

As a second informal check for the presence of measurement error arising from the mis-match between $c_{1,t}$ and $c_{1,t-1}$ we enter a full set of current observable characteristics of parents (e.g., current income, average recent past income, wealth, education, religious affiliation, and other demographic variables—in short, a set of observable characteristics that parallels the set of children's characteristics that we also control for). Parent current income is significant in the religious giving model and parent average recent past income over 1994-2000 is on the margin of

[10]We calculated the giving of the 1943-1956 cohort in young adulthood (ages 17-30 in 1973) and in middle adulthood (ages 44-57 in 2000), using the *National Study of Philanthropy* to estimate 1973 giving (Morgan et al. 1979). The cohort's average religious giving did increase, from $513 to $1,105, but their secular giving quadrupled from $166 to $714.

significance in the secular giving model—both parent income coefficients are negative. The negative parent income coefficients are an indirect indication of the presence of measurement error (as is made clear in Appendix R1). We also enter parent income from the distant past (average past income over 1968-1972), but this is not statistically significant in either the religious or secular model. Hence we have mixed results from this second informal check on measurement error.

However, it is important to note that estimates of the intergenerational elasticities themselves show little sensitivity to entering the full set of parent characteristics: the Tobit latent religious elasticity is a bit higher (.58) and the latent secular elasticity is a bit lower (.09). The insensitivity of the intergenerational elasticities to including the full set of parent characteristics is important because if the parental giving variables had been primarily stand-ins for omitted child permanent income characteristics we should have seen qualitative changes in the coefficient estimates when other likely stand-ins for omitted child permanent income characteristics were added.

Just as importantly, the insensitivity of the intergenerational elasticities to the full set of parent characteristics allows a different conceptual interpretation of the results. In the model with the full set of parent characteristics, the intergenerational elasticities are estimated using variation in the parental giving variables that is orthogonal to the observable parent characteristics included in the model. Hence, if we compare two children who are expected to give the same amount (based on having the same observable child characteristics), and whose parents are expected to give the same amount (based on having the same observable parent characteristics), but the second child's parent gives more than the first child's parent (this is the only observable difference between the two children and between the two parents), the

intergenerational elasticities suggest that the giving of the second child will be higher.[11]

There is little we can do to check for attenuation bias directly with the *PSID* giving data, but we can get a ballpark indication of the bias by using tax panel data to calculate an attenuation factor. That calculation indicates that the elasticities we estimate should be multiplied by a factor of 2 or more to get a sense of the magnitudes of permanent elasticities. This suggests that attenuation bias is as large here as it is in the income mobility literature.[12]

We conducted several additional sensitivity checks. Elasticities estimated from the subsample of parents and children residing in different states do not drop toward zero, providing some evidence that common cotemporaneous unobservables are not driving the results: the Tobit latent estimates are .53 for the religious elasticity and .20 for the secular elasticity.

We checked to see whether the results changed when adding a vector of controls available from the 1968 wave of the *PSID* describing parental attitudes, dispositions, and behaviors that might proxy for mechanisms of generosity transmission: whether the parent trusts most other people, knows a lot of neighbors (social connectedness), helps friends or relatives a lot, feels an obligation to financially help parents or relatives, angers easily (difficulty in regulating emotion is thought to inhibit sympathetic responses; Eisenberg 2002), desires approbation, and attends

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[11]We are grateful to a referee for pointing this interpretation out.

[12] The calculation follows Solon (1999, p. 1778): under all the simplifying assumptions invoked there the attenuation factor is the ratio of the variances of permanent giving over permanent-plus-transitory giving, a signal-to-noise ratio. Using estimates of these variances from the tax data analyzed by Auten et al. (1999), the attenuation factor is .4154/(.4154+.5652) = .42; the reciprocal of this is the correction factor used to multiply our estimates so that they reflect permanent elasticities. We stress this is a ballpark indication of attenuation bias: the tax sample is different (different time period and itemizers only), the controls available in tax data to net out observable changes in giving are different, and the variances are for total giving (religious and secular combined).

church frequently. Adding the controls leads to a small drop in the religious elasticity, and no change in the secular elasticity.[13]

We examined a variety of alternative functional forms. If we regress the children's percentage of income given on the parents' percentage given the pattern of results is similar to Table 2. Adding the log tax price to the models produces price estimates of the correct sign, magnitudes similar to previous cross-section estimates, and negligible effects on the intergenerational elasticities. Because tax price effects are identified off of functional form, we take this as some evidence that the intergenerational elasticities are not arising from functional form misspecification.

Another functional form argument is that children likely know whether their parents give to religious and secular purposes, but are unaware of the amounts parents give. We estimated the models under the extreme assumption that children know only whether or not their parents give. The results are qualitatively similar to those already discussed. We also estimated the model under a middle-ground assumption: children know the quartile in which their parents' giving falls. Again the results are qualitatively similar to those already discussed. All of these results are available to interested readers, upon request.

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[13]The Tobit latent religious elasticity drops from .616 to .506 (the initial .616 estimate is slightly higher than in Table 2, row 5 because the model is estimated using the subset of parents for whom the 1968 controls are available; n = 1,500). Parents' trusting others, helping friends or relatives, desiring approbation, and frequent church attendance are positively associated with children's religious giving. Adding the controls causes little change in the religious-with-respect-to-secular elasticity; because one of the controls is also a proxy for parental religiosity (frequent church attendance), the lack of change in the religious-with-respect-to-secular elasticity suggests the negative association is not due to omitted parental religiosity. As already mentioned, adding the controls to the children's secular model causes no change in the elasticities—only one of the controls (social connectedness) is statistically significant.

Other results

We examined total giving (religious plus secular) and the separate five main categories of secular giving (poverty relief, health, education, combined purposes, and a catch-all "other" category adding together the remaining secular purposes). The Tobit latent elasticity of children's total giving with respect to parents' total giving is .246 (the Tobit marginal elasticity $\partial E(y|\boldsymbol{x})/\partial x_j$ = .195)—not surprisingly the total elasticity is in between the religious and secular elasticities reported in Table 2. When we examine the five main categories of secular giving the results show a positive association between the log amount a child gives to each purpose and a dummy variable indicating whether his parent gives anything at all to that same purpose. The strongest of these associations is for poverty relief (Tobit marginal coefficient = .245) and combined purposes (Tobit marginal coefficient = .217); the other marginal coefficients are in the .11 to .15 range. The results do not show large associations between the log amount a child gives to each purpose and the log amount his parent gives to the same purpose when the dummies for whether his parent gives anything at all to the same purpose are included, but the associations are large and statistically significant when the dummies are omitted. The religious-to-secular positive association discussed above (the association through the dummy variable for whether the parent gives anything to religious purposes) is primarily due to an association between whether parents give anything to religious purposes and amounts their children give to health purposes and the catch-all "other" category. We also find that, despite religious teaching on charity towards the poor, whether or not parents give to religious purposes has no bearing on children's giving to relieve poverty.

Several estimated coefficients on independent variables besides the intergenerational elasticities are robust across the specifications in Table 2. Income is significantly positive in all

specifications. In the religious giving models there is evidence of a positive relationship with education, being married, living in the south, and (not surprisingly) religious affiliation. In the secular giving models those with higher wealth (specifically, the measure of wealth excluding home equity), higher education, and who are married give more. Religious affiliation is not associated with significantly higher secular giving in a robust manner across specifications (with the possible exception of Jews).[14]

C. Magnitudes of the intergenerational giving elasticities

To get a sense of the magnitudes of the intergenerational giving elasticities in Table 2 we compare them to estimates of other intergenerational elasticities in Table 3. The Table 3 estimates are from OLS regressions that include all the demographic controls we have used in the giving models as well as the income and wealth controls when so indicated. Using these controls facilitates comparisons with our giving elasticities, but in some cases means that the Table 3 intergenerational elasticities are not directly comparable to previously published elasticities.

In column 1 the elasticity of children's log current income with respect to parents' log average (recent) past income is .144—much smaller than the .4 to .5 range well-known from the mobility literature. A closer replication reproduces that literature's results with our sample: the elasticity rises to .32 when the set of demographic controls is reduced to age quadratics only and then to .42 when parental income is measured over 1968-1972 instead of the recent past. The increase by one-third in the mobility elasticity when using income from earlier in the parent's life-cycle reminds us about potential life-cycle bias toward zero in the giving elasticities. The

[14] Jewish affiliation has a significantly positive coefficient in OLS, Tobit, NLS, and SCLS specifications; in CLAD the coefficient is positive, though not significant.

.194 intergenerational wealth elasticity in column 2 is comparable to Charles and Hurst's (2003) estimate when they control for age and income. The final three elasticities are for food expenditure, consumption expenditure imputed as in Skinner (1987), and consumption expenditure imputed using Lupton's (2002) expenditure regressions.[15] Because these dependent variables are expenditures we add children's income and wealth as independent variables; the specifications are therefore identical to the giving models. The estimates from these models range from .065 to .097.[16] Comparing the Table 3 estimates to the religious and secular elasticities of observable outcomes (ranging from .259 to .309 and .084 to .142 in Table 2, ignoring the row 3 results) we see that the religious elasticity is much larger than the income and expenditure elasticities, and somewhat larger than the wealth elasticity. The secular elasticity is in the same range as the expenditure elasticities but smaller than the income and wealth elasticities.[17]

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[15] Skinner imputes consumption expenditure from expenditures on food consumed at home, food eaten out, house value, and rent. Lupton's expenditure regressions use the two food expenditures, mortgage payments, rent, and utility payments. Both are based on the *Consumer Expenditure Survey*. Because Skinner's imputation includes house value, we re-estimated the intergenerational elasticity omitting the control for home equity; the estimate rises to .13.

[16] This range is smaller than reported by Waldkirch et al. (2004) whose results imply an elasticity of .224 for food expenditure. Although some of the difference is likely due to differences in econometric methods (Waldkirch et al. use a factor model), a lot of it is due to attenuation bias. A ballpark calculation like that done for giving based on their results and their equation A2 suggests an attenuation factor of 2.5 for food expenditure. If we more closely replicate their sample (drop all divorced/separated parents when both remain in the survey) and independent variables (use only average income, sex, age, marital status, family size, and employment status) our estimate rises to .08. When increased by the attenuation factor ($0.08 \times 2.5 = .2$) it is much closer to Waldkirch et al.'s result. A similar ballpark argument delivers a similar result for consumption imputed as in Skinner (1987).

[17] Toledo (2006) reports the intergenerational elasticity of work hours to be in the range of .117 to .200 (depending on whether time-invariant controls are used or not). Hence, the intergenerational elasticity of work hours seems stronger than the secular giving elasticity but

Two other ways to assess the size of the intergenerational giving elasticities are to compare them to the effect of own income and to predict giving differences between children based on differences in their parents' giving. The religious elasticity is about one-third of the elasticity of religious giving with respect to children's average past income, and the secular elasticity is about one-tenth of the income elasticity of secular giving.[18]

Turning to predictions, the giving elasticities suggest differences in the giving of otherwise similar children whose parents give different amounts. Figure 1 shows predicted child religious giving (in levels) as a function of parent religious giving (also in levels). Expected child religious giving is based on the tobit marginal effects, evaluated at children's average current income, recent past income, and wealth; and for a child who is college-educated, Protestant, average age, married with one child, employed, in good health, white, living in a large city, and not living in the south. Also, the child's parent is giving the average (among parents) to secular purposes ($1,187). Figure 1 predicts that a child whose parent gives at the first quartile of the conditional distribution of religious giving among parents ($450) has religious giving at $539. Compare this child to a second child who has the same observable characteristics, except that the religious giving of the second child's parent is at the median ($1,000): the second child's predicted religious giving is $746, 38 percent higher than the first child. A 49 percent difference occurs if we compare children whose parents are at the median and third quartile ($2,500) of

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weaker than the religious giving elasticity.

[18] These comparisons are taken from specifications in which children's average past income is the only child resource variable used; this forces all of the effects of average past income, current income, and wealth to operate through one variable. There is little change between the estimates of intergenerational elasticities in these specifications and the estimates in Table 2.

religious giving.[19]

Figure 1 also shows predicted child secular giving as a function of parent secular giving, for a child with the characteristics described in the previous paragraph, except now the parent's religious giving is at the average level among parents ($1,358), and now the x-axis is the parent's level of secular giving. The level of the child's secular giving and the slope with respect to parent secular giving are smaller than in the plot of children's religious giving. Moving from the first quartile to the median in the conditional distribution of secular giving among parents ($150 to $400) is associated with moving from $211 to $233 in the secular giving of their children, an 11 percent difference.

D. Why is the religious elasticity larger than the secular elasticity?

The transmission of religiosity likely plays a role in the transmission of religious giving, but even so it is possible to transmit central dimensions of religiosity (e.g., prayer, reading sacred texts, attendance at services) without necessarily transmitting the practice of religious giving and effecting a parent–child correlation in religious giving. The parent–child correlation in religious giving will be effected only if generosity toward places of worship is also transmitted. In the same way, it is possible to transmit a love of the arts, but so doing will effect a correlation in giving to the arts only if generosity toward the arts is also transmitted.

Nevertheless, it may be that the transmission of religiosity is more strongly tied to the

[19]The non-linearity in the left-most part of the religious giving curve reflects the negative coefficient on the dummy variable indicating whether the parent gives at all to religious purposes: the child whose parent gives zero to religious purposes is predicted to give $260 and the child whose parent gives $1 to religious purposes is predicted to give $153. Once parent giving reaches $54, predicted child giving is back to $260. Only 23 parents (three percent) out of the 740 who give to religious purposes give less than $54.

transmission of religious giving in some religious affiliations, and that the large religious giving elasticity we estimate is really just capturing the transmission of these religious affiliations.[20] For example, if a Mormon parent successfully transmits her Mormon affiliation to her child, the Mormon-to-Mormon transmission will effect a correlation in religious giving due to the stronger tithing expectation among Mormons, in addition to any transmission of religious generosity. Transmission of religious affiliation for affiliations with less strong tithing expectations (e.g., Catholic, Methodist) will effect a correlation in religious giving but only to the extent that religious generosity is also transmitted. The data limit our ability to check this possibility, but the checks we are able to perform suggest that this possibility is not driving the large religious elasticity.[21]

Another possible explanation of the large religious elasticity is simply that religious giving is

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[20]A few religious groups use fixed fees (dues) and for these groups the transmission of religious affiliation is necessarily tied to the transmission of religious "giving." However, only two percent of all giving to congregations is in the form of fixed fees (Hodgkinson and Weitzman 1992, p.71). Hence, most religious giving is voluntary.

[21]The checks interact log parents' religious giving with a dummy variable indicating the parent's affiliation with a fundamentalist sect. The underlying idea is that fundamentalists experience stronger tithing expectations and give larger amounts to their churches (Hoge et al. 1996, pp. 47-51) and fundamentalists more strongly socialize their children's religiosity. We use *PSID* data describing a respondent's affiliation with a religious denomination and Smith's (1987) classification of denominations to determine whether the respondent is fundamentalist. The largest group in the *PSID* data classified as fundamentalist are Baptists. The main data limitation is that responses to the *PSID* affiliation question cannot always be clearly classified as fundamentalist (e.g., Smith classifies six of the seven major Baptist denominations as fundamentalist, but the *PSID* affiliation response is simply "Baptist").

The log parent religious giving–fundamentalist dummy interaction term is positive (as the sect-specific explanation would suggest) but very small and insignificant. Similarly, the religious elasticity estimate changes little even if the fundamentalist dummy is redefined to indicate <u>both</u> parent and child are fundamentalist (indicating a successful transmission of sect-specific religiosity) or if the dummies are expanded to include Jewish parents and children (including another group that, though not fundamentalist, often experiences strong expectations to support synagogues).

more strongly socialized than is secular giving. We cannot test this explanation directly, but the explanation is reasonable—religious parents may speak more often to their children specifically about religious giving, parents' religious giving can be more easily observed by children, and children attending religious meetings likely hear additional discussion about giving (perhaps specifically to that religious group) and witness giving rituals.

VI. Conclusions

We introduce new data on charitable giving and use it to estimate the elasticity of children's giving with respect to parents' giving. The estimates range from .26 to .31 for religious giving and from .08 to .14 for secular giving. The intergenerational religious giving elasticity is roughly the same magnitude as intergenerational elasticities of income and wealth. The magnitude of the secular giving elasticity is similar to that of intergenerational consumption expenditure.

Our informal checks suggest that the estimates of giving elasticities may be biased toward zero by measurement error and life-cycle bias and that these are more serious problems than potential overestimation due to correlated contemporaneous shocks. Similarly, the ballpark correction factor to adjust for attenuation bias suggests that the permanent elasticities might be as much as twice the magnitude of the elasticities we report. However, we recognize that the data have limited ability to check for these sources of bias and this should be kept in mind when drawing implications from the estimates.

While we cannot make a case for a causal interpretation of these correlations between the generosity of parents and their adult children, several noncausal explanations can be dismissed. The correlation does not appear to stem from the parent's giving acting as a proxy for the child's permanent income or from unobservable local conditions.

The elasticity estimates of children's giving with respect to parents' giving are consistent with the view that children's warm glow emerges (at least in part) from parents, a view that is in turn consistent with the findings of psychologists who study the development of pro-social behavior in children. This view has markedly different implications for social policy than what typically arises in intergenerational models of giving: if parental giving can be manipulated by government action, for example by tax policy, and if parental giving is to some extent transmitted to the next generation, parental giving can serve to amplify rather than to undo governmental policy.

Table 1. Descriptive Statistics: Children's Giving By Whether Parents Give to Religious and Secular Purposes.

	All children	Parent religious giving		Parent secular giving	
		No	Yes	No	Yes
Variable	(1)	(2)	(3)	(4)	(5)
Giving to religious purposes					
Fraction giving	0.43	0.29	0.52	0.38	0.46
Amount, conditional on giving	1,783 (3,579) [600]	1,173 (1,792) [400]	1,970 (3,951) [710]	1,792 (3,736) [600]	1,779 (3,517) [600]
Giving to secular purposes					
Fraction giving	0.55	0.43	0.62	0.41	0.62
Amount, conditional on giving	795 (2,042) [300]	679 (1,461) [290]	840 (2,224) [336]	571 (952) [300]	867 (2,279) [325]
Number of observations	2,384	849	1,535	785	1,599

Notes: Standard deviations in parentheses. Medians in square brackets.

Table 2. Models of Children's Giving.

Specification	Dependent variables: Child's log religious giving — Independent variables: Coefficient on log parent giving to: Religious purposes	Child's log religious giving — Coefficient on log parent giving to: Secular purposes	Child's log secular giving — Coefficient on log parent giving to: Religious purposes	Child's log secular giving — Coefficient on log parent giving to: Secular purposes
1. Tobit – marginal effects: $\partial E(y\|\boldsymbol{x})/\partial x_j$ (evaluated at means)[a]	0.259*** (0.039)	−0.068* (0.038)	−0.032 (0.035)	0.084** (0.035)
2. OLS (including zero gifts)	0.309*** (0.043)	−0.090** (0.040)	−0.043 (0.034)	0.097*** (0.033)
3. NLS – exponential model	0.501*** (0.039)	−0.178*** (0.034)	−0.123*** (0.029)	0.032 (0.027)
4. NLS – same as row 3, but omit outliers	0.300*** (0.033)	−0.082** (0.030)	−0.133*** (0.024)	0.142*** (0.026)
5. Tobit – raw coefficients: $\partial E(y^*\|\boldsymbol{x})/\partial x_j$	0.558*** (0.084)	−0.147* (0.082)	−0.050 (0.054)	0.130** (0.053)
6. SCLS	0.528*** (0.133)	−0.223* (0.124)	−0.079 (0.061)	0.119** (0.058)
7. CLAD – median	0.544*** (0.145)	−0.346*** (0.125)	−0.074 (0.067)	0.120** (0.061)
Specification test				
8. Conditional moment - normality (χ^2_2)	281***		219***	
9. Conditional moment - homoskedasticity (χ^2_{31})	127***		186***	
10. Hausman (Tobit–SCLS; χ^2_{31})	17		94**	
11. Hausman (Tobit–CLAD; χ^2_{31})	42		23	

Notes: The dependent variable in the first two columns is the amount given for religious purposes; in the second two columns the dependent variable is the amount given for secular purposes. Each row presents estimation results from the indicated specification for models of both dependent variables; only the coefficients on the log amounts given by parents are displayed.

Other controls included in the models but not displayed are: dummies for whether the parent gives to religious purposes and secular purposes; current income and average past income (both in logs); home equity and wealth excluding home equity (both in logs); dummies for wealth and home equity being zero or negative; the education and religious affiliation of the household head; the sex, age (quadratic), race, ethnicity, work status, health, and marital status of the household head; the number of children present in the household, a dummy for no children, whether the household is located in the South, and whether it is located in a large metropolitan area. N = 2,384.

In all rows except 3 and 4 the dependent variables are in logs. In rows 3 and 4 the dependent variables are in levels: $y = \exp(X'\beta) + u$ where $X'\beta$ are the same independent variables as in the other rows; the models in rows 3 and 4 are estimated using nonlinear least squares.

Standard errors are in parentheses (robust for the OLS model; bootstrapped for SCLS and CLAD).

[a] The row 1 Tobit marginal effects on $E(y)$ are <u>not</u> conditional on $y^* > 0$.

[*] - Significant at 10 percent. [**] - Significant at 5 percent. [***] - Significant at 1 percent.

Table 3. Intergenerational Elasticities for Income, Wealth and Consumption.

	Income (average)	Wealth (excluding home equity)	Food	Imputed Consumption (Skinner)	Imputed Consumption (Lupton)
Elasticity	0.144 (0.020)	0.194 (0.036)	0.065 (0.016)	0.097 (0.014)	0.066 (0.018)
Income controls[a]	No	Yes	Yes	Yes	Yes
Wealth controls[a]	No	No	Yes	Yes	Yes
N	2,384	2,384	2,280	2,097	1,410

Notes: The coefficients are OLS elasticities from regressions of child variables (labeled in the columns) on the corresponding parent variable. The regressions include the demographic controls listed in Table 2, and the income and wealth controls as indicated in the present table. Robust standard errors are in parentheses. The number of observations in column 5 is much smaller because of missing data on utility payments that are necessary to impute consumption.

[a] The same income and wealth controls as listed in the notes to Table 2.

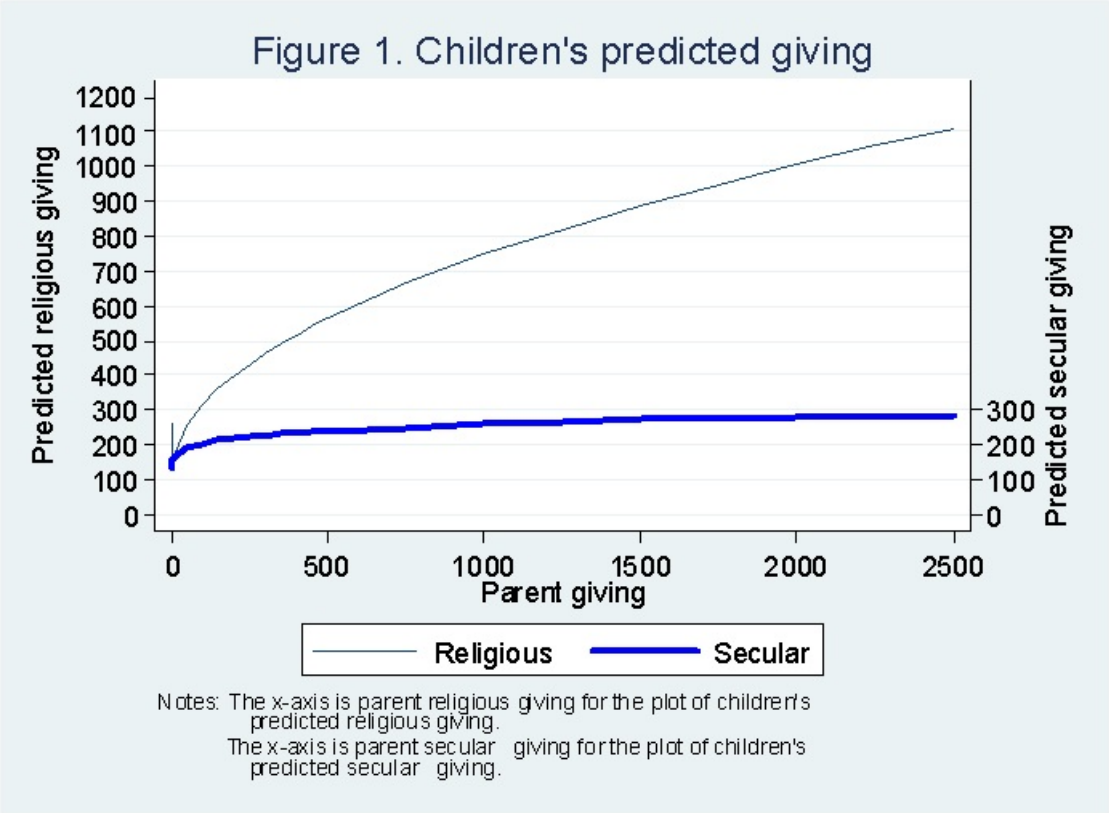
Figure 1. Children's predicted giving
Predicted religious giving
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
Predicted secular giving
300
200
100
0
0
500
1000
1500
2000
2500
Parent giving
Religious
Secular
Notes: The x-axis is parent religious giving for the plot of children's predicted religious giving.
The x-axis is parent secular giving for the plot of children's predicted secular giving.

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Appendix A. Descriptive Statistics

Variable	Mean	Standard deviation
Log parent religious giving	5.126	2.454
Log parent secular giving	4.717	2.018
Parent gives to religion	.621	.485
Parent gives to secular	.667	.472
Log current income	10.875	.874
Log average past income[a]	10.780	.763
Log wealth (excluding home equity)	8.674	3.676
Wealth (excluding home equity) zero or in debt	.207	.405
Log home equity	7.339	4.245
Home equity zero or in debt	.403	.491
Education – Less than high school	.102	.302
– Some college	.281	.450
– College	.166	.372
– Post - college	.096	.295
Religious affiliation – Catholic	.225	.418
– Protestant	.492	.500
– Jewish	.028	.164
– Other	.120	.324
Female head of household	.166	.372
Age	36.8	9.7
Married	.635	.481
Number of children in the household	.956	1.127
No children in the household	.483	.500
Employed	.911	.285

Health is fair or poor	.070	.255
African-American	.065	.246
Hispanic	.024	.153
Ethnicity missing	.063	.244
Resides in south	.306	.461
Resides in a large city	.707	.455
N	2,384	

Note: All demographic characteristics (e.g., age, race, education) are that of the head.

[a] Income is averaged over five *PSID* waves 1995-1997, 1999, and 2001. Fewer waves are used if five are not available.

Appendix R1. Empirical Model – Detailed Development. For referees; not intended for publication.

This appendix contains a detailed development of the empirical model (1) estimated in the paper. The detailed development makes two points clear:

(a) ρ (the intergenerational elasticity of giving) captures all mechanisms underlying the transmission of generosity (role modeling, other parent actions such as empathy-based induction and dispositional praise, and genetic predisposition), and

(b) a mis-match between the parent's current giving and past giving ($c_{1,t}$ and $c_{1,t-1}$) causes the parent's current and past observable characteristics to enter (1) and causes measurement error terms (unobservables) to also enter (1).

We begin with a simple model of the transmission of generosity:

$$\gamma_{i2} = m\, c_{1,it-1} + \tau\, \gamma_{i1} + v_i \qquad \text{(R.1)}$$

where γ_1 and γ_2 are preference parameters driving charitable giving of the parent and child, $c_{1,t-1}$ is the log of parent giving during the childhood years $t-1$, v represents random influences on children's generosity, and m and τ are parameters determining the strength of transmission (i indexes the parent–child pair but will now be dropped to ease notation).

The term $m\, c_{1,t-1}$ represents the effect of the parent's role model of charitable giving on the generosity of her son. The term $\tau\, \gamma_1$ represents automatic transmission mechanisms such as genetic similarity in generosity, but it also approximates relatively low-cost transmission techniques such as empathy-based induction and dispositional praise. The error term v captures all other unobservable formative influences on the child's generosity and is assumed to be uncorrelated with γ_1 and $c_{1,t-1}$. Unobservable influences correlated with $c_{1,t-1}$ are modeled by γ_1.

Parental charitable giving during the childhood years is:

$$c_{1,t-1} = \alpha_1\, \gamma_1 + \delta_1\, y_{1,t-1} + u_{1,t-1} \qquad \text{(R.2)}$$

where $y_{1,t-1}$ is log income, $u_{1,t-1}$ is an error term capturing unobservable effects on parental giving that are uncorrelated with γ_1 and $y_{1,t}$, and α_1 and δ_1 are scalar parameters. To ease notational burden we do not include parent controls other than income (how other parent controls would enter the analysis can be seen by following $y_{1,t-1}$), but other parent controls are checked in the empirical work. A similar model describes the child's giving during adulthood:

$$c_{2,t} = \alpha_2\, \gamma_2 + \delta_2\, y_{2,t} + u_{2,t}. \qquad \text{(R.3)}$$

Substituting (R.1) into (R.3) yields:

$$c_{2,t} = \alpha_2\, m\, c_{1,t-1} + \alpha_2\, \tau\, \gamma_1 + \alpha_2\, v + \delta_2\, y_{2,t} + u_{2,t}. \qquad \text{(R.4)}$$

Ideally, we would like to estimate (R.4), because then we could obtain separate estimates of the role model ($\alpha_2\ m$) and automatic transmission ($\alpha_2\ \tau$) mechanisms. If we had data on $c_{1,t-1}$ and γ_1 we could estimate (R.4) without measurement error, but we do not have data on $c_{1,t-1}$ and γ_1.

Lacking data on $c_{1,t-1}$ and γ_1 we use (R.2) to eliminate $c_{1,t-1}$ from (R.4); solve for γ_1 in the period t version of (R.2)—the equation of parent's giving that is contemporaneous with the child's giving:

$$c_{1,t} = \alpha_1 \gamma_1 + \delta_1 y_{1,t} + u_{1,t} \qquad \text{(R.2')}$$

and use the solution for γ_1 to replace the γ_1 term in (R.4). This yields child giving as a function of parent giving, child income, and other variables, but no unobservable generosity variables:

$$\begin{aligned} c_{2,t} = {} & \rho\ c_{1,t} + \delta_2\ y_{2,t} - \alpha_2\, m\, \delta_1\, [y_{1,t} - y_{1,t-1}] - \alpha_2\, \tau\, \delta_1\, \alpha_1^{-1}\, y_{1,t} \\ & + \alpha_2\, v + u_{2,t} - \alpha_2\, \tau\, \alpha_1^{-1}\, u_{1,t} - \alpha_2\, m\, [u_{1,t} - u_{1,t-1}] \end{aligned} \qquad \text{(R.5)}$$

where $\rho \equiv \alpha_2\ (\tau + m\ \alpha_1)\ \alpha_1^{-1}$ is the elasticity of child giving with respect to parent giving; part of ρ arises from the automatic transmission mechanisms and part arises from role modeling. Notice that parental income ($y_{1,t}$ and $y_{1,t-1}$) and parental unobservables ($u_{1,t}$ and $u_{1,t-1}$) enter (R.5) only because of the elimination of $c_{1,t-1}$ and the substitution for γ_1 that we did because we lacked data on $c_{1,t-1}$ and γ_1.

Equation (1) in the text is similar to (R.5), except that (1) omits parent controls other than $c_{1,t}$. Omitting parent controls other than $c_{1,t}$ allows us to compare our intergenerational giving elasticities to intergenerational income elasticities from the intergenerational income mobility literature. And, as we noted in the text, estimates of ρ are not sensitive to the inclusion of parent controls other than $c_{1,t}$.

We now turn to a discussion of the econometric problems in estimating ρ , unless the econometric problems were extensively described in the text. Our discussion is organized according to the likely direction of bias the econometric problems produce.

There are two econometric problems suggesting a potential bias of $\hat{\rho}$ away from zero. First, if permanent income drives giving but current income is used for $y_{2,t}$, measurement error could leak over to affect $\hat{\rho}$; the permanent component of parent's giving would almost certainly be positively correlated with any unmeasured child permanent income. We attempt to mitigate this potential source of bias by including controls for children's income averaged over the recent past and controls for their current wealth. Second, $\hat{\rho}$ is potentially biased away from zero to the extent that $c_{1,t}$ and $u_{2,t}$ are correlated, as would be the case if parents and children are responding to common unobservable influences when making giving decisions. If common unobservables are a problem but less correlated when parents and children live in different states (because the local need conditions to which parents and children respond are different in the different states) then a robustness check—estimating models with data from parents and children residing in different states—will cause $\hat{\rho}$ to drop toward zero (this does not happen; see the bottom of page

16 of the text).

Several econometric problems suggest a potential bias of $\hat{\rho}$ toward zero (other than corner solutions $c_{2,t} = 0$ that were extensively discussed in the text). One potential source of bias toward zero is measurement error arising from using $c_{1,t}$ to estimate ρ if the earlier $c_{1,t-1}$ is the parental giving variable that actually produced the role model effect—the mis-match between $c_{1,t}$ and $c_{1,t-1}$ discussed in the text. This is the source of the $-\alpha_2 m [u_{1,t} - u_{1,t-1}]$ term in (R.5)—notice that this term vanishes if there is no role model effect ($m = 0$). The bias is mitigated if the covariance between $u_{1,t}$ and $u_{1,t-1}$ is higher, suggesting that measurement error may be less problematic for the subsample of younger children because current parent giving is a better signal of the past giving that influenced preferences.

The term $-\alpha_2 \tau \alpha_1^{-1} u_{1,t}$ is measurement error that arises because we are attempting to estimate the combination of automatic/low-cost transmission and role modeling whereas $c_{1,t}$ is a noisy measure of the latent variable γ_1 that models automatic/low-cost transmission. Even if we could regress $c_{2,t}$ on $c_{1,t-1}$ (eliminating the $u_{1,t} - u_{1,t-1}$ source of measurement error) we would still have to interpret the resulting estimate as an underestimate of the combined automatic/low-cost transmission and role model effect (because $c_{1,t-1}$ would still be a noisy measure of γ_1) or an overestimate of the role model effect on its own (because $c_{1,t-1}$ is correlated with γ_1).

Corresponding to these two sources of measurement error are the observable parent variables $-\alpha_2 m \delta_1 [y_{1,t} - y_{1,t-1}]$ and $-\alpha_2 \tau \delta_1 \alpha_1^{-1} y_{1,t}$ appearing on the right-hand side of (R.5). In the text (pages 6-7) we argued that adding parent current and past observable variables like income to (1) provides an informal check for the presence of measurement error because both parent income and the measurement error terms enter (1) in a parallel way through the mis-match between $c_{1,t}$ and $c_{1,t-1}$. In the text (page 15) we report mixed evidence from adding parent current and past income to (1). Current and recent past parent income variables enter (1) significantly in the children's religious giving model and on the margin of significance in the children's secular giving model. And, current and recent past parent income enter with negative signs, consistent with the $-\alpha_2 m \delta_1 [y_{1,t} - y_{1,t-1}]$ and $-\alpha_2 \tau \delta_1 \alpha_1^{-1} y_{1,t}$ terms. However, distant past parent income ($y_{1,t-1}$) is not statistically significant in either the religious or secular model. Hence we have mixed results from this informal check on measurement error.

Appendix R2. Main Results – Details. For referees; not intended for publication.

This appendix contains the estimates from the OLS, NLS, Tobit, and CLAD models in Table 2 (the tables begin on the next page).

Table R.1 OLS Estimates.

Dependent Variables:	Child's log religious giving	Child's log secular giving
Independent variables		
Log parent religious giving	.308***	−.043
	(.043)	(.033)
Log parent secular giving	−.090**	.097***
	(.040)	(.033)
Whether parent gives to religion	−.738***	.314*
	(.204)	(.167)
Whether parent gives to secular	.142***	−.003
	(.164)	(.133)
Log average past income	.273***	.646***
	(.082)	(.071)
Log current income − Log average past income	.218**	.304***
	(.087)	(.084)
Log wealth (excluding home equity)	.076**	.108***
	(.030)	(.025)
Wealth (excluding home equity) zero or in debt	.348	.556***
	(.221)	(.187)
Log home equity	.102***	.169***
	(.053)	(.042)
Home equity zero or in debt	.552	1.072***
	(.412)	(.331)
Education – Less than high school	.033	−.124
	(.126)	(.106)
– Some college	.286***	.307***
	(.102)	(.086)
– College	.522***	.547***
	(.132)	(.110)
– Post - college	.518***	.859***
	(.177)	(.137)

Religious affiliation – Catholic	.497***	−.085
	(.118)	(.114)
– Protestant	.789***	.018
	(.108)	(.100)
– Jewish	.324	.500***
	(.294)	(.183)
– Other	.147	.123
	(.143)	(.123)
Female head of household	−.033	.303***
	(.106)	(.105)
Age	−.089***	−.030
	(.033)	(.027)
Age squared	.002***	.0006*
	(.0004)	(.0004)
Married	.622***	.169*
	(.117)	(.100)
Number of children in the household	.116*	.070
	(.061)	(.050)
No children in the household	−.142	.094
	(.143)	(.115)
Employed	.180	.006
	(.132)	(.109)
Health is fair or poor	−.148	−.159
	(.151)	(.127)
African-American	.260	−.015
	(.171)	(.134)
Hispanic	.178	−.028
	(.271)	(.234)
Ethnicity missing	−.130	−.112
	(.153)	(.122)
Resides in south	.370***	.039
	(.094)	(.077)
Resides in a large city	.059	.126*
	(.094)	(.076)

constant	−1.827 (1.046)	−6.322 (.842)
R^2	.299	.372

Notes: Specification from Table 2, row 2. Robust standard errors are in parentheses. The omitted religious affiliation category is "none."

* - Significant at 10 percent. ** - Significant at 5 percent. *** - Significant at 1 percent.

Table R.2 NLS Exponential Estimates: Without Outliers.

Dependent Variables:	Child's log religious giving	Child's log secular giving
Independent variables		
Log parent religious giving	.300***	−.133***
	(.033)	(.024)
Log parent secular giving	−.082***	.142***
	(.038)	(.026)
Whether parent gives to religion	−.601***	.623***
	(.104)	(.121)
Whether parent gives to secular	.059	.074
	(.132)	(.144)
Log average past income	.622***	.664***
	(.071)	(.058)
Log current income − Log average past income	.304***	.792***
	(.083)	(.076)
Log wealth (excluding home equity)	.029	.093***
	(.025)	(.025)
Wealth (excluding home equity) zero or in debt	.216	.327
	(.267)	(.404)
Log home equity	.056	.214***
	(.045)	(.039)
Home equity zero or in debt	−.146	1.373***
	(.394)	(.397)
Education – Less than high school	−.186	−.753
	(.391)	(.801)
– Some college	.372***	.447***
	(.127)	(.145)
– College	.396***	.593***
	(.133)	(.136)
– Post - college	.927***	.235*
	(.133)	(.142)
Religious affiliation – Catholic	2.399***	.358**
	(.849)	(.153)

– Protestant	3.042***	.466***
	(.851)	(.159)
– Jewish	2.064**	.598***
	(.921)	(.162)
– Other	2.105**	.154
	(.868)	(.179)
Female head of household	1.061**	.503*
	(.472)	(.260)
Age	.073	.122**
	(.057)	(.051)
Age squared	−.0008	−.001*
	(.0007)	(.0006)
Married	1.350***	.314
	(.469)	(.214)
Number of children in the household	.055	−.050
	(.046)	(.047)
No children in the household	−.428***	−.251**
	(.124)	(.112)
Employed	−.678***	−.550***
	(.095)	(.087)
Health is fair or poor	1.128***	−1.802***
	(.111)	(.651)
African-American	.815***	.187
	(.173)	(.254)
Hispanic	.576*	−.136
	(.317)	(.385)
Ethnicity missing	−1.057***	−.518*
	(.411)	(.288)
Resides in south	.286***	.624***
	(.078)	(.064)
Resides in a large city	−.647***	.518***
	(.072)	(.154)
constant	−8.321	−9.583
	(1.705)	(1.236)

R^2	.339	.440
N	2,380	2,379

Notes: Specification from Table 2, row 4. Standard errors are in parentheses. The omitted religious affiliation category is "none."

* - Significant at 10 percent. ** - Significant at 5 percent. *** - Significant at 1 percent.

Table R.3 Tobit Estimates: Marginal Effects on the Latent Dependent Variable.

Dependent Variables:	Child's log religious giving	Child's log secular giving
Independent variables		
Log parent religious giving	.558***	−.050
	(.084)	(.054)
Log parent secular giving	−.147*	.130**
	(.082)	(.053)
Whether parent gives to religion	−1.032*	.462*
	(.438)	(.279)
Whether parent gives to secular	.145	.229
	(.352)	(.230)
Log average past income	.589***	1.174***
	(.199)	(.131)
Log current income − Log average past income	.601**	.656***
	(.247)	(.162)
Log wealth (excluding home equity)	.151**	.144***
	(.068)	(.044)
Wealth (excluding home equity) zero or in debt	.637	.593
	(.562)	(.357)
Log home equity	.069	.108
	(.108)	(.071)
Home equity zero or in debt	−.083	.408
	(.881)	(.577)
Education – Less than high school	−.584	−.673***
	(.386)	(.246)
– Some college	.682***	.534***
	(.286)	(.146)
– College	1.033***	.779***
	(.269)	(.176)
– Post - college	.894***	1.140***
	(.326)	(.212)
Religious affiliation – Catholic	2.017***	.021
	(.365)	(.211)

– Protestant	2.549***	.212
	(.333)	(.191)
– Jewish	1.627***	.683*
	(.609)	(.369)
– Other	1.108***	.362
	(.409)	(.240)
Female head of household	−.250	.562
	(.343)	(.203)
Age	−.027	−.001
	(.081)	(.052)
Age squared	.001	.0004
	(.001)	(.0007)
Married	1.607***	.339*
	(.294)	(.183)
Number of children in the household	.142	.073
	(.135)	(.090)
No children in the household	−.271	.187
	(.311)	(.205)
Employed	.650*	.271
	(.359)	(.227)
Health is fair or poor	−.546	−.354
	(.400)	(.253)
African-American	.794**	−.208
	(.395)	(.226)
Hispanic	.620	.047
	(.581)	(.386)
Ethnicity missing	−.300	−.302
	(.399)	(.260)
Resides in south	.688***	.042
	(.200)	(.131)
Resides in a large city	.067	.190
	(.210)	(.137)
constant	−12.741	−14.411
	(2.483)	(1.617)

Log-likelihood	−3524	−3773
Pseudo-R^2	.106	.117

Notes: Specification from Table 2, row 5. Standard errors are in parentheses. The omitted religious affiliation category is "none."

Table R.4 CLAD Estimates.

Dependent Variables:	Child's log religious giving	Child's log secular giving
Independent variables		
Log parent religious giving	.544***	−.074
	(.145)	(.067)
Log parent secular giving	−.346***	.120**
	(.125)	(.061)
Whether parent gives to religion	−.801	.578*
	(.829)	(.336)
Whether parent gives to secular	.486	.201
	(.488)	(.297)
Log average past income	.877***	1.015***
	(.303)	(.194)
Log current income − Log average past income	.466	.853***
	(.344)	(.301)
Log wealth (excluding home equity)	.058	.171***
	(.092)	(.061)
Wealth (excluding home equity) zero or in debt	−.646	.695
	(1.000)	(.604)
Log home equity	.056	.054
	(.150)	(.077)
Home equity zero or in debt	−.906	−.095
	(1.360)	(.698)
Education – Less than high school	.326	−.187
	(.773)	(.751)
– Some college	.674	.397*
	(.412)	(.223)
– College	1.233***	.551***
	(.447)	(.197)
– Post - college	1.183**	.849***
	(.548)	(.209)
Religious affiliation – Catholic	2.006**	−.019
	(1.067)	(.280)

– Protestant	2.391**	.267
	(1.020)	(.258)
– Jewish	1.991	.396
	(1.239)	(.334)
– Other	.524	.301
	(1.296)	(.345)
Female head of household	.979	.638
	(1.543)	(.406)
Age	−.035	.071
	(.159)	(.092)
Age squared	.001	−.0004
	(.002)	(.0011)
Married	1.318	.615***
	(1.557)	(.183)
Number of children in the household	.299**	−.015
	(.125)	(.085)
No children in the household	−.361	.097
	(.411)	(.228)
Employed	.642	.031
	(.557)	(.304)
Health is fair or poor	−.592	−.242
	(.760)	(.462)
African-American	1.011	−.454
	(.645)	(.453)
Hispanic	1.238	−.155
	(1.085)	(.663)
Ethnicity missing	.050	−.411
	(.647)	(.449)
Resides in south	.698**	−.098
	(.296)	(.177)
Resides in a large city	−.004	.316
	(.320)	(.209)
constant	−15.496	−15.251
	(4.545)	(2.491)

Pseudo-R^2	.133	.185

Notes: Specification from Table 2, row 7. Bootstrapped standard errors are in parentheses. The omitted religious affiliation category is "none."

* - Significant at 10 percent. ** - Significant at 5 percent. *** - Significant at 1 percent.