

Learned Generosity? An Artefactual Field Experiment with Parents and their Children

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Abstract

An active area of research within the social sciences concerns the underlying motivation for sharing scarce resources and engaging in other pro-social actions. In this paper we ask: do parents model social preference behavior to children, and do children emulate this behavior? We develop a theoretical framework to examine this question, and conduct an experiment with 147 3 to 5 year-old children and their parents, using dictator games to measure generosity. We find (1) evidence of parental teaching/modeling in the case of fathers and in that of parents of relatively generous children, and (2) an emulation effect such that children who initially share less than half of their endowment subsequently share more the more they see a parent or other adult share. We find little correlation between baseline sharing of children and the parents, with the possible exception of the oldest children.

Keywords: field experiment, children, parents, transmission, social preferences, influence

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1. Introduction

While Adam Smith, widely regarded as the founder of economics, showed no naiveté about the importance of self-interest, he also asserted that human nature gives the typical person an “interest ... in the fortune of others, and render[s] their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it” (Smith, 1759). The so-called “sentimental moralist” stance of Smith and his contemporary David Hume has been rightly identified as a precursor of modern discussions of innate human sociality in contemporary work by developmental psychologists (e.g., Warneken and Tomasello, 2009), evolutionary psychological theorists (e.g., Bloom, 2013), and students of behavior in social animals (e.g., DeWaal, 2009).

Related work has used experiments with children to study how the propensity to share or help develops. Developmental psychologists stage situations in which adults appear to get into difficulties in front of young children otherwise occupied at play, and find that children of ages 21 to 31 months spontaneously attempt to help (Warneken, 2013; Warneken and Tomasello, 2013).¹ Within economics, other-regarding behavior, or generosity, has been studied in dictator games, in which an individual is provided with an endowment and decides how to split it between himself and an anonymous receiver. A significant number of adults voluntarily allocate some amount to the recipient (for a survey of the literature, see Engel, 2011). Moreover, even very young children display other-regarding behavior (Harbaugh and Krause, 2000; Harbaugh et al., 2003; Fehr and Rockenbach, 2004; Kosfeld et al., 2005; Benenson et al., 2007; Gummerum et al., 2010).

Investigating how other-regarding preferences are acquired among children may provide insight into the development of the motivation to give. This has immediate importance to the

¹ For example, children spontaneously help by picking up dropped objects or helping to open boxes or cabinets, doing so without encouragement or prior acknowledgment of the child’s presence by the adult. Warneken and Tomasello (2013) find that neither presence nor encouragement of the child’s parent alters the young child’s tendency to proactively help the adult stranger.

economics of philanthropy and may also have bearing on other economic domains in which pro-sociality plays a role (for instance, in political participation, tax compliance, and teamwork). We propose that the respective roles played by genes and the environment can be explored by investigating the behavior of young children who are exposed (or not) to the influence of their parents. Parental influence by itself, however, is not exogenous. Indeed, whether or not a parent will attempt to transmit certain social preferences to his or her child may be influenced not only by culture, socio-economic factors, and the parent's temperament, but also by the temperament of the child. For instance, a parent may make less effort to reinforce generosity in a child who appears naturally sympathetic, or may emphasize the importance of self-protection to one who seems too trusting (see Becker's (1974) 'rotten kid theorem' for related insights).

We develop a theoretical framework that sheds light on the developmental origins of social preferences by providing mechanisms through which parents transmit preferences for generosity to their children. Our theoretical model predicts that parents will attempt to model generosity to their children, and that children will prefer mimicking parents, as utility of children is lowered by a large deviation from the norm set by the parent. Becker, Murphy and Spenkuch (2016) provide one possible mechanism for parental modeling of preferences to children: parents want to teach children to be generous, so that children will provide for parents in their elderly years. Ottoni-Wilhelm and Zhang (2011) propose three parental motives for parents to transmit generosity: generosity makes one happy, generosity is a duty, and generosity is a part of one's identity. The transmission process and its effect on parental actions for some general behaviors and beliefs is modeled by Adriani and Sonderegger (2016). We propose a mechanism that likewise emphasizes parental modeling behavior, with a specific application to generosity.

To test the predictions of our theory, we conduct an artefactual field experiment (Harrison and List, 2004) with 147 3 to 5 year-old children and their parents. Age 3 to 5 is a time of rapid moral preference development (Fehr et al., 2008), and interventions by parents during this stage could be key. In the experiment, children and parents separately play a series of dictator games, choosing how many resources to keep and how many to share with an anonymous match (we match children to an anonymous other child, and parents to an anonymous other adult). From a series of decisions made in differing conditions, we measure whether parents change their behavior when they know their child may see their dictator game decisions prior to their child making his or her own decision (Show condition) or when they are told their child will not see their decisions (Control condition). We also investigate whether children change their behavior when they observe how their mother, father, or another adult shared (Influence-Parent and Influence-Other Adult treatments) relative to children who do not observe an adult sharing (No Influence treatment).

Our main results are: (1) change of parental behavior when the parent knows the child will see his or her choice is detected weakly in fathers and in parents of those children who are relatively generous in their initial, uninfluenced choice; and (2) there is strong evidence that preschoolers whose initial decision was either more or less generous than an equal split adjust their sharing decision in response to an observed parental choice in a similar setting. There is very little overall correlation between the uninfluenced sharing decisions of preschoolers and of parent sharing in the Control condition, though some correlation is detected for the older children.

In the remainder of the paper, Section 2 reviews related literature, Section 3 introduces the theory, Section 4 describes the experiment, Section 5 summarizes the results and Section 6 concludes.

2. Related Literature

While economics is often characterized by its assumption that human behavior is motivated by self-interest, a growing empirical literature has provided evidence consonant with models of other-regarding behavior, or generosity, among children and adults. For instance, even 2-year old children spontaneously attempt to help an experimenter (Warneken, 2013; Warneken and Tomasello, 2013) and 3-5 year-olds are willing to share scarce resources with others (Fehr et al., 2008). Research also shows a rapid development of other-regarding behavior with age (Fehr et al., 2008; Bar-Tal and Leiser; 1980; Benenson et al., 2007; Devanath, 2010; Fehr et al., 2011).

To understand motivations behind generosity of children, researchers have conducted experiments in which children play a dictator game and have the opportunity to share resources with another child. List and Samak (2013) varied whether the recipient was another child or a teddy bear to disentangle the roles of altruism and warm glow in the motivation to share. Zinser, Perry and Edgar (1975) studied the role of empathy by comparing giving to poor or rich recipients. Houser, Montinari and Piovesan (2012) found that the presence of watching peers increased generosity for children ages 9 and up, but not for children below age 9. Our use of the dictator game with children ages 3-5 is in line with a large literature that has successfully done this.

Our work is also related to work investigating correlations of other-regarding behavior between parents and their children. Cipriani et al. (2013) conduct public goods games with children ages preschool through 6th grade and their parents, and find no correlation between generosity of parents and their children. Bettinger and Slonim (2006) investigate other-regarding preferences of children and their parents as part of an educational intervention and find a positive but insignificant correlation between parental and child giving. We also explore the association between parent and

child generosity, but go beyond correlations to study the effect of an experimental condition in which parents have the chance to directly influence their child's generosity.

Levy-Garboua, Meidinger and Rapoport (2006) review the economic, psychological and biological literatures on children's altruism. The hypothesis that a child's inclination to help results at least in part from an innate disposition is impossible to reject. There is evidence from identical twin studies that variation in the degree of pro-social, cooperative or altruistic behavior is heritable (Wallace *et al.*, 2007; Cesarini *et al.*, 2008). Environment and culture also play a role in shaping a child's social preferences. For example, researchers related generosity of children to socio-economic status (Benenson *et al.*, 2007; Bauer *et al.*, 2014). Cappelen *et al.* (2016) and Bettinger and Slonim (2006) found that random assignment to preschool programs or school vouchers, respectively, increased children's other-regarding preferences as measured by experiments. More broadly, cultural transmission of traits such as religion and politics is thought to come through the family (Cavalli-Sforza *et al.*, 1976).

A direct channel through which a child's social preferences may be influenced as he or she grows up is parental modeling. An early study of parental influence on child altruism suggests that altruistic fifth graders have at least one (usually same-sex) parent who communicates altruistic values and a parent (often opposite-sex) who uses victim-centered discipline techniques suggesting reparation and apology (Hoffman, 1975). Frequent parental expressions of affection also contribute to child altruism (Zumbühl *et al.*, 2013). Early work on imitative altruism showed that children will change their behavior in response to an adult model, but much of this work was done with children ages 6 and up and never with the child's own parents (for a review, see Rushton, 1976). For example, children ages 7-11 exposed to moral behavior by an adult role model increased donations to a charity (Rushton, 1975). In a study conducted concurrently to ours, Candelo *et al.*

(2015) found that information about behavior of peers and teachers, but not of parents, affected children's helping behavior.

Recent views on the human propensity to conformism suggest that children are eager to copy even in the absence of explicit incentives. Harris (2012) reports experiments in which children or chimpanzees are given demonstrations of how to accomplish a task to which a materially superfluous element has been added. The chimpanzees become adept at accomplishing the task but quickly discard the unneeded step, whereas the children faithfully include that step in their performances even when not watched and despite showing clear awareness that the physical necessity of the step is at a minimum unclear. The take-away is that humans have a strong predisposition to try to understand “how things are done” in the social group they identify with, and to act accordingly. These findings, as Harris notes, are consistent with the role accorded to the “conformist” impulse in the theory of culture proposed by Boyd and Richerson (2005).

Few studies in economics have addressed parental modeling behavior. As Adriani and Sonderegger (2016) write, “most of the empirical literature has focused on the effects of parental influence on the behavior of children. The effects of parental influence on *parental* behavior have not received nearly as much attention.”² While largely theoretical, their paper includes some evidence that parents of seventh graders engage in significantly less consumption of alcohol, less smoking, and more church attendance, if their opinion response concerning the importance of parental influence on child behavior is in the upper third of its distribution among all interviewees.

² Becker *et al.* (2016) is an exception, focused on how the parent's knowledge of his/her ability to affect the child's altruistic preferences affects parental choice of investment in influencing those preferences. However, while role modeling is mentioned in their discussion, the preference-affecting parental investment is modeled by them as a generic or black box-like costly expenditure, and their focus is on altruistic care of the parent in old age as opposed to the more general social trait of altruism or fairness concern that our paper focuses on.

Parental influence on the sharing decision has also been investigated in work conducted concurrently with ours. Blake, Corbit, Callaghan and Warneken (2016) study parental modeling and influence on sharing by 3-8 year-old children in India and the United States, finding some evidence of influence increasing with child age and concluding that what parents attempt to teach is culture-specific. In Blake et al. (2016), parents were instructed to model either a stingy or generous donation, and their child's subsequent behavior in a dictator game was observed. Blake et al. (2016) found that children in both societies were influenced to give less after viewing the stingy donation, but that the generous model was only influential for children in India. In our paper, we use a more naturalistic design in which parents model their own preference, rather than an assigned one. In addition, we study whether parents attempt to model generosity to their children by investigating parent giving in a condition where their child will and will not see their decision. Our paper is one of the first experiments in economics that includes a focus on parental modeling behavior.

3. Theoretical Framework

In this section, we summarize a framework for analyzing the relationship between parents' and their children's generosity in the context of our experiment (proofs available upon request). In our setup, preferences towards generosity are revealed through decisions in which parents and children have opportunities to share an endowment with an anonymous match. We denote the parent's utility function as:

$$(1) \quad U_p(g_p, c_p) + V_p(g_c, c_c)$$

where g_p is the amount the parent gives in the experiment, c_p is the parent's consumption, and $U_p(g_p, c_p)$ is the parent's private utility, assumed to be quasi-concave in g_p and c_p . In the second

term, g_c is the amount the child gives in the experiment, c_c is the child's consumption, and, $V_p(g_c, c_c)$ is the parent's utility from the child's behavior, assumed to be quasi-concave in g_c and c_c .³ We denote the child's utility as:

$$(2) \quad U_c(g_c, c_c) - \alpha \cdot I(\text{observe parent's choice}) \cdot f(g_c, g_p)$$

where $\alpha > 0$ is a constant measuring the weight in the child's utility of minimizing behavioral deviations from the parent, I is an indicator function for the child observing the parent's choice in the Influenced case, and f is a function increasing in the absolute difference between g_c and g_p . We also assume that $U_c(g_c, c_c)$ is quasi-concave in g_c and c_c , and the marginal utility of both g_c and c_c in $U_c(g_c, c_c)$ is positive. While we omit individual or family level identifiers, we consider the possibility that differences exist in the exact shapes of the U and V functions.

When the parent maximizes her utility independently of social influence considerations, and the parent's maximization problem has an interior solution, g_p^* , then:

$$(3) \quad U_{pg}(g_p^*, r + M_p - g_p^*) = U_{pc}(g_p^*, r + M_p - g_p^*)$$

Here r is the experimental endowment and M_p is resources available to the parent from outside the experiment. By assuming that g_p and c_p are normal goods, $\frac{\partial g_p^*}{\partial M_p} > 0$, that is the parent's optimal giving increases with income.⁴

Similarly, in the No Influence condition, where the child is not shown his or her parent's choice in the experiment, an interior equilibrium of the child's maximization problem satisfies:

$$(4) \quad U_{cg}(g_c^*, s + M_c - g_c^*) = U_{cc}(g_c^*, s + M_c - g_c^*)$$

³ We leave open whether the decision-maker's valuation of giving is entirely driven by the recipient's need, as in models of pure altruism, or whether the act of giving is valued in itself for warm-glow or identity reasons.

⁴ This is a one period model in which giving cannot exceed the experiment endowment but consumption is understood to be the retained portion of the endowment *plus* outside resources available at roughly the same time. The duration of the relevant present period is unspecified but we assume it to be short (say, a week or month).

where s is the child's experimental endowment (6 stickers) and M_c is the child's "income" (for example, in stickers and other toys) outside the game. As in the case of the parent, $\frac{\partial g_c^*}{\partial M_c} > 0$, i.e. optimal giving is an increasing function of the child's resources.

Since parent and child giving are partly determined by their resources and because we assume the latter to be correlated, the model predicts:

$$(5) \quad \text{Cov}\left(\frac{U_{pg}}{U_{pc}}(g_p, c_p), \frac{U_{cg}}{U_{cc}}(g_c, c_c)\right) > 0, \forall (g_p, c_p, g_c, c_c)$$

meaning that parents' and children's MRS between giving and private consumption are positively correlated. This prediction follows even if parent and child preferences are uncorrelated, and it is strengthened if one assumes that genes or past influence make the U functions of parent and child more alike than those of randomly chosen others. This establishes a reason for why parent and child decisions may be correlated at baseline. The data we collect allows us to indirectly explore whether parent and child sharing is correlated at baseline, by comparing parent decisions in the Control condition to child decisions in the No Influence condition. However, since in the Control condition parents are told that their decision "may" be shown to another child (but not to their own child) we do not have a dictator game baseline for parents that is completely uninfluenced by social concerns.

The main research questions in our paper, for which we derive testable hypotheses, are whether parents model behavior to their children, and whether a child's generosity is influenced by parental behavior observed by the child, such as in the experiment's Show condition.

We first turn to the question of how parents make their sharing decision when they know that it will be observed by their child (the Show condition). We propose that the decision is partly driven by the desire to model a behavior – that is, parents will tend to show their children behaviors that they would like their children to emulate. This assumes, of course, that at least some parents

hold a view of what constitutes ideal behavior, in a case such as our giving decision, such that the parents' utility is higher, *ceteris paribus*, for a child choice closer to the ideal.⁵ The parent can use backward-induction to solve the child's maximization problem and predict the child's emulative choice $\hat{g}_c^*(\hat{g}_p)$. The parent's maximization problem is thus:

$$\max_{\hat{g}_p} U_p^g(\hat{g}_p) + U_p^c(r + M_p - \hat{g}_p) + V_p^g(\hat{g}_c^*(\hat{g}_p)) + V_p^c(s + M_c - \hat{g}_c^*(\hat{g}_p))$$

To examine the case of a parent who cares about his or her child's sharing, we define

$$(6) \quad V_p^g(g_c) + V_p^c(c_c) = X(g_c) + \beta[U_c^g(g_c) + U_c^c(c_c)]$$

$$\beta \geq 0, X'(0) \geq 0 \exists g_c^{**} \in [0, s], \text{st. } X'(g_c^{**}) = 0 \text{ and } X''(g_c) < 0$$

Here, function $X(g_c)$ captures the parent's additional utility from the child's generosity, and g_c^{**} is the level of generosity the parent holds as ideal independent of the child's direct short-run utility considerations. The term $\beta[U_c^g(g_c) + U_c^c(c_c)]$ takes into account the child's immediate utility as such, with β indicating the weight that the parent places on it.

Assume that (i) parents accurately assess their child's U function,⁶ and that (ii) parents' private choices (such as their choice in Control condition) are typically biased towards self-interest, i.e., $g_p^* \leq g_c^{**}$.⁷ The second assumption implies that $X'(\hat{g}_c^*(g_p^*)) > 0$ for parents inclined to model generosity, while the first assumption means that the parents of children inclined to behave

⁵ This leaves open whether the ideal is based on ethical principles, notions of what will help the child in the long run, or something else. We note again that the motivation for parental modeling is probably strengthened in practice by beliefs that not only the child's choice in the present but also the child's preference function in the future is susceptible to being influenced by parental choices seen by the child. A dynamic model in which the child's utility function can change over time, with one influence on it being a desire to reduce the amount of conflict between own preference and parental model (the difference between g_c^* of eq. (4) and the $\hat{g}_p$ which solves the next paragraphs' optimization problem), would go further towards capturing this, but is left to others, our goal being only that of providing the simplest modeling framework capable of giving rise to emulation and parental modeling and thus helping to organize discussion of our experimental data.

⁶ A weaker assumption that the parent merely guesses the function with better-than-random accuracy would also do, but we adopt this stronger version to avoid entering into explicit modeling of information.

⁷ While the ideals underlying g_c^{**} might be expected to affect the parent's Control choice g_p^* in a manner that could be further modeled, we chose not to incorporate this into the parent's initial maximization problem so as to avoid unnecessary complexity.

generously will be led to act more generously in the Show condition by the parental altruism (β) argument in (6). These assumptions lead us to:

Hypothesis 1 (teaching/role modeling hypothesis): Parents who change their decision from the Control to Show condition tend to increase their sharing, and parents of children who are more generous in the No Influence condition have a greater tendency to make such changes.

Next, we turn to whether children respond to parental modeling. On the basis of the literature reviewed earlier, we propose that children adjust their sharing decisions based on the sharing they observe by their parents. We treat both the parent's and the child's utility functions as givens and assuming only that they are not strongly negatively correlated. To explore the mechanism of emulation at a given point in time, we specify additive versions of the parent's and child's utility functions, respectively:

$$(7) \quad U_p(g_p, c_p) + V_p(g_c, c_c) = U_p^g(g_p) + U_p^c(c_p) + V_p^g(g_c) + V_p^c(c_c)$$

$$U_c(g_c, c_c) = U_c^g(g_c) + U_c^c(c_c), U'(\cdot) > 0, U''(\cdot) < 0, V''(\cdot) < 0$$

and

$$(7) \quad U_c^g(g_c) + U_c^c(c_c) - \alpha \cdot f(g_c, \hat{g}_p)$$

$$\alpha > 0, f(g_c, \hat{g}_p) = g_c - \hat{g}_p, \forall g_c \geq \hat{g}_p \text{ and } f(g_c, \hat{g}_p) = \hat{g}_p - g_c, \forall g_c < \hat{g}_p$$

The last two inequalities mean that the child incurs disutility from making a decision that is different from the parent's shown decision, denoted $\hat{g}_p$. Accordingly, the child may sacrifice some of the direct utility associated with her U_c terms to reduce the size of the gap, although the child's other utility concerns will often prevent this. This leads to:

Hypothesis 2 (emulation hypothesis): children adjust their sharing decisions to reduce the difference between their sharing and the observed sharing decisions of their parents.

4. Experimental Environment

4.1 Procedures

The dictator games were conducted at the Chicago Heights Early Childhood Center (CHECC) in November 2011. CHECC was launched in August 2010 and serves as a ‘laboratory’ for experiments of this sort, as well as for studying the impacts of alternative preschool programming on child outcomes. CHECC is located in a predominately low-income area, with a median annual income of around \$43,000 and a large minority population. Area families are eligible to participate in CHECC if they have children between the ages of 3-5.

For this experiment, we sent recruitment letters to 700 households who have children ages 3-5 and participate in CHECC (about 300 mother-child and 500 father-child pairs). We did not inform participants of the nature of the experiment before they arrived.

Parents and children participated in the experiment separately. Upon arriving to the experimental session, parents were escorted to the parent experiment room while children were escorted to one of the child experiment rooms. In the parent experiment room, during each session the experimenter read instructions aloud while 5-20 participants followed along on their instruction sheets. For Spanish-speaking parents, we translated the instructions before the experiment. A native Spanish speaker who worked at the school read the instructions out loud in Spanish at the same time as the experimenter, and Spanish speakers could listen to the instructions on headphones that we provided them. Then, parents made decisions in dictator games in private using paper and pencil. Decision sheets were collected following the experiment.

In the child experiment rooms, children participated in dictator games one-on-one with an experimenter either in English or in Spanish, depending on the child’s primary language. The

experimenter read the instructions out loud and the child listened. For children, a series of pictures were also displayed to aid in understanding the instructions.

Participation took approximately 45 minutes and parents received a \$15 show-up payment at the end of the study. Parents and children also received the money and stickers that they chose to keep for themselves at the end of the experiment (up to an additional \$24 for parents and up to 18 stickers for each child). All monetary payments were disbursed in cash immediately at the end of the experiment, and children took their stickers with them when leaving. Other families who had not participated in the experiment actually received the amounts given in the dictator games. Recipients were always anonymous to the dictators.

4.2 Experimental Design

The main goals of our experiment were to investigate (1) the role of parent teaching/role modeling in parent generosity and (2) child emulation of parent generosity. We measure generosity based on the giving decision in the dictator game of both parents and children.

Table 1 summarizes the experimental design; full experimental instructions are presented in the online appendix. Parents and children played several dictator games, as described below. The recipient in most of the games can be described as relatively poor. While we never explicitly used the term “poor,” for adults, we summarized the low-income status of the recipient, and for children, we explained that the recipient lives in a small house and has very few toys. These are the dictator games that are central to our analysis. Parents and children also played several games with a relatively rich recipient, but we do not incorporate these in the analysis because children never played games against such recipients after viewing a parent’s decision. Hence, the “relatively rich” games are outside the scope of this paper.

Adult Dictator Games

Adults acted as dictators in four games matched with four different anonymous receiver adults. In each game, adults received an endowment of \$6 and chose how to divide it between himself or herself and the receiver. In each game, subjects received six one dollar bills, a blank envelope for themselves that said “keep,” a blank envelope for the recipient that said “send,” an informational sheet about the recipient, and a short letter explaining the task that generated the payment, aimed at the recipient. The letter provided information about each recipient such as the average income, home ownership rate, and average home price in the recipient’s city.⁸

Within the four dictator games, two were played in the Show condition and two in the Control condition. We randomly varied the order of Show and Control, but within these orders participants decided simultaneously about their sharing with a relatively poor recipient and a relatively rich recipient. In the Show condition, we told parents that their decision *will* be shown to their own child prior to the child making a similar decision. In the Control condition, we told parents that their decision *may* be shown to another participating child – but not their own child – prior to that child making a similar decision. Each game within the Show and Control conditions either had a description of a relatively rich or relatively poor recipient. This leaves us with one game with a relatively poor recipient in Show, and one game with a relatively poor recipient in Control, which we use for the analysis.

Child Dictator Games

All children acted as dictators in three consecutive games, matched with three different anonymous receiver children, each time choosing how to divide six stickers between themselves and the other child. Prior to starting each game, children selected a preferred sticker pack from among six different packs. Since we could not use cash incentives with young children, this was our attempt to make sure that all children received incentives that they liked. Stickers have been used as dictator game currency in previous studies with children (e.g., Li et al., 2013). Children were told that the stickers were theirs now, but that they would decide if they would like to keep them or send them to another child. To make a decision, children were asked to distribute stickers between a plate that was for them to keep and another plate to send to the other child. Information about the recipients was displayed by showing a drawing of a child including his/her house and toys to make the decision more concrete.⁹

To collect baseline data, we asked children to play the first two dictator games without any influence (No influence condition). Following the two games, we assigned children randomly to one of two conditions or to a control group. In one treatment (Influence treatment – Parent), children were told how many resources their parent shared in a similar game before the children made their own decision. In the second treatment (Influence treatment – Other Adult), children were told how many resources another adult (but not their own parent) shared in a similar game.¹⁰ The decision of the parent or other adult was described in words and also displayed in an animation (which showed giving of dollars rather than of stickers) on the computer screen. The children in the Control treatment did not receive any additional information about parent or adult giving before

⁹ Children played the first two games in one of two orders, rich recipient then poor recipient, or poor then rich. No order effects were observed. In the third and final game where children were assigned to a condition, children always made a decision about giving to a poor recipient, hence, for the purposes of this paper, we explore only giving to the poor recipient.

¹⁰ Thus in the Influence treatment – Parent, a child saw the decision his or her parent made in the Show condition. In the Influence treatment– Other Adult, the child saw what an adult (another child’s parent) did in the Control condition.

playing the third dictator game. In the analysis, the baseline game used is the one in which children played against a relatively poor recipient.

In all games we also matched the gender of the recipient to the child dictator's gender. For example, if the child was female, both the child and parent (mother or father) were matched to another female; if the child was male, both the child and parent (mother or father) were matched to another male. Matching gender is a common protocol for child studies, since it reduces noise associated with introducing additional variation in recipient information and suggests that the recipient may like a similar type of sticker set chosen by the dictator (e.g., Blake and Rand, 2010).

We used a random number generator in Excel to assign participants to treatments in advance using all children whose parents originally signed them up for the study. The largest number of children were assigned to Influence treatment-Parent (double the size of the other treatments) since we wanted to be able to compare mother to father influence. Since some parents did not actually end up bringing in their kids, this resulted in a slightly lower number of participants in the No Influence relative to the other treatments. Note that parents were not aware of which treatment they were assigned to until the beginning of the study, so that differential show up rates cannot be due to treatment assignment.

5. Results and Analysis

5.1 Data

165 parent-child pairs participated in the experiment (204 originally signed up to participate). Because of missing demographic information on some children and/or their parents, we have usable data for 147 pairs. Analyses that exclude demographic information using all 165 pairs yield similar results; we present analyses based on the 147 pairs only. Of the 147 children

used in the analysis, 70 were boys and 77 were girls. The mean (and median) age was 4.5 years, with a minimum of 3.2 and a maximum of 6.1 (with only one child in the sample having turned 6 at the time of the experiment). Half of the children were Hispanic, a third black, and the remainder white. Of the 147 parents, 49 were fathers and 98 were mothers.

In the analysis, we explore overall results but also consider heterogeneous treatment effects by gender, age of child, and gender match of the parent and child (i.e., mother-daughter, mother-son, father-daughter, father-son pairs). While our theory does not explicitly provide impetus for conducting this additional subgroup analysis, we find it nevertheless important and interesting. For instance, related work has shown differential responses of parents (mostly mothers) to modeling lying behavior in front of sons versus daughters (Houser et al., 2016).

5.2 Overview of Decisions

In sum, we have data on parent choices both with and without showing to their own children (to measure parental modeling), and on child choices made before exposure to adult decisions and after seeing what a parent or another adult has done (to measure emulation). Tables 2a and 2b provide summary statistics for giving by parents and children in the various experimental conditions. There are no statistically significant order effects for adults or children. Hence, in the analyses that are reported below, no dummy for order is included (including one does not affect the results).

The mean giving of \$2.90 by adults (out of \$6), is higher than that reported in most other studies (about a third of the endowment—see Engel, 2011). A possible reason for the higher giving in our study is that parents make decisions knowing that their decision will either be shown to their own child or may be shown to another child. The mean giving in both Show and Control conditions

is about \$2.90, with fathers giving slightly more and mothers slightly less in the Show condition as compared to the Control condition (statistically insignificant differences). 35% of parents gave less than half of their endowment, 47% gave exactly half of their endowment, and 18% gave more than half; the distributions are similar between mothers and fathers.

For children, the mean giving is about 1.90 stickers (out of 6 stickers). Child giving in our experiment is comparable to that in other dictator games with preschoolers: for example, in List and Samek (2013) children give about 25% of their marshmallow endowment to an anonymous recipient, while children in our experiment give away about 30% of their endowment. In the No Influence condition, 55% of children give less than half of their endowment, 34% give exactly half, and 11% give more than half. We use these ranges in the analysis below to classify child “type.” There are no statistically significant differences in giving by gender. Like in related studies, older children in our study give more than younger children (mean giving in the No Influence condition for below median-aged children is 1.73 stickers and at or above median is 2.13 stickers).

Figure 1 presents the distributions of child and adult giving in the various experimental conditions. The distributions show several patterns. First, the two panels describing child giving, without influence and with influence of parent and other adult giving (thus excluding the 28 children in treatment “repeat of No Influence” in round three), are quite similar. Second, adults’ giving shows similarity between the two conditions. Third, the children’s and adults’ distributions look different. Preschoolers give a lower proportion of their endowment overall and their giving is bimodal, with similar fractions splitting the stickers equally and giving no stickers, whereas parental giving shows a clear mode at an equal split of dollars. Finally, while each group’s decisions are similar with and without the possibility of influence, there are small differences that could perhaps be associated with parental influence.

To study stability of preferences across conditions, Tables 3a and 3b summarize the differences between decisions in the Control condition to those in the Show condition, for parents, and from the No Influence to the Influence condition, for children. In these tables and in some of our analyses, we group giving decisions (from among the seven available options (0, 1,...6) into three broad bins. For the sake of mnemonic convenience, we call a child or adult who gives 0, 1 or 2 in the No Influence or Control condition “selfish,” one who gives 3 (exactly half) “fair,” and one who gives 4, 5, or 6 “generous.” The reader should understand these three terms as if quotation marks apply in every usage, since our intention is not to make value judgements about giving behavior of our participants.¹¹

The relative stability of types is clear along the Table 3 diagonals for parents and children. Yet some movement is also noticeable for both. 10 of 41 selfish parents in Control chose to be fair or generous in the Show condition, and 14 of 68 children made a similar transition from No Influence to Influence. Whereas the great majority of generous parents remained such in the Show condition, 9 of the 16 children who were generous in the No Influence condition became selfish and 3 became fair in the Influence condition. Most fair parents remained fair in the Show condition, with 12 out of 48 changing to selfish and 9 to generous, and most fair children remained fair, with 10 out of 38 changing to selfish in Influence and another 6 changing to generous. These dynamics reveal substantial heterogeneity in both types and in changes in types.

5.3 Correlation between Parent and Child Sharing at Baseline

¹¹ The bins were chosen in view of the number of observations. An alternative approach would be to treat as “selfish” only children who gave 0 stickers, which is done in some related work (e.g., Benenson et al., 2007; Blake and Rand, 2010). As suggested by an anonymous referee, we tested these alternative bins as well, and we also tested excluding the minimum (0) and maximum (6) from the analysis. These alternative do not alter the conclusions reported later: more generous children respond to observation of parental modeling by giving less, and less generous children by giving more.

We first investigate the relationship between what the 147 children and their parents send in experiments when they play dictator games in the Control and No Influence conditions, Y_{NI} and X_C , respectively, controlling for age and gender of the child. We further test differences associated with age by splitting the sample at the median age (4.5 years) and conducting similar analyses on the subsamples of younger and older preschoolers.

Begin by noting that child and adult giving is restricted to integers (whole stickers or dollars). To account for the nature of the data and their distribution, use of ordered probit is advised. As is common in the experimental economics literature, however, we obtained estimates using both ordered probit and OLS and we report only the latter due to its advantage for direct interpretation of coefficients and provide probit estimates in the online appendix. The ordered probit estimates are comparable with respect to relative size, and in most cases significance, although there are differences in the latter on which we will comment. Equation (9), where child indexing has been suppressed, represents our first analysis.

$$(9) \quad y = \sum_{k=1}^K \beta_k D_k + (\alpha + \sum_{k=1}^K \beta_k D_k) X_C + \varepsilon$$

The notation is defined in the lower panel of Table 1. D_k consists of father and mother dummies (the latter is the reference category), boy and girl child (the latter is the reference category), pairing of father-son, father-daughter, mother-son and mother-daughter (the latter is the reference category), age groupings of 3, 4 and 5 year olds (4 year old is the reference category), and black, Hispanic and white (the latter is the reference category). Using continuous age in weeks does not alter the estimates on non-age variables. Evidence for transmission through genetic inheritance and/or family environment would be represented by a non-zero estimate of α . We include a number of different estimations to explore possible effects of parent and child gender.

The results of these estimations are presented in Table 4a. Most specifications show no significant correlation between Y_{NI} and X_C , giving by children and their parents when there is no consideration by parent of modeling for own child and no observation of parental choice by that child. There is no association moderated by parent gender (column 2) or child gender (column 3). There is no association when we consider parent-child gender pairing (column 4) or race/ethnicity (column 6). There is an indication in the regression of column 5, which allows the association to vary by age, that the sending of 5-year-old children is correlated with that of their parent at the 5% level. However, the same coefficient reaches significance at the 10% level only, in ordered probit estimates.¹² The conclusion we draw from this analysis is that there is little association between the giving of parents and their preschool-age children in our dictator games when parental modeling for the child and child knowledge of parental decision are absent.

It is conceivable that parents model behaviors consistently over time that reflect preferences they would like their children to have, as we predicted in Hypothesis 1, and that this intentional modeling differs from their behaviors when they are not observed by their own children. If so, Y_{NI} could be correlated with X_S rather than X_C . We repeated the analysis reported in Table 4a with X_S , but again found no correlations.

We also consider whether there is intergenerational transmission of giving inclination as represented by our three “types”—selfish, fair, and generous. In Table 4b we present a multinomial logit analysis of determinants of child type by parent type, with controls. Results for subsamples of older and younger children are similar to those based on the full sample.

¹² Moreover, we obtain results similar to specifications (1) – (4) and (6) when we split the sample by mean age of 4.5 years; that is, even for children above the median age, we find no correlation between No Influence child and Control parent sharing. (Results based on the two subsamples for this and subsequent analyses are available upon request).

There may be several reasons for this result. First, the suggestive indication that older children (aged 5) are more likely to behave like their parents may be an indication that moral development is still ongoing at this early age, and that children ages 3-4 have not yet fully expressed the behavior of their parents. Second, it is possible that the influence of the family is not as strong as we may have expected a priori. In fact, several other studies also find no correlation between sharing behavior of parents and children even when children are a little older (Bettinger and Slonim, 2006; Cipriani et al., 2013). Finally, there could be other contextual influences that we have not controlled for, such as how the tasks are construed by each participant.

5.4 Test of Role Modeling Hypothesis

Next, we test the role of the modeling effect predicted by Hypothesis 1. To test this hypothesis, we compare the decisions made by parents in the Show and Control conditions. As previously discussed, parental decisions about modeling behavior to their child could differ depending on what they assess the particular child's disposition to be—i.e., the parent might urge fairness concerns on a child she perceives as being overly selfish, but might take a different approach towards a child who seems to show too little self-concern. We allow for this in our analysis by using our child types as above, based on each preschooler's uninfluenced giving Y_{NI} and assuming that the parent has knowledge of the child's disposition (the parent is not told explicitly about the child's uninfluenced giving). The modeling effect is then estimated by including child type, as well as adult fixed effect and parent-child gender pairing. The dependent variable is parent giving x in the two conditions, X_S and X_C ; see equation (10).

$$(10) \quad x = (\alpha + \sum_{k=1}^K \beta_k D_k) D_{show} + \sum_i \gamma_i d_i + \varepsilon$$

There are 292 observations in Table 5, where the results are presented, coming from 146 parents in the Control and Show conditions (one parent's observations were dropped due to missing demographic data). They reflect the decisions of parents who know, in the Show condition, that their own child will see the decision, whereas in the Control condition their own child would not see their decision (but another child may). In the first specification, the estimate on the Show (vs. Control) dummy alone is small and statistically insignificant. However, there is a possibility of heterogeneity in parental behavior; the remaining specifications explore this possibility.

In column (2) we consider whether the parent is the father or mother. In this specification, the coefficient on D_{show} is negative and insignificant, but its interaction with the father dummy is positive, almost three times as large, and significant at the 10% level; the corresponding coefficients are significant at the 10% and 5% level respectively in ordered probit estimates. This suggests that on average fathers increase their giving by about 28 cents when it will be shown to their child, whereas mothers slightly reduce theirs, in the Show as compared to the Control condition. When we estimate model (1) separately for fathers and mothers, the estimate on D_{show} for fathers is 0.167 and for mothers it is -0.112, but both are statistically insignificant. There appear to be no child gender, ethnicity/race or age effects in parent's decisions (columns 3, 4 and 6).

In column (5), we control for interaction with child type and find that parents of generous children (as measured by child giving in the No Influence condition) increase their own giving between Control and Show conditions by an average of 52 cents more than other parents do. While the coefficient in question is significant at the 10% level only, the corresponding coefficient in our ordered probit estimate is significant at the 1% level. No effect is detected for parents of Selfish children.

In sum, Table 5 provides evidence of parents modeling to their preschoolers under specific conditions. There is a significant tendency in our sample for fathers to show more generosity when they know their decision will be made known to their own child, while there is marginally significant evidence of a smaller shift in the opposite direction by mothers.¹³ There is also evidence that parents of more generous children give more when their child will see their decision. Greater sending in general, and greater sending in particular to a more generous child, were predicted in Hypothesis 1 owing to two factors: (i) that parents attempt to transmit their behavioral ideals to their children and that when parents' ideals of giving differ from their unwatched behaviors, their ideals tend to be more generous than their unwatched behaviors, and (ii) that parents take into account the child's disutility from a gap between parent and child behavior and therefore altruistically attempt to reduce the size of that gap. Factor (ii) predicts greater sending when watched by a generous child if parents can make better-than-random guesses about their child's uninfluenced generosity (not shown to them in the experiment). We did not predict greater paternal than maternal modeling, and indeed our general prediction of modeling failed to be supported in the data with respect to mothers.

5.5 Test of the Emulation Hypothesis

While children show little sign of sharing the preferences of their parents in our data, perhaps they are influenced by their parents' choices when they see these choices prior to making their decision. This is the basis of Hypothesis 2, which proposes that children emulate their parents, that is, that Y_I is influenced by X_S . Emulation is assessed in equation (10), which relates what a

¹³ Note that Table 2a does not support an explanation that fathers behave significantly more selfishly when unobserved and that their shift upwards in sending in the Show condition is attributable to some need to more closely conform with the altruism of mothers when being watched.

child gives in the No Influence and Influence conditions (Y_{NI} and Y_I , respectively) to what the adult gives in the Show condition (X_S) multiplied by the Influence condition dummy R , and child fixed effects. The influence of X_S on child giving in the two conditions may be affected (moderated) by child's ethnicity/race, age, whether he or she was exposed to the mother or father's decision, or that of another adult, and the child's own type. We evaluate the role of these variables in equation (11) below, where y is child giving in the two conditions, No Influence and Influence, Y_{NI} and Y_I , D_k variables are child demographics and source of influence, and d_i s are child dummies:

$$(11) \quad y = (\alpha X_S + \sum_{k=1}^K \beta_k D_k X_S) R + \sum_i \gamma_i d_i + \varepsilon$$

The results are presented in Table 6. The number of observations is 234, with two observations for each of the 117 child-parent pairs, after excluding the children that were in the control condition of No Influence condition in round three.¹⁴ As with Table 4a, we present OLS results for ease of interpretation; results of ordered probit estimates are qualitatively similar.

The story told by Table 6 is interesting. Column (1) provides evidence of the role of “any adult influence” – there is no overall effect, since the principal explanatory variable is $(X_S)*R$, adult Show condition sending interacted with R , a dummy variable distinguishing child Influence condition ($R = 1$) from the No Influence condition ($R = 0$) is negative and insignificant. Column (2) provides evidence of the separate effects of mothers and fathers by adding separate interactions for father and mother, but all variables remain insignificant.

Next we look at subgroup analysis. In specification (3) and in specifications (4) - (7), we add to the column (1) specification either an interaction between X_S*R and the child's gender (*Boy*),

¹⁴ Recall that in the third (and last) round children were divided into three treatment groups: in one group children were shown their own parents' giving, in another group they were shown the giving of an adult who is not their parent (this adult was a parent of another child), and a third group repeated the No Influence condition. For clarity, in Table 6 we use only the parent and other adult data, omitting the children under No Influence in this round. However, the inclusion of that group as a separate category does not qualitatively affect the results.

an interaction between $X_s * R$ and the child's uninfluenced sending Y_{NI} , or both. Adding the interaction with Y_{NI} , which allows for the possibility that the rate of emulation differs depending on the child's initial sharing inclination, causes the coefficient on $X_s * R$ to become large, positive, and significant, in line with Hypothesis 2, while the coefficient on the interaction term is an equally significant negative term of around a third to half the first coefficient's magnitude. We interpret this to mean that a child who sent nothing in the No Influence condition increases sending by around 0.3 stickers per dollar the adult sends, but that the greater was Y_{NI} , the less is the adult copied. When only the interaction with *Boy* is included (see column (3)), the coefficient on $X_s * R$ is positive and marginally significant and that on the interaction is highly significant and negative, implying that girls emulate whereas boys do the opposite. However, the estimates in columns (5) and (7), which include also the interaction with Y_{NI} , indicate that the latter effect is more robust; the negative impact of child gender becomes insignificant once that interaction is controlled for. When father and mother interactions like those in column (2) are re-introduced to the column (4) and (5) specifications, in columns (6) and (7) respectively, the two significant coefficients remain significant and little changed in value, while the coefficients on the added interaction terms are entirely insignificant. This is interesting since it suggests that the emulation indicated by the first coefficients in specifications (3) and higher might reflect emulation of *any* adult (or conceivably even copying of any illustrative decision shown to the child), not the specific influence of parents.

In column (8), we use specifications allowing for difference of reaction by child "type" in order to further explore the indications that the response differs for initially low-sending (selfish) vs. high-sending (generous) children. Consistent with the column (4) – (7) estimates, the emulation term for the generous children is significant and negative, that for the selfish children is positive, whether we include the controls of specification (7) (not shown in the table) or drop them. While

the effect for selfish children is only marginally significant, in OLS, it is significant at the 1% level in the ordered probit estimates. This reassures us that the effect is indeed present for that majority of the children who sent fewer than three stickers in their uninfluenced decision. It is also worth bearing in mind that the generous category includes only 16 of 122 children, of whom 9 sent 2 or fewer stickers in Influenced condition (see again Table 3b)—hence a relatively small number of child decisions underlie the estimated negative emulation for that group and the result should be treated with caution.

Column (9) shows that the estimates on the interaction between $X_S \cdot R$ and child age (3 and 5 year old dummies) are small and statistically insignificant. In other specifications, not shown, we separately explore whether interactions between $X_S \cdot R$ and race/ethnicity and between $X_S \cdot R$ and parent-child gender pairings, have significant effects. All of these interaction terms prove to be insignificant, whether in a specification otherwise resembling that of column (1) or in one resembling column (7). The main results of column (7) are also robust to these variables' inclusion.

In sum, these regressions show that preschoolers were significantly influenced by the adult sharing decisions shown them, albeit with smaller or directionally counter-intuitive impact for generous No Influence child sending decision. The children did not respond differently when told that the adult in question was their father, mother, or another adult, and once the moderating effect of No Influence sending is controlled for, emulation by boys is not different from that of girls.

6. Conclusions

The question of whether, and how, parents transmit normative preferences or values to children is an interesting and potentially important one that has barely begun to be studied empirically by economists, despite its relevance to the economics of the family, philanthropy, civic

cooperation, and other domains. We propose a theoretical model that predicts parental role modeling to children, and children's emulation of parents' decisions, as a possible mechanism for transmission. We test our theory through an experiment in which we asked preschoolers and their parents to participate in dictator games allocating items—stickers for the children, dollars for the adults—between themselves and an unknown other child or adult. One of a parent's decisions was shown either to their own child or to an unrelated child.

Our analysis focused mainly on (1) whether parents make different choices when they know a choice may be shown to their own child (modeling effect), and (2) whether children's choices change to resemble those of their parent or another adult after such a choice is shown to them (emulation effect). We also explored the associations between parent and child giving at baseline. We did not find significant overall effects of either modeling or emulation. However, we did find (1) evidence of parental teaching/modeling in the case of fathers and in that of parents of children who gave generously, and (2) an emulation effect insofar as children who initially share fewer than half of six stickers share more subsequently the more they see a parent or other adult share. We also do not find significant associations between parent and child sharing when comparing the child's initial choice to one by the parent that may be viewed by another but not own child. The results by subgroup should be interpreted with caution since sample sizes are small and the subgroup selection was done ex-post based on other interesting findings in the literature.

Our empirical findings can be contrasted with our own theoretical hypotheses. The findings do not support the expectation of correlation between parent Control and child No influence choice, with the possible exception of the oldest preschoolers. The very young age of the subjects, and relatively small sample size, might be the main cause of this lack of, or very weak, correlation. Moreover, slight differences in experiment design between parents and children – for instance, the

use of stickers with children but money with parents, and the use of the phrase “these are yours now” when describing stickers to children but not using similar phrasing with parents – could contribute to the lack of correlation. The modeling hypothesis is partly supported. The tendency of parents to increase their giving when observed by children already displaying a tendency towards generosity may reflect the fact that these children have already been influenced by similar parental modeling at home, as well as the desires of the parents not to create disutility-fostering dissonance by deviating from the inclination of their preschooler. We could provide no explanation of paternal but not maternal modeling.¹⁵ With regard to the hypothesis that the child would emulate a displayed decision by the parent, the difference between the child emulation effect observed among less versus more generous children depends mainly on a few initially high sharers among the children, so the more intuitive positive emulation effect for children who initially send little probably deserves more emphasis. That effect is consistent with the one hypothesized.

Many extensions for future research deserve consideration. Most obviously, experiments similar to ours should be conducted with older children, and across a broader range of socioeconomic groups. The method of conveying of the parental decision to the child should be varied to see whether modeling and influence are greater, and whether influence of parent versus other adult is more differentiated, if, for example, the parent’s decision is taken in view of the child, rather than merely being reported to him or her. More broadly, future research should look for ways of investigating whether the transmission of behaviors and preferences in moral or other-regarding domains has qualitatively different features from that of influencing other kinds of behaviors or preferences. Such research could contribute to ongoing discussions of whether humans are born with innate sensitivity to messages about the proper balance between self-interest

¹⁵ We reiterate that the conjecture that only fathers seem to raise their giving because they are less generous than mothers when not observed is not supported by our data.

and concern for others, or are better described by either strict self-interest or by cognitive blank-slate type characterizations.

References

- Adriani, F., & Sonderegger, S. (2016), "On the Mechanics of Cultural Transmission: Teaching by Example," Working Paper, University of Nottingham.
- Bar-Tal, D., Raviv, A., & Leiser, T. (1980). The development of altruistic behavior: Empirical evidence. *Developmental Psychology*, 16(5), 516.
- Bauer, Michal, Chytilová, J., & Pertold-Gebicka, B. (2014) "Parental background and other-regarding preferences in children." *Experimental Economics* 17(1), 24-46.
- Becker, G. S. (1974). "A Theory of Social Interactions." *Journal of Political Economy* 82(6), 1063-93.
- Becker, Gary S., Murphy, K., & Spenkuch, J. (2016). "The Manipulation of Children's Preferences, Old Age Support, and Investment in Children's Human Capital" *Journal of Labor Economics, Journal of Labor Economics* (34)2, S3–S30.
- Benenson, J. F., Pascoe, J., & Radmore, N. (2007) "Children's altruistic behavior in the dictator game." *Evolution and Human Behavior* 28(3), 168-175.
- Bettinger, E., & Slonim, R. (2006). "Using Experimental Economics to Measure the Effects of a Natural Educational Experiment on Altruism." *Journal of Public Economics*, 90 (8-9),1625-1648.
- Blake, Peter, Corbit, J., Callaghan, T., & Warneken, F. (2016). "Give as I Give: Socialization Goals in Two Cultures Moderate Parental Influence on Children's Giving," *Journal of Experimental Child Psychology*. Volume 152, Pages 149-160.
- Blake, P. R., & Rand, D. (2010). "Currency value moderates equity preference among young children." *Evolution and human behavior* 31(3), 210-218.
- Bloom, P. (2013). *Just Babies: The Origins of Good and Evil*. Crown Publishing.
- Boyd, R., & Richerson, P. (2005). *Not by Genes Alone: How Culture Transformed Human Evolution*. Chicago: University of Chicago Press.
- Cavalli-Sforza LL, Feldman MW, Chen KH, Dornbusch SM. "Theory and observation in cultural transmission." *Science*. 1982 Oct 1;218(4567):19-27.
- Candelo, Natalia; Scherenberg, Ericka and Sherry Xin Li. (2015). *Parenting, Teaching, or Peer Effect: An Experiment on Children's Pro-Social Behavior*. Work in progress.

- Cappelen AW, List JA, Samek A, Tungodden B. The Effect of Early Education on Social Preferences. National Bureau of Economic Research; 2016 Dec 1.
- Cesarini, D., Dawes, C. T., Fowler, J. H., Johannesson, M., Lichtenstein, P., & Wallace, B. (2008). "Heritability of cooperative behavior in the trust game," *Proceedings of the National Academy of sciences*, 105(10), 3721-3726.
- Cipriani, M., Giuliano, P., & Jeanne, O. (2013). "Like mother like son? Experimental evidence on the transmission of values from parents to children." *Journal of Economic Behavior & Organization* 90, 100-111.
- Devanath, S. (2010). "How Socialization Relates to Early Prosocial Development," Bachelor's Thesis, University of Pittsburgh Departments of Sociology and Psychology.
- DeWaal, Frans. (2009). *The Age of Empathy: Nature's Lessons for a Kinder Society*. Crown.
- Engel, C. (2011). "Dictator games: a meta study." *Experimental Economics* 14(4), 583-610.
- Fehr, E., & Rockenbach, B. (2004). Human altruism: economic, neural, and evolutionary perspectives. *Current opinion in neurobiology*, 14(6), 784-790.
- Fehr, E., Bernhard, H., & Rockenbach, B. (2008). "Egalitarianism in Young Children," *Nature*, 454(7208), 1079-1083.
- Fehr, E., Rützler, D., & Sutter, M., (2011). "The Development of Egalitarianism, Altruism, Spite and Parochialism in Childhood and Adolescence," Working Paper.
- Gummerum, M., Hanoch, Y., Keller, M., Parsons, K., & Hummel, A. (2010). "Preschoolers' Allocations in the Dictator Game: The Role of Moral Emotions," *Journal of Economic Psychology* 31(1), 25–34.
- Harbaugh, W. T., & Krause, K. (2000). "Children's altruism in public good and dictator experiments." *Economic Inquiry* 38(1), 95-109.
- Harbaugh, W. T., Krause, K., & Liday, S. J. (2003). "Bargaining by children." *University of Oregon Economics Working Paper* 2002-4.
- Harris, P. (2012). *Trusting What You're Told: How Children Learn From Others*. Belknap Press of Harvard University Press.
- Harrison, G.W. and List, J.A. (2004). "Field Experiments." *Journal of Economic Literature* 42(4), 1009-1055.
- Hoffman, M. L. (1975). "Altruistic Behavior and the Parent-Child Relationship," *Journal of Personality and Social Psychology* 31(5), 937.

- Houser D, List JA, Piovesan M, Samek A, Winter J. "Dishonesty: From parents to children." *European Economic Review*. 2016 Feb 29;82:242-54.
- Houser, D., Montinari, N., & Piovesan, M., (2012) "Private and Public Decisions in Social Dilemmas: Evidence from Children's Behavior," *PLoS ONE* 7(8) e41568, 1 – 6.
- Kosfeld, M., Heinrichs, M., Zak, P.J., Fischbacher, U., & Fehr, E. (2005). "Oxytocin increases trust in humans." *Nature* 435(7042), 673-676.
- Lévy-Garboua, L., Meidinger, C. and Rapoport, B., 2006. "The formation of social preferences: Some lessons from psychology and biology." *Handbook of the economics of giving, altruism and reciprocity*, Edited by Serge-Christophe Kolm and Jean Mercier Ythier, Elsevier B.V., pp.545-613.
- Li, Y., et al. (2013). "Experiencing a natural disaster alters children's altruistic giving." *Psychological Science* 24(9), 1686-1695.
- List, J. (2007). "On the Interpretation of Giving in Dictator Games," *Journal of Political Economy* 115(3), 482 – 493.
- List, J. & Samek, A. (2013). "Exploring the Origins of Charitable Acts: Evidence from an Artefactual Field Experiment with Young Children," *Economics Letters* 118(3), 431 – 434.
- Otoni-Wilhelm, M., & Ye Zhang. (2011) "What Motives Cause Parents to Transmit Generosity," Working Paper, IUPUI.
- Rushton, J. P. (1975). "Generosity in Children: Immediate and Long-term Effects of Modeling, Preaching, and Moral Judgment," *Journal of Personality and Social Psychology* 31(3)
- Rushton JP. "Socialization and the altruistic behavior of children." *Psychological Bulletin*. 1976 Sep;83(5):898.
- Smith, A. (1759). *The Theory of the Moral Sentiments*.
- Wallace, B., Cesarini, D., Lichtenstein, P., & Johannesson, M. (2007). Heritability of ultimatum game responder behavior. *Proceedings of the National Academy of Sciences*, 104(40), 15631-15634.
- Warneken, F. (2013). "Young Children Proactively Remedy Unnoticed Accidents," *Cognition* 126, 101 – 108.
- Warneken, F., & Tomasello, M. (2009). "The Roots of Human Altruism," *British Journal of Psychology* 100(3), 445 – 471.
- Warneken, F., & Tomasello, M. (2013). "Parental Presence and Encouragement Do Not Influence Helping in Young Children," *Infancy* 18(3), 345 – 368.

- Wilhelm, Mark Ottoni, Eleanor Brown, Patrick M. Rooney, and Richard Steinberg. "The Intergenerational Transmission of Generosity." *Journal of Public Economics* 92, no. 10-11 (2008): 2146-156.
- Zinser, O., Perry, J., & Edgar, R. (1975). "Affluence of the Recipient, Value of Donations, and Sharing Behavior in Preschool Children," *Journal of Psychology* 89, 301 – 305.
- Zumbühl, M., Dohmen, T., & Pfann, G. (2013). "Parental Investment and the Intergenerational Transmission of Economic Preferences and Attitudes," IZA Working Paper 7476.

Table 1. Summary of Experimental Design and Notation (see online appendix for details)

	<i>Parents</i>	<i>Children</i>
Endowment	\$6	6 preferred stickers
Experimental conditions. In all conditions there was same-gender pairing	C: Control: “In this round, some children from today’s activity may be shown the choices that you made before they make their choices in the child activity right after this. However, your own child will not see the choices you made for this round...” S: Show: “In this round <i>we will show your child</i> the choices you made before he/she makes some of his/her choices in the child activity that’s just getting started”	NI: No Influence: “On this plate there are some stickers. They are yours now. You are going to decide how many to keep, and how many to send to this [boy, girl]. You can keep as many of your stickers as you want, and you can send none, some, or all of your stickers to [him, her]. It is up to you how many you keep and how many you send...” I: Influence: “...But before you make your own choice, I want to tell you that other people played a similar game before you. They did not play the game with [boy, girl] but with similar people. Here is what [your mother, your father, another adult] did (animation)...”

X_{ns}: Adult giving in the <i>Control</i> condition X_s: Adult giving in the <i>Show</i> condition Y_{ni}: Child giving in the <i>No Influence</i> condition Y_i: Child giving in the <i>Influence</i> condition x^* = latent variable for X_c and X_s y^* = latent variable for Y_{ni} and Y_i D_{show} =1 for <i>Show</i> condition, =0 for <i>Control</i> R = round 3 of child experiment =1 for <i>Influence</i> condition, =0 for <i>No Influence</i>	<i>Child/adult type</i> • Selfish: $Y_{NI}/X_C = 0, 1$ or 2 • Fair: $Y_{NI}/X_s = 3$ • Generous: $Y_{NI}/X_C = 4, 5$ or 6 D_k = vector of dummies for child type, gender, age and ethnicity d_i = individual dummy variables (child or adult, depends on the context)
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Table 2a. Summary Statistics for Adults’ Giving

Giving	Sample size	Mean	Standard error	Minimum	Maximum
Parent-Control (X_C)	147	2.91	1.48	0	6
Parent-show (X_s)	146	2.90	1.61	0	6
Father-Control	49	2.86	1.67	0	6
Father-show	48	3.04	1.75	0	6
Mother-Control	98	2.94	1.39	0	6
Mother- show	98	2.83	1.54	0	6
Parent type classification by number of dollars given in the Control condition					
Selfish (gave less than half): 51 (18 fathers, 33 mothers)		Fair (gave half): 69 (22 fathers, 47 mothers)		Generous (gave more than half): 27 (9 fathers, 18 mothers)	

Table 2b. Summary Statistics for Children's Giving

Giving (Y _i)	Sample size	Mean	Standard error	Minimum	Maximum
No influence	147	1.91	1.64	0	6
<i>Boy</i>	70	2.11	1.79	0	6
<i>Girl</i>	77	1.73	1.47	0	6
Third round	145	1.89	1.66	0	6
<i>Father influence</i>	40	1.93	1.67	0	6
<i>Mother influence</i>	37	2.05	1.81	0	6
<i>Other adult influence</i>	40	1.75	1.63	0	6
<i>Repeat no influence</i>	28	2.04	1.55	0	6
Child type classification by number of stickers given in the No Influence condition					
Selfish (gave less than half): 80 (37 boys, 43 girls)		Fair (gave half): 50 (21 boys, 29 girls)		Generous (gave more than half): 16 (12 boys, 4 girls)	

Table 3a. Transition table for parents, by type

	Selfish in Show	Fair in Show	Generous in Show	Total
Selfish in Control	41	7	3	51
Fair in Control	12	48	9	69
Generous in Control	1	4	22	27
Total	54	59	34	147

Table 3b. Transition table for children, by type (excludes children who were in the No Influence condition in the third round)

	Selfish in Influence	Fair in Influence	Generous in Influence	Total
Selfish in No Influence	54	12	2	68
Fair in No Influence	10	22	6	38
Generous in No Influence	9	3	4	16
Total	73	37	12	122

Table 4a. Association Between Parent/Child Baseline Giving: OLS

	(1)	(2)	(3)	(4)	(5)	(6)
Xc	-0.010 (0.092)	0.057 (0.121)	-0.039 (0.126)	0.080 (0.191)	-0.161 (0.130)	-0.488 (0.327)
Father*Xc		-0.161 (0.187)				
Father		0.383 (0.614)				
Boy*Xc			0.094 (0.185)			
Boy			0.118 (0.601)			
(Father-son)*Xc				-0.209 (0.306)		
(Father-Daughter)*Xc				-0.168 (0.255)		
(Mother-son)*Xc				0.122 (0.255)		
Father-Son				0.551 (0.848)		
Father-daughter				-1.101 (0.899)		
Mother-Son				-0.819 (0.778)		
(3 YO)*Xc					0.155 (0.225)	
(5 YO)*Xc					0.462** (0.226)	
3 YO					-0.443 (0.732)	
5 YO					-1.224* (0.727)	
Black*Xc						0.482 (0.354)
Hispanic*Xc						0.555 (0.356)
Black						-1.159 (1.038)
Hispanic						-1.390 (1.027)
Constant	1.940*** (0.300)	1.772*** (0.392)	1.846*** (0.429)	2.181*** (0.545)	2.367*** (0.439)	3.114*** (0.923)
R ²	0.000	0.006	0.016	0.052	0.029	0.018
Observations	147	147	147	147	147	147

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1
Excluded (reference) dummy variables:
- Mother (for father)
- Girl (for boy)
- 4 year old (for 3 YO and 5 YO)
- White (for Black and Hispanic)
- Mother-daughter (for Father-son, father-daughter and mother-son)

Table 4b. Association of Baseline Child and Parent Giving by Type: Multinomial Logit. Dependent variable: Child Type, “Fair” Child is the baseline category

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Selfish child	Generous child	Selfish child	Generous child	Selfish child	Generous child	Selfish child	Generous child	Self.child	Generous child
Selfish parent	-0.483 (0.406)	0.570 (0.652)	-0.482 (0.407)	0.577 (0.664)	-0.485 (0.407)	0.563 (0.653)	-0.484 (0.407)	0.567 (0.665)	-0.486 (0.407)	0.549 (0.655)
Generous parent	-0.380 (0.492)	0.231 (0.825)	-0.362 (0.495)	0.421 (0.845)	-0.381 (0.492)	0.228 (0.826)	-0.364 (0.495)	0.429 (0.846)	-0.396 (0.503)	0.100 (0.842)
Boy			0.134 (0.367)	1.433** (0.650)			0.135 (0.367)	1.438** (0.651)		
Father					0.075 (0.386)	0.227 (0.601)	0.077 (0.387)	0.250 (0.615)		
Black									0.058 (0.564)	0.645 (0.932)
Hispanic									-0.105 (0.515)	0.050 (0.905)
Constant	0.717*** (0.266)	-1.435*** (0.498)	0.654** (0.315)	-2.323*** (0.689)	0.693** (0.292)	-1.510*** (0.539)	0.630* (0.338)	-2.410*** (0.727)	0.757 (0.476)	-1.662* (0.873)
Pseudo R2										
Observations	147	147	147	147	147	147	147	147	147	147

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Omitted (reference) dummy variable for Selfish parent and Generous parent is fair parent.

Table 5. Teaching/Role Modeling Effect for Parents: OLS with Parent Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)
D_{show}	-0.021 (0.077)	-0.112 (0.094)	-0.026 (0.108)	0.000 (0.192)	-0.020 (0.130)	-0.074 (0.114)
Father* D_{show}		0.279* (0.164)				
Boy* D_{show}			0.012 (0.156)			
Black* D_{show}				-0.085 (0.236)		
Hispanic* D_{show}				0.013 (0.221)		
Selfish child* D_{show}					-0.105 (0.166)	
Generous child* D_{show}					0.520* (0.265)	
Age 3* D_{show}						0.193 (0.184)
Age 5* D_{show}						-0.010 (0.193)
Constant	1.487*** (0.461)	-0.038 (0.467)	2.509*** (0.465)	2.425*** (0.473)	1.750*** (0.470)	1.542*** (0.475)
R ²	0.909	0.911	0.913	0.909	0.909	0.910
Observations	292	292	292	292	292	292

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 6. Emulation Effect for Children: OLS with Child Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
X_S^*R	-0.016 (0.049)	-0.043 (0.083)	0.106* (0.063)	0.277*** (0.064)	0.313*** (0.068)	0.264*** (0.089)	0.294*** (0.091)	-0.021 (0.080)	-0.016 (0.070)
Father* X_S^*R		0.051 (0.118)				0.046 (0.103)	0.047 (0.102)		
Mother* X_S^*R		0.032 (0.122)				-0.008 (0.107)	0.010 (0.107)		
Boy* X_S^*R			-0.279*** (0.095)		-0.137 (0.089)		-0.135 (0.091)		
$Y_{NI}^*X_S^*R$				-0.144*** (0.024)	-0.133*** (0.025)	-0.144*** (0.024)	-0.133*** (0.025)		
Selfish Child* X_S^*R								0.174* (0.101)	
Generous Child* X_S^*R								-0.468*** (0.130)	
3 YO* X_S^*R									0.034 (0.115)
5 YO* X_S^*R									-0.046 (0.125)
Constant	0.047 (0.939)	2.976*** (0.968)	2.682*** (0.918)	-0.831 (0.835)	3.651*** (0.844)	0.068 (0.860)	-0.476 (0.882)	0.781 (0.894)	3.185*** (0.985)
R ²	0.699	0.700	0.720	0.772	0.776	0.772	0.777	0.760	0.760
Observations	234	234	234	234	234	234	234	234	234

Note: No influence is the omitted category. Columns 1, 3 5 measure the impact of any influence (mother, father or other adult). In Columns 2, 6 and 7 we distinguish between the any influence coefficient and an interaction of the influence with father or mother. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1