Self-Control, Social Preferences and the Effect of Delayed Payments☆

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Abstract

We extend the dual-self model to include altruistic preferences. This explains (1) why people may have preferences for equality in the laboratory but not in the field, (2) why intermediate donations may occur in dictator games, (3) why cognitive load and time pressure may increase giving, and (4) why people often "avoid the ask" from solicitors when they would have donated if avoiding was impossible. Also, our model predicts that (5) delaying payments to both parties in the dictator game decreases giving. We verify this prediction in two large-scale experiments: people give less when payoffs are delayed.

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1. Introduction

Altruistic behavior, that is when people help others without any chance of future gain themselves, has been widely demonstrated in laboratory experiments. For example, in the more than twenty years since the Dictator Game was first introduced Forsythe et al (1994), countless experiments have found that a substantial subset of people will transfer money to anonymous strangers. Moreover, altruism is not limited to the laboratory: millions of people donate money to charitable organizations, and many of them do so anonymously.

The goal of this paper is to show how a very simple and stark application of the dual-self model of costly impulse control (Fudenberg and Levine (2006), Fudenberg and Levine (2011), Fudenberg and Levine (2012)) provides a unified explanation for various facts which are inconsistent with standard models of social preferences.[5] In particular we highlight that standard theories do not account for the following facts: there is more giving in the laboratory than the street; people often give intermediate amounts rather than all, nothing, or 50%; higher cognitive load or time pressure can lead to increased giving, so that giving appears impulsive; and people will invest some effort to "avoid the ask" and not be put in a position where they might be inclined to give.

Our supposition is that, as the dual-self model hypothesizes, a single patient self makes decisions in each period to maximize the discounted sum of utility net of a cost of self control. This cost in turn depends on the temptations faced by a shorter-run self who values future utility less than the longer-run self does, but otherwise has exactly the same objective function. This simple model is already known to provide qualitative and in some cases quantitative explanations of a wide variety of "behavioral" paradoxes outside the social domain, including the Rabin paradox (small stakes risk aversion), the Allais paradox, preferences for commitment in menu choice, violations of the weak axiom of revealed preference, non-exponential discounting, and the effect of cognitive load on individual decision making and reversals due to probabilis-

[5] See, for example, Rabin (1993),Levine (1988), Fehr and Schmidt (1999), Bolton and Ockenfels (2000), Brandts and Sola (2001), Charness and Rabin (2002).

tic rewards (Fudenberg and Levine (2006), Fudenberg and Levine (2011), Fudenberg and Levine (2012)).

The concept of mental accounts that are set in a "cool state" in which planned daily spending is not subject to much temptation is a key ingredient here and in previous applications of the dual-self model.[6] After the mental account is set, temptation acts as a subsidy on spending from unanticipated earnings, so that the agent will choose to spend all of small windfalls, but will use self control and save if the windfall is sufficiently large. In this paper we maintain the assumption that the differing valuations of future payoffs is the only conflict between the two selves, so in particular the two selves have exactly the same social preferences. As we will see, this simple and stark assumption is enough to generate a number of predictions about altruism. These predictions are largely supported by previous empirical studies.[7]

The model makes the following predictions: First, there will be more giving in the lab than on the street. The giving in the lab comes from the windfall payment of the experiment, so withholding donations is "taxed" by the cost of self control. Second, the model predicts that people will sometimes give intermediate fractions, not just nothing, everything, or 50% of the endowment in the dictator game (unlike many social preference models that are derived from long-run considerations and hence have nearly linear utility functions for giving). Third, increasing the cost of exerting self-control (for example, by imposing cognitive load or time pressure) will lead to increased altruistic behavior, as doing so frees the shorter-run self to behave altruistically.[8]Fourth, if

[6]Thaler (1980)and Tversky and Kahneman (1981) discuss exogenous mental accounts as an explanation for the reference-point dependence of prospect theory; Thaler and Shefrin (1981) introduce the idea of an endogenous mental account that is used as a self-control device.

[7]Of course a wider range of behavior could be accommodated by allowing the social preferences of the two selves to differ. We make the simpler and starker assumption of no difference in the interest of parsimony, but we do briefly discuss how assuming that the shorter-run self is more altruistic than the long-run self helps explain "avoiding the ask."

[8]In a related dual-self model, Loewenstein and O'Donoghue (2007) conclude that the implications of cognitive load for giving depend on the degree of sympathy that the donor has for the recipient at the time of the decision. Their model allows the deliberative or long-run self to be either more or less altruistic than the short-run self depending on the

we add a degree of freedom by supposing that the shorter-run self is more altruistic than the long-run self, the dual-self model can explain why the long-run self is willing to pay a cost to avoid exposing the shorter-run self to temptation, thus “avoiding the ask” (for example, crossing the street to avoid a volunteer asking for donations). Fifth, even reverting to the simplifying assumption that the short- and long-run self place equal weight on the welfare of others, people will be less altruistic when there is a delay in when payments are paid out in for example the dictator game (because delaying payments reduces the utility the short-run self gets from giving, allowing the long-run self to divert more money to savings).

The first four of these predictions are supported by substantial empirical evidence. First, giving rates are typically higher in the lab than in the field, although both types of altruism correlate (see, for example, Benz and Meier (2008) and Peysakhovich et al (2014)). For example, while many people give away 50% of their earnings in lab Dictator Games (average donations around 28%, with even higher average giving when the recipient is charity rather than another person Engel (2011)), the average American only donates 3% of their annual income to charitable organizations Charity Review Council (2014). Second, the experimental evidence suggests that people often donate intermediate amounts, in dictator game experiments (Forsythe et al (1994), Engel (2011)) rather than giving nothing, everything, or 50% of the endowment. Third, a recent meta-analysis of giving in 22 Dictator Game experiments found that increasing the cost of self-control (via cognitive load, time pressure, or a recall induction that discourages careful thinking) increased giving among women (and has no significant effect on giving among men) Rand et al. (2016).[9] Fourth, many people who will give if they have the opportunity nonetheless “avoid the ask”: they choose to avoid the possibility

level of sympathy evoked.

[9]The model predicts in particular that those that have altruistic preferences that are sometimes dampened by the long-run self will give more when the costs of self-control increase. Andersson et al (2015) provide further support for this, as they find that subliminal priming increases DG giving among participants with strong prosocial preferences.

of giving, for example, by crossing the street to avoid a volunteer asking for donations (for example, Andreoni et al (2011), Della Vigna et al (2012), and Dana et al (2007)).

In contrast to the first four predictions, the fifth prediction, regarding the effect of delayed payments, is a new prediction of the model and relatively untested. Only one prior study has examined the effect of delaying payments on DG giving. Consistent with our model's prediction, Kovarik (2009) finds that dictators give less in games where the dictator's and recipient's rewards are postponed (by an equal amount). Because this last result is less well established than the other facts, we not only show why it is predicted by the dual-self model, but also provide additional empirical evidence for it with two large-scale experiments.

The first part of the paper develops the relevant theory. The second part describes in more detail the empirical evidence that is explained by the dual-self model (but is inconsistent with many standard social preference models). The third part describes two large-scale experiments that we performed to test the theory's prediction that delaying payments to both parties in a dictator game should decrease giving. In our main experiment, which uses a between-subject design, we had 1417 participants make dictator decisions in an anonymous online setting (Amazon Mechanical Turk), with two experimental conditions: one in which dictators allocate money between themselves and a recipient with both agents receiving their payments the same day, and one in which dictators allocate money between themselves and a recipient with both agents receiving their payments in 30 days. In both cases, the money allocated to the recipient was doubled, that is, by forgoing one cent the participant could give two cents to the other. As predicted, delay decreased dictator-game giving significantly, with donations 13% higher today relative to in 30 days (38% of the endowment donated now versus 34% of the endowment donated in 30 days). This difference was driven by the fraction of participants giving nothing increasing from 31% to 35% with delay, while the fraction giving away the full endowment decreased from 20% to 16%. Our second experiment was a direct replication of this result in a between-subjects analysis of 3103 additional dictators.[10]

2. The Model

2.1. Payoffs and The Timing of Decisions

To explain the empirical observations described above in Section 2, we introduce altruism - a positive concern for others - into the dual-self model, and develop its implications for dictator game giving. Our model takes altruistic preferences as a given, and does not seek to explain when and to whom they apply, or why such preferences might have been developed.[11]Moreover, we restrict attention to settings where, as in many lab experiments on giving, there is a single possible direct recipient of altruistic gifts (rather than, for example, a charity, which distributes an unknown fraction of the donated money to an unknown number of recipients at an unknown point in the future), and do not say how this recipient is identified when there are several conceivable candidates. Instead, we focus on how altruism is influenced by delay, price or "proportionality" multipliers, and unexpected windfalls.

In our model, the long-run self and the shorter-run self have exactly the same per-period or flow utility function, and in particular have the same view about the allocation of a fixed sum between own immediate consumption and gifts others; the only conflict between them concerns the tradeoff between immediate rewards and future ones. The model has three periods $t = 0, 1, 2$.

These periods differ in length, with T_t the length of period t. Decisions are only made in periods 0 and 1, and in period 2 consumption occurs. See Figure 1 for a diagram of the timeline.

[10]We also attempted to conduct two within-subject analyses, but these failed to provide useful data due to consistency effects. See below for details.

[11]One possibility is that altruism has arisen as a heuristic shortcut to implement reciprocity-based cooperation in response to the fact that most social interactions have been repeated and not one-shot; see, for example, Burnham and Johnson (2005),Hagen and Hammerstein (2006), Rand et al (2014) for an exposition of this view, and Bear and Rand (2016) for a formal model.

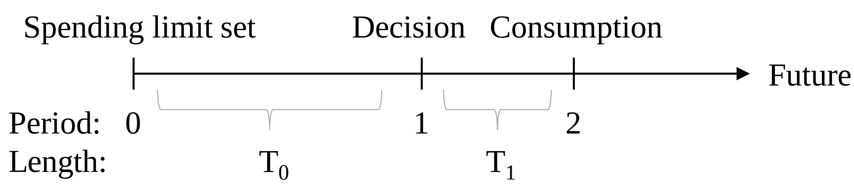

Figure 1. Timeline of the model.

0. In period 0 a "mental account" in the form of a spending limit $x \geq 0$ is decided; this constrains the period 1 decision. The length of the period T_0 is of medium length, on the order of months; that is, the spending limit is set infrequently, and thus far in advance of most interactions.

- In period 1, the "decision period," an amount of wealth w_1 is available, and in addition found money z is unexpectedly discovered.[12] The individual then allocates an amount $m \geq 0$ to "*me*" and an amount $y \geq 0$ to another person whom we refer to as "*you*." This spending must satisfy the limit $m + y \leq x + z$: the total amount to be spent cannot exceed the x that was set in period 0 plus the found money. In the lab participants are generally constrained only to make donations from found money, so there is the additional constraint $y \leq z$. The money allocated to *you* may be augmented on a proportional basis, for example by the experimenter: allocating y actually gives the amount py to you where p is the constant of proportionality, so 100% matching funds corresponds to $p = 2$.

- In period 2 the allocation determined in period 1 is consumed, resulting in a flow of utility to the shorter-run self of $v(m) + \alpha u(py)$ where α represents the "worthiness" of the recipient *you*. We expect α to be smaller for richer recipients than for poor ones, and it may depend on

[12] A small probability of encountering found money would not have much impact on decision making in period 0.

other measures of “worthiness” as well.[13]

An amount $w_2 = w_1 + z - m - y$ is left over for future consumption.We assume that u, v are strictly increasing, twice differentiable, concave and have finite derivative at the origin.[14]

- Following the end of period 2, the left-over wealth w_2 is consumed. Because the long-run self is relatively patient, we ignore discounting by the long-run self and interest accumulated on wealth, and we suppose that the total expenditure $m + y$ is small relative to wealth w_1. Then as in Fudenberg et al (2014), wealth w_2 will be consumed over a very long period of time and is large relative to $m + y$, so we can approximate the continuation value with a linear function, and specify that period 2 wealth w_2 yields present value to the long-run self of Vw_2.

Following Fudenberg and Levine (2012) we suppose that the shorter-run self is not completely myopic, but discounts the future with subjective interest rate ρ. As we indicated above, the length of $T_0$is taken to be long enough that the long-run self faces a negligible control cost when setting up mental accounts to govern period 1 decisions. Since once the mental accounts are set up the length of period 0 does not effect the subsequent decision in period 1 we use period 1 as the base period for discounting. The interval T_1 between the allocation decision and the realization of the consumption utility $v(m)+\alpha u(py)$ may also be be relatively short, as in the case of giving money to a panhandler in the street, or somewhat longer but not more than a few weeks or a month; we set $\phi = e^{-\rho T_1}$ to be the corresponding discount factor of the shorter-run self. By contrast we assume that $e^{-\rho T_2}$ is quite small so that the shorter-run self's

[13] Note that the worthiness parameter α resembles the sympathy parameter in the model of Loewenstein and O'Donoghue (2007), as both increase the desire to give.

[14] Our assumptions rule out the kinks that predict exactly equal splits across a range of proportionality parameters as for example in Fehr and Schmidt (1999). Some non-differentiable utility functions that predict equal splits, such as the Leontief utility function, can be approximated arbitrarily closely by differentiable functions. Giving will display a small but non-zero response to proportionality factors with such utility functions, but given the discrete nature of the choice we use the differentiability assumption for convenience.

utility effectively does not depend on w_2. Hence the shorter-run self's utility starting in period 1 is

$$U_{SR}(m,y) = \phi\left(v(m) + \alpha u(py)\right).$$

The long-run self cares about the utility flow of the shorter-run self, and also about future utility Vw_2. Given a self-control cost c of the decision made in period 1, and using the approximation that the long-run self does not discount over these relatively short time spans, the utility of the long-run self is therefore

$$U_{LR}(m,y,c) \quad = \quad v(m) + \alpha u(py) + V(w_1 + z - m - y) - c.$$

In the absence of self control or spending limits, the shorter-run self will choose expenditures to maximize her own objective. For this reason the long-run self will generally choose to impose a spending limit on the shorter-run self, and may also choose to exert costly self control. As indicated, the expenditure limit x set in period 0 constrains the period 1 consumption decision of the shorter-run self. We suppose that the cost of self-control is linear with coefficient γ in the foregone value of the shorter-run self. Hence, because the shorter-run self will wish to spend everything she is allowed to spend, the foregone value is simply the difference in utility between what the shorter-run self would get by spending everything optimally and what the shorter run self is forced to spend by the longer-run self. Hence we may write the cost of forcing the shorter-run self in Period 1 to choose m, y as

$$c = \gamma\phi\left(\max_{m'+y'=x+z}\left(v(m') + \alpha u(p(y'))\right) - \left(v(m) + \alpha u(py)\right)\right).$$

2.2. Optimal Choice of Spending Limit

Our basic hypothesis is that the long-run self anticipates that $p = 1 = \alpha$ and $z = 0$ - that is, she thinks it is unlikely to come across "matching funds," especially worthy recipients, or found money. We also suppose that the long-run self anticipates that the decision will take place in the "street" where all money available to the short run self is available for donation. Consider the unconstrained problem of the long-run self. Because v, u are concave, the long-run self's objective function is concave as well, and at the optimum, the first order conditions hold with equality. The unconstrained problem is to maximize $v(m)+\alpha u(py)+V(w_1+z-m-y)$, so the solution with respect to m has $v'(m) \leq V$ with equality if $m > 0$, and with respect to y has $\alpha p u'(py) \leq V$ with equality if $y > 0$. Since we observe that people spend small amounts of daily cash on lunch, coffee and so forth, but do not walk down the street giving money away to strangers, we assume that $v'(0) > V$ and $u'(0) \leq V$ so that for a recipient with $\alpha = 1$ and $p = 1$, the long-run self chooses and consumes some amount for itself but gives nothing to the recipient, so that$V = v'(m) > u'(0)$. Giving to others is inframarginal on the perfect foresight path, so the agent will only make gifts if she finds "enough" found money or if she encounters an unusually worthy (high α) recipient. One implication of this is that for extremely small stakes we should not observe any giving in the usual static dictator game, but at such low stakes the model breaks down and we expect that decisions can be influenced by all sorts of idiosyncratic factors that more typically have little effect.

Suppose that in the initial "cool" period 0, the long-run self chooses the spending limit x so that $v'(x) = V$. It follows that the optimum for the shorter-run self in period 1 is to choose $m = x, y = 0$ since then $v'(m) \geq u'(0)$ and the budget constraint $m + y = x$ is satisfied. In other words, the long-run self can implement the unconstrained optimum without incurring any self-control cost by the appropriate choice of the spending limit x. Thus when the agent walks down the street, she will not be tempted to give, yet no self-control costs are incurred.

Notice that in this model giving is never planned for period 1, which is the period of interest for our analysis. This does not mean that the dual-self model predicts there will never be planned giving. In particular, in period 0, the long-run self may anticipate a good giving opportunity (high α) at some other time. In this case, money would be budgeted in period 0 for that purpose and for that time period. This will have no effect on the spending limit for period 1 when no giving opportunity is anticipated. We have not explicitly introduced other periods with other giving opportunities and variation in α since that is not our focus of interest.

2.3. Giving in the Street

Before analyzing the model in the lab setting, we apply it to the typical case of "giving in the street," meaning that $z = 0$ (no additional windfall funds have been provided by an outside party), but where in contrast to the agent's expectations when she set the mental accounts, she has the chance to make a donation that will be multiplied by some $p > 1$ and/or to a worthy recipient with $\alpha > 1$. We will show that if αp is not too much bigger than 1, the agent continues to give zero, but if αp is sufficiently greater than 1, then she will donate. In either case, no self control is needed, as in this simple model the only conflict between the long-run self and the shorter-run self concerns the overall level of spending, so changing how a given level of spending is distributed between the agent and the recipient does not create a conflict between the shorter-run and long-run selves.[15] Recall that we have assumed $u'(0) < V$.

Theorem 1. *If* $\alpha p \leq V/u'(0)$ the agent sets $y = 0$, if $\alpha p > V/u'(0)$ then $y > 0$.

Proof. Suppose that the control constraint is slack. Then in the absence of a self-control problem the long-run self's objective function in period 1 is

$$U_{LR}(m, y) = v(m) + \alpha u(py) + V(w_1 - m - y).$$

If$\alpha p \leq V/u'(0)$then in the absence of a self control cost the long-run self prefers to stick to the perfect foresight path $y = 0$, $m = x$ as $v'(x) = V \geq \alpha p u'(0)$. The shorter-run self's objective is to maximize $v(m) + \alpha u(py)$ subject to $m + y \leq x$. Since $v'(x) > u'(0)$ and all the budget is spent, this is also the

[15] As we discuss in section 3.4, this very stark conclusion would change if the two selves also had different views about the best allocation of current consumption, for example because some current expenditures on the shorter-run self have long-term health benefits, or if caring for others is driven by "hot" emotions that the shorter-run self experiences more than the long-run self.

shorter-run self's most preferred feasible plan, so it can be implemented without incurring a control cost. Thus the hypothesis of a slack control constraint is verified.

On the other hand, if $\alpha p > V/u'(0)$ then since $v'(x) \leq u'(0)$,$\alpha p u'(0) > \max\{V, u'(x))\}$ and in the absence of a self control problem the long-run self still wants to spend all of the available budget of x but now prefers to set a strictly positive level of y, namely the unique solution to $v'(x - y) = u'(y)$. Once again, because all of x is spent, the interests of the long-run self and short-run self are aligned and again no self control is needed. $\square$

2.4. Giving in the Lab

We now consider what happens when "unexpectedly" the agent encounters found money z in the lab [16] in period 1 and is given the opportunity to give some of it (but no other funds) to an anonymous recipient with multiplier $p \geq 1$. Here we assume that the recipient is "typical" meaning that $\alpha = 1$.

Let E be the unique (and positive) solution of $(1 + \gamma\phi)v'(x + E) = V$.[17] Define $H(z) = v'(x + \min\{z, E\}))$. This is a weakly decreasing function taking on the value V at $z = 0$ and equal to $V/(1 + \gamma\phi)$ for all $z \geq E$. As the next theorem shows, H plays a key role in the effect of found money.

Theorem 2. *Assume*

1) [No Donations] The agent sets $y = 0$ if and only if $H(z) \geq pu'(0)$, that is for small z and a low transfer ratio $p \leq V/u'(0)$.

2) [Intermediate Donations] The agent gives an intermediate amount if and only if $V = v'(x) \geq pu'(pz)$and $H(z) < pu'(0)$, that is for large z. In this case both m and y are strictly increasing in $\min\{z, E\}$.

3) [Maximum Donations] The agent sets $y = z$ if and only if $pu'(pz) \geq V$, that is, for small z and a high transfer ratio $p > V/u'(0)$.

Proof. Let $F^*(x + z) = (\max_{m+y \leq x+z, m \geq x, y \geq 0} (v(m) + u(py))$. This is the

[16]That is, the lab payment was not expected at the time months earlier when the agent set the mental accounts

[17]E exists and is unique because v is strictly concave and $(1 + \gamma\phi)v'(x) \geq V = v'(x)$.

"temptation value," that is the maximum utility the short-run self can obtain with the found money z and multiplier p. The long-run self's objective function in period 1 is

$$\begin{aligned} U_{LR}(m,y) &= v(m)+u(py)+V(w_1+z-m-y)-\gamma\phi\left(F^*-(v(m)+u(py))\right) \\ &= (1+\gamma\phi)[v(m)+u(py)]+V(w_1+z-m-y)-\gamma\phi F^*; \end{aligned}$$

where we omit the argument of F^*since it has has no effect on the long-run self's optimal choice. The long-run self wants to maximize this expression given the constraints $m, y \geq 0$,$m+y \leq x+z$ and since in the lab only found money can be spent on you, $y \leq z$.

Define excess expenditure $e = m+y-x \leq z$, then we can write

$$U_{LR}(y) = (1+\gamma\phi)[\quad v(x+e-y)+u(py)]+V(w_1+z-e-x)-\gamma\phi F^*.$$

The first order conditions for e are $(1+\gamma\phi)v'(x+e) \geq V$ and $e = z$, or $(1+\gamma\phi)v'(x+e) = V$ and $0 < e < z$. (Note that the optimal $e > 0$ because $v'(x) = V$).The first order condition for y is that either $y = 0$ and $v'(x+e) \geq pu'(0)$ or $0 < y < z$ and $v'(x+e) = pu'(py)$ or $y = z$ and $V = v'(x) \leq pu'(pz)$.

Set E to be the unique (and positive) solution of $(1+\gamma\phi)v'(x+E) = V$. Note that if $z > E$ the first order condition for e holds with equality and $e = E$ so that the (necessary and sufficient) first order condition for $y = 0$ becomes

$$V/(1+\gamma\phi) = v'(x+E) \geq pu'(0). \tag{2.1}$$

If $z < E$ then $e = z$ (all of z is spent) and then $y = 0$ if and only if $v'(x+z) \geq pu'(0)$. Thus if we define $H(z) = v'(x+\min\{z, E\}))$ we see that $y = 0$ if and only if $H(z) \geq pu'(0)$, which proves (1).

As shown above, the first-order condition for y implies it is optimal to spend all of z on y when $V = v'(x) \leq pu'(pz)$, which proves (3).

From (1) and (3) an intermediate amount is given if and only if $V = v'(x) \geq pu'(pz)$ and $H(z) < pu'(0)$. In this case, the first order condition is

$v'(x+m) = pu'(p(\min\{z,E\} - m))$. From the implicit function theorem, this implies that both m and $y = \min(z,E) - m$ are normal goods, that is, strictly increasing in $\min\{z,E\}$; this proves (2). $\square$

Note that E increases in γ . Thus if an agent would give a positive amount, but less than the maximum, at a particular value of γ, the agent will give more when γ increases due to for example to increased cognitive load or time pressure, the donation goes up.

Corollary 1. *[Positive Donations] There is a threshold level $\overline{z}$ such that the agent sets $y > 0$ for all $z > \overline{z}$ if and only if $V < (1+\gamma\phi)pu'(0)$. That is, positive donations occur if and only if $\gamma\phi$ lies above a critical value. In this case, excepting the borderline situation that $u'(0) = V$, the threshold $\overline{z} = 0$ is possible only if $p > 1$.*

Proof. From the proof of Theorem 2 $H(z) \geq pu'(0)$ is necessary and sufficient for $y = 0$. Since $H(z)$ is decreasing, there is a critical value of z such that for smaller z there is no giving, and for greater z there is giving.We just need to establish when the critical value of z is actually smaller than E, which is to say when the inequality fails for $z = E$. From equation 2.1 the necessary and sufficient condition for $y = 0$ at $z = E$ is $V \geq (1+\gamma\phi)pu'(0)$ so that the reverse inequality is the condition for positive giving. $\square$

Just as Theorem 2 shows that increasing γ raises the amount of giving by those who give an intermediate amount, the corollary shows that increasing γ increases the range of other parameters for which there will be positive giving.

2.5. The Story so Far

Let us now consider how the various empirical paradoxes are explained by Theorems 1 and 2. Note that the model has three parameters α, γ,and ϕ. With a fixed period length and no variation in cognitive load, as in our experiment, only the product $\gamma\phi$ matters. We included them as separate parameters because in an experimental setting they can be varied independently: γ reflects increased cognitive load/time pressure, while ϕ reflects decreased payment delay. Similarly, the parameter α is not identified if all potential recipients are identical; we included it to show how the model predicts giving to some but not all potential recipients on the street.

- Giving in the lab and not the field: Theorem 1 says that when $\alpha = p = 1$ and $u'(0) \leq V$ there is no giving in the field. Theorem 2 shows that there will be giving in the lab provided that $v'(x+z) < u'(0)$ where $E > 0$. Recalling that $v'(x) = V$, we see that for $z > 0$ we have $v'(x + \min\{z, E\})) < V$. Hence if $u'(0)$ is not too small, in particular for $u'(0) = V$ we have no giving in the field, but giving in the lab.

- Cognitive load/time pressure: As in Fudenberg and Levine (2006) we assume that cognitive load increases the cost γ of self-control. Because impulses are typically immediate and spontaneously occurring whereas self-control often requires some time for deliberation (see, for example, Posner and Snyder (1975), Evans (2003), Kahneman (2003)), we similarly assume that applying time pressure increases γ. As in Fudenberg and Levine (2006), increasing γ increases immediate consumption. , Here we have specified the parameters such that an agent who receives a windfall needs to consume "enough" over baseline before she starts giving. From $(1+\gamma\phi)v'(x+E) = V$ we see that increasing γ must increase E, hence lower H which is to say it lowers the threshold level of the windfall z needed to induce positive giving; it also increases the level of intermediate and maximal giving.

- Avoiding the ask: In the stripped-down model analyzed here, the long-run self and shorter-run self only face a conflict when there is found money, as the mental account is sufficient to eliminate the conflict between long-run self and shorter-run self over how much to spend provided that no more money is found. In this simple model, there is no reason to "avoid the ask" by say crossing the street to avoid a "worthy" ($\alpha > 1$) panhandler or to switch radio stations to avoid hearing about a subsidized ($p > 1$) donation opportunity. However, it is easy to explain avoiding the ask if we add a reason that the two selves disagree over the allocation of a fixed amount of spending. This can either be done mechanically by replacing the common value of α with separate values $\alpha_{LR} < \alpha_{SR}$ or by supposing that some fraction of current spending on *me* has a long-run benefits (such as health from eating a proper meal) so that the long-run self values it more than the shorter-run self does. Once this conflict is introduced, the long-run self will choose to use self control in settings with $\alpha_{SR}p > 1$, and so the long-run self is willing to pay (say by walking across the street) to reduce the cost of self control.[18] The working (2010) paper version of Fudenberg and Levine (2012) made this point in a model without mental accounts, so that the conflict between the selves concerned current overall consumption; it is straightforward to adapt that argument to this setting.

- Effect of the timing of the payoff: Increasing the time period between deciding and experiencing the consequences, T_1, lowers ϕ (the discounted value that the shorter-run self places on its payoff) by moving the payoff further into the future. As in the case of cognitive load/time pressure, we see from $(1+\gamma\phi)v'(x+E) = V$ that increasing ϕ, like increasing γ, must increase E, and hence lower H. As a result, increasing T_1increases the thresholds for positive giving and for maximal giving (and thus reduces the expected level of giving).

In the next section, we provide empirical evidence in support of these predictions.

3. Empirical Evidence

Here we review evidence for aspects of altruistic behavior that are inconsistent with standard social preference models but are explained by the dual-self model.

[18] In the case of a purely myopic short run self, no control cost at all is needed to avoid the ask. With a partially myopic one, the cost of avoidance is positive but still smaller than the cost of exerting self control not to give, because it is always cheaper to avoid a future temptation than a current one.

First, consider the disconnect between giving in the lab and giving in daily life. Hundreds of experiments using the Dictator Game (DG) have found that a substantial fraction of subjects (and in many cases, a majority of subjects) endowed with some money give a substantial fraction to anonymous strangers (the modal non-zero donation amount is typically 50%). The original paper of Forsythe et al (1994) found that the average donation amount was 22.6%, and in a recent meta-analysis of 129 papers, Engel 2011 found an average donation amount of 28.3%. [19] Yet most people do not walk down the street splitting money with strangers: data on charitable giving suggests that the average American donates just 3% of their annual income to charity (Charity Review Council (2014)). Such a disconnect between lab and field is clearly inconsistent with standard models of other-regarding preferences.

Second, consider the distribution of donation amounts in the DG. Basic models of altruism that are designed to be consistent with long-run behavior outside the lab suppose that utility for money for both players inside the lab is linear (Ledyard (1995)), and hence that donations should be all or nothing. Other models such as Fehr and Schmidt (1999) and the main-text version of Charness and Rabin (2002) have a piecewise linear utility function predicting that subjects will give either all, nothing, or half of the endowment in a standard Dictator Game where each dollar of donation gives one dollar to the recipient.[20] Yet many subjects give other amounts: 51% of subjects in Forsythe et al (1994), and 42% of subjects in the Engel (2011) meta-analysis.

Third, experimental evidence suggests that increasing the cost of self-control works to increase giving in the DG. Specifically, a meta-analysis of 22 DG experiments examined the effect on giving to an anonymous recipient

[19]Note, however, that Engel (2011) includes in the meta-analysis many experimental conditions designed to increase giving, for example by reducing social distance. Thus the average donation in standard baseline DGs is likely to be lower than 28.3%.

[20]The model in Charness and Rabin (2002) Appendix A can predict other splits when donations are augmented by external funds so that each dollar donated gives more than a dollar to the recipient (that is, when $p > 1$ in our model), as can models with nonlinearities over small money amounts. However, extra assumptions are needed to reconcile behavior in the lab, where only the experimental endowments seem to matter, with field behavior that is sensitive to lifetime wealth.

of applying cognitive load, time pressure, or a recall task designed to reduced careful consideration (Rand et al. (2016)).[21] A highly significant gender interaction was observed, such that increasing the cost of self-control increased giving among women, and had no effect on giving among men. These findings regarding women's giving are clearly inconsistent with subjects having a single set of other-regarding preferences, but are easily explained by the dual-self model if we assume that women have a stronger short-run desire for altruism (relative to other desires) than men.

Fourth, many people have the tendency to "avoid the ask." In the field, this has been illustrated by Andreoni et al (2011) and Della Vigna et al (2012) who show that when people can avoid being asked by solicitors for donations to a charity, a significant share do so, while many would have been generous had they been asked. Moreover, few subjects seek out a chance to give: in Andreoni et al (2011) only 2 percent choose to do so. There is also evidence of this from the lab. Dana et al (2007) provide evidence of people avoiding the temptation to give in a binary choice DG by choosing not to learn the recipient's payoff function when it is hidden. Lazear et al (2012) find that there is a substantial proportion of "reluctant sharers" in the normal DG. These participants share if they are asked but opt out of the game if possible and thus prefer to avoid the ask.

Lastly, we consider the timing of when payouts are received. The only prior work on this issue that we have found is that of Kovarik (2009), who varies the timing of the payments in a dictator game such that both parties are paid out either 0, 2, 6, 10, 14, 18 or 22 days from the actual decision in the experiment.[22] The results show that as the delay in payments increases,

[21]This meta-analysis included all previously published studies from other groups applying these manipulations to DG giving, in addition to a number of previously unpublished studies conducted by the authors. The three different manipulations considered all work to increase the cost of exercising deliberative self-control, and no significant differences were found in effect size across manipulation type. Note that these experiments involve *manipulations*, rather than just correlations (for example, reaction time correlations, which are influenced more by decision-conflict than by extent of deliberation/self-control (Evans et al (2015),Krajbich et al (2015))).

[22]Breman (2011) studies the effect of a different sort of delay: a sample of people who

altruism decreases, both in terms of median behavior and the distribution of giving. Since we cannot view this result as well-established after a single study, we acquired additional evidence for this delay effect with new experiments. Our main experiment uses a very large sample, in an online setting where experimenters do not know the identities of the any of the subjects. We also use a subject pool from a large online labor market which is substantially more diverse than the undergraduate subjects used in Kovarik (2009) (and most other lab experiments). We examine a dictator game with a 2:1 multiplier on transfers (thus $p = 2$, whereas Kovarik (2009) used a 1:1 multiplier) and use a between-subject design comparing giving where payments to both parties are made on the same day, to those delayed by 30 days. Consistent with Kovarik (2009), we find that giving is significantly lower when payments are delayed by 30 days. In particular, we find evidence that delay shifts participants from giving nothing to giving everything (the socially efficient choice). We then replicate this between-subjects result in an even larger direct replication. In the next section, we describe our experiments in more detail.

4. Description of the Main Experiment

To gather additional evidence about the role of delay we conducted an experiment. In our experiment, participants played a DG where we varied the timing of the payments. Participants were randomized either to be dictators or recipients. Participants acting as dictators received an endowment that they could allocate between themselves and the other participant. In the "Now" condition", dictators allocated money between themselves and a recipient with both participants receiving their payments the same day. In the "Later" condition, dictators allocated money between themselves and a recip-

were already making monthly contributions to a charity were asked whether they would agree to increase the monthly amount, either effective immediately or effective at a later date. Breman finds that people donate more when the increase is effective in the future rather than immediately. The recurring payments, along with the unknown lag between the payroll deduction and the charitable spending it finances, makes the analysis of this experiment in our framework quite complicated.

ient with both participants receiving their payments in 30 days. Participants were randomized to one of the two delay conditions. Dictators were told that the person they were paired with would receive no other payment apart from the dictator's transfer and a show-up fee.

To encourage giving, any money given by the dictator to the other participant was doubled, that is $\beta = 2$. We did this to induce enough giving "Now" to be able to observe a potential decrease in giving "Later" and thus an effect of delay.

2822 US residents (1411 dictators) were recruited through Amazon Mechanical Turk (MTurk), an online labor market.[23] On this platform, employers can recruit anonymous workers for short tasks in exchange for small payments: tasks are typically less than five minutes with participants earning less than \$1. A number of studies suggest that the results using economic games obtained from experiments on MTurk with stakes in this range are similar to those obtained in the physical laboratory with higher stakes, and that the MTurk subject pool is much more diverse than typical undergraduate subject pools (see for example Horton et al (2011), Suri and Watts (2011), Amir et al (2012)). Furthermore, the level of anonymity on MTurk is greater than in the lab, as the experimenters know nothing about the participants except for their 14-character "WorkerID" which Amazon uses for processing payments. Consistent with standard wages on MTurk, our participants received a \$0.50 show-up fee and were given a \$0.30 endowment to divide in the DG (money could be given in increments of \$0.05).

Before making their DG decision, dictators answered three comprehension

[23]Prior to the MTurk experiments, we also conducted a small initial pilot experiment in Harvard Decision Sciences Laboratory in which we added delay to the setup of Andreoni and Miller (2002). The results were qualitatively as predicted by the theory, in that giving was lower with delay, but overall giving was very low even without delay: dictators kept 90% of their endowment (in contrast, the equivalent number for our MTurk experiment was 62%). Therefore, we decided to switch to MTurk, based on the desire for a much larger sample than what is typically possible in the lab, and for higher baseline giving rates than what we observed in the pilot (non-student samples typically show much higher giving rates than student samples Engel (2011)). Details about the pilot can be found in the supplemental material.

questions that they were told that they had to answer correctly to get paid. These questions asked how the participants would maximize money for themselves and for the recipient, and when the payments would be made. See Appendix A for the experimental instructions. Finally, participants also filled out a demographic questionnaire.

Based on the theoretical results presented above, we arrive at our experimental hypothesis: DG giving will be lower in the "Later" condition compared to the "Now" condition.

5. Results

As predicted, giving is lower in the "Later" condition compared to the "Now" condition. Participants give on average 11.34 cents "Now" versus 10.05 cents "Later" (38% of the endowment vs 34%). The fraction of participants who give nothing climbs from 31.1% Now to 35.3% Later. The fraction of participants who give everything falls from 20.3% Now to 16.2% Later. See Figure 2 and Table 1.

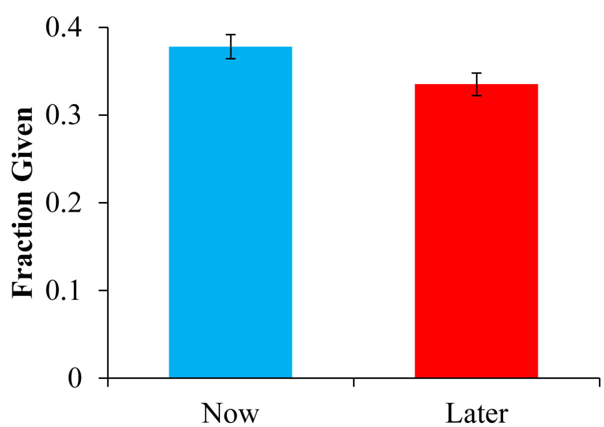

Figure 2. Mean giving Now versus Later. Error bars indicate standard errors of the mean.

Table 1: Summary statistics per condition.				
Condition	N	Mean giving (S.D)	Share giving 0	Share giving all
Now	705	11.34 (10.94)	31.06%	20.28%
Later	712	10.05 (10.45)	35.25%	16.15%

To interpret the magnitude of these effects, bear in mind that the model predicts that delay has no effect on people who are not very altruistic (if the shorter-run self is selfish, there is no conflict with the long-run self - both want to keep all the money), or on people with strong self-control (if the agent is willing to pay the cost of self-control, the long-run self overrides the shorter-run self's desire to give Now). Based on past work we conjecture it could be half or more of the total population: only about half of the participants typically show self-control problems in the laboratory,[24] and studies on dictator games without delay typically find that about half of participants give nothing (for example, Engel (2011)). If this is correct, the effect on the susceptible population is at least twice as large as the averages we report here. A within-subject design, where participants make decisions having varying levels of delay, would be the most direct way to assess this issue. We attempted two different within-subject designs (described in Section 6.1), but neither was usable.

We now give a more detailed analysis of the data.

[24]We only observe a lower bound on participants who do not have a self control problem, since participants who do not exhibit self-control problems in one setting might in another where the temptation was substantially increased. However data across a wide variety of studies seems surprisingly consistent. In their study of preference for earlier versus later money payments, Keren and Roelofsma (1995) find 43% of participants exhibiting a reversal when payoffs are certain; this is the most tempting case they considered, so only this fraction displayed a self-control problem in their experiment. Similarly Baucells and Heukamp (2012) find a 35% reversal rate in a common ratio paradox when payoffs are immediate; and Benjamin et al (2006) find in a sample of high school students that 46% exhibit a reversal in an Allais paradox when under additional cognitive load. So it seems that for the level of temptations typically seen in the laboratory, about half or more of the participants are not subject to a self-control problem.

5.1. Average Giving

Giving is significantly lower when there is delay (difference in means= 1.291, standard error = 0.568, Rank-sum $p = 0.029$). We examine the effect of delay on giving in more detail with a regression analysis that asks how the amount given depends on a binary variable "Now" that takes the value 1 if the condition is "Now" and 0 if the condition is "Later." We perform Tobit regressions, since the DG variable is truncated; for easier interpretation of the effect of the coefficient on the unconditional means we also perform OLS regressions. In both cases, we use robust standard errors. We see that participants are significantly more generous in the "Now" condition compared to the "Later" condition (Tobit: $coeff = 2.62$, $p = 0.023$; OLS: $coeff = 1.29$, $p = 0.023$). We also see that this effect of delay on giving found in the unconditional averages is robust to including control variables: When adding different relevant control variables consecutively to the regressions, we find that the "Now" coefficient increases in size while the statistical significance improves (adding controls for the comprehension questions: Tobit: $coeff = 2.78$, $p = 0.010$; OLS $coeff = 1.38$, $p = 0.010$; adding a control for previous MTurk experience (the number of previous studies participants had participated in) and demographic controls: Tobit: $coeff = 2.90$, $p = 0.007$; OLS $coeff = 1.43$, $p = 0.007$). See Appendix Table A1.

We also find that participants who were confused about which choice maximized their own payoff give significantly more (since they typically did not realize that keeping everything was best for them), and participants who were confused about which choice maximized the recipient's payoff give significantly less (since they typically did not realize that giving everything was best for the other). In fact, a substantial fraction of participants failed at least one comprehension question (27.9% overall: 27.9% Now and 27.8% Later) (see Appendix Table A2).[25] We therefore also perform a regression analysis excluding those

[25]This rate of comprehension failure is well in line with typical results using economic games on MTurk. For example, Engel and Rand (2014) find that 39.2% of U.S. MTurk participants failed comprehension questions for a one-shot Prisoner's Dilemma, and in the meta-analysis of Rand et al (2014), 26.5% of 3751 U.S. MTurk participants failed similar

participants that answered either or both control questions incorrectly. The results are qualitatively similar to what we found above (Tobit: $coeff = 3.04$, $p = 0.032$; OLS: $coeff = 1.37$, $p = 0.035$).[26] See Appendix Table A3.

Regarding the correlation between DG giving and the control variables, the most robust result is the significant negative correlation between previous MTurk experience and DG giving, suggesting that the more experienced our participants are, the less altruistic they are. There is also evidence of a significant positive correlation between DG giving and age. [27]

5.2. Extreme Giving: None, All, or Some?

We can gain additional insight into the effect of delay by considering its impact on the distribution of giving. Recall that in our DG experiment, any amount given is doubled. If acting "Now" increases altruism or efficiency concerns, we should see an increase in the fraction of participants giving the maximum amount. If acting "Now" increases inequity aversion, we should instead see a larger fraction of participants giving 10 cents "Now" compared to "Later" (creating an equal outcome between the dictator and the recipient). Consistent with the first possibility, significantly more participants choose to give away all 30 cents "Now" ($Now = 20.3\%$; $Later = 16.2\%$; Chi2 test $p = 0.044$; logit regression: $coeff = 0.278$, $p = 0.044$, including controls: $coeff = 0.365$, $p = 0.015$), whereas we see little change in the fraction of participants giving 10 cents ($Now = 26.4\%$; $Later = 25.7\%$; Chi2 test $p = 0.770$; logit regression: $coeff = 0.0353$, $p = 0.770$, including controls: $coeff = 0.0521$, $p = 0.675$).

comprehension questions for a one-shot Public Goods Game.

[26] Adding a control for previous MTurk experience and demographic controls does not qualitatively alter the results (Tobit: $coeff = 2.79$, $p = 0.045$; OLS: $coeff = 1.28$,$p = 0.048$).

[27] It is worth noting that risk preferences could play a role in explaining our (and Kovarik's) results: if there is an asymmetric non-payment risk between dictators and recipients, with some dictators believing that delayed payments to the other party will be implemented or claimed with a probability less than one (that is, making p lower than 2) while also being more risk averse on behalf of others compared to themselves, then this could explain why there is less giving "Later" compared to "Now". However, experimental results suggest that people are in fact as risk averse or less risk averse on behalf of others Chakravarty et al (2011)Andersson et al (2013) so we believe this is unlikely.

We find a correspondingly lower fraction of participants keeping everything "Now", suggesting that delay shifts participants from giving nothing to giving everything (although the results are only marginally significant when controls are not included; $Now = 31.1\%$; $Later = 35.3\%$; Chi2 test: $p = 0.094$; logit regression: $coeff = -0.189$, $p = 0.094$, including controls: $coeff = -0.245$, $p = 0.044$). See Appendix Table A4 and Figure A1.

When it comes to the correlation between extreme giving and control variables, our results suggest that women are significantly more likely to give 10 (and thus end up with an equal split with the recipient), significantly less likely to give nothing, and marginally significantly less likely to give everything, compared to men. These results are in line with previous results on gender differences in altruism, which find that women typically give more than men in zero-sum dictator games (see, for example, Croson and Gneezy (2009), Eckel and Grossman (2008), Engel (2011), Rand et al. (2016)), and that women are more inequity averse and less efficiency concerned than men (Andreoni and Vesterlund (2001)).

6. Additional Experiments

6.1. Within-Subject Experiments

Consistency effects pose a clear challenge for within-subject designs. In our first within-subject experiment, we attempted to avoid consistency effects by having 844 dictators make 5 decisions with different endowments, multipliers, and payment delays. The first and last decision had the same payoff structure as our main experiment (30 cent endowment, transfers multiplied by 2, delay of 0 or 30 days), and were our focus: some participants made a non-delayed decision first and a 30-day delayed decision last, while others made a 30-day delayed decision first and a non-delayed decision last. The intervening three decisions were largely intended as filler tasks to reduce consistency, and had delays of either 5, 10, or 20 days (in random order) and payoff structures of either a 10 cent endowment with a multiplier of 4, a 20 cent endowment with a multiplier of 3, or a 40 cent endowment with a multiplier of 1 (in random order). Given the numerous decisions, we also made various changes to the layout of the instructions, and asked one comprehension question per decision (in addition to the same two qualitative comprehension questions used in the main experiment); see Supplemental Materials for screenshots. Furthermore, we followed previous within-subject designs and paid for only one randomly selected decision (e.g. Andreoni and Miller (2002)).

In retrospect, we realized that only paying probabilistically reduces the self-control problem if costs are at all convex (Fudenberg and Levine (2012)), and thus should undermine the effect of delay (as well as reducing overall giving, assuming that the long-run self is more selfish than the short-run self). Indeed, participants were much more selfish here in the decisions with an endowment of 30 cents and a multiplier of 2 than in our main experiment where payoffs were certain (giving was 33% higher in our main experiment: 8.0 cents here vs 10.7 cents in the main experiment), and we found no significant effect of delay[28], either over all decisions (Tobit: $coeff = 7e-5$, $p = 0.78$; OLS: $coeff = 6e-5$, $p = 0.74$), just the first and last decision (Tobit: $coeff = 3e-4$, $p = 0.18$; OLS: $coeff = 2e-4$, $p = 0.14$), or just the first decision (Tobit: $coeff = 2e-4$, $p = 0.83$; OLS: $coeff = 2e-4$, $p = 0.70$); see Appendix Tables A5-A6.

In the second within-subjects experiment, we tried to address potential issues arising from only paying for one choice by having 3103 dictators[29] make only two decisions, both with identical instructions and payoffs to the main experiment having only the payment timing varied (today vs 30 days); and paying participants for both decisions.[30]Unfortunately, we found strong evi-

[28]In these regressions, delay is a continuous variable between 0 and 30 (where Now is the same as delay=0), rather than the Now vs Later dummy of the main experiment (where Now=1).

[29]Based on the results in the main experiment, we calculated that this number of dictators would give us a power of at least 90% to find a true positive effect.

[30]What varied across participants was thus the order of payment timings: some participants first played a game paying out today and then a game paying out in 30 days, while other participants first played a game paying out in 30 days and then a game paying out today. To allow the first decision to be a direct replication of our main experiment, participants were given no information at the start of the study about how many decisions they would be making, and were informed about the second game after finishing the first. See Supplemental Materials for the exact instructions. We also note that due to a programming

dence of consistency effects: there was an extremely strong within-individual correlation between decision 1 and decision 2 (Pearson's correlation $\rho = 0.81$; 79.9% of subjects gave the same amount in both decisions). This correlation is much higher than what is typically observed just due to individual differences in social preferences (for example, Peysakhovich et al (2014) where an individual's play correlates across cooperation games, and across time, at roughly 0.4). Thus, once again, this within-subject experiment was not useful for its intended purpose of identifying more versus less susceptible participants.

6.2. Direct Replication of Main Experiment

While not useful for within-subjects analyses, this second within-subject experiment *does* allow us to conduct a direct replication of our main experiment by performing a between-subjects analysis of the first decision. Because participants did not know the second decision was going to occur, their experience up through the first decision was identical to that of the participants in the main experiment. Thus, we can ask whether our first finding regarding the negative effect of delaying payments on giving are replicated in this additional (even larger-scale) experiment. Indeed, examining the first decision, we found significantly more giving Now compared to Later (12.2 cents Now vs 11.4 cents Later; difference in means= 0.830, standard error = 0.366, Rank-sum $p = 0.0334$; for regressions see Appendix Table A7), successfully replicating our original result. Furthermore, aggregating the data from the main experiment and the first decision of this experiment (total $N = 4520$) provides further stronger evidence for our effect (11.9 cents Now vs 10.9 cents Later; difference in means= 0.979, standard error = 0.309, Rank-sum $p = 0.0027$). We also find a strongly statistically significant effect of delay even when aggregating the main experiment and the first decision of both within-subjects experiments (total N=5364, 11.3 cents Now vs 10.4 cents Later; difference in means= 0.805, standard error = 0.273, Rank-sum $p = 0.0075$).

error, the data from decision 2 was lost for the first 271 participants.

7. Relation to previous results

Kovarik (2009) is to our knowledge the only previous study that examines how delay of the implementation of dictator game decisions impact giving. Kovarik has 7 treatments, varying t (the delay in payment compared to the experiment, in days) such that $t = 1, 2, 6, 10, 14, 18, 22$ days. The results show that as t increases, giving decreases. Similarly, we can think of our experiment as consisting of 2 treatments where $t = 0$ or $t = 30$. Kovarik's treatments with higher t values are thus the most relevant for us. Interestingly, Kovarik finds that the biggest effect of delay occurs for higher t values: participants in Kovarik's experiment give 11% less of the endowment when $t > 14$ days compared to when $t \leq 14$ days. In our experiment, participants give 4.3% less of the endowment in 30 days compared to today (11.4% less of the endowment among inexperienced subjects). Thus even though the two experiments differ in numerous ways (Kovarik studies a dictator game without a multiplier in a lab experiment with 24-30 students per treatment, we study a dictator game where giving is doubled by us on the internet platform MTurk with more than 700 participants per treatment), the results are fairly similar. Kovarik's somewhat larger overall effect size may be due in part to the difference in subject pools: for example his student subjects may have less self-control than the substantially older MTurk population we study, and are likely less experienced with experiments (our median subject has participated 300 academic studies). Indeed, delay induces both Kovarik and our inexperienced subjects to give 11% less of the endowment. It could also be that the effect size in our experiment is blunted by the lower level of control (and thus higher level of noise) inherent in online studies. Either way, Kovarik's results show that our effect is not an artifact of (or unique to) the online environment we use, and if anything suggests that the effect is larger than estimated by our experiment.[31]

[31] And our replication experiment shows that our online results are robust.

8. Conclusion

This paper shows how extending the dual-self model to include altruistic preferences explains why people appear to have preferences for equality in the laboratory, while not giving anywhere close to half of their income to obviously poorer individuals in the field.[32] The model also explains why people often "avoid the ask" from solicitors or charities when they would have donated if avoiding was impossible (as in Andreoni et al (2011) and Della Vigna et al (2012)), and why cognitive load and time pressure may increase giving. Moreover, while most social preferences models can explain that subjects give either half or nothing in the lab, the dual-self model can also explain the often observed intermediate donations in DG experiments in the lab. In addition, the paper uses the dual-self model to make the novel prediction that delay reduces payments in the dictator game. Kovarik (2009) provided initial empirical evidence for this result in a lab experiment on students, and we have here shown that this result is robust in a large-scale online experiment: people give less when making decisions for the future compared to when there is no delay and payoffs are paid out the same day.

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[32]We do not explain, for example, why some people give money to panhandlers, while others subside students' college tuition, and we do not explain why someone who found money at a bus stop where only one other person is waiting might be more tempted to share it than if the bus stop were crowded.

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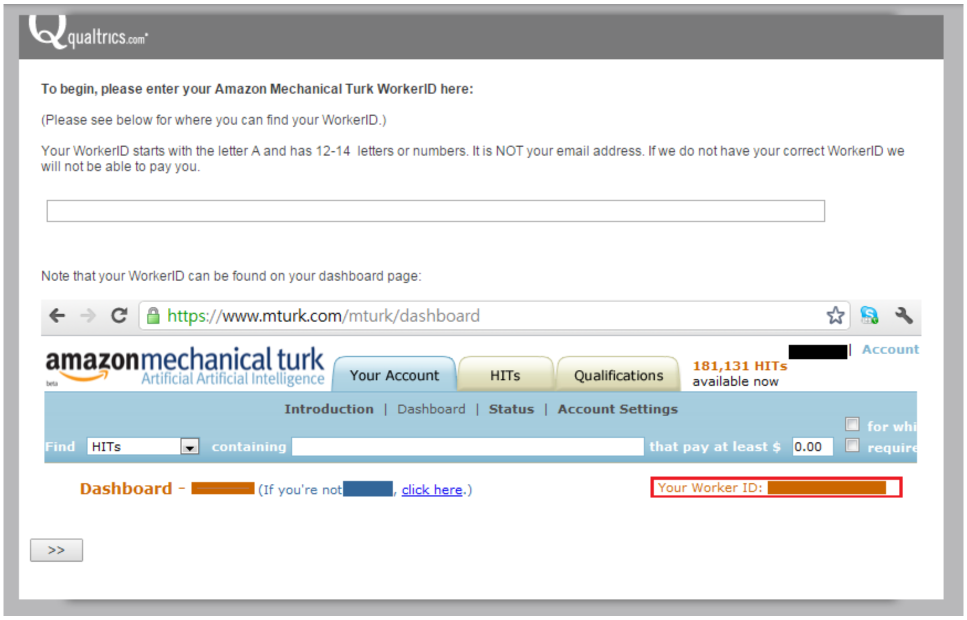
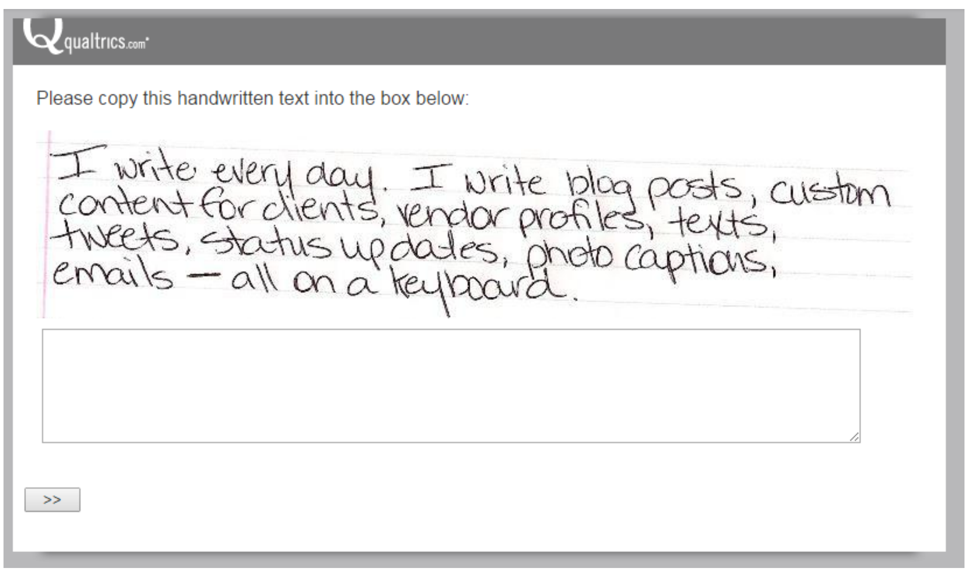
Appendix A: Screen shots





[This transcription screen is a common technique used on MTurk to discourage workers who are planning to just click through as fast as possible from participating.]

Note that HIT ("Human Intelligence Task") is the standard name of jobs on MTurk.

qualtrics.com

In this HIT, you are given 30 cents (in addition to the 50 cents you received already for participating).

You then decide how much of your 30 cents to keep for yourself, and how much (if any) to give to a random other MTurk worker (your "recipient").

Any money you give to your recipient will be doubled. Thus, for every 1 cent you give, the recipient will receive 2 cents.

After you have made your decision, we will randomly pair you with another MTurk worker. This person will be your recipient and we will carry out your decision: your bonus and the other person's bonus will be determined based on the split you chose. Your recipient receives no bonus other than from what you give.

Once you have chosen how much to give, the interaction is over. You will then complete a short questionnaire and then the HIT will be done.

Your choice will be implemented today, and you and the other people will receive your resulting bonuses by the end of the day.

The other people are real and will really receive a bonus based on what you give – there is no deception in this study.

You MUST answer these questions correctly to receive your bonus!

How many cents would you give to the other person in order to maximize your own earnings?

0	5	10	15	20	25	30
○	○	○	○	○	○	○

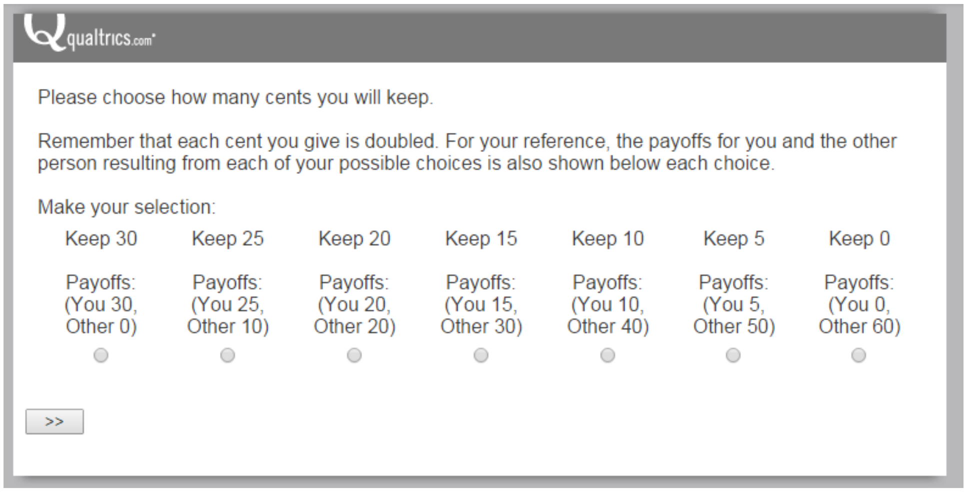
How many cents would you give to the other person in order to maximize the other person's earnings?

0	5	10	15	20	25	30
○	○	○	○	○	○	○

When will the bonuses get paid?

Today	In 5 days	In 10 days	In 20 days	In 30 days
○	○	○	○	○

>>



qualtrics.com

Please choose how many cents you will keep.

Remember that each cent you give is doubled. For your reference, the payoffs for you and the other person resulting from each of your possible choices is also shown below each choice.

Make your selection:

Keep 30	Keep 25	Keep 20	Keep 15	Keep 10	Keep 5	Keep 0
Payoffs: (You 30, Other 0)	Payoffs: (You 25, Other 10)	Payoffs: (You 20, Other 20)	Payoffs: (You 15, Other 30)	Payoffs: (You 10, Other 40)	Payoffs: (You 5, Other 50)	Payoffs: (You 0, Other 60)

>>

Appendix B: Regression Tables and Additional Figures

Table A1: Giving Now versus Later, all participants.

	Tobit			OLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Now	2.619**	2.782**	2.895***	1.291**	1.377**	1.430***
	(1.153)	(1.079)	(1.064)	(0.569)	(0.534)	(0.531)
Failed own payoff q		19.58***	17.23***		9.715***	8.411***
		(1.618)	(1.669)		(0.728)	(0.780)
Failed other's payoff q		-16.02***	-16.61***		-8.203***	-8.428***
		(1.648)	(1.694)		(0.697)	(0.728)
Failed timing question		0.826	-0.866		0.559	-0.477
		(4.766)	(4.546)		(2.474)	(2.381)
MTurk experience			-3.541***			-1.968***
			(0.665)			(0.333)
Age			0.111**			0.0488*
			(0.0493)			(0.0255)
Female			0.429			-0.208
			(1.091)			(0.549)
Education controls?	No	No	Yes	No	No	Yes
Income controls?	No	No	Yes	No	No	Yes
Constant	6.777***	4.222***	16.79***	10.05***	8.771***	15.04***
	(0.801)	(0.834)	(4.736)	(0.392)	(0.403)	(2.702)
Observations	1,417	1,417	1,406	1,417	1,417	1,406
R-squared	0.001	0.024	0.031	0.004	0.123	0.157

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

Table A2: Fraction failing comprehension questions (p-values from Chi2 test)				
	Failed own payoff	Failed other's payoff	Failed timing	Failed at least one
Now	0.245	0.146	0.014	0.279
Later	0.247	0.138	0.011	0.278
Overall	0.246	0.142	0.013	0.279
p-value Now vs Later	0.9373	0.6483	0.6204	0.9551

Table A3: Giving Now versus Later, perfect comprehenders only.				
	Tobit		OLS	
	(1)	(2)	(3)	(4)
Now	3.039**	2.791**	1.373**	1.282**
	(1.417)	(1.391)	(0.652)	(0.648)
MTurk experience		-4.469***		-2.259***
		(0.877)		(0.404)
Age		0.191***		0.0801**
		(0.0710)		(0.0339)
Female		0.802		-0.134
		(1.399)		(0.659)
Education controls?	No	Yes	No	Yes
Income controls?	No	Yes	No	Yes
Constant	3.688***	17.79***	8.716***	15.70***
	(1.000)	(5.847)	(0.445)	(3.083)
Observations	1,022	1,016	1,022	1,016
R-squared	0.001	0.011	0.004	0.053

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

Table A4: Giving zero, everything or 10, Now versus Later, Logit regressions, all participants.

	Giving zero		Giving everything		Giving 10	
	(1)	(2)	(3)	(4)	(5)	(6)
Now	-0.189*	-0.245**	0.278**	0.365**	0.0353	0.0521
	(0.113)	(0.122)	(0.138)	(0.151)	(0.121)	(0.124)
Failed own payoff q		-2.112***		1.358***		0.0739
		(0.267)		(0.188)		(0.170)
Failed other's payoff q		1.062***		-3.068***		0.199
		(0.252)		(0.411)		(0.195)
Failed timing question		0.179		-0.0235		-0.168
		(0.742)		(0.604)		(0.584)
MTurk experience		0.258***		-0.373***		0.132*
		(0.0771)		(0.0926)		(0.0763)
Age		-0.0202***		0.00253		0.0148**
		(0.00674)		(0.00758)		(0.00591)
Female		-0.360***		-0.292*		0.454***
		(0.130)		(0.164)		(0.129)
Education controls?	No	Yes	No	Yes	No	Yes
Income controls?	No	Yes	No	Yes	No	Yes
Constant	-0.608***	-1.855*	-1.647***	-0.242	-1.062***	-1.811**
	(0.0785)	(1.111)	(0.102)	(0.831)	(0.0858)	(0.714)
Observations	1,417	1,404	1,417	1,406	1,417	1,406
Pseudo R-squared	0.003	0.107	0.003	0.123	0.000	0.023

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

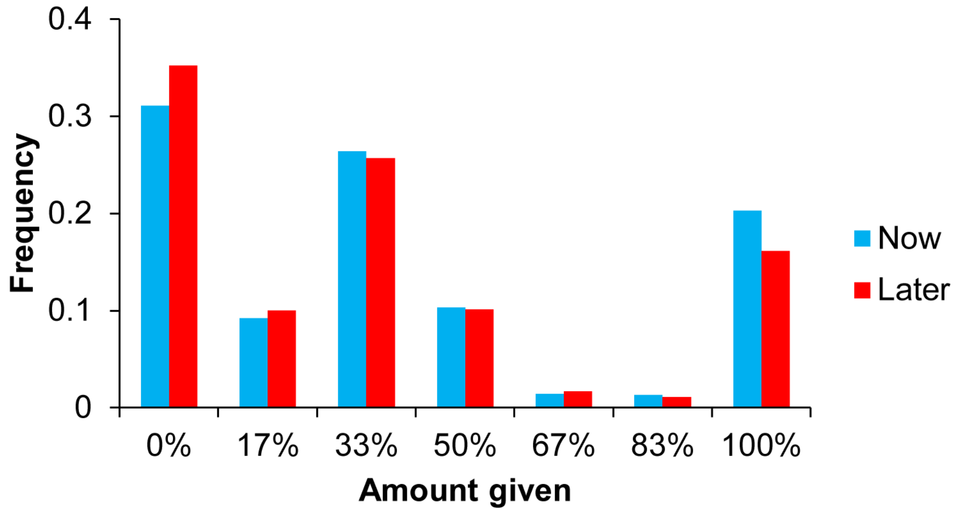


Figure A1. Distribution of giving Now and Later.

Table A5: Giving Now vs Later (continuous variable), 1st within-subject experiment.						
	All decisions		Decisions 1 and 5		Decision 1	
	Tobit	OLS	Tobit	OLS	Tobit	OLS
Delay (days)	7.24e-05	6.02e-05	0.000325	0.000257	0.000168	0.000203
	(0.000257)	(0.000181)	(0.000244)	(0.000175)	(0.000762)	(0.000530)
Constant	0.220***	0.272***	0.214***	0.262***	0.218***	0.264***
	(0.0112)	(0.00763)	(0.0114)	(0.00795)	(0.0161)	(0.0112)
Observations	4,199	4,199	1,680	1,680	844	844
R-squared		0.000		0.000		0.000

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

Table A6: Giving Now vs Later (continuous variable) including controls, 1st within-subject experiment.

	All decisions		Decisions 1 and 5		Decision 1	
	Tobit	OLS	Tobit	OLS	Tobit	OLS
Delay (days)	0.000132	0.000106	0.000348	0.000270	0.000202	0.000230
	(0.000257)	(0.000183)	(0.000245)	(0.000178)	(0.000754)	(0.000529)
Order	0.0104	0.00893	-0.00460	-0.00138		
	(0.0207)	(0.0139)	(0.0211)	(0.0147)		
Failed comp q	0.0544**	0.0321**	0.0480**	0.0295*	0.0312	0.0168
	(0.0226)	(0.0152)	(0.0230)	(0.0160)	(0.0243)	(0.0171)
MTurk exp	-0.0684***	-0.0459***	-0.0693***	-0.0491***	-0.0624***	-0.0439***
	(0.0128)	(0.00832)	(0.0132)	(0.00885)	(0.0142)	(0.00955)
Age	0.00351	0.00241***	0.00326	0.00236***	0.00262	0.00190**
	(0)	(0.000699)	(0)	(0.000751)	(0)	(0.000794)
Female	-0.00799	-0.0118	-0.000949	-0.00827	0.00719	-0.00250
	(0.0217)	(0.0146)	(0.0220)	(0.0154)	(0.0234)	(0.0165)
Educ controls?	Yes	Yes	Yes	Yes	Yes	Yes
Income controls?	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.281***	0.326***	0.311***	0.356***	0.320***	0.366***
	(0.103)	(0.0648)	(0.102)	(0.0683)	(0.108)	(0.0768)
Observations	4,120	4,120	1,648	1,648	824	824
R-squared		0.049		0.0.058		0.042

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

Table A7: Giving Now versus Later, Replication (Decision 1 of 2nd within-subject experiment).

	Tobit			OLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Now	1.311**	1.168**	1.269**	0.830**	0.711**	0.769**
	(0.625)	(0.568)	(0.569)	(0.366)	(0.335)	(0.336)
Failed own payoff q		16.74***	14.99***		9.689***	8.673***
		(0.838)	(0.900)		(0.436)	(0.489)
Failed other's payoff q		-14.93***	-14.74***		-8.931***	-8.827***
		(0.824)	(0.834)		(0.414)	(0.424)
Failed timing q		-2.254*	-2.029		-1.094	-1.020
		(1.211)	(1.406)		(0.774)	(0.918)
MTurk exp			-2.599***			-1.597***
			(0.571)			(0.353)
Age			0.0613**			0.0315**
			(0.0242)			(0.0145)
Female			-0.547			-0.631*
			(0.597)			(0.351)
Educ controls?	No	No	Yes	No	No	Yes
Income controls?	No	No	Yes	No	No	Yes
Constant	10.23***	7.471***	12.18**	11.35***	9.769***	13.97***
	(0.433)	(0.476)	(4.828)	(0.256)	(0.280)	(2.827)
Observations	3,103	3,103	3,020	3,103	3,103	3,020
R-squared				0.002	0.168	0.196

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