Altruism and Self-Control☆

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Abstract

We extend the dual-self model to include altruistic preferences. This lets us explain (1) why people appear to have preferences for equality in the laboratory, while not giving much to obviously poorer individuals in the field, (2) why they often "avoid the ask" from solicitors or charities when they would have donated if avoiding was impossible, (3) why cognitive load and (4) time pressure may increase giving, and (5) why intermediate (rather than just zero or even-split) donations may occur in dictator game experiments. In addition, we (6) point out that the dual-self model predicts that delaying payments to both parties in the dictator game decreases giving. We verify this prediction in a large-scale online experiment: people give less when making decisions for the future compared to when payoffs occur on the day of the experiment.

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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.

Standard explanations of altruistic behavior[5] fail to explain important aspects of altruism. The goal of this paper is to show how the dual-self model of costly impulse control (Fudenberg and Levine (2006), Fudenberg and Levine (2011), Fudenberg and Levine (2012)) can provide a unified explanation for various facts which are inconsistent with standard models of social preferences. We focus on the following problems with standard theories. A first and very significant observation is that altruistic behavior in the laboratory seems unconnected to much of behavior outside of the lab:[6] People who seem to have Leontief preferences for equality in the laboratory do not give away half their income to charity outside the laboratory. Moreover, while many people make contributions in laboratory experiments such as the dictator game, most of these same people do not give substantial amounts to the first person they meet in the street before arriving in the lab, even if that person is seemingly poorer and asking for donations. Second, social preference models often predict giving nothing, everything, or 50% of the endowment, yet many givers choose to donate other intermediate fractions (Forsythe et al (1994), Engel (2011)). Third, many people who will give if they have the opportunity nonetheless "avoid the ask" - they choose to avoid the possibility of giving, for example, by crossing the street to avoid a volunteer asking for donations (for example, Andreoni, Rao and Trachtman (2011), Della Vigna, List, and Malmendier (2012)). Fourth, studies suggest that cognitive load can increase altruistic behavior.[7] Fifth, reducing the amount of time subjects have in which to decide can also increase prosociality[8] Sixth, 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 is less well established than the other facts we provide additional evidence for it with two large-scale experiments; we also show why it is predicted by the dual-self model.

Each of these observations about altruistic giving is inconsistent with the idea that people have a single set of altruistic or inequity averse social preferences that they apply across different

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

[6] There is however evidence suggesting that altruism in the lab correlates with altruism in the field: see for example Benz and Meier (2008) and Peysakhovich et al (2014)

[7] Roch et al (2000), Cornelissen, Dewitte and Warlop (2011), Schulz et al (2014) find evidence of this effect, while Hauge et al (2009) finds that cognitive load is neutral.

[8] Rand et al (2012), Rand et al (2014), Rand and Kraft-Todd (2014), Cone and Rand (2014) and Rand et al. (2014) find evidence of this effect, while Tinghög et al (2013) and Verkoeijen and Bouwmeester (2014) find that time pressure is neutral. Note that here we are considering decision time *manipulations*, rather than correlations between decision time and giving (such correlations are confounded by various factors not associated with self-control, such as level of conflictedness Evans et al (2014)).

environments and time horizons. These findings are, however, consistent with a conflicted self characterized by two different competing sets of desires. In particular, if we suppose that there is a temptation to be generous, that is, that there is an impulsive self who is more keen to be altruistic than a longer-run self, we can reconcile these inconsistencies. Suppose 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. This 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 decision making and reversals due to probabilistic rewards (Fudenberg and Levine (2006), Fudenberg and Levine (2011), Fudenberg and Levine (2012)).

In this paper we show that the dual-self model also explains important elements of altruistic behavior. As in earlier applications of the dual-self model, we use the concept of mental accounts that are set in a "cool state" in which planned daily spending is not subject to much temptation.[9] 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. As we will see, this same logic implies that a subject will be willing to give away some money in an experiment even though she would not do so on the street: the giving comes from the windfall payment of the experiment, so withholding donations is "taxed" by the cost of self control. A similar logic explains why the dual-self model predicts that some agents will choose to give away an intermediate fraction of their endowment in dictator game experiments, instead of behavior implied by models that are derived from long-run considerations and hence have nearly linear utility functions for giving. It also explains the avoidance by the longer-run self of exposing the shorter-run self to temptations to give - that is, "avoiding the ask".

Furthermore, it is clear that if the shorter-run self is more altruistic than the long-run self, cognitive load should increase giving, as it uses up the mental resources needed for self control, thus increasing its cost and freeing the shorter-run self to behave altruistically.[10] Similarly, because making impulsive decisions is typically easy and fast, but exerting self-control requires time as well as effort (Posner and Snyder (1975), Evans (2003), Kahneman (2003)), applying time pressure also reduces available mental resources, and so should increase altruistic behavior. Finally, we use the dual-self formulation in Fudenberg and Levine (2012), in which the infinite-lived long-run self

[9]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.

[10]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 level of sympathy evoked.

uses discount factor δ and the impulsive shorter-run self is also infinitely lived but uses a lower discount factor $\phi\delta$, to generate the first theoretical predictions of the effect of delayed payment on giving and thus altruistic behavior.[11] Specifically, the dual-self model predicts that there will be less giving when the payment of rewards- to both the donor and recipient- are delayed by a given amount; this is because when the consequences of a decision are delayed, the long-run self cares relatively more about them, so optimally chooses to exert more self control

The first part of the paper describes in more detail experimental evidence that is inconsistent with standard social preference models but is explained by the dual-self model. The second part develops the relevant theory. The third part describes large-scale experiments that we performed to confirm a prediction of theory which has received little prior attention,[12] namely that delaying payments to both parties in a dictator game should decrease giving. We had 1417 non-student subjects make dictator decisions in a maximally anonymous online setting, 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 subject 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 33% of the endowment donated in 30 days).[13] This difference was driven by the fraction of subjects giving nothing increasing from 31% to 35% with delay, while the fraction giving away the full endowment decreased from 20% to 16%. Moreover, as predicted by the theory, the effect of delay was substantially larger in a subset of subjects that is typically both less selfish at baseline and worse at self-control: online subjects without prior experience playing economic games. Among these inexperienced subjects, donations were 27% higher when paid today relative to with a delay (54% of the endowment donated now versus 42% of the endowment donated in 30 days), the fraction giving nothing at all increased from 20% to 29% with delay, and the fraction that gave away the full endowment decreased from 34% to 22% with delay.

2. Empirical Evidence

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

First, we 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

[11] Unlike Fudenberg and Levine (2012), the starkest version of the dual-self model has a fixed horizon for the shorter-run self, and so, like quasi-hyperbolic discounting, (Strotz (1955), Phelps and Pollak (1968), Laibson (1997), O'Donoghue and Rabin (1999)), it cannot explain the overwhelming evidence that the length of delay has a continuous impact on decisions.

[12] To our knowledge, Kovarik (2009) is the only previous paper providing experimental evidence on this issue.

[13] We also replicate this finding in a second experiment with 3103 additional dictators.

(and in many cases, a majority of subjects) endowed with some money give a non-zero fraction to anonymous strangers. The original paper of Forsythe et al (1994) found that 70% of subjects donated a non-zero amount, and in a recent meta-analysis of 129 papers, Engel 2011 found that 64% of subjects chose to donate some amount in the DG. [14] Yet personal experience clearly demonstrates that most people do not walk down the street splitting money with strangers.

Second, we examine the distribution of donation amounts in the Dictator Game. Basic models of altruism that are designed to be consistent with long-run behavior outside the laboratory suppose that utility for money for both players inside the laboratory 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.[15] 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, many people have the tendency to "avoid the ask." In the field, this has been illustrated by Andreoni, Rao and Trachtman (2011) and Della Vigna, List, and Malmendier (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, Rao and Trachtman (2011) only 2 percent choose to do so.Also, Dana, Weber and Kuang (2007) provide laboratory 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.

Fourth, evidence suggests that people may be more likely to give to others when they face a higher cognitive load. Having subjects complete a cognitively demanding task while making their decision was found to increase fair decisions in a zero-sum resource consumption game by Roch et al (2000), and in a series of 20 binary-choice dictator decisions by Schulz et al (2014). Cornelissen, Dewitte and Warlop (2011) found a similar result in a one-shot dictator game, but only for subjects who were prosocial in other contexts; only Hauge et al (2009) found no significant effect of load on dictator giving. Kessler and Meier (2014) found that when mental resources were depleted, subjects donated more to a charity.[16] Finally, Ruff et al (2013) found that electrically impairing the

[14]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 overall fraction of givers in standard baseline Dictator Games is likely to be lower than 64%.

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

[16]Surprisingly, Kessler and Meier (2014) found that performing cognitively demanding tasks decreased performance on subsequent math tests in two experiments (indicating reduced mental resources, as expected), but increased performance in the two others. They also found that this load significantly increased charitably giving in the experiments where load impaired mental resources, and significantly decreased giving in the experiments were load enhanced mental resources. Thus, while the results of Kessler and Meier (2014) raise questions about cognitive load as an effective

function of the right lateral prefrontal cortex, a brain region associated with inhibition, increased giving in a dictator game, whereas enhancing activity in this region decreased giving. Overall, these cognitive load studies find either a positive effect or no effect of depleting mental resources on altruism, but never a significant negative effect. These findings are clearly inconsistent with subjects having a single set of other-regarding preferences.

Fifth, evidence also suggests that people may be more likely to cooperate in one-shot social dilemma games when they have less time available for decision-making. Rand et al (2012) found in two studies that time pressure increased contributions in a Public Goods Game relative to asking subjects to stop and think prior to deciding, and Rand et al. (2014),Cone and Rand (2014) found that this effect extended to games framed as competitions or played with out-group members. A similar overall effect was found by Rand et al (2014) in a meta-analysis of 15 time pressure studies, although there was substantial study-level variation: some studies found positive effects of time pressure and some found null effects, but no studies found a significant negative effect. Consistent with the pattern in this meta-analysis, Rand and Kraft-Todd (2014) found a positive effect of time pressure in a subset of subjects playing a Public Goods Game, and Tinghög et al (2013) and Verkoeijen and Bouwmeester (2014) found no effect. Thus time pressure in social dilemma games follows a similar pattern to cognitive load in dictator games.

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.[17] The results show that as the delay in payments increases, 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 a new experiment. Our experiment uses a very large sample, and conditions of maximum anonymity, by performing the experiment online such that the 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 (whereas Kovarik (2009) used a 1:1 multiplier) and compare 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 subjects from giving nothing to giving everything (the socially efficient choice).

means for reducing available mental resources, they provide consistent evidence that having greater mental resources available reduces altruistic giving.

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

See below for more details regarding our experiment.

3. The Model

3.1. 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.[18]Moreover, we restrict attention to settings where there is a single possible recipient of altruistic gifts, and do not say how this recipient is identified when there are several conceivable candidates; for example, we do not explain why some people give money to poor people in poor countries, while others give to disaster victims in wealthy ones, 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. Instead, we focus on how altruism is influenced by delay, price or "proportionality" multipliers, and unexpected windfalls.

The model has four periods $t = 0, 1, 2, 3$. These periods differ in length, with T_t the length of period t.

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.

1. In period 1, the "decision period," an amount of wealth w_1 is available, and in addition found money z is unexpectedly discovered[19] The individual then allocates an amount $m \geq 0$ to "*me*" and an amount y 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. Depending on whether the decision takes place on the "street" or in the "lab" it may be possible to transfer additional funds as well as the found money. That is, in the laboratory, participants are constrained only to make donations from the found money z allocated by the experimenter, but no such constraint exists outside the lab.

The money allocated to *you* may be augmented on a proportional basis, for example by the experimenter or by a charity that advertises matching funds: allocating y actually gives the amount py to you where p is the constant of proportionality, so 100% matching funds corresponds to $p = 2$.

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

[18]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 and Nowak (2013), Rand et al (2014) for an exposition of this view.

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

expect it to be small for richer recipients, large for poor recipients, and perhaps depend on other measures of "worthiness" as well.[20]

[21]

Period 1 is short; it represents the lag between the decision and its immediate effect on consumption; it may be be relatively immediate for example 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.

An amount $w_2 = w_1 + z - m - y$ is left over for future consumption. To model the fact that the two selves have conflicting views on this, we set period T_2 to be of medium length, on the order of months. We assume that u, v are strictly increasing, twice differentiable, concave and have finite derivative at the origin.

3. In period 3 the left over wealth w_2 is consumed. Because the total length of time from period 0 to period 3 is of medium length - on the order of months - and 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. As in Fudenberg Levine and Manidiadis (2014), period 3 stands in for the entire future, so wealth w_2 will be consumed over a very long period of time and is large relative to $m + y$. We can therefore e approximate the value function in period 3 by a linear function, and specify that period 2 wealth 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. We assume that $e^{-\rho T_0}, e^{-\rho T_3}$ are negligible, and set $\phi = e^{-\rho T_1}$ to be the discount factor of the shorter-run self between the time the allocation decision over m, y is taken and the utility $v(m) + \alpha u(py)$ is realized. Hence the shorter-run self's utility starting in period 1 is

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

The long-run self cares about the utility of the shorter-run self, and also about future utility Vw_2. Given a self-control cost c of the decision made at time 1 the utility of the long-run self is

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

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,

[20] 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.

[21] 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.

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, we may write the cost of forcing the shorter-run self in period 1 to choose m, y as

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

Consider first the unconstrained problem of the long-run self, and suppose that the long-run self anticipates that $p = 1 = \alpha$ and $z = 0$ (i.e. she thinks it is unlikely to come across "matching funds," especially worthy recipients, or found money) but that the decision will take place in the "street" where all money available to the short run self is available for donation. Because v, u are concave, the long-run self's objective function is concave as well, and we can use the first order conditions to characterize the optimum. The unconstrained problem is to maximize $v(m) + \alpha u(py) + V(w_1 + z - m - y)$, so the solution has $v'(m) \leq V$ with equality if $m > 0$ and $\alpha p u'(py) \leq V$ 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 $m = v^{-1}(V) > 0$ and $y = 0$.

Thus in the initial "cool" period 0, the long-run self chooses the spending limit x so that $v'(x) = V$. Therefore 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. As this shows, the long-run self can use the spending limits to implement its desired consumption plan without incurring self control costs in a deterministic environment (that is, where there is perfect confidence that $\alpha = p = 1$). Thus when the agent walks down the street, so long as there are no unexpectedly good donation opportunities, she will not be tempted to give.

3.2. 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 $\beta > 1$ and/or to a worthy recipient with $\alpha > 1$. We can show that if $\alpha\beta$ is not too much bigger than 1, the agent continues to give zero, but if $\alpha\beta$ is sufficiently great 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. (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.) Recall that $V/u'(0) \geq 1$.

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

Proof. In the absence of a self-control problem the long-run self's objective function in period 1 is

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

so when $\alpha p \leq V/u'(0)$ at the corner value $y = 0$ the long-run self prefers not to spend more on *you*, that is to spend all of x on *me*, $m = x$. The short-run self's objective is to maximize $v(m)+\alpha u(py)$ subject to $m + y \leq x$, and substituting y=0 the first order condition is $v'(m) - \alpha pu'(x - m) \leq 0$ with equality if $m < x$. Recall also that $v'(x) = V$ from the first stage problem. Using$\alpha p \leq V/u'(0)$ we see that $v'(x) - \alpha pu(0) \leq V - V = 0$ so that indeed the long-run self can obtain its most desired outcome without using self control.

On the other hand, since $u'(x) \leq u'(0)$ if $\alpha p > V/u'(0)$ then $\alpha pu'(0) > \max\{V, u'(x))\}$ and in the absence of a self control problem optimal y is positive. Here too, though, the interests of the long-run self and short-run self are aligned and no self control is needed. □

3.3. Giving in the Lab

We now consider what happens when "unexpectedly" the agent encounters found money z in the lab [22] in period 1 and is given the opportunity to give some of it (but no other funds) to an anonymous recipient with multiplier $\beta \geq 1$. Here we assume that the recipient is "typical" meaning that $\alpha = 1$.

Let E be the unique (and positive) solution of $(1 + \gamma\phi)v'(x + E) = V$.[23] 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* $u'(0) \leq V < v'(0)$.

1) The agent sets $y = 0$ *if and only if* $H(z) \geq pu'(0)$.

2) There is a threshold level $\overline{z}$ *such that the agent sets* $y > 0$ *for all* $z > \overline{z}$ *if and only if* $V < (1 + \gamma\phi)pu'(0)$. *This is true if and only if* $\gamma\phi$ *lies above a critical value. Then if* $u'(0) < V$, *the threshold* $\overline{z} = 0$ *is possible only if* $p > 1$.

3) If and only if $v'(x) \leq pu'(pz)$ *and* $H(z) < pu'(0)$ *the agent gives an intermediate amount, and both* m *and* y *are strictly increasing in* $\min\{z, E\}$.

4) The agents sets $y = z$ *if and only if* $pu'(pz) \geq V$.

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

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

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

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

where we omit the argument of F^*since it has has no effect on the long-run self's optimal choice.

The constraints are $m+y \leq x+z$, $m \geq x, y \geq 0$.

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 $v'(x+e) \geq \beta u'(0)$ or $0<y<z$ and $v'(x+e)=pu'(py)$ or $y=z$ and $V=v'(x) \leq \beta pu'(pz)$.

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

Next, as we have established that $H(z) \geq pu'(0)$ is necessary and sufficient for $y=0$, and $H(z)$ 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. When then critical value is at $z=E$. We t $H(z)=H(E)=V/(1+\gamma\phi)$. Plugging in we see that the 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. This proves (2).

Finally, as shown above, the first-order condition for y implies it is optimal to spend all of z on y when $V=v'(x) \leq \beta u'(\beta z)$, which proves (4).

From (1) and (4) an intermediate amount is given if and only if $v'(x) \leq pu'(pz)$ and $H(+z) < \beta pu'(0)$. 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 (3). □

A key implication of this result is that as E increases due to higher γ - due to increased cognitive load or time pressure - conditional on donating a positive amount less than the maximum the donation goes up, and the threshold at which the maximum is donated goes down.

3.4. 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 (e.g. Posner and Snyder (1975), Evans (2003), Kahneman (2003)), we similarly assume that applying time pressure increases γ. 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 for positive giving and increases the level of intermediate 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 would be easy to explain avoiding the ask if we added a reason that the two selves would 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) 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.[24] 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. That is, as in the case of cognitive

[24] 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.

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. This lowers the threshold for positive giving and increases the level of intermediate giving, and in turn makes it less costly for the long-run self to exert self control. As a result, increasing T_1increases the threshold for positive giving (and thus reduces the expected level of giving).

In the next section, we provide experimental evidence in support of this final prediction, extending the results of Kovarik (2009)'s experiment by gathering additional data on the effect of delaying the payment of payoffs. We also test an additional prediction of the theory, namely that the effect of delay should be larger among subjects whose short-run self is more altruistic (i.e. whose $u(py)$ is more strongly increasing in py) and who have greater problems with self-control (i.e. have larger γ). We cannot directly identify such subjects, so we use a proxy as explained below.

4. Description of the Experiment

To gather additional evidence about the role of delay we conducted an experiment. In our experiment, participants played a dictator game (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 recipient 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. 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 subjects 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 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 1 and Table 1.

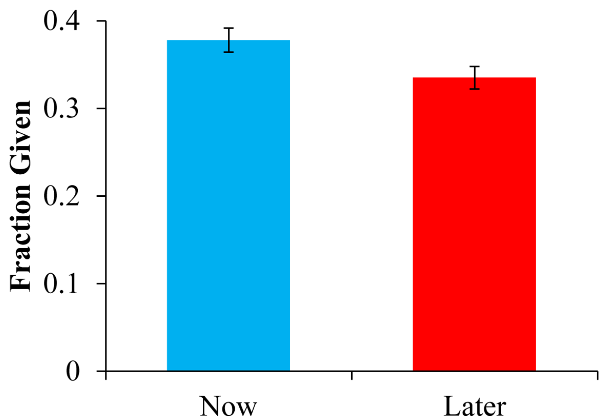

Figure 1. Mean giving Now versus Later. Error bars indicate standard errors of the mean.

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 delay has no effect on people who are not very altruistic (and so always give 0) as well as those who do not display evidence of a self-control problem in our experiment. Based on past work we conjecture it could be half or more of the total population: only about half of the subjects typically show self-control problems in the laboratory,[25] and studies on dictator games without delay typically find that about half of subjects give nothing (e.g. 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 subjects 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 5.4), but neither was usable. Thus we instead provide evidence for a substantially larger effect size among susceptible subjects in Section 5.3 by examining a sub-set of our population that have a trait previously linked to both less selfishness and worse self-control: subjects without prior experience playing economic games.

We now give a more detailed analysis of the data.

5.1. Average Giving

Giving is significantly lower when there is delay (Mann-Whitney 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; linear: 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

[25] We only observe a lower bound on subjects who do not have a self control problem, since subjects 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 subjects 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, Brown and Shapiro (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 subjects are not subject to a self-control problem.

(27.9% overall: 27.9% Now and 27.8% Later) (see Appendix Table A2).[26] We therefore also perform a regression analysis excluding those 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).[27] 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. [28]

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). 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

[26] 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 comprehension questions for a one-shot Public Goods Game.

[27] 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).

[28] 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, Harrison, Haruvy, Rutström (2011)Andersson, Holm, Tyran, Wengström (2013) so we believe this is unlikely.

games (see, for example, Croson and Gneezy (2009), Eckel and Grossman (2008), Engel (2011)), and that women are more inequity averse and less efficiency concerned than men (Andreoni and Vesterlund (2001)).

5.3. Effect size among inexperienced subjects

Prior research on MTurk has demonstrated that the subject pool varies widely in prior experience with experiments, with some subjects being extremely experienced and others largely inexperienced (Rand et al (2014); Chandler et al (2014)). This is useful for us because it has been shown that subjects having no prior experience with economic games are both less selfish than more experienced subjects (Capraro et al. (2014)), and also more inclined to rely on their intuitions (Rand et al (2012, 2014); Rand and Kraft-Todd (2014)) a characteristic which has been linked with lack of self-control Frederick (2005).[29] Our data provide further evidence for both of these features. We too find that inexperienced subjects[30] are much less selfish overall (giving 49% of the endowment compared to more experienced subjects' 33%; Mann-Whitney, $p<0.001$. This is robust to controlling for comprehension questions and demographics (see Appendix Table A5). We also replicate the finding from Rand and Kraft-Todd (2014) that inexperienced subjects self-report having more faith in their intuitions than experienced subjects (using the 1-item version of the "faith in intuition" scale used by Rand and Kraft-Todd (2014), 3.88 vs 3.77 (on a 1-5 scale), Rank-sum $p=0.048$; 25% of inexperienced subjects indicated the maximum level of faith in intuition, compared to only 16% of experienced subjects).

Due to both less selfishness and greater problems with self-control, our theory therefore predicts that inexperienced subjects will be more susceptible to the experimental manipulation than the overall population.[31] Indeed, the effect of delaying payments is roughly twice as large among inexperienced subjects as in the overall sample (Figure 2 and Table 2). Inexperienced participants give on average 16.08 cents "Now" versus 12.66 cents "Later" (54% of the endowment vs 42%). The fraction of inexperienced participants who give nothing climbs from 20.2% Now to 29.0% Later. The fraction of participants who give everything falls from 34.1% Now to 22.4% Later. See Appendix Tables A6 and A7 and Figure A2 for more detailed analysis. Including controls, there are significantly more participants giving everything Now compared to Later ($p=0.022$) whereas

[29] Our theory may also help to explain why time pressure has been found to have a much greater positive effect on cooperation among inexperienced subjects Rand et al (2014); Rand and Kraft-Todd (2014).

[30] We assessed experience with economic games in the same was as (Rand et al (2012, 2014); Rand and Kraft-Todd (2014)): our subjects were asked "To what extent have you previously participated in other studies like to this one (i.e. that involve the dividing up of money)?" with the response options "1-Nothing like this scenario", "2", "3-Something like this scenario", "4", "5-Exactly this scenario", and we classify the 17% of subjects indicating option 1 as "inexperienced" (referred to as "naive" in Rand et al (2012, 2014); Rand and Kraft-Todd (2014)). Note that this is distinct from experience with experiments more generally (i.e. not just economic games), which we include (log10-transformed) in regressions using demographic controls.

[31] We do not know whether experienced MTurk subjects differ from inexperienced subjects because of learning or selection. This question is irrelevant for our analysis, however, as we are merely use (in)experience as a means to filter for subjects who are (on average) less selfish and have less self control than the general subject pool, whatever the reason.

the other differences are not statistically significant (although note the smaller sample size here compared to when including all subjects).

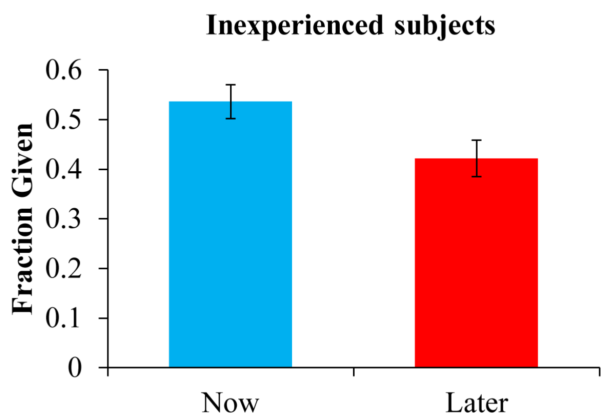

Figure 2. Mean giving Now versus Later among inexperienced subjects. Error bars indicate standard errors of the mean.

Table 2: Summary statistics per condition, inexperienced subjects only.

Condition	N	Mean giving (S.D)	Share giving 0	Share giving all
Now	129	16.09 (11.69)	20.16%	34.11%
Later	107	12.66 (11.40)	28.97%	22.43%

5.4. Within-subject experiments

In addition to our main experiment, we conducted two additional experiments with within-subject designs, where each subject made multiple decisions having different delays. The goal of these experiments was to achieve a more accurate estimate of the effect size of delay by studying its effect on subjects who did sometimes choose to give - the subjects who never gave were either not altruistic or had no self-control problem. Neither experiment was successful due to order effects, but we report their results here for completeness.

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 subjects 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 Appendix A 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, subjects 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[32], 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 A8-A9.

In the second within-subjects experiment, we tried to address these issues by having 3103 dictators[33] 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 subjects for both decisions.[34]Examining the first decision (a direct replication of our main experiment), we found significantly more giving Now compared to Later (12.2 cents Now vs 11.4 cents Later, Rank-sum p=0.0334 ; for regressions see Appendix Table A10), successfully replicating our original result. When examining the second decision, however, we found strong evidence of order effects: giving Now was slightly *lower* compared to Later (11.3 cents Now vs 11.6 cents Later, Rank-sum p=0.328; for regressions see Appendix Table A11. This makes sense in the context of consistency effects. Subjects in the Now condition of Decision 2 were in the Later condition immediately beforehand during Decision 1, where they gave less; and consistency would lead to them giving somewhat less on Decision 2.[35] Thus the null effect on Decision 2 is likely the result of a positive effect of Now timing on Decision 2 canceling out a negative consistency effect from having given less in the Later

[32]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).

[33]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.

[34]What varied across subjects was thus the order of payment timings: some subjects first played a game paying out today and then a game paying out in 30 days, while other subjects 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, subjects 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. We also note that due to a programming error, the data from decision 2 was lost for the first 271 subjects.

[35]Direct evidence of consistency effects comes from an extremely strong within-individual correlation between Decision 1 and Decision 2 (Pearson's correlation = 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 (e.g. Peysakhovich et al (2014) where an individual's play correlates across cooperation games at roughly 0.4).

condition of Decision 1. As a result of these order effects, this experiment was not useful for its intended purpose of identifying more versus less susceptible subjects. It does, however, serve as a successful replication of our original effect with an even larger sample size.

5.5. 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 artefact of (or unique to) the online environment we use, and if anything suggests that the effect is larger than estimated by our experiment.[36]

6. 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. 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, Rao and Trachtman (2011) and Della Vigna, List, and Malmendier (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

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

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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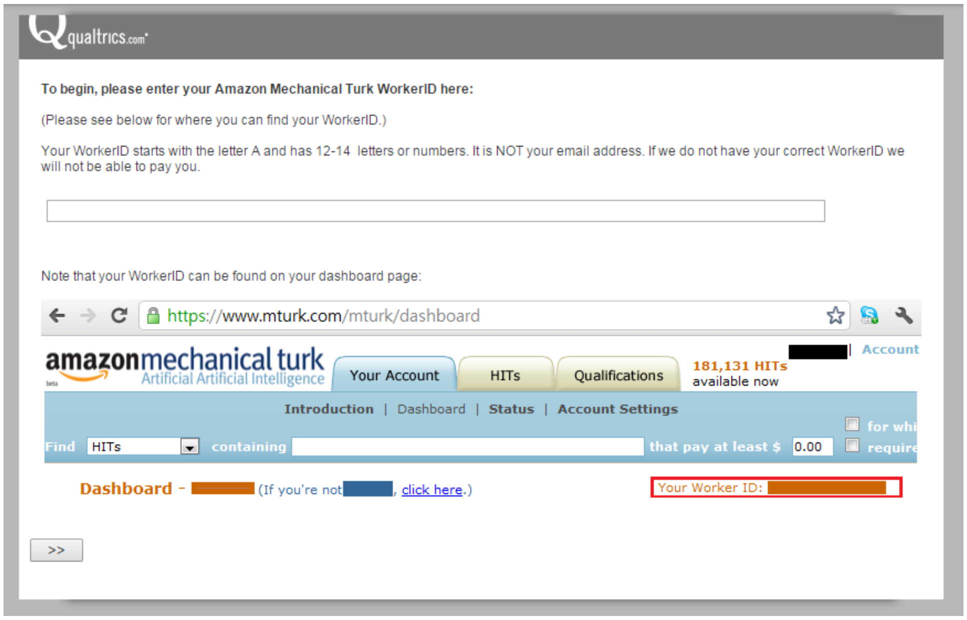
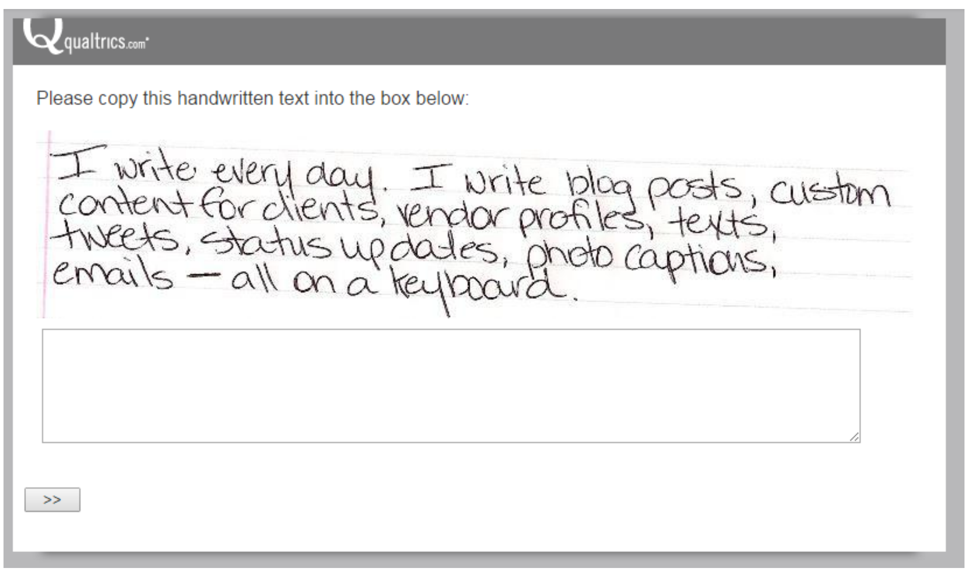
Appendix A: Screen shots

All experiments began with the same two screens:





[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.]

Main Experiment

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

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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

>>

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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.

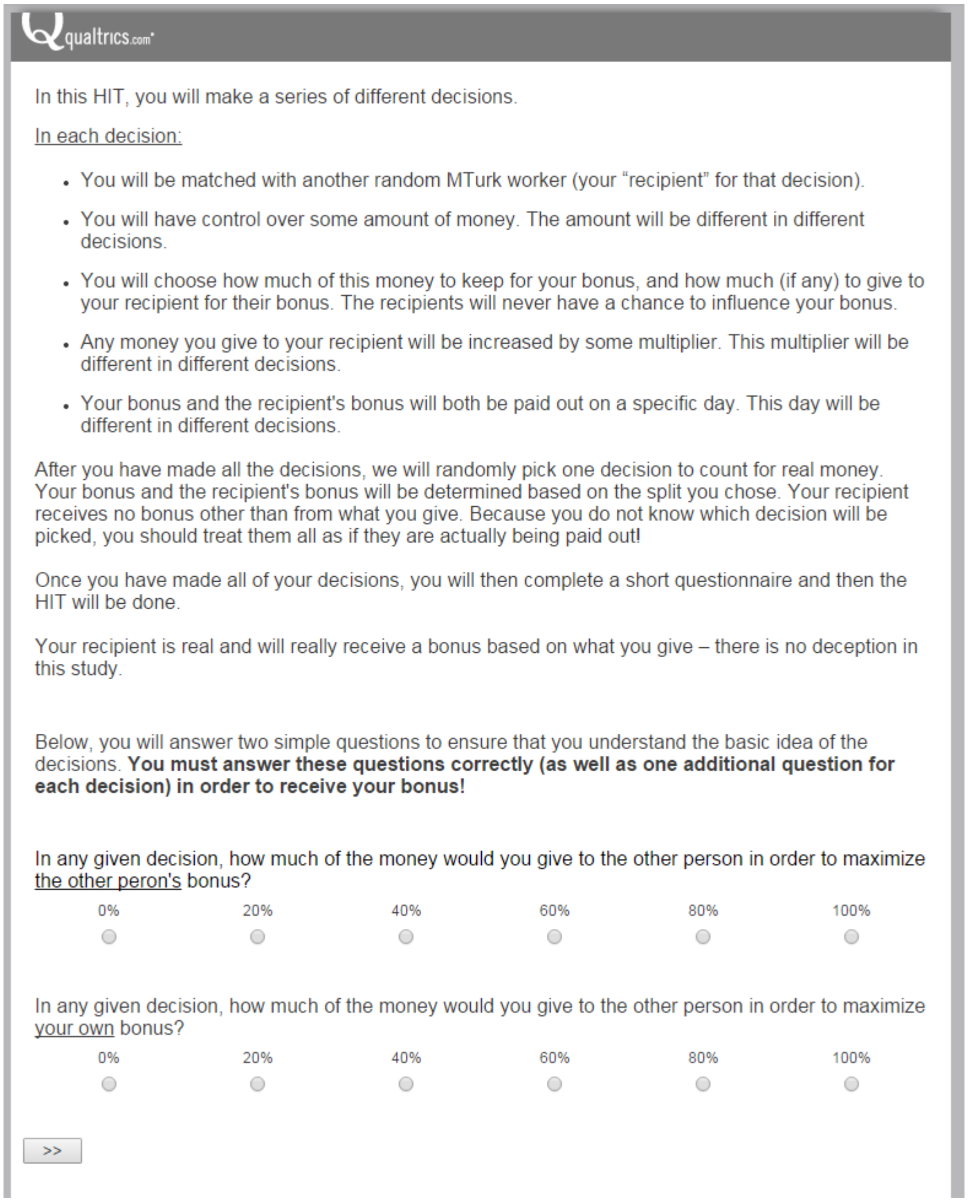
Make your selection:

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)

>>

First Within-Subject Experiment

Shown is one specific instance of the random ordering of questions 2-4.



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In this HIT, you will make a series of different decisions.

In each decision:

- You will be matched with another random MTurk worker (your "recipient" for that decision).
- You will have control over some amount of money. The amount will be different in different decisions.
- You will choose how much of this money to keep for your bonus, and how much (if any) to give to your recipient for their bonus. The recipients will never have a chance to influence your bonus.
- Any money you give to your recipient will be increased by some multiplier. This multiplier will be different in different decisions.
- Your bonus and the recipient's bonus will both be paid out on a specific day. This day will be different in different decisions.

After you have made all the decisions, we will randomly pick one decision to count for real money. Your bonus and the recipient's bonus will be determined based on the split you chose. Your recipient receives no bonus other than from what you give. Because you do not know which decision will be picked, you should treat them all as if they are actually being paid out!

Once you have made all of your decisions, you will then complete a short questionnaire and then the HIT will be done.

Your recipient is real and will really receive a bonus based on what you give – there is no deception in this study.

Below, you will answer two simple questions to ensure that you understand the basic idea of the decisions. **You must answer these questions correctly (as well as one additional question for each decision) in order to receive your bonus!**

In any given decision, how much of the money would you give to the other person in order to maximize the other peron's bonus?

0% 20% 40% 60% 80% 100%

In any given decision, how much of the money would you give to the other person in order to maximize your own bonus?

0% 20% 40% 60% 80% 100%

>>

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In this decision:

You are given: 30 cents

Each cent that you transfer to the recipient is:
Multiplied by 2 (doubled)

Your bonus and the recipients bonus will be paid out:
30 days from today.

Attention check question:

When will bonuses for this decision be paid to you and your recipient?

Today	In 5 days	In 10 days	In 15 days	In 20 days	In 25 days	In 30 days
○	○	○	○	○	○	○

Please choose how many cents you will keep.

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)
○	○	○	○	○	○	○

>>

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In this decision:

You are given: 40 cents

Each cent that you transfer to the recipient is:
Multiplied by 1 (not changed)

Your bonus and the recipients bonus will be paid out:
5 days from today.

Attention check question:

How much money are you given in this decision?

5 cents	10 cents	15 cents	20 cents	25 cents	30 cents	35 cents	40 cents
○	○	○	○	○	○	○	○

Please choose how many cents you will keep.

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 40	Keep 35	Keep 30	Keep 25	Keep 20	Keep 15	Keep 10	Keep 5	Keep 0
Payoffs: (You 40, Other 0)	Payoffs: (You 35, Other 5)	Payoffs: (You 30, Other 10)	Payoffs: (You 25, Other 15)	Payoffs: (You 20, Other 20)	Payoffs: (You 15, Other 35)	Payoffs: (You 10, Other 30)	Payoffs: (You 5, Other 35)	Payoffs: (You 0, Other 40)
○	○	○	○	○	○	○	○	○

>>

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In this decision:

You are given: 10 cents

Each cent that you transfer to the recipient is:
Multiplied by 4 (quadrupled)

Your bonus and the recipients bonus will be paid out:
10 days from today.

Attention check question:

How much will each cent you transfer to your recipient will be multiplied by?

1 (not changed)	2 (doubled)	3 (tripled)	4 (Quardupled)
○	○	○	○

Please choose how many cents you will keep.

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 10	Keep 8	Keep 6	Keep 4	Keep 2	Keep 0
Payoffs: (You 10, Other 0)	Payoffs: (You 8, Other 8)	Payoffs: (You 6, Other 16)	Payoffs: (You 4, Other 24)	Payoffs: (You 2, Other 32)	Payoffs: (You 0, Other 40)
○	○	○	○	○	○

>>

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In this decision:

You are given: 20 **cents**

Each cent that you transfer to the recipient is:
Multiplied by 3 (tripled)

Your bonus and the recipients bonus will be paid out:
20 **days from today.**

Attention check question:

How much will each cent you transfer to your recipient will be multiplied by?

1 (not changed)	2 (doubled)	3 (tripled)	4 (Quardupled)
○	○	○	○

Please choose how many cents you will keep.

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 20	Keep 15	Keep 10	Keep 5	Keep 0
Payoffs: (You 20, Other 0)	Payoffs: (You 15, Other 15)	Payoffs: (You 10, Other 30)	Payoffs: (You 5, Other 45)	Payoffs: (You 0, Other 60)
○	○	○	○	○

>>

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In this decision:

You are given: 30 cents

Each cent that you transfer to the recipient is:
Multiplied by 2 (doubled)

Your bonus and the recipients bonus will be paid out:
Today

Attention check question:

When will bonuses for this decision be paid to you and your recipient?

Today	In 5 days	In 10 days	In 15 days	In 20 days	In 25 days	In 30 days
○	○	○	○	○	○	○

Please choose how many cents you will keep.

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)
○	○	○	○	○	○	○

>>

Second Within-Subject Experiment

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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.

Your choice will be implemented 30 days from now, and you and the other person will receive your resulting bonuses 30 days from today.

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
○	○	○	○	○

>>

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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)
○	○	○	○	○	○	○

>>

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You will now make a second decision.

Here you are given another 30 cents, and you again 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"). The person is DIFFERENT from the person you interacted with in the previous decision.

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 person 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
○	○	○	○	○

>>

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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 subjects.

	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 subjects.

	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. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

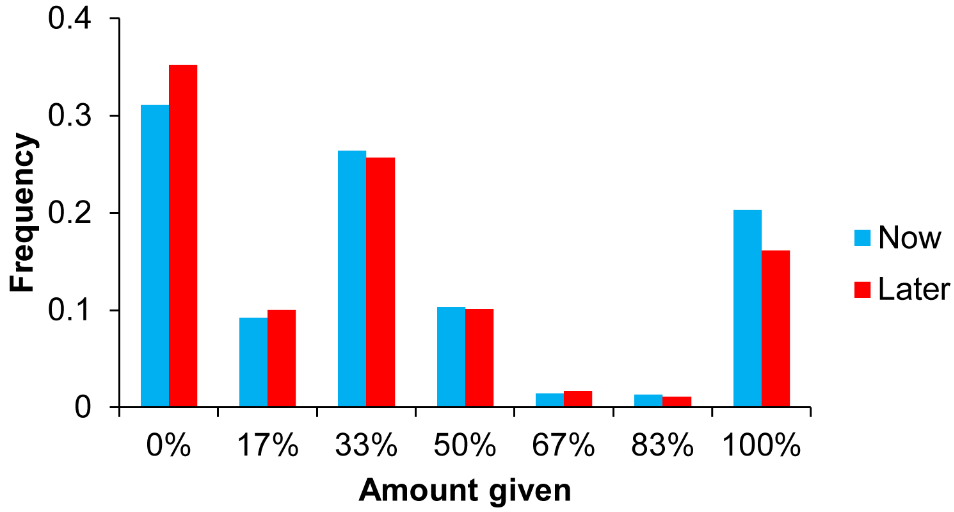

Figure A1. Distribution of giving Now and Later.

Table A5: Regressing giving on binary inexperienced variable, all subjects.

	Tobit			OLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Inexperienced (0 or 1)	8.389***	5.363***	5.429***	4.627***	3.163***	3.182***
	(1.595)	(1.518)	(1.524)	(0.816)	(0.771)	(0.777)
Failed own payoff q		18.36***	18.10***		8.979***	8.806***
		(1.631)	(1.656)		(0.743)	(0.762)
Failed other's payoff q		-16.08***	-16.08***		-8.211***	-8.093***
		(1.631)	(1.660)		(0.681)	(0.702)
Failed timing question		0.302	0.0676		0.193	-0.00405
		(4.675)	(4.651)		(2.386)	(2.398)
Age			0.0973**			0.0425*
			(0.0495)			(0.0256)
Female			0.404			-0.187
			(1.100)			(0.553)
Education controls?	No	No	Yes	No	No	Yes
Income controls?	No	No	Yes	No	No	Yes
Constant	6.691***	5.054***	8.470*	9.907***	9.112***	10.13***
	(0.609)	(0.656)	(4.531)	(0.301)	(0.326)	(2.592)
Observations	1,413	1,413	1,413	1,413	1,413	1,413
R-squared				0.026	0.128	0.141

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

Table A6: Giving Now versus Later, inexperienced subjects.						
	Tobit			OLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Now	7.104**	6.049**	6.320**	3.422**	2.952**	3.214**
	(3.184)	(2.829)	(2.808)	(1.508)	(1.367)	(1.401)
Failed own payoff q		24.25***	22.46***		11.78***	10.90***
		(3.606)	(3.668)		(1.443)	(1.607)
Failed other's payoff q		-19.51***	-18.83***		-9.977***	-9.721***
		(3.319)	(3.436)		(1.389)	(1.508)
Failed timing question		4.670	2.541		2.537	1.513
		(6.102)	(6.755)		(2.317)	(3.019)
MTurk experience			-3.629**			-1.936**
			(1.698)			(0.837)
Age			-0.206			-0.110*
			(0)			(0.0581)
Female			0.663			0.111
			(2.889)			(1.471)
Education controls?	No	No	Yes	No	No	Yes
Income controls?	No	No	Yes	No	No	Yes
Constant	11.32***	5.107**	17.77*	12.66***	9.671***	15.47***
	(2.285)	(2.530)	(10.39)	(1.101)	(1.211)	(5.762)
Observations	236	236	235	236	236	235
R-squared				0.021	0.244	0.300

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

Table A7: Giving zero, everything or 10, Now versus Later, Logit regressions, inexperienced subjects.						
	Giving zero		Giving everything		Giving 10	
	(1)	(2)	(3)	(4)	(5)	(6)
Now	-0.480	-0.439	0.582*	0.831**	-0.147	-0.0902
	(0.307)	(0.371)	(0.298)	(0.364)	(0.311)	(0.361)
Failed own payoff q		-2.682***		2.012***		-0.316
		(0.668)		(0.439)		(0.490)
Failed other's payoff q		0.765		-3.016***		0.914*
		(0.698)		(0.534)		(0.498)
Failed timing question		0.746		0.206		-0.980
		(1.218)		(1.078)		(0.924)
MTurk experience		0.690***		-0.156		-0.146
		(0.244)		(0.190)		(0.216)
Age		-0.00367		-0.0448**		0.0124
		(0.0176)		(0.0198)		(0.0206)
Female		-0.838**		-0.432		0.937***
		(0.393)		(0.436)		(0.363)
Education controls?	No	Yes	No	Yes	No	Yes
Income controls?	No	Yes	No	Yes	No	Yes
Constant	-0.897***	-12.39***	-1.241***	1.038	-1.136***	-3.817
	(0.214)	(1.384)	(0.232)	(1.433)	(0.226)	(2.325)
Observations	236	218	236	234	236	222
Pseudo R-squared	0.010	0.267	0.014	0.239	0.001	0.141

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

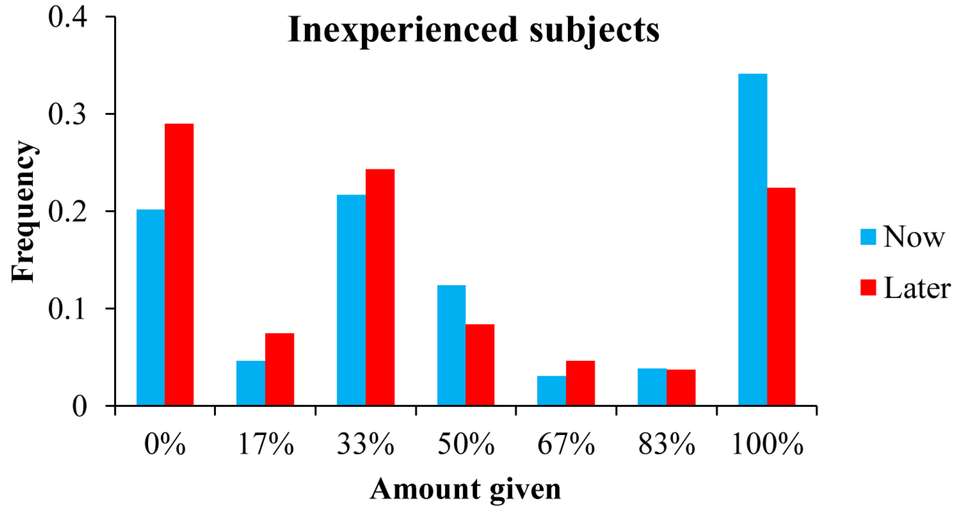

Figure A2. Distribution of giving Now and Later, inexperienced subjects only.

Table A8: Giving Now vs Later (continuous variable), all subjects, within-design 1.

	All decisions		Decisions 1 and 5		Decision 1	
	Tobit	OLS	Tobit	OLS	Tobit	OLS
Later	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 A9: Giving Now vs Later (continuous variable) including controls, all subjects, within-design 1.						
	All decisions		Decisions 1 and 5		Decision 1	
	Tobit	OLS	Tobit	OLS	Tobit	OLS
Later	0.000132	0.000106	0.000348	0.000270	0.000202	0.000230
	(0.000257)	(0.000183)	(0.000245)	(0.000178)	(0.000754)	(0.000529)
First decision Later	0.0104	0.00893	-0.00460	-0.00138		
	(0.0207)	(0.0139)	(0.0211)	(0.0147)		
Failed comprehension 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 experience	-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)
Education 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 A10: Giving Now versus Later, Decision 1, within-design 2.						
	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 question		-2.254*	-2.029		-1.094	-1.020
		(1.211)	(1.406)		(0.774)	(0.918)
MTurk experience			-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)
Education 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

Table A11: Giving Now versus Later, Decision 2, within-design 2.						
	Tobit			OLS		
	(1)	(2)	(3)	(4)	(5)	(6)
Now	-0.546	-0.351	-0.225	-0.342	-0.198	-0.109
	(0.688)	(0.623)	(0.619)	(0.388)	(0.354)	(0.351)
Failed own payoff q		19.28***	17.08***		10.54***	9.324***
		(0.984)	(0.994)		(0.468)	(0.492)
Failed other's payoff q		-17.12***	-16.94***		-9.656***	-9.572***
		(0.972)	(0.973)		(0.439)	(0.445)
Failed timing question		-0.0648	-1.017		0.370	-0.165
		(0.901)	(0.914)		(0.519)	(0.523)
MTurk experience			-3.749***			-2.165***
			(0.372)			(0.205)
Age			0.0465*			0.0231
			(0.0272)			(0.0155)
Female			0.0148			-0.351
			(0.648)			(0.367)
Education controls?	No	No	Yes	No	No	Yes
Income controls?	No	No	Yes	No	No	Yes
Constant	10.38***	7.846***	17.20***	11.61***	10.16***	16.63***
	(0.484)	(0.520)	(5.247)	(0.275)	(0.297)	(2.942)
Observations	2,829	2,829	2,754	2,829	2,829	2,754
R-squared				0.000	0.172	0.214

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