Does Altruism Eliminate Market Anomalies?

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Abstract

Using random assignment in an online laboratory setting to different orderings of a charitable donation solicitation and elicitation of subjects' WTA or WTP for an unrelated good, we examine whether altruistic behavior reduces the endowment effect. We use social norming and framing sub-treatments to stimulate giving exogenously, observing the effect on a subsequent WTA/WTP elicitation for treated subjects. We find that giving shrinks the endowment effect. We observe increased susceptibility to our main treatment for subjects who demonstrate an untreated higher propensity to give, suggesting the presence of an underlying trait that renders people more capable of setting aside ownership-contingent valuation. The results provide an explanation for the survival of altruism in market contexts and offer insights for devising new policy solutions to address public goods problems.

Keywords   loss aversion; attachment; ownership effects; philanthropy; market mechanism; simulated market experiments.

JEL Codes   D11, D64, D91.

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The point is, ladies and gentlemen, that greed... is good. Greed is right. Greed works.

- Gordon Gekko, address to Teldar Paper stockholders, *Wall Street* (1987)

The love of money as a possession—as distinguished from the love of money as a means to the enjoyments and realities of life—will be recognized for what it is, a somewhat disgusting morbidity, one of those semi-criminal, semi-pathological propensities which one hands over with a shudder to the specialists in mental disease.

-J. M. Keynes, "Economic Possibilities for Our Grandchildren" (1930)

1   Introduction

Why does altruism survive in humans? When agents must depend upon one another and acts create reputations or observable signals, it is easy to produce examples of quasi-altruistic behaviors that contribute to the survival of the agent. A pharmaceutical company may donate drugs to people in developing countries, knowing that regulators and would-be customers will witness its behavior and so be disposed to acting in its interests in return. A woman may help a homeless person on the street or tip generously in a restaurant she will never return to, knowing that other people, even if they do not observe these actions, will somehow recognize her for who she is and treat her in turn with greater kindness and generosity.

But consider how the situation changes when there are few interdependencies between agents and reputational/signaling effects are weak, such as in an unfettered market. Does a person benefit from being altruistic in this context; and does an altruistic person, for that matter, do anyone else any good if the invisible hand assures the most efficient allocation in this context? That is to say, could it turn out, where all interdependences are stripped away, that "greed is good" after all? And if this is increasingly the world we live in—or the world that public policy and politics seek to create—could it be that the kindnesses we witness in everyday life are merely, or soon to become, vestigial?

This paper presents new evidence contrary to this narrative—evidence that altruism contributes to the efficiency of markets and that markets contribute to the survival of altruists. The evidence comes in the form of a demonstration that altruistic behavior causally attenuates the endowment effect, the widely-replicated observation that valua-

tions are not independent of current holdings (see, e.g., Knetsch 1989, Kahneman et al. 1990, Bateman et al. 1997).

We investigate the relationship of altruistic behavior to the endowment effect in an online laboratory setting. Our objective is not to identify associations between traits and variation in the endowment effect as many studies do,[1] but rather a causal connection whereby *a pattern of discretionary behavior precipitates variation*. We measure the endowment effect by eliciting either willingness-to-accept (WTA) or willingness-to-pay (WTP) for a lottery ticket from our participants, who are randomly assigned to these elicitation conditions. Our main treatment exposes participants to a charitable donation solicitation, with an additional random assignment varying whether participants face this solicitation first or the WTA/WTP elicitation first. A key element of our design is the application of two independent sub-treatments that vary participants' motivation to give in response to the solicitation. Specifically, participants are given randomly varied social norm information about the behavior of participants in a past experiment, and we toggle framing the donation as how much participants wish to give versus how much they wish to keep for themselves. These sub-treatments allow us to vary exogenously the amount given to examine the causal effects of giving itself.

We find that giving shrinks the endowment effect. Individuals who are normatively pressed to give more and those who face a solicitation that de-emphasizes the act of giving give more in the experiment. Both subsequently exhibit a significantly reduced endowment effect relative to the baseline.

While we do not find that our main treatment significantly influences the endowment effect per se, we do find significant heterogeneity in its influence. The reduction in the endowment effect in response to our main treatment is larger for those who give more in our experiment. Additionally, participants who self-report giving a lot to charity in the previous year are much more susceptible to the effects of our treatment, as demonstrated by a significantly lowered endowment effect when treated relative to those who did not report giving a lot to charity in the previous year.

The causal mechanism we propose follows from the notion that the endowment effect accrues at least in part to individuals' sense of attachment to their possessions (Kogut and Kogut 2011; Shu and Peck 2011). We hypothesize that the act of giving habituates individuals to parting with the things they own, thereby lowering the differential between

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[1]For example, Maddux et al. (2010) demonstrate that East Asians, who show a more interdependent self-construal than Westerners, exhibit a reduced endowment effect.

willingness to accept that the individual requires to part with something they own and their corresponding willingness to pay for a similar item. We propose that this effect will occur even in subsequent transactions, including those that are unrelated to the initial act of charitable giving.

Our design, which involves exogenous randomized treatments, rules out selection as an explanation for our treatment effects. We find that construal level (see, e.g., Trope and Liberman 2003) is an important moderator of the treatment effect. Participants with a high (abstract) construal, who are prone to notice conceptual connections, exhibit a reduction in the endowment effect that increases more with amount given to charity following the charitable giving stage than participants with a low (concrete) construal, who focus more on tangible details. We believe that the high construal individuals were more likely to intuit a relationship between their willingness to give and their attachment and acted accordingly. Similarly we find larger effects for older participants, women, people with more experience in online experiments, and people who complete the experiment more quickly.

To understand the broader the implications of our finding, consider a market context in which some people behave altruistically while others behave egoistically. Building on a general equilibrium framework based on Akerlof and Yellen (1985), List (2003) demonstrated that if agents who exhibit the endowment effect are distributed in an exchange economy with agents who do not exhibit the endowment effect, the agents who exhibit the endowment effect suffer significant losses relative to those who do not. Moreover, the latter are able to engage in arbitrage that restores the efficient level of trade found in a market that does not feature consumers encumbered by attachment, i.e. the endowment effect.

Two implications follow from our experimental results in view of List's analysis.[2] First, agents behaving altruistically, because they exhibit a smaller endowment effect, will prosper more effectively in competitive markets than other agents, all else equal. In short, *markets benefit altruists*. Ironically, those who are not perfectly "self-interested" may end up faring better in a competitive market environment because their preferences align more closely with the neoclassical model in an essential domain than those who pursue pure self-interest. Second, altruistically-motivated giving, in tempering the endowment effect, eliminates market anomalies and leads to more efficiently functioning

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[2]These implications rely additionally on the general equilibrium's independence of whether preferences are other-regarding. See Dufwenberg et al. (2011)

markets with greater gains from trade. In short—and again perhaps ironically—*altruism benefits markets*. This represents a previously unrecognized and rather surprising welfare contribution accruing to altruism, completely distinct from the conventional arguments in favor altruism, that altruism helps facilitate cooperation in the presence of market failures.

The remainder of this section discusses the related literature. Section 2 outlines our experimental design. Section 3 describes summary statistics of the experimental data and the effect of our sub-treatments on charitable giving. Section 4 presents our main econometric estimation results. Section 5 discusses the implications of our results and the potential mechanisms they represent.

1.1 Related Literature

The endowment effect has most commonly been attributed to loss aversion as proposed by prospect theory (Kahneman and Tversky 1979), but other theories have been proposed. Morewedge et al.'s (2009) finding that traders, whether they are buyers or sellers and whether what they are trading is their own item or not, value objects more when they possess an identical item, points to the endowment effect as an ownership effect. Yet additional evidence suggests neither loss aversion nor ownership may be sufficient. Chatterjee et al. (2013) and Dommer and Swaminathan (2013) find that individuals' valuations are vulnerable to treatments aimed at affecting subjects' cognitive basis for caring about the things they own. Thus the broader, cognitive notion of *attachment* may better explain why valuations vary. In particular Kogut and Kogut (2011) link the magnitude of the endowment effect to heterogeneity in people's attachment styles (i.e., how people form relationships), a concept from the literature on childhood development. Alternatively, Shu and Peck (2011) argue that the endowment effect stems from the immediate emotional attachment subjects feel to the particular object of the WTA/WTP elicitation. Most recently, Cerreia-Vioglio et al. (2024) show that the endowment effect may represent a cautious approach to valuation rather than loss aversion or attachment. While our focus in on attachment, our finding that altruism reduces the endowment effect is equally consistent with giving attentuating a person's aversion to loss, reducing their caution, or some combination of the three.

The research on altruism divides between literatures on altruism in animals and altruism in humans. Among animals, fitness-reducing acts that confer benefits on others

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are largely restricted to close kin (Fehr and Fischbacher 2003). Altruism directed at close kin can survive as a trait from an evolutionary perspective, because siblings and children share a large fraction of the genes from the altruist and can propagate these (Simon 1993). Though genetic selection of altruistic traits is plausible in groups not consisting of close kin, it is considered unlikely to occur empirically due to the possibility of migration of non-altruists between groups and their within-group fitness advantage over altruists (Aoki 1982).

Explanations of altruistic behavior in humans depend upon its individual rationality under certain circumstances (Becker 1976, Hirshleifer 1984, Frank 1987, Simon 1993) or describe cultural mechanisms for transmission of learned altruistic behavior and the suppression of selfishness (Fehr and Fischbacher 2003). In both cases, altruism prospers because of the interdependence of individuals within a group. Unlike these, our endowment effect account constitutes a truly *asocial* altruism that does not rely on considerations of reciprocity or even the warm glow of giving. It can explain the modern-day survival of human giving in a environment in which markets dominate interactions and personal group relations involving trust and mutual reciprocation are secondary (Kranton 1996).

Prior work relating altruism to the endowment effect is limited. Van Boven et al. (2000) find egocentric empathy gaps by which owners and buyers overestimate the similarity between their own valuation of a commodity and the valuation of the counter-party in the transaction. This suggests in effect that the endowment effect would be mitigated in situations that involve empathy for the counter-party. In contrast, our paper demonstrates the operation of a mitigating mechanism that accrues to altruistic behavior but that is independent of specific empathy in the transactional context.

Krekels (2015) and Pushkarskaya et al. (2020) find, respectively, that greed—as measured using a dispositional greed scale—and hoarding disorder are associated with an increased endowment effect. In a study of the endowment effect for power, Foster et al. (2021) find that individuals who gave more in an experimental dictator game exhibited a lower endowment effect. The associations found in these studies might or might not reflect a causal relationship by which altruism results in a lower endowment effect; indeed, they might indicate reverse causality. Several recent studies have shown that priming a loss frame leads to reduced generosity in the classic dictator game (Boun My et al. 2018, Fiedler and Hillenbrand 2020, Benistant and Suchon 2021). Similarly, measured greed and observed hoarding behavior, as in the first two studies cited above, could conceivably

originate from exogenously elevated loss aversion.

A recently published legal and policy analysis by Kaja and Nagler (2024) investigates the implications a relationship between altruism and the endowment effect for efficient public goods provision.

2 Experimental Design

2.1 Participants

Our preregistered study was conducted online on the Prolific platform using a survey programmed in Qualtrics. Participants were recruited through Prolific using a U.S.-based representative sampling procedure. As part of their initial recruitment, individuals are asked to answer some basic demographic questions, including gender and age, which are passed through along with the survey results. Approximately 1,700 individuals completed the survey. A full set of the Qualtrics screens presented to participants in the survey is provided in the Appendix.

2.2 Phases

All participants were run through two online study phases, one consisting of giving to passive charities (i.e., dictator giving) and the other consisting of a WTA-WTP elicitation.

In the charity-giving phase, participants were endowed with 100 experimental dollars ("ED"). They were then asked how much they would like to donate out of the 100 ED to each of five charities: the American Red Cross, Feed The Children, Doctors Without Borders, The Salvation Army, and OxFam International. The charity elicitations were presented sequentially, and participants were instructed to view them as *independent* decisions; to wit, in each case they would be deciding how much out of the 100 ED to give to the charity in question, as if that charity were the only one to which they would be giving. Participants were advised that a random drawing would be conducted at the end of the experiment to determine if they were one of the participants to actually receive the $100 in real US dollars. If they were selected, then one of the five charities would be selected at random to receive an actual disbursement out of the participant's endowment for the amount of money they had chosen to give that charity. Only one such charity would be selected, and the rest of the money would be the participant's to keep,

in addition to whatever else the participant would earn during the survey. Following the completion of all five elicitations, we present participants with an open-response question in which we ask them to describe the experience of giving in the previous phase. The purpose of this elicitation is to increase the salience of the giving.

In the WTA-WTP elicitation trading phase, participants were randomly assigned to either a "WTA group" or a "WTP group." Individuals in the WTA group were endowed with a lottery ticket, which they were told would have a 50% chance of paying 100 ED. Using a standard multiple-price list (MPL) mechanism,[3] we elicited their WTA for the lottery ticket, defined as the least they would be willing to accept to part with the ticket. Meanwhile, individuals in the WTP group were endowed with 50 ED, and we elicited their WTP for a lottery ticket identical the one endowed to the WTA group was described to them. We elicited the WTP of these individuals for the ticket using MPL. Both groups were informed that a random drawing would be conducted at the end of the experiment; if chosen, the lottery ticket and money would be real, implying that any decision they made would potentially matter.

2.3   Treatments

We employ a $2 \times 2 \times 2$ experimental design. Our main treatment uses random assignment to vary the time order of the charity-giving and trading phases for different participants: two-thirds of participants encounter the charity-giving first (treatment arm), while the remaining one-third encounter the trading phase first (control arm). The purpose of this treatment is to determine whether exposure to the opportunity for charitable giving causally reduces the endowment effect subsequently measured. We assign twice as many participants to the treatment group because we were most interested in measuring critical differences within the sub-treatments of the treatment group.

We generate independently randomized sub-treatments in which we randomly vary participants' inducement to give during the charity-giving phase using alternate framings. Half of participants are assigned to a "give" condition, in which they are asked how much of their 100 ED endowment they wish to give to each successive charity. The other half of participants are assigned to a "keep" condition, in which they are asked how much of their endowment they wish to keep for themselves. Our charity elicitation employs a slider which participants move to the right from the 0 point to make their

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[3]See, e.g., Brebner and Sonnemans (2018).

elections.[4] The wording on the slider varies accordingly with the condition, as well as the instruction language: both are designed to make giving more or less salient, while otherwise maintaining consistent wording across conditions.

We also randomly vary participants' inducement to give during the charity-giving phase in one additional (and orthogonal) way: by exposing participants to different social norms of giving.[5] Following the charitable giving instructions, but before their gift amounts are elicited, all participants are presented with a screen in which they are informed what percentage of their endowment participants "in a prior study" allocated to charity. For half of participants, we used a value from a study where a relatively large percentage (69%) chose to give, while for the other half we use a value from a study where a relatively small percentage (11%) chose to give. To ensure their attention to this information as well as their understanding, we ask participants (as an open-response question) to tell us how much this means the participants in question kept for themselves.

2.4   Additional Elicitations

Beyond the phases described above, we conduct some additional elicitations. We also ask them, using a 5-point qualitative scale (i.e., "none at all," "a little," "a moderate amount," "a lot," and "a great deal"), to state how much they have donated to charity during the past 12 months. Finally, participants are administered a battery of 7 questions from the Behavioral Identification Form (BIF) designed to measure their construal level (Vallacher and Wegner 1989).

3   Data

Following the analysis plan laid out in our preregistration,[6] we restrict our analysis to a subsample of participants who (1) completed the experiment; (2) met a minimum time requirement for the duration of their participation in the experiment; (3) satisfied an attention check question; and (4) did not fail single switching in the multiple-price list elicitation (for WTA or WTP). We additionally restrict our analysis to participants

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[4]Participants are forced to move the slider before proceeding to the next screen of the experiment, such that they must move the slider to the right and then back to 0 if they wish to elect "0."

[5]The method we employ here is similar to Frey and Meier (2004), Shang and Croson (2009), and Ho et al. (2016).

[6]Provided at https://osf.io/nmh8p.

who responded with a minimum of 35 characters across the survey's two open-response questions.

Table 1 provides summary statistics separately for the control group (i.e., WTA–WTP elicitation first) and the treatment group (i.e., charity-giving first). Demographic characteristics such as age and gender appear to have been well balanced between treatment and control. Construal—which was measured ex post so as not to contaminate our main treatment—appears to be uncontaminated by our main experimental elicitation. The amount given to charities was significantly higher for our treatment group ($p < .001$) where giving to charities was solicited before our WTP-WTA elicitation. The difference is perhaps due to experimental fatigue. We will return to this issue in our discussion.

One notable observation is that there is no obvious difference in means for WTA and WTP between the full-sample treatment and control groups. In light of this, we turn to exploratory subgroup analysis as proposed in our preregistration to investigate treatment effects on WTA and WTP further.

Table 1: Summary Statistics by Treatment Status

| | (1) | | (2) | |
| | Control | | Treatment | |
	Mean	Std Dev	Mean	Std Dev
Willingness to Accept ($)	49.70	(22.66)	48.81	(23.23)
Willingness to Pay ($)	19.09	(10.38)	19.13	(10.43)
Average Charitable Contribution ($)	23.79	(22.70)	29.48	(25.23)
High Construal Level	0.52	(0.50)	0.50	(0.50)
Donated in Past Year	0.76	(0.43)	0.77	(0.42)
Age (Years)	42.72	(14.98)	42.50	(15.03)
White	0.70	(0.46)	0.69	(0.46)
Male	0.48	(0.50)	0.49	(0.50)

Notes: High construal level indicates an above-median score on the Behavior Identification Form (BIF). Prior survey experience measures the number of previous survey approvals. Response length counts total words in free-response questions.

Figure 1 shows the treatment effect on WTA and WTP for three pairs of subgroups: participants with above- and below-median self-reported past-year donation amounts, those with above- and below-median within-experiment (i.e., dictator giving) charitable giving amounts, and those with above- and below-median BIF scores. The most visible treatment effect we observe is for those who donated more than the median in the past year: it appears the treatment made it easier for these participants to part with the lottery ticket, lowering their WTA for the ticket in so doing. This may be interpreted as
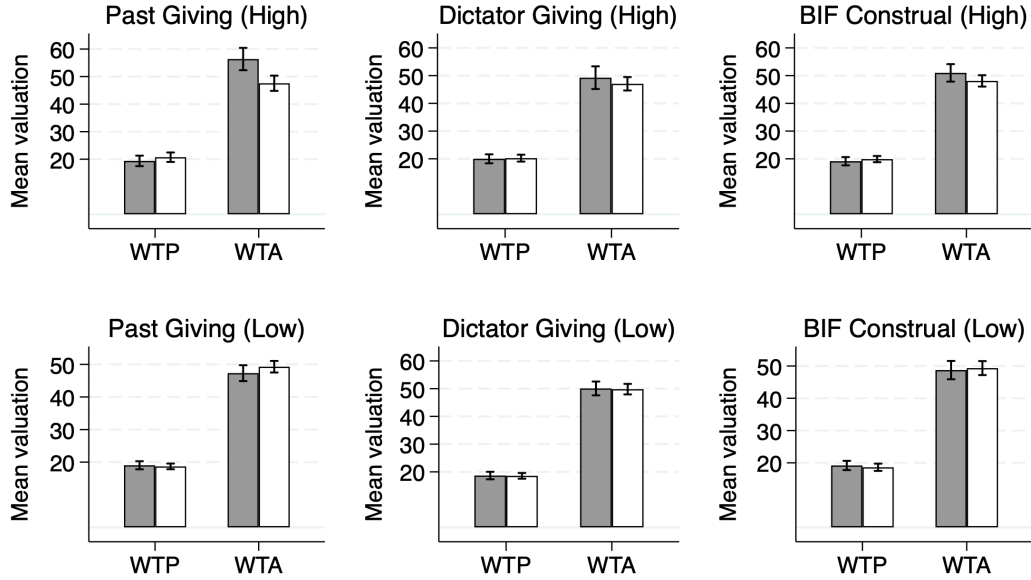
Note: Bars show means with 95% confidence intervals. Control (Grey Bar) vs. Treatment (White Bar)

Figure 1: Mean WTP/WTA Valuations within Subgroups

a reduction in attachment. Similar effects—though less obviously visible—appear also to be present for those participants who gave more when given the chance to donate in our experiment and for those more likely to exhibit high-level construal. We will check whether these are significant differences in our regression analysis in the following section.

Before turning to regression results that display the influence of our treatments on the endowment effect, we present in Table 2 the results of a regression of charitable giving on an indicator for the main treatment group; two additional regressions show, respectively, the addition of indicators for our Keep Framing (KF) and High Social Norm (HSN) sub-treatments along with interactions between the main treatment and each sub-treatment. Consistent with what our summary statistics seemed to show and perhaps an indication of experimental fatigue, individuals donated more in the treatment condition, as indicated by the significant "treatment group" coefficient across all three columns. What is most directly relevant to our experiment, however, are the significant coefficients on the KF and HSN sub-treatment indicators: these point to the effectiveness of our sub-treatments as tweaks of participants' inducement to give. In particular, the KF sub-treatment increased charitable giving by 10.39 ED, while the HSN sub-treatment increased charitable giving by 11.09 ED. The interaction terms in columns (2) and (3) are not significant, revealing

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no additional experimental fatigue effects due to the sub-treatments.

Table 2: Treatment Effect on Charitable Giving

	(1) Baseline	(2) Keep Framing	(3) Social Norms
Treated	5.912***	6.442***	4.627***
	(1.008)	(1.223)	(1.233)
Keep Framing (KF)		10.39***	
		(1.536)	
Treated × DK		-0.990	
		(1.975)	
High Social Norm (HSN)			11.09***
			(1.546)
Treated × HSN			1.650
			(1.966)
Constant	23.77***	18.61***	18.49***
	(0.787)	(0.947)	(0.934)
Observations	2449	2449	2449
R-squared	0.0129	0.0522	0.0743

Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

4 Results

Our regression models of the influence of our treatments on attachment rely on measures of the endowment effect through its constituent variables, WTA and WTP, measured separately (see, e.g., MacDonald and Bowker 1994, Yamamoto and Navarro-Martinez 2022). Treatments that decrease WTA for the participants for whom WTA was measured while not affecting WTP for those for whom WTP was measured are conceived as decreasing attachment. Similarly, a treatment decreases attachment when it is associated with higher WTP while not exhibiting a significant influence on WTA: this interpretation accrues to the treatment being associated with higher participant valuations of the lottery ticket while also reducing their attachment to it.

Table 3 presents our primary results: the treatment effect of being giving an opportunity to give to charities on WTP and WTA. Columns 1 and 4 show pure treatment group

Table 3: Treatment Effects on Willingness to Pay and Willingness to Accept

	(1) WTP	(2) WTP	(3) WTP	(4) WTA	(5) WTA	(6) WTA
Treated	0.14	0.11	-1.25	-1.10	1.50	-2.43
	(0.67)	(0.95)	(0.93)	(1.32)	(1.81)	(1.81)
Keep Framing (KF)		0.11			2.48	
		(1.06)			(2.15)	
Treated × KF		0.07			-5.25**	
		(1.33)			(2.63)	
High Social Norm (HSN)			-0.86			-3.48
			(1.05)			(2.15)
Treated × HSN			2.83**			2.76
			(1.32)			(2.63)
Constant	19.15***	19.10***	19.55***	49.84***	48.62***	51.55***
	(0.53)	(0.75)	(0.76)	(1.07)	(1.44)	(1.47)
Observations	1073	1073	1073	1376	1376	1376

Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

effects on WTP and WTA, respectively. Columns 2 and 3 show the influence of our two manipulations of the inducement to donate on WTP by way of the treatment; columns 5 and 6 show the same for WTA. What we observe is that both manipulations impact the WTA-WTP disparity significantly. The HSN sub-treatment increases WTP on average by \$2.83, while the KF sub-treatment decreases WTA on average by \$5.25.[7] Considering that the mean WTP in the treatment group is \$19 as compared to a mean WTA of \$49, the elasticities of the WTA/WTP ratio with respect to the HSN sub-treatment and KF sub-treatment are quite similar. Taking these findings together with the results in Table 2, we find that manipulations that increase participants' desire to donate reduce the WTA/WTP roughly proportionally to their effect on donation amounts, shrinking the endowment effect.

We turn next to look at heterogeneity in the effects of the main treatment. Table 4

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[7]While both measured effects imply a reduction in the endowment effect, the increase in WTP engendered by the HSN sub-treatment additionally implies an increase in the *overall valuation* of the lottery ticket, all else equal. This suggests that exposure to a high social norm of giving somehow had a side effect of affecting participants' construal of the ticket's value.

Table 4: Heterogeneous Treatment Effects on Willingness to Accept

	(1) WTA	(2) WTA	(3) WTA
Treated	1.54	1.97	0.62
	(1.89)	(1.53)	(1.81)
Charitable Contribution (CC in $)	0.03		
	(0.05)		
Treated × CC	-0.10*		
	(0.06)		
High Past Donations (HPN)		9.07***	
		(2.39)	
Treated × HPN		-10.77***	
		(2.91)	
High Construal (BIF)			2.25
			(2.15)
Treated × BIF			-3.51
			(2.63)
Constant	49.20***	47.30***	48.73***
	(1.50)	(1.24)	(1.44)
Observations	1376	1376	1376

Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

shows how treatment effects on WTA vary with the amount given in the charity-giving phase, with whether the participant reported a high level of past-year donations, and with whether the participant's measured construal level was high.[8] The treatment effects vary significantly with variation in the first two factors, as shown in columns 1 and 2. Recognizing that the mean charitable contribution across participants and across the five charities was $29, column 1 suggests that those who chose to donate at the mean level of $29 would have their WTA reduced by $2.90, a small, marginally significant reduction of the mean WTA of $49 attributable to the opportunity to donate to charity. In marginal terms, each incremental dollar of donation for treated participants corresponds to a

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[8]We find no significant heterogeneity of any kind in treatment effects on WTP and so do not present WTP heterogeneity results in this paper. These results are available from the authors upon request.

reduction in the WTA of 10 cents. Heterogeneous effects are more strongly evident based on prior history of giving. Participants who were above the median on a 5-point Likert scale of their self-reported past-year donation had a $10.77 lower WTA in the treatment group than those who reported below-median. We find no significant variation in the treatment effect on WTA for high- versus low-construal participants. We will discuss the effects of construal in greater detail later on.

Table 5: Treatment Effects on WTA by Subgroups

	(1) High BIF	(2) Low BIF	(3) Young	(4) Old	(5) Male	(6) Female
Treated	2.90	0.01	0.39	2.17	-1.06	4.94*
	(2.89)	(2.52)	(2.45)	(3.02)	(2.49)	(2.89)
Avg Charit Contrib (ACC)	0.08	-0.07	-0.04	0.08	0.04	0.02
	(0.06)	(0.08)	(0.07)	(0.08)	(0.06)	(0.08)
Treated × ACC	-0.20***	0.04	0.04	-0.19**	-0.05	-0.16*
	(0.08)	(0.09)	(0.08)	(0.09)	(0.08)	(0.09)
Constant	48.75***	49.96***	49.05***	49.68***	47.59***	50.74***
	(2.38)	(1.95)	(1.86)	(2.51)	(2.01)	(2.28)
Observations	672	704	710	666	683	693

Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

BIF is a measure of construal level (high/low)

Young is defined as age < 41

To explore possible heterogeneity in our treatment effect further, Table 5 runs the specification from column 1 of Table 4—our measure of heterogeneous effects with respect to the giving conducted within our experiment—for a range of subgroups. The treatment interacted with the amount the participant donated—the main coefficient of interest in this specification—is larger and more significant for three subgroups.

The first subgroup is high-construal participants—those who, based on our elicitation using the BIF battery, demonstrate that they perceive the world in more abstract terms. Specifically, for individuals who scored above the median, each $1 of additional donation corresponds to a reduction in WTA of $0.20, a substantial marginal effect, given the mean WTA valuation was $49. The second subgroup where a stronger marginal treatment effect was observed is older participants. For people over the median sample age of 41, $1 of additional giving reduces WTA by $0.19. Finally, for female participants, $1 of additional

giving corresponds to a $0.16 reduction in WTA. These results are shown in Columns 1, 4, and 6 in Table 5, respectively.

The coefficient on Treated in Column 6 is marginally significantly positive at 4.94. But as noted above, the interaction term is negative. The mean level of charitable giving for treated women in our sample is 31.5. So women who were of above average generosity had a lower WTA, as expected.

Table 6: Treatment Effects on WTA by Effort Measures

	(1) Short Resp	(2) Long Resp	(3) Low Appr	(4) High Appr	(5) Fast	(6) Slow
Treated	0.46	2.33	2.80	1.25	1.01	1.86
	(2.68)	(2.68)	(2.84)	(2.57)	(2.43)	(2.98)
ACC	0.04	0.01	-0.02	0.07	0.07	-0.03
	(0.07)	(0.07)	(0.07)	(0.08)	(0.06)	(0.08)
Treated × ACC	-0.12	-0.07	-0.06	-0.16*	-0.16**	-0.05
	(0.08)	(0.09)	(0.08)	(0.09)	(0.08)	(0.09)
Constant	48.49***	50.06***	51.09***	47.58***	47.59***	51.46***
	(2.08)	(2.17)	(2.10)	(2.13)	(1.88)	(2.44)
Observations	708	668	640	736	698	678

Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01
Short/Long Response split at 34 words; Low/High Approvals split at 1000; Fast/Slow split at 414 seconds

Table 6 further explores subgroup heterogeneity by dividing the sample based on how much time and effort subjects appeared to spend on it. In particular we looked at how long their open-ended answers were (Columns 1 and 2), how many Prolific studies they had successfully completed prior to our study (Columns 3 and 4), and how much time they spent on our experiment (Columns 5 and 6). The primary takeaways are that a significant main effect is seen for those who have had more experience on Prolific and those who were faster in completing the experiment. The latter effects may be because those who took too long saw the effects of charitable giving decline with time they had spent on the experiment.

Finally, we should acknowledge that there is significant correlation between most of the subgroup pairings in our sample. Table 7 shows a correlation matrix of the subgroups we consider in the study.

Table 7: Correlation Matrix

	Giving	Past Don	High BIF	Age	Male	Words	Approvals	Time
Giving	1.000							
Past Don	0.122***	1.000						
High BIF	0.153***	0.057***	1.000					
Age	0.098***	0.221***	0.169***	1.000				
Male	-0.010	-0.018	0.042**	-0.031*	1.000			
Words	0.068***	-0.038**	0.078***	-0.046***	-0.009	1.000		
Approvals	-0.128***	0.014	0.035**	0.264***	0.113***	-0.093***	1.000	
Time	-0.001	0.042**	-0.034**	-0.027	-0.026	-0.042**	-0.030*	1.000

* $p<0.10$, ** $p<0.05$, *** $p<0.01$

5 Discussion and Conclusions

We have investigated whether a causal relationship exists between altruism and the endowment effect. The experimental design we have described attempts to disentangle the causal effects of giving on the endowment effect from mere associations that might exist between observed giving behavior and the endowment effect. Our treatments along these lines included random assignment to different time orderings of a giving exercise and a WTA or WTP elicitation combined with different sub-treatment conditions involving inducements to give.

We have found, via the identification strategy provided by our inducements, that altruistic behavior causally reduces the endowment effect. Specifically, the more people give within a precise context, the more their WTA-WTP disparity is subsequently reduced. Moreover, we have found that prior exposure to a charitable giving exercise reduces the endowment effect more for people who make large charitable donations within the experiment and those who self-report having given more in the previous year. This seems to indicate the presence of an underlying trait that renders people more capable of setting aside ownership-contingent valuation. Overall, altruism appears to influence endowment effect in two specific ways: through the act of giving, and through the meta-effect of rendering the act of giving more potent for people predisposed to giving.

Our findings suggest that altruists experience less attachment, or perhaps less caution (consistent with Cerreia-Vioglio et al. 2024) or less loss aversion, making them more effective market participants. This indicates in turn that altruists can take advantage of gains from trade overlooked by less altruistic individuals. Their activity in this regard improves the function of markets (*altruists benefit markets*), while the altruists themselves

pocket the benefits (*markets benefit altruists*).

The causal nature of the relationship between altruism and the endowment effect suggests interventions to induce altruistic behavior could improve the function of markets. Our experimental inducements are particularly promising in this regard. If, say, alterations in the tax code or social media campaigns encouraged individuals to increase their giving, we might expect a corresponding reduction in the endowment effect for those individuals, resulting in an increase in socially beneficial trade. Other policy changes might be implemented to take advantage of the role of altruists as arbitrageurs. Kaja and Nagler's (2024) recommendation that cap-in-trade exchange activity be expanded to account for the extraordinary effectiveness of altruists as market makers anticipates our experimental finding. The authors note further that in favoring the survival of altruists markets support public goods provision in a way not previously recognized. This suggests that initiatives that promote public goods by working with and through the market may be more effective at achieving their goals than those that proceed along lines orthogonal to the market.

We do not know the precise mechanism by which giving reduces the endowment effect. It is possible that the giving exercise conditions individuals to experience reduced attachment according to the process of operant conditioning (see, e.g., Skinner 1936). Alternatively, it may be that an individual who willingly gives out of their endowment signals themselves that they are not the sort of person who experiences attachment (see, e.g., Bem 1972, Bénabou and Tirole 2011). The finding that our effects are concentrated in people with more abstract construal suggests a cognitive connection that underlies the connection between giving and attachment. Determining what mechanisms are at work is a project for additional research.

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A   Appendix A: Survey Flow from Experiment

Below we display the questions presented to participants in our study. The ordering shown consists of what participants see when randomly assigned to charity-giving first. Blue boxes show the display logic for certain portions of the survey that are presented only to certain treatment groups.

⊙

What is your prolific ID?   (Please note that this response should auto-fill with the correct ID)

_____

In this phase of the study, you will be endowed with 100 experimental dollars. You will be presented with a sequence of 5 charities. For each charity, you will be asked to select how much you would want to give to that charity out of the $100.

There will be a random drawing at the end of the survey to determine if you are one of the participants to actually receive the $100 in real US dollars. (This is in addition to whatever you else you may earn during this survey.) If you are selected, one of the 5 charities will be selected at random to receive an actual disbursement out of your endowment for the amount you selected to give them. Only one such charity will be selected; the rest of the money will be yours to keep.

Display this question:

     If Social Norm = Low

In a prior study, participants on average allocated 11% of their endowment to the charity. This means the participant on average kept how much for themselves, in $ terms, if they had $100 in their endowment?

_____

In a prior study, participants on average allocated 69% of their endowment to the charity. This means the participant on average kept how much for themselves, in $ terms, if they had $100 in their endowment?

_____

End of Block: Social Norm Q

Start of Block: Charity

How you answer the following question will determine what portion of your endowment will be donated to ${lm://Field/2}, ${lm://Field/1}, if they are the randomly-selected charity. The length of the slider represents the maximum amount of money available to keep for yourself if ${lm://Field/1} is the selected charity. Use the slider to decide how much you want to keep for yourself. The amount to the left of the slider is what would go to you, the amount left over out of $100 would go to the charity.

$USD

0   10 20 30 40 50 60 70 80 90 100

I would keep this much $USD for myself	

How you answer the following question will determine what portion of your endowment will be donated to ${lm://Field/2}, ${lm://Field/1}, if they are the randomly-selected charity. The length of the slider represents the maximum amount of money available to give to ${lm://Field/1} if they are the selected charity. Use the slider to decide how much you want to give to this charity. The amount to the left of the slider is what would go to the charity, the amount left over out of $100 would go to you.

$USD

0   10 20 30 40 50 60 70 80 90 100

I would give this much $USD to ${lm://Field/1}	

REMEMBER: In a prior study, participants on average gave 69% of their endowment to the charity.

REMEMBER: In a prior study, participants on average gave 11% of their endowment to the charity.

REMEMBER: In a prior study, participants on average kept 31% of their endowment for themselves.

REMEMBER: In a prior study, participants on average kept 89% of their endowment for themselves.

End of Block: Charity

Start of Block: Describe..

In as much detail as possible, describe the experience you have just had of giving to the charities.

_____

End of Block: Describe..

Start of Block: Loss Aversion

Upon satisfactory completion of this survey there will be a drawing and you may be chosen at random to receive a lottery ticket that grants a 50% chance of winning $100 US dollars. (This is in addition to whatever you else you may earn during this survey.)   Write a sentence stating what you think you might use the $100 for, if you were to win it.

_____

If you do win the lottery ticket, you will have the opportunity to sell it for money. The price of the lottery ticket will be determined later at random. Any money you receive from selling the lottery ticket, or winnings you receive from the lottery ticket if you do not sell it, will be yours to keep at the conclusion of the experiment.

Here, we would like you to tell us your preference for selling the lottery ticket for different amounts of money versus keeping it. Your answers here are your actual asking price for the lottery ticket: if you do win the lottery ticket, you will successfully sell it for your lowest "ask" if that asking price is lower than the randomly-determined price.

Please make sure to make a choice for each row.

Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $100
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $95
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $90
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $85
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $80
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $75
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $70
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $65
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $60
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $55
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $50
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $45
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $40
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $35
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $30
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $25
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $20
Keep Lottery Ticket	○	○	Sell the lottery ticket at a price of $15

Upon satisfactory completion of this survey there will be a drawing and you may be chosen at random to receive $50 USD dollars. (This is in addition to whatever else you may earn during this survey.)   Write a sentence stating what you think you might use the $50 for, if you were to win it.

_____

If you do win the $50, you will have the opportunity to spend part of the winnings on a lottery ticket that grants a 50% chance of winning $100 US dollars. The price of the lottery ticket will be determined later at random. Any money you win from the lottery ticket, or have left over after purchasing or not purchasing the lottery ticket, will be yours to keep at the conclusion of the experiment.

Here, we would like you to tell us your preference for buying the lottery ticket for different amounts of money versus keeping the $50. Your answers here are your actual bid for the lottery ticket: if you do win the $50, you will get the ticket for your highest bid if that bid is greater than the randomly-determined price.

Please make sure to make a choice for each row.

Keep $50	○	○	Buy the lottery ticket at a price of $50 and keep the remaining $0
Keep $50	○	○	Buy the lottery ticket at a price of $45 and keep the remaining $5
Keep $50	○	○	Buy the lottery ticket at a price of $40 and keep the remaining $10
Keep $50	○	○	Buy the lottery ticket at a price of $35 and keep the remaining $15
Keep $50	○	○	Buy the lottery ticket at a price of $30 and keep the remaining $20
Keep $50	○	○	Buy the lottery ticket at a price of $25 and keep the remaining $25
Keep $50	○	○	Buy the lottery ticket at a price of $20 and keep the remaining $30
Keep $50	○	○	Buy the lottery ticket at a price of $15 and keep the remaining $35
Keep $50	○	○	Buy the lottery ticket at a price of $10 and keep the remaining $40

End of Block: Loss Aversion

Suppose you are given $100 and have the opportunity to give any amount of it anonymously to another person. How much will you give? Use the sliding scale below to indicate how much of the $100 you would give to another person. (This question is purely hypothetical.)

$USD

0   10 20 30 40 50 60 70 80 90 100

I would give this much to another person	

How much have you donated to charity during the past 12 months?

○ None at all (1)

○ A little (2)

○ A moderate amount (3)

○ A lot (4)

○ A great deal (5)

For each of the seven questions appearing on this page, you will see different behaviors listed. After each behavior there will be two choices of different ways in which the behavior might be identified. Your task is to choose the answer that best describes the behavior for you. Please choose only one answer per question. Of course, there are no right or wrong answers. People simply differ in their preferences for different behavior descriptions, and we are interested in your personal preferences. Remember, choose the description that you personally believe is more appropriate in each pair.

Voting

○ Influencing the election (1)

○ Marking a ballot (2)

Cleaning the house

○ Showing one's cleanliness (1)

○ Vacuuming the floor (2)

Filling out a personality test

○ Answering questions (1)

○ Revealing what you're like (2)

Caring for house plants

○ Watering plants (1)

○ Making the room look nice (2)

Resisting temptation

○ Saying "no" (1)

○ Showing moral courage (2)

Joining the army

○ Helping the Nation's defense (1)

○ Signing up (2)

Greeting someone

○ Saying hello (1)

○ Showing friendliness (2)

End of Block: Manipulation check Qs

Start of Block: Thank you

Thank you for taking part in this study. Please click the button below to be redirected back to Prolific and register your submission.

End of Block: Thank you