3-14-2023

Simon Doesn't Say: Minimal Qualitative Distortions from Experimenter Demand

David Danz

Marissa Lepper
University of Pittsburgh

Guillermo Lezama

Priyoma Mustafi

Lise Verterlund
University of Pittsburgh

See next page for additional authors

Simon Doesn't Say: Minimal Qualitative Distortions from Experimenter Demand

David Danz Marissa Lepper Guillermo Lezama Priyoma Mustafi
Lise Vesterlund Alistair J. Wilson K. Pun Winichakul

March 14, 2023

Abstract

Experimenter demand is a clear threat to the validity of experimental results. To understand the extent of this threat for lab studies, we apply the quantitative framework from de Quidt, Haushofer and Roth (2018) to explore whether experimenter demand can generate flawed qualitative inference in experimental studies, using four classic behavioral findings. In these four settings we examine the extent to which demand can alter the nature of a comparative-static conclusion, a stronger test of the potential distortions resulting from experimenter demand. Starting with the laboratory population, we demonstrate that even in a stark environment with deliberate researcher attempts to manipulate participant behavior, quantitative effects are small and experimenter demand effects are not large enough to impact the core qualitative inferences in our four experimental comparisons. This result is then extended to two commonly used online populations, Prolific and mTurk–which show larger quantitative demand effects, but again, not large enough to alter the qualitative conclusions.

1 Introduction

Experiments provide a critical tool for testing and understanding economic phenomena where clear inference would be impossible in purely observational data. In an experiment, the researcher can induce and control the decision-making environment to uncover an isolated causal relationship. However, participants' awareness of the experiment and that their choices are contributing to the assessment of a hypothesis can distort their behavior if their actions respond to their beliefs about the underlying research question.

The ensuing “experimenter demand" can undermine the validity of an experiment’s findings, potentially leading to incorrect inferences on the nature of a causal relationship.

One way to evaluate the degree of bias caused by experimenter demand is to purposefully vary the framing of the decision-making environment. Indeed, a recent study by de Quidt, Haushofer and Roth (2018) finds significant quantitative effects from intentionally inducing experimenter demand in a series of economic decisions made by an online population. Yet, the interpretation and communication of experimental findings to both scholarly and lay audiences often boils down to the key qualitative inference (Kessler and Vesterlund, 2015). The quantitative magnitude of experimenter demand can impact qualitative inference if it generates directional results that are not truly there (false positives), can attenuate effect sizes (and create false negatives), or even reverse the true comparative static relationship if large enough. It is also possible that even large demand effects do not alter the underlying inferences on the direction of any relationship. As such, our paper focuses on measuring both the quantitative effects (which we find to be small) and assessing whether they can impact a comparative static conclusion (which we find no evidence for).

While one contribution of our paper is in extending the de Quidt, Haushofer and Roth measurements to a laboratory population, another focus in on providing insight into the links between the quantitative effects of experimenter demand *within* an isolated choice setting and the subsequent qualitative effects on inference when making comparisons *across* choice settings. To that purpose, we study four classic behavioral comparative-static findings. Using the de Quidt, Haushofer and Roth method to deliberately induce strong directional experimenter demands, we measure the extent to which participant choices can be moved in both a positive and negative direction in a fixed task. Using the exaggerated demand frame, we generate bounds on the quantitative impact of demand on each decision. However, beyond the isolated sensitivity to demand, our choice tasks are chosen to allow for a comparison across task pairs that reveal economic phenomena—an endowment effect, probability weighting, inter-temporal substitution and the tradeoffs between self and society. Using these choice pairs, we can therefore also construct bounds on the extent to which experimenter demand influences inference made on the comparative static finding across decisions in a worst case where the demand-effects interact with the experimental manipulation.

We find that the core *qualitative* inferences are unaffected across our comparisons, primarily due to small *quantitative* responses to the stark experimenter demand manipula-

tion. In addition to our core laboratory assessments, we replicate this result on two commonly used online populations, Amazon's Mechanical Turk (mTurk) and Prolific. While the demand sensitivities are larger in the online populations than the lab sample, we find no effect on qualitative inferences within the two online populations. Strengthening the bounds from de Quidt, Haushofer and Roth (2018), our results suggests that at least for these core economic domains, the potential size of demand-effects is small.

For our four canonical behavioral topics, the qualitative results are derived by comparing two decision settings, A and B, and using differences in the average choices x_A and x_B to identify the directional effect of treatment, $\Delta x = x_A - x_B$. While the four domains we examine involve fundamental economic tradeoffs (endowment, risk, inter-temporal and self-other), our comparative statics were selected for varied expected qualitative treatment effects based on literature. This allows us to examine the impact of experimenter demand on both false positives and false negatives.

Our tests of the endowment effect, the S-shaped probability-weighting function, and response to the price of giving were well-powered and explored robust phenomena with clear behavioral hypotheses. We use these contexts to examine the extent to which experimenter demand might generate a false negative (or indeed, an effect reversal). By inducing experimenter demand that minimizes the treatment effect by attempting to decrease the average choice in A while increasing it in B, we examine the manipulated treatment effect $\Delta x^{\ominus} = x_A^-$ - x_B^+. If demand effects are sufficiently large, we can thus fail to reject the null of no effect, where the literature would strongly indicate a true causal effect under the alternative $H_A : \Delta x > 0$. On the flip side, our test for present bias (and a stronger form of the charitable giving hypothesis that is not backed by economic theory) has an intuitive directional prediction; however, the literature here does not lead us to expect a rejection of the null in our sample. We therefore use these settings to explore the possibility that experimenter demand can generate a false positive where the null $H_0 : \Delta x = 0$ is incorrectly rejected. In this setting, we use the induced demand treatments to maximize the treatment effects, obtaining $\Delta x^{\oplus} = x_A^+$ - x_B^-, seeking to increase (decrease) the average choice value in the A (B) treatment.

Across our comparisons, we fail to observe any comparative static inferences that are distinct from the literature finding. Behavior responds significantly (insignificantly) to treatment in the settings where we expect (do not expect) an effect, and therefore none of the qualitative findings are affected by our extreme experimenter demand manipulations. In other words, we neither find false positive nor false negatives. This failure to

find a qualitative result reversal, which our study is constructed around, is driven by an insensitivity to demand effects within each task in the laboratory population. To probe the effect across populations, we replicate our study on both mTurk (the population used in de Quidt, Haushofer and Roth (2018)) and Prolific. Our results here mirror the findings in the laboratory sample. While the sensitivity to demand does increase in the online samples, the quantitative effects are small and we do not find any substantive evidence that the qualitative conclusions can be altered via demand effects.

The remainder of the paper is organized as follows. Section 2 describes our laboratory experimental design and Section 3 discusses the impact of experimenter demand on qualitative comparative statics. In Section 4, we summarize the small magnitudes of the quantitative effects of experimenter demand found in our laboratory population and report results from online replications on mTurk and Prolific. Finally, in Section 5 we conclude.

2 Design

Our sample consists of 236 undergraduates recruited from the Pittsburgh Experimental Economics Laboratory. We conduct 12 sessions in November 2020 that follow the virtual laboratory procedures outlined in Danz et al. (2021). Our experiment is preregistered through both the AEA RCT Registry and AsPredicted (Registration numbers AEARCTR-0006847 and #53869, respectively).[1] Participants make eight within-subject decisions, divided into four tasks, before completing a short demographic survey.[2] Payments, made over Venmo, consist of a $10 lump-sum payment, the necessary amount to cover instant transfer fees, and compensation based on one randomly selected decision.[3]

Three between-subject treatments, randomized at the session level, manipulate the induced experimenter demand environment: (i) *no demand* - 80 participants; (ii) *positive demand* - 77 participants; and (iii) *negative demand* - 79 participants.[4] The three demand environments are identical but for the addition of one sentence that is read out loud and

[1] Due to an inadvertent error with our specified sample size in the AEA registration, we follow the details described in the AsPredicted preregistration.

[2] Participants move through the study at their own pace but are required to fully listen to pre-recorded instructions for each task and decision.

[3] All lump-sum and most decision payments occur immediately following the session and the rest happen at pre-specified payment dates.

[4] We select the sample size to obtain at least 90 percent power for all comparative statics where we expect to reject the null hypothesis based on effect sizes reported in prior literature but remain underpowered for our test of present bias. See the Appendix for further information on power calculations.

shown in red on each decision screen in the positive (negative) treatment: *"You will do us a favor if you* take a higher (lower) action *than you normally would."*[5] This induces extreme experimenter demand in the desired directions, thereby eliciting the highest and lowest estimates that bound the true value $x \in [x^-, x^+]$.

Each task is composed of two questions that form the A/B decision pairs needed to study a canonical behavior.[6] We first elicit indifference points over lotteries with probability $p \in \left\{1/10, 9/10\right\}$ of winning a \$10 prize using a Becker, DeGroot and Marschak (1964) mechanism. We elicit participants' willingness-to-pay (WTP) in Task 1 and willingness-to-accept (WTA) in Task 2 for both probabilities. In Task 3, participants allocate money between two payment dates. They are endowed \$1 in the "later" period and \$10 in the "sooner" one, of which up to \$9 can be redistributed.[7] Any amount moved from the "sooner" date to the "later" date earns 20 percent interest. The sooner date – either that day or the next – varies by decision. The later date follows exactly one week after the sooner one. Finally, in Task 4 participants decide how much of a \$20 endowment to donate to a local food bank. Participants make decisions when their donation is matched dollar-for-dollar (i.e., a \$5 participant contribution yields \$10 for the charity) and when it is unmatched.[8]

3 Experimental Results

We analyze the four classic behavioral findings in turn in our laboratory sample. For each, we first outline and report results regarding the standard comparative static found in the literature. Second, we explore the extent to which experimenter demand affects qualitative inference by making comparisons across demand environments within each task. Unless otherwise stated, reported p-values are derived from t-tests examining the

[5] This is the same language used in the strong demand treatment in de Quidt, Haushofer and Roth (2018), which dates back to Binmore, Shaked and Sutton (1985)'s instructions in an ultimatum game. See also Ellingsen, Östling and Wengström (2018)'s use of strong language to deliberately induce demand effects.

[6] We maintain consistency in our implementation of statistical tests by not leveraging this within-subject identification as exploring comparative static reversals is only possible through between-subject variation in demand environments. However, our results are robust to these tests as they mechanically reduce the p-values.

[7] Having a minimum payment in both time periods removes corner solutions that result from minimizing transaction costs.

[8] Participants first see Tasks 1 and 2 in an individually randomized order, followed by Tasks 3 and 4. The order of questions within-task varies at an individual level, with the order of lottery probabilities being fixed per participant between Tasks 1 and 2.

alternative hypothesis presented within each section.

3.1 Probability Weighting

Our first comparative static uses participants' WTP for lotteries to test for the existence of a probability weighting function.[9] Participants are endowed with \$10 and make purchasing decisions over two types of lotteries that vary the probability $p \in \{\text{low} = 1/10, \text{high} = 9/10\}$ percent chance of winning \$10. According to standard economic theory, a risk-neutral agent's indifference point, i.e., their WTP for the lottery, will be the expected value (EV) of the lottery. However, loss aversion (a result of prospect theory) instead predicts probability weighting – specifically, the overweighting of low probabilities and the underweighting of high ones (Kahneman and Tversky, 1979; Prelec, 1998).[10]

Classic comparative static: We expect participants' WTP to be above (below) the EV for low-(high-)probability lotteries. The probability weighting comparative static is thus the joint effect of:

$$H_A : \text{Probability weighting}_{\text{Low-}p} = \text{WTP}_{\text{Low-}p} > \text{EV}_{\text{Low-}p} \tag{1}$$

$$H_A : \text{Probability weighting}_{\text{High-}p} = \text{WTP}_{\text{High-}p} < \text{EV}_{\text{High-}p} \tag{2}$$

Figure 1 shows the average WTP for low (gray bars) and high (white bars) probability lotteries. The dashed red lines at \$1 and \$9 indicate the respective EVs for low- and high-probability lotteries. The furthest left cluster provides the average WTP by probability pooled across all participants, while the remaining clusters are separated by demand environment. The figure clearly demonstrates the behavioral probability weighting finding: within each cluster, high-probability lotteries are valued on average significantly below \$9 while low-probability lotteries are valued significantly above \$1. When pooling across demand environments, we find an average valuation of \$6.33 ($p < 0.001$) for high-probability lotteries and of \$1.87 ($p < 0.001$) for low-probability ones. The largest p-value across the six comparisons (lottery X demand environment combination) in isolation is $p = 0.002$[11], meaning that probability weighting is seen in every comparison. Joint tests of no difference between the WTP of both lottery types and their respective EV are rejected with high confidence ($p < 0.001$ in all comparisons) in favor of the predicted over-

[9] Our findings are all robust to using WTA.

[10] All analysis is robust to relaxing the assumption of risk neutrality by additionally using the implied average CRRA utility parameter in non-linear tests of differences.

[11] This p-value is found in the low-probability lottery with no demand.

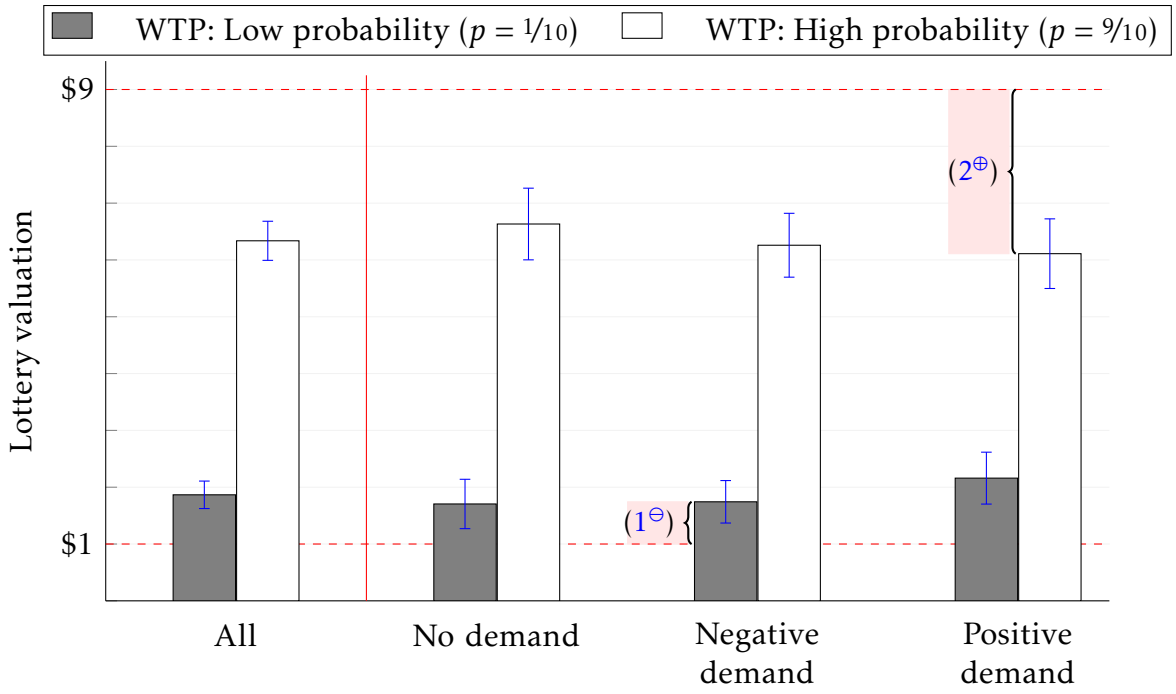


Figure 1: Probability Weighting

Note: Average WTP for a lottery with a Low ($p = 1/10$) or High ($p = 9/10$) chance of winning \$10, both pooled and separated by demand environment. Solid blue lines represent 95 percent confidence intervals. Dashed red lines demarcate $\text{EV}_p = p \cdot \$10$.

or under-weighting directions in each treatment.[12]

Tests for a false negative & comparative static reversal: We compare choices over the low- (high-)probability lottery made in the negative (positive) demand environment against the EV. Comparing these choices to the EV tests if experimenter demand can create a false negative by attenuating effects that would support the existence of a probability weighting function or, more strongly, reverse the direction of the comparative static. We explore this through the joint assessment of the following relationships, denoted by the red shaded areas in Figure 1:

$$\text{Probability weighting}^{\ominus}_{\text{Low-}p} = \text{WTP}^{-}_{\text{Low-}p} - \text{EV}_{\text{Low-}p}, \qquad (1^{\ominus})$$

$$\text{Probability weighting}^{\ominus}_{\text{High-}p} = \text{WTP}^{+}_{\text{High-}p} - \text{EV}_{\text{High-}p} \qquad (2^{\oplus})$$

First, we do not find that experimenter demand causes any false negatives. In the negative demand environment ($1^{\ominus}$), we find $\text{Probability weighting}^{\ominus}_{\text{Low-}p}$ =\$1.74, demon-

[12] Joint test p-values are from F-tests for similar $WTP–EV$ differences across the two lotteries. A stronger null hypothesis, that *both* differences are zero (i.e., risk neutrality) leads to qualitatively similar results.

strating that the average valuation of the low-probability lottery is still above its EV ($p < 0.001$). Conversely, the average valuation of the high-probability lottery in the positive-demand environment ($2^{\oplus}$) is well below its EV (Probability weighting$^{\ominus}_{\text{High-}p}$=\$6.11, $p < 0.001$). We reject the null hypothesis for the joint assessment of equivalence across the two lottery types with high confidence ($p < 0.001$). Thus, the classic behavioral inference of an s-shaped probability weighting function is not meaningfully attenuated, much less reversed, with strong experimenter demand.

3.2 Endowment Effect

Our second comparative static focuses on the endowment effect where, due to loss aversion, the minimum price an agent would sell an item for (i.e., their willingness-to-*accept*) exceeds the maximum price they would pay for the same item (i.e., their willingness-to-*pay*) (Kahneman, Knetsch and Thaler, 1990, 1991). This phenomenon contrasts procedural invariance, which generates the non-behavioral prediction that WTA and WTP are identical. We test for the endowment effect by comparing the average WTA and WTP for each lottery type.

Classic comparative static: We expect participants' WTA to be larger than their WTP for each lottery type. The endowment effect comparative statics are therefore:

$$H_A : \text{Endowment effect}_{\text{Low-}p} = \text{WTA}_{\text{Low-}p} - \text{WTP}_{\text{Low-}p} \qquad > 0 \qquad (3)$$

$$H_A : \text{Endowment effect}_{\text{High-}p} = \text{WTA}_{\text{High-}p} - \text{WTP}_{\text{High-}p} \qquad > 0 \qquad (4)$$

Figure 2 shows the average WTA (white bars) and WTP (gray bars) for each lottery type. We find evidence of the endowment effect using data pooled across demand environment (the far-left cluster) and when looking within each demand environment. On average, participants pooled across all demand environments require more to sell their lotteries (\$3.15 and \$6.95 for the low- and high-probability lotteries, respectively) than they are willing to pay to acquire the exact same ones (\$1.86 and \$6.33, respectively). These differences are significant both individually (low – $p < 0.001$; high – $p = 0.019$) and jointly ($p < 0.001$). When we compare the average WTA to the average WTP within each demand environment, we find evidence for the endowment effect for all but one lottery.[13] We reject the joint-null of no-effect in the comparison pair for each environment

[13] We find a null ($p = 0.731$) for the high-probability lottery in the no-demand environment.

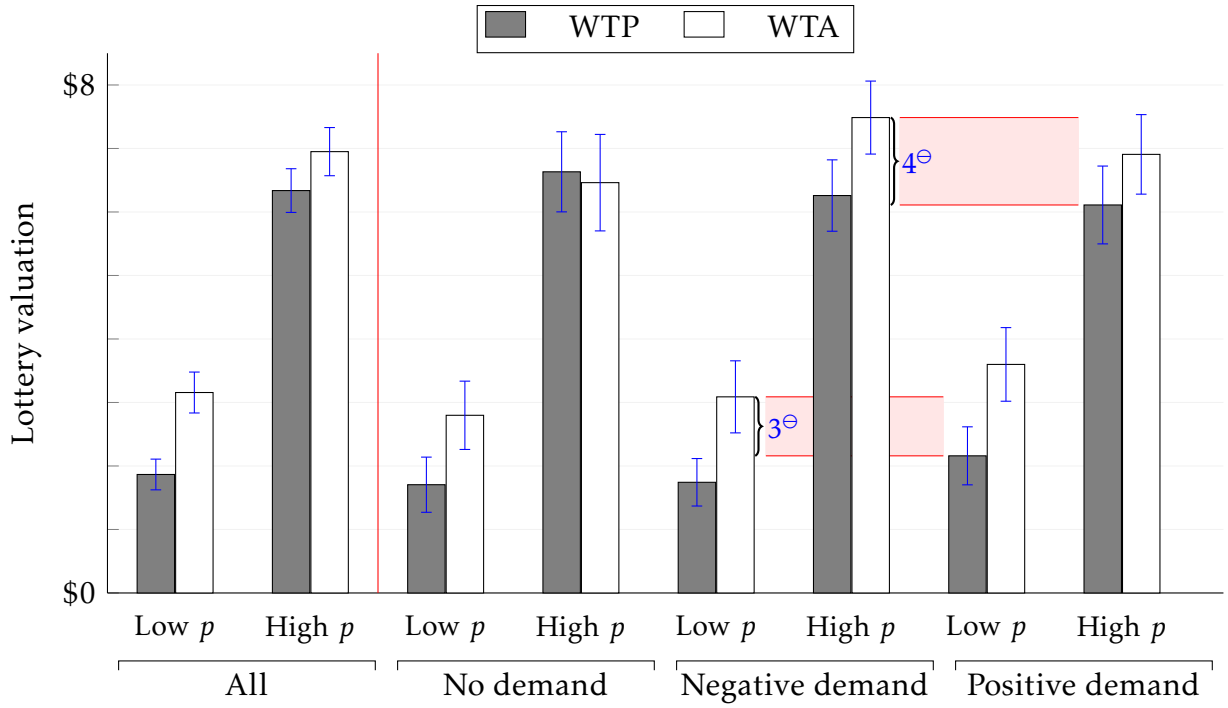


Figure 2: Endowment Effect

Note: Average WTP and WTA for lotteries with a Low ($p = 1/10$) or High ($p = 9/10$) chance of winning \$10, both pooled and separated by demand environment. Blue lines represent 95 percent confidence intervals.

in isolation with a maximal p-value of 0.037, found in the no demand environment.[14]

Tests for a false negative & comparative static reversal: We compare WTA decisions in the negative demand environment to WTP decisions in the positive demand environment. This tests if experimenter demand can create a false negative by attenuating results that would be consistent with the endowment effect or, more strongly, reverse the direction of the comparative static and lead to WTP above WTA. Specifically, for both lottery types we explore the following relationships, denoted by the red shaded areas in Figure 2:

$$\text{Endowment effect}^{\ominus}_{\text{Low-}p} = \text{WTA}^{-}_{\text{Low-}p} - \text{WTP}^{+}_{\text{Low-}p} \qquad (3^{\ominus})$$

$$\text{Endowment effect}^{\ominus}_{\text{High-}p} = \text{WTA}^{-}_{\text{High-}p} - \text{WTP}^{+}_{\text{High-}p} \qquad (4^{\ominus})$$

Overall, we do not find that experimenter demand creates false negatives. When par-

[14] We find smaller effects for the high-probability lottery comparisons (with univariate test p-values of 0.001/0.731/0.072 for the negative, no demand, and positive environments, respectively) than the low-probability ones (0.000/0.002/0.000), demonstrating that low-probability lotteries drive our result.

ticipants are asked to under-value items they own and over-value the same item when they do not, the valuation gap between WTA and WTP in the low-probability lottery ($3^{\ominus}$) is attenuated in both magnitude (Endowment effect$^{\ominus}_{\text{Low-}p}$=\$0.93) and p-value, but remains significant ($p = 0.012$). The valuation gap in the high-probability lottery ($4^{\ominus}$), which already had quantitatively smaller effects when making comparisons within demand environment, actually increases (Endowment effect$^{\ominus}_{\text{High-}p}$=\$1.38, $p = 0.001$). To a certain extent, the *increasing* gap in the high probability lottery resulting from experimenter demand could be analogous to what one might expect from pure statistical noise. Ultimately, our inability to generate a false negative for either lottery type also means that we do not find any reversals of the canonical endowment effect ($p < 0.001$ for the joint assessment). Thus, even extreme experimenter demand cannot remove the endowment effect nor reverse the classic behavioral finding.

3.3 Present Biased Preferences

Our third comparative static examines an intertemporal phenomenon: present bias. Participants redistribute up to \$9 from a sooner payment date ($t \in \{\text{Immediate} = 0, \text{Delay} = 1\}$) to a later one ($t + 7$), earning 20 percent interest on any amount pushed to the future.[15] Standard theory predicts that only the temporal distance between payment dates influences intertemporal allocation decisions. This distance is fixed at one week for both decisions, meaning that the average choice value should not vary across t. However, if decision makers have a present bias parameter that uniformly discounts everything that is not immediate, they will instead demonstrate extreme impatience (Laibson, 1997; O'Donoghue and Rabin, 1999). The desire for immediate gratification leads to present bias, lowering the amount transferred to the later date (and therefore the amount of interest earned) when the sooner payment is not immediate and instead made with a small delay.

Classic comparative static: Participants with present bias preferences will transfer more money to the later payment date when the sooner date is delayed. The present bias comparative static is therefore:

$$H_A : \text{Present bias} = \text{Transfer}_{\text{Delay}-t} - \text{Transfer}_{\text{Immediate}-t} > 0 \tag{5}$$

[15] Our analysis is over the amount pushed back, but is robust to instead using the later payment amount (a simple monotonic transformation account for interest) as the outcome.

However, we use a convex budget set adapted from Andreoni and Sprenger (2012) and calculate power based on their results to deliberately select a sample size small enough that we expect to fail to reject the null of dynamic consistency. We therefore leverage our underpowered setting to examine if experimenter demand can generate a false qualitative finding.

Figure 3 shows the average allocation to the later payment date when the sooner date is either immediate (gray bars) or delayed by one day (white bars), both using the pooled data and looking within each demand environment. While the results presented in Figure 3 provide suggestive evidence of present bias, they also reflect the underpowered nature of the sample. For example, the pooled data shows that the average amount transferred to the later payment date is \$8.05 when the sooner date is delayed. In comparison, the average transfer is \$7.88 when the sooner payment is immediate. Although this pattern is consistent with present-bias, the effect is not significant ($p = 0.339$). This pattern of differences in average choices across t in the correct direction but not significant holds within each demand environment.[16] As such, our results are consistent with our expectation of failing to reject the null hypothesis.

Tests for a false positive & comparative static reversal: We compare choices when the sooner date is delayed in the positive demand environment to choices when the sooner date is immediate in the negative demand environment. This tests if experimenter demand can create a false positive. We additionally test if we can reverse the direction of the comparative static through the opposite comparison.[17] These tests are explored through the following relationships, one which maximizes and the other which minimizes the treatment effect:

$$\text{Present bias}^{\oplus} = \text{Transfer}^{+}_{\text{Delay}-t} - \text{Transfer}^{-}_{\text{Immediate}-t} \tag{5$^{\oplus}$}$$

$$\text{Present bias}^{\ominus} = \text{Transfer}^{-}_{\text{Delay}-t} - \text{Transfer}^{+}_{\text{Immediate}-t} \tag{5$^{\ominus}$}$$

We do not find that inducing asymmetric experimenter demand designed to push behavior toward present bias causes a false positive result. Transfers to the later payment date are larger when the sooner date is delayed (5$^{\oplus}$) (Present Bias$^{\oplus}$=\$0.23) but not significant ($p = 0.465$). We are, however, able to reverse the direction of the classic comparative

[16] The largest difference occurs in no demand environment, where participants transfer \$0.36 more to the later date when the sooner payment is delayed ($p = 0.239$).

[17] Testing for the reversal of the comparative static requires comparing choices when the sooner date is delayed in the negative demand environment to choices when the sooner date is immediate in the positive demand environment.

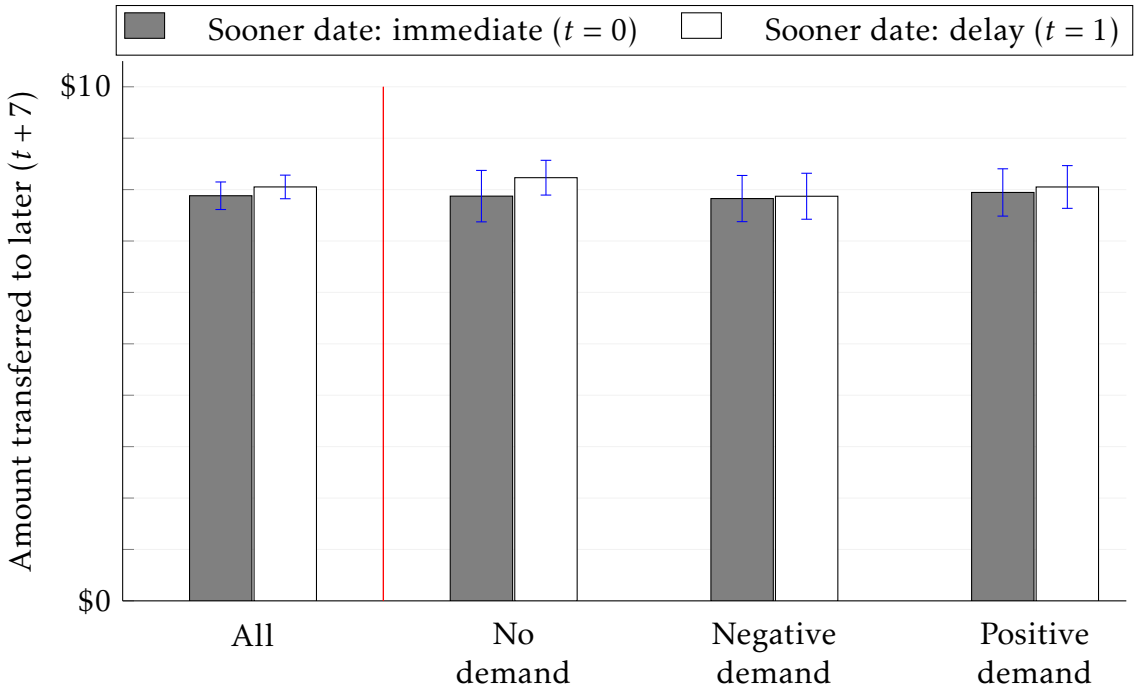


Figure 3: Present Biased Preferences

Note: Average amount of money postponed to the later date when the sooner date is Immediate ($t = 0$) or has a Delay ($t = 1$), both pooled and separated by demand environment. Blue lines represent 95 percent confidence intervals.

static ($5^{\ominus}$) by generating transfers to the later payment date that are smaller when the sooner date is delayed (Present Bias$^{\ominus}$ = –\$0.07), although not significantly ($p = 0.819$). Altogether, our strong experimenter demand manipulations do not distort the qualitative inference of present bias, neither by creating a false positive result nor by generating a significant comparative static reversal.

3.4 Donation Responses to the Price of Giving

Our fourth comparative static examines responses to changes in the price of charitable giving. In each of the two decisions, we endow participants with \$20 to allocate between themselves and a local food bank. We vary the price of giving, $p \in \{\text{low} = \$0.50, \text{high} = \$1\}$, through the presence (or lack thereof) of a one-to-one contribution match. Participants decide their out-of-pocket contribution, which we also refer to as the "self-cost" of donating. The charity then receives a donation of $D(p)$ for an out-of-pocket contribution of $p \cdot D(p)$. Choice theory predicts that a ceteris paribus decrease in the cost of giving, p, increases the total donation received by the charity, $D(p)$. Models of impure altruism in

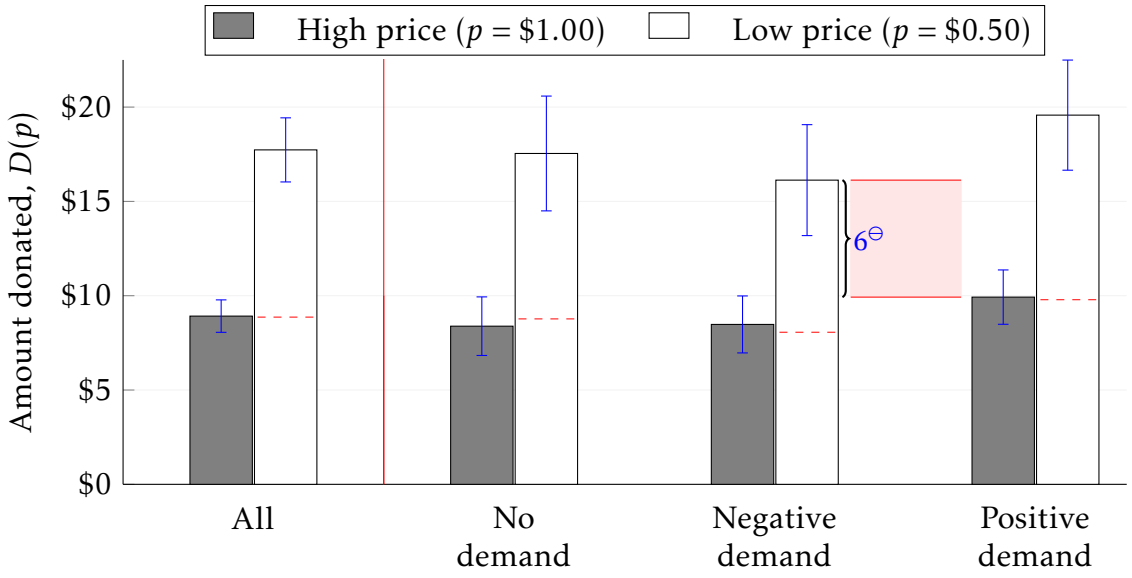


Figure 4: Response to the Price of Giving

Note: Average donation received by the charity when the price is Low ($p = \$0.50$)) or High ($p = \$1.00$), both pooled and separated by demand environment. Solid blue lines represent 95 percent confidence intervals. Dashed red lines demarcate the average self-cost, $p \cdot D(p)$, for matched donations.

which individuals value both their individual donation and total public good provision predict incomplete crowd out and therefore potentially a lower out-of-pocket contribution (Andreoni, 1989), but still imply an increase in the total amount received by the charity in response to a price reduction. Existing empirical evidence (e.g., Andreoni and Miller, 2002; Huck and Rasul, 2011; Karlan and List, 2007) finds this inverse relationship between $D(p)$ and the price of giving.[18]

Classic comparative static: We expect the donation received by the charity, $D(p)$, to increase when the price of giving is lower, i.e., contributions are matched. The comparative static over donation responses to the price of giving is therefore:

$$H_A : \text{Donation response} = D(p_{\text{Low}}) - D(p_{\text{High}}) > 0. \tag{6}$$

Figure 4 shows the average donation received by the charity when the price of giv-

[18] Foundational models of voluntary public good provision instead predict that $D(p)$ is independent of p, as individuals would reduce their self-cost in response to the lower price (Bergstrom, Blume and Varian, 1986). We also consider results with the self-cost, $p \cdot D(p)$, as the outcome. Existing empirical evidence has found mixed results in terms of how out-of-pocket contributions react to a price shock (Huck and Rasul, 2011; Karlan and List, 2007). We therefore examine whether self-costs decrease, as one might expect from foundational public goods provision models or models of impure altruism (Andreoni, 1989), or if they remain constant as one might expect from models of pure warm-glow.

ing is high (gray bars) and low (white bars), using pooled data and then separated by demand environment. Figure 4 clearly illustrates an inverse relationship between the price of giving and the donation amount received, as expected. This increase in the donation received by the charity when the price of giving decreases is observed in both the pooled data ($8.81) and within each demand environment ($7.65/$9.12/$9.65 for the negative/no/positive environments, respectively). All comparisons are significant at the $p < 0.001$ level.[19]

Tests for a false negative & comparative static reversal: We compare donations received by the charity when the price of giving is low in the positive demand environment to donations when the price is high in the negative demand environment. This tests if experimenter demand can create a false negative by attenuating results or, more strongly, reverse the direction of the comparative static. In particular, we explore the following relationship, denoted by the red shaded area in Figure 4:

$$\text{Donation response}^{\ominus} = D^{-}(p_{\text{Low}}) - D^{+}(p_{\text{High}}) \qquad (6^{\ominus})$$

We do not find that inducing asymmetric experimenter demand designed to reduce donations received by the charity when prices are low and increase donations when prices are high causes a false negative. Donation amounts received by the charity when prices are low are still significantly larger than when prices are high ($p < 0.001$), although the difference is lower (*Donation effect*$^{\ominus}$ = $6.20).[20] Our inability to generate a false negative for the response to the price of giving means that we also do not find a reversal of our classic comparative static ($6^{\ominus}$). Taken together, we find limited evidence that qualitative inference is affected even by extreme experimenter demand in the domain of charitable giving.

[19] In contrast, we find no significant differences in the self-cost of the donation, represented in Figure 4 by comparing the heights of the high-price bars to the dashed red lines in each cluster. We fail to reject the null with the pooled data ($p = 0.931$) or in any of the three demand environments. The smallest p-value among the latter tests is 0.696, found in the negative demand environment.

[20] We also examine the extent to which inferences about the self-cost of donating may be impacted. Since we do not have a clear directional prediction for the self-cost outcome, we both maximize and minimize the difference in self-costs between the two prices. Maximizing the treatment effect through experimenter demand insignificantly increases the average low-price self-costs compared to high-price ones (Self-cost effect$^{\oplus}$ = $\frac{1}{2}D^{+}(p_{\text{Low}}) - D^{-}(p_{\text{High}})$=$1.31, $p = 0.217$) and therefore does not qualitatively change our result. When we instead minimize the treatment effect, the average self-costs when prices are low decrease compared to when they are high (Self-cost effect$^{\ominus}$ = $\frac{1}{2}D^{-}(p_{\text{Low}}) - D^{+}(p_{\text{High}})$=$1.86), an effect that is marginally significant ($p = 0.074$). We note, however, that Bonferroni adjustments to account for the number of hypotheses examined renders this result insignificant.

4 Quantitative Effects and Online Replications

In the previous section, we show that strongly induced experimenter demand does not distort *qualitative* inference in a laboratory setting. The lack of impact on the core comparative statics stems from quantitative effects that are small in magnitude. Following the approach in de Quidt, Haushofer and Roth (2018), we document the quantitative sensitivity to experimenter demand for each of the eight experimental decisions. The results are reported in panel (a) of Figure 5, where each bar is the z-scored difference between the average decision in the positive or negative demand environment using the no demand environment as a baseline. We also estimate the pooled effects across the eight decisions in the "All Tasks" measure.

The All Tasks measure shows that the pooled impact of the positive demand environment (0.10σ) is only marginally significant ($p = 0.08$), while the pooled impact of the negative environment is not significantly different than baseline. Similar conclusions follow for each separate decision—the only significant quantitative effect we find in the predicted direction is in the low-p WTA elicitation.[21]

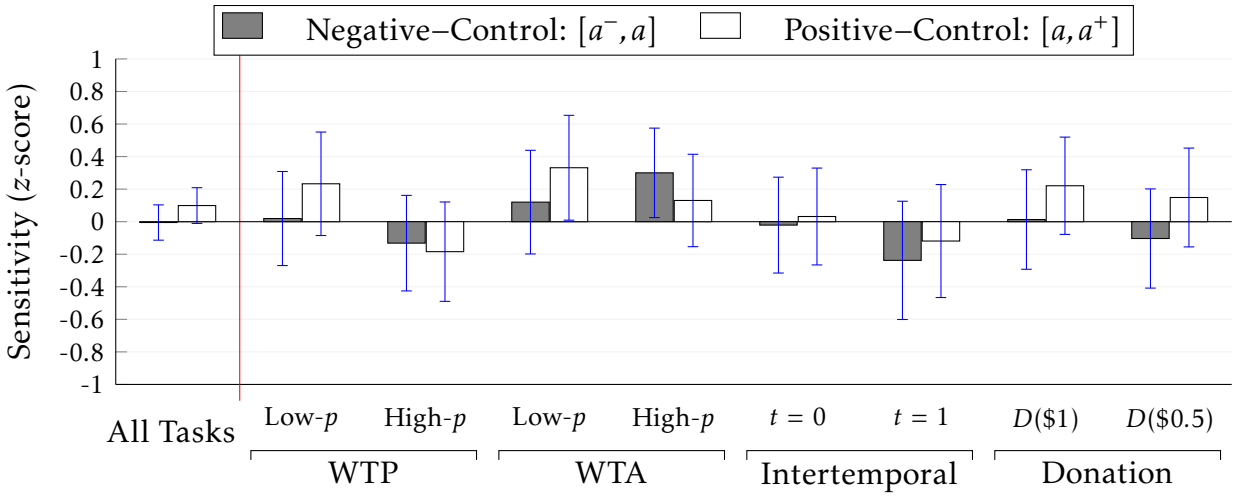
In addition to the novel laboratory population, we replicate our design in two online experiments using 756 participants recruited on Amazon Mechanical Turk and 732 participants recruiting on Prolific.[22] This broadens our understanding of how susceptible qualitative inference is to experimenter demand by demonstrating that our results are not specific to the laboratory population. The quantitative results from the mTurk and Prolific replications are reported in panels (b) and (c) of Figure 5.[23]

Like the lab, the quantitative impacts of experimenter demand in our online samples are small but estimated with greater precision given the larger respective samples. Unlike in the lab, however, the positive and negative demand environments on mTurk (Prolific) both generate statistically significant pooled effects of 0.15σ (0.10σ) and -0.08σ (-0.10σ) in the induced directions. When looking at each task individually for the mTurk population, the largest effects of the positive demand environment are found in the unmatched

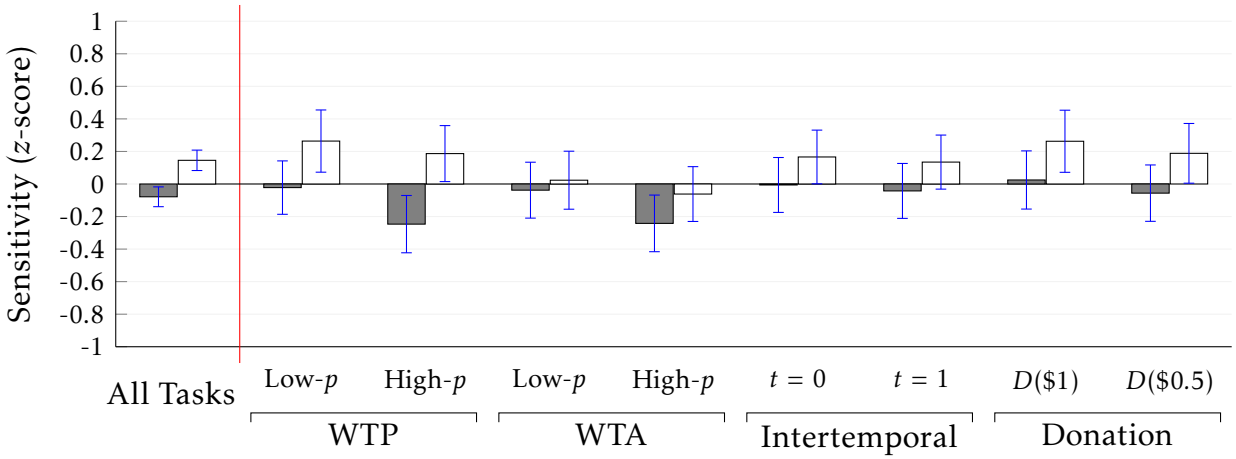
[21] We do find a significant demand effect on the high-p WTA lottery, however, in the *opposite* direction of the predicted outcome.

[22] Our MTurk and Prolific replications differs from the lab portion as follows: (i) We lower the incentives by one-fifth (a lump-sum payment of $2 and task incentives between $1-2) to create ecologically valid stake sizes. (ii) Demand environment randomization happens at the individual level.

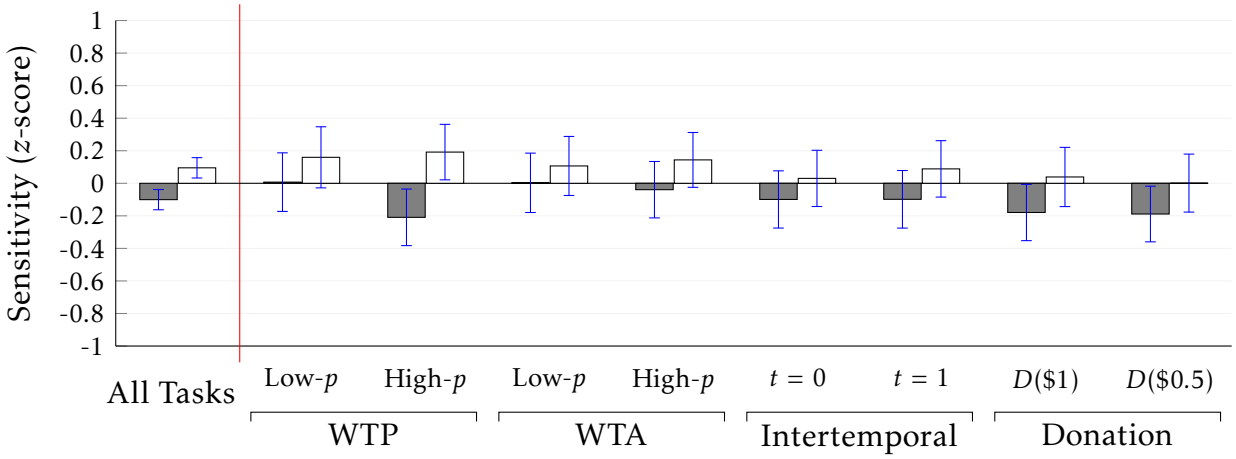
[23] We include full qualitative results from our MTurk and Prolific replications in the Appendix. On Prolific, we do not produce the classic probability weighting comparative static for the low-probability lottery in the no demand environment ($p = 0.102$); however, the joint test across lotteries is statistically significant.



(a) Laboratory



(b) MTurk



(c) Prolific

Figure 5: Sensitivity Analysis

charitable-donation decision and the low-p WTP elicitation, both 0.26σ. For the negative demand environment, we find the largest effects for the high-probability lotteries for both WTA and WTP elicitations, of -0.24σ and -0.25σ, respectively. While the pooled effect magnitudes are similar on Prolific to those found on mTurk, we find differences in which individual tasks exhibit the greatest quantitative sensitivity to the demand environments. On Prolific, we find that WTP elicitations across both lottery types (0.16σ for low, 0.19σ for high) are most sensitive to the positive demand environment, while both donation decisions (-0.18σ for unmatched, -0.19σ for matched) and WTP for the high-probability lottery (-0.21σ) are most affected by the negative demand environment.

As with the laboratory findings, the small quantitative effects translate into limited distortions to qualitative inference in our online populations, with no evidence of false negatives or comparative static reversals. However, as shown in Figure A.4 and Figure A.8, we find the potential for experimenter demand to create false positives in our underpowered test of present bias among our online populations.[24] While not identifiable within our design, we consider potential explanations for the smaller quantitative effects than those estimated in de Quidt, Haushofer and Roth (2018), which also serve as exploratory avenues for future work. First, the difference may be driven by differences between the populations. Although both studies use MTurk, de Quidt, Haushofer and Roth (2018) ran in 2016/2017 while we ran at the end of 2020 during the COVID-19 pandemic. In complement, recent quality control advancements for online participant recruitment unavailable on mTurk when de Quidt, Haushofer and Roth (2018) was run may also serve to attenuate the impacts of experimenter demand on this platform. These factors are important to consider when evaluating the extent to which experimenter demand poses an inferential threat in experimental contexts.

Finally, it is important to reiterate that our decision environment is an extreme one where experimenter demand is deliberately and asymmetrically induced, meaning that the impacts found in our study are much larger than those that one might expect to find in a standard experiment. This case of limited distortion on inference in multiple online populations frequently used by researchers, coupled with the lack of distortions in the lab setting, suggests a muted role of demand on the qualitative findings of experimental studies more broadly.

[24] We also find an impact on inference about the self-cost of charitable contributions, shown in Figure A.5 and Figure A.9. However, given the mixed empirical evidence over this result, we neither interpret the findings as *false* positive or negative results.

5 Conclusion

This study tests if experimenter demand can distort key inferences drawn from laboratory experiments. We follow the technique introduced by de Quidt, Haushofer and Roth (2018) to bound the quantitative impact of experimenter demand on decisions made within four classic behavioral phenomena. We then use these bounds to explore if the most extreme instances of experimenter demand can generate false negative results, false positive outcomes, or reverse comparative statics, each of which threatens qualitative implications drawn from experimental studies. Using a novel laboratory population, we find small quantitative effects of experimenter demand that do not impact qualitative inference. We view this as an encouraging sign that qualitative inference from experiments is likely robust to concerns of experimenter demand, particularly given its deliberate imposition in our context.

References

Andreoni, James. 1989. "Giving with impure altruism: Applications to charity and Ricardian equivalence." *Journal of Political Economy*, 97(6): 1447–58.

Andreoni, James, and Charles Sprenger. 2012. "Estimating time preferences from convex budgets." *American Economic Review*, 102(7): 3333–56.

Andreoni, James, and John Miller. 2002. "Giving according to GARP: An experimental test of the consistency of preferences for altruism." *Econometrica*, 70(2): 737–753.

Becker, Gordon M, Morris H DeGroot, and Jacob Marschak. 1964. "Measuring utility by a single-response sequential method." *Behavioral Science*, 9(3): 226–232.

Bergstrom, Theodore, Lawrence Blume, and Hal Varian. 1986. "On the private provision of public goods." *Journal of Public Economics*, 29(1): 25–49.

Binmore, Ken, Avner Shaked, and John Sutton. 1985. "Testing noncooperative bargaining theory: A preliminary study." *American Economic Review*, 75(5): 1178–1180.

Danz, David, Neeraja Gupta, Marissa Lepper, Lise Vesterlund, and K. Pun Winichakul. 2021. "Going virtual: A step-by-step guide to taking the in-person experimental lab online." Available at SSRN: http://dx.doi.org/10.2139/ssrn.3931028.

de Quidt, Jonathan, Johannes Haushofer, and Christopher Roth. 2018. "Measuring and bouding experimenter demand." *American Economic Review*, 108(11): 3266–3302.

Ellingsen, Tore, Robert Östling, and Erik Wengström. 2018. "How does communication affect beliefs in one-shot games with complete information?" *Games & Economic Behavior*, 107: 153–181.

Huck, Steffen, and Imran Rasul. 2011. "Matched fundraising: Evidence from a natural field experiment." *Journal of Public Economics*, 95: 351–362.

Kahneman, Daniel, and Amos Tversky. 1979. "Prospect Theory: An Analysis of Decision under Risk." *Econometrica*, 47(2): 263–292.

Kahneman, Daniel, Jack L Knetsch, and Richard H Thaler. 1990. "Experimental tests of the endowment effect and the Coase theorem." *Journal of Political Economy*, 98(6): 1325–1348.

Kahneman, Daniel, Jack L Knetsch, and Richard H Thaler. 1991. "Anomalies: The endowment effect, loss aversion, and status quo bias." *Journal of Economic Perspectives*, 5(1): 193–206.

Karlan, Dean, and John A. List. 2007. "Does price matter in charitable giving? Evidence from a large-scale natural field experiment." *American Economic Review*, 97(5): 1774—93.

Kessler, Judd, and Lise Vesterlund. 2015. *The external validity of laboratory experiments: The misleading emphasis on quantitative effects.* Vol. 18, Oxford University Press Oxford, UK.

Laibson, David. 1997. "Golden eggs and hyperbolic discounting." *Quarterly Journal of Economics*, 112(2): 443–478.

O'Donoghue, Ted, and Matthew Rabin. 1999. "Doing it now or later." *American Economic Review*, 89(1): 103–124.

Prelec, Drazen. 1998. "The probability weighting function." *Econometrica*, 497–527.

A Online Appendix: Additional Results

Table A.1: Experiment Design

Task	Endowment	Decisions
WTP	\$10	10% lottery
	\$10	90% lottery
WTA	\$10	10% lottery
	\$10	90% lottery
Time Preferences	\$10	Pay today vs. week from today
	\$10	Pay tomorrow vs. week from tomorrow
Charitable Giving	\$20	Donation not matched
	\$20	Donation matched

Note: Decisions within each task were randomized. WTA and WTP task orders were also randomly determined. In total, participants faced one of sixteen possible decision orders. Experiment stakes shown correspond to laboratory sample. Stakes were scaled down by one-fifth for the MTurk sample.

Table A.2: Summary of Participant Sample

Sample-Type	Total Participants	Participants by Treatment		
		Negative	*No-demand*	*Positive*
Laboratory	236	79	80	77
Amazon MTurk	756	245	262	249
Prolific	732	244	242	246
Totals	1,724	568	584	572

Note: Total observations are reported above for each demand treatment, and described separately for our laboratory, Amazon Mechanical Turk, and Prolific samples.

Table A.3: Comparative static tests (p-values)

(a) Laboratory

	All	Fixed demand			Mixed demand	
		No demand	Negative	Positive	Minimize$^{\ominus}$	Maximize$^{\oplus}$
Probability weighting:						
High-p	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Low-p	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001
Joint	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Endowment effect:						
Low-p	< 0.001	0.002	< 0.001	< 0.001	0.012	< 0.001
High-p	0.019	**0.731**	0.001	0.072	0.001	0.127
Joint	< 0.001	0.037	< 0.001	< 0.001	< 0.001	< 0.001
Present bias:						
	0.339	0.239	0.888	0.733	0.819	0.465
Other regarding:						
Donation effect	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Self-cost effect	0.931	0.725	0.696	0.893	**0.074**	0.217

(b) MTurk

	All	Fixed demand			Mixed demand	
		No demand	Negative	Positive	Minimize$^{\ominus}$	Maximize$^{\oplus}$
Probability weighting:						
High-p	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Low-p	< 0.001	0.001	0.001	< 0.001	0.001	< 0.001
Joint	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Endowment effect:						
Low-p	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
High-p	< 0.001	< 0.001	< 0.001	0.005	**0.574**	< 0.001
Joint	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001
Present bias:						
	0.843	0.716	0.954	0.992	**0.033**	**0.039**
Other regarding:						
Donation effect	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Self-cost effect	0.376	0.273	0.876	0.759	**0.026**	**0.007**

(c) Prolific

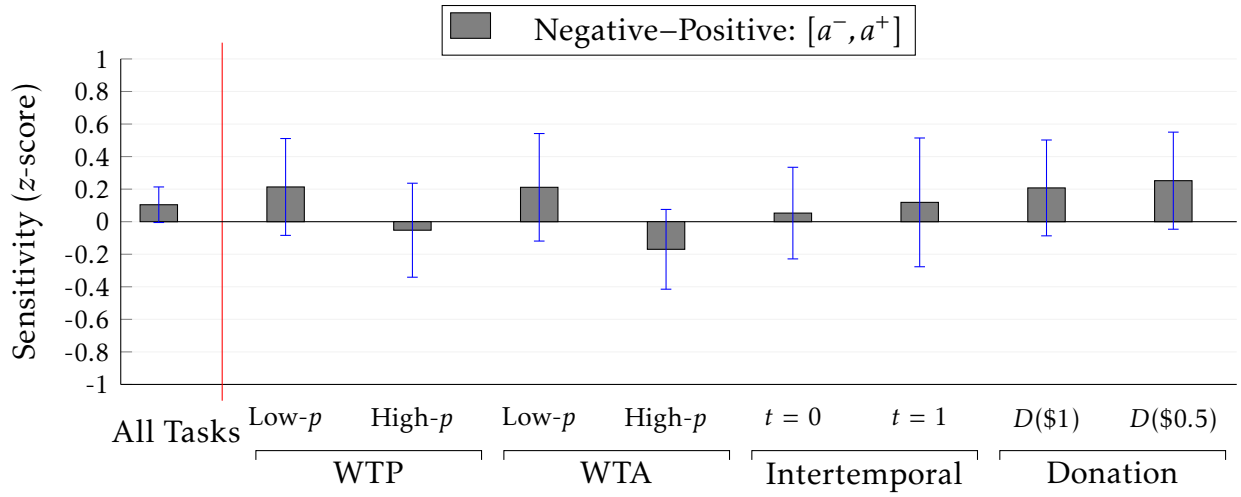
	All	Fixed demand			Mixed demand	
		No demand	Negative	Positive	Minimize$^{\ominus}$	Maximize$^{\oplus}$
Probability weighting:						
High-p	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Low-p	< 0.001	**0.102**	0.087	< 0.001	0.087	< 0.001
Joint	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Endowment effect:						
Low-p	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
High-p	< 0.001	< 0.001	< 0.001	0.011	**0.249**	< 0.001
Joint	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Present bias:						
	0.862	0.902	0.920	0.588	0.112	**0.043**
Other regarding:						
Donation effect	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Self-cost effect	0.271	0.414	0.478	0.689	**0.082**	**0.004**

Note: Significant/insignificant results against experimental expectations are provided in bold face.

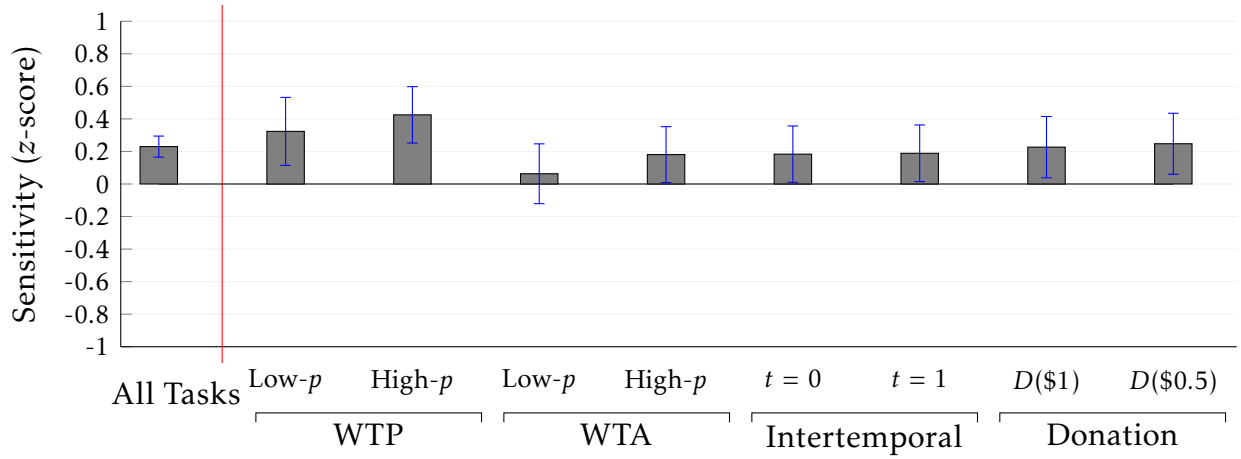
Table A.4: Summary Statistics

	$WTA_{10\%}$	$WTA_{90\%}$	$WTP_{10\%}$	$WTP_{10\%}$	Today	Tomorrow	Not-matched	Matched
Panel A: Laboratory Sessions								
Positive Demand								
Mean	3.599	6.907	2.160	6.110	7.945	8.051	9.926	19.574
Std. Err	0.291	0.314	0.229	0.308	0.231	0.209	0.723	1.466
Obs.	77	77	77	77	77	77	77	77
No demand								
Mean	2.798	6.462	1.705	6.633	7.873	8.232	8.385	17.541
Std. Err	0.270	0.382	0.218	0.317	0.251	0.170	0.780	1.529
Obs.	80	80	80	80	80	80	80	80
Negative Demand								
Mean	3.089	7.487	1.743	6.259	7.826	7.871	8.478	16.128
Std. Err	0.178	0.289	0.188	0.282	0.226	0.225	0.759	1.477
Obs.	79	79	79	79	79	79	79	79
Total Obs.	236	236	236	236	236	236	236	236
Panel B: Mturk Sessions								
Positive Demand								
Mean	3.325	6.780	2.133	6.047	6.254	6.257	5.116	10.566
Std. Err	0.197	0.192	0.180	0.177	0.213	0.216	0.388	0.758
Obs	249	249	249	249	249	249	249	249
No demand								
Mean	3.257	6.979	1.505	5.511	5.636	5.755	3.762	8.536
Std. Err	0.182	0.199	0.147	0.177	0.230	0.231	0.319	0.666
Obs	262	262	262	262	262	262	262	262
Negative Demand								
Mean	3.145	6.126	1.452	4.804	5.614	5.596	3.890	7.931
Std. Err	0.183	0.201	0.134	0.187	0.223	0.224	0.346	0.681
Obs	245	245	245	245	245	245	245	245
Total Obs.	756	756	756	756	756	756	756	756
Panel B: Prolific Sessions								
Positive Demand								
Mean	3.078	1.473	7.116	6.220	6.530	6.689	7.151	14.813
Std. Err	0.177	0.127	0.186	0.167	0.208	0.206	0.453	0.893
Obs	246	246	246	246	246	246	246	246
No demand								
Mean	2.795	1.188	6.647	5.673	6.427	6.388	6.888	14.795
Std. Err	0.171	0.115	0.210	0.183	0.221	0.218	0.435	0.893
Obs	242	242	242	242	242	242	242	242
Negative Demand								
Mean	2.803	1.201	6.518	5.076	6.085	6.054	5.675	12.172
Std. Err	0.179	0.117	0.198	0.174	0.215	0.215	0.409	0.819
Obs	244	244	244	244	244	244	244	244
Total Obs.	732	732	732	732	732	732	732	732

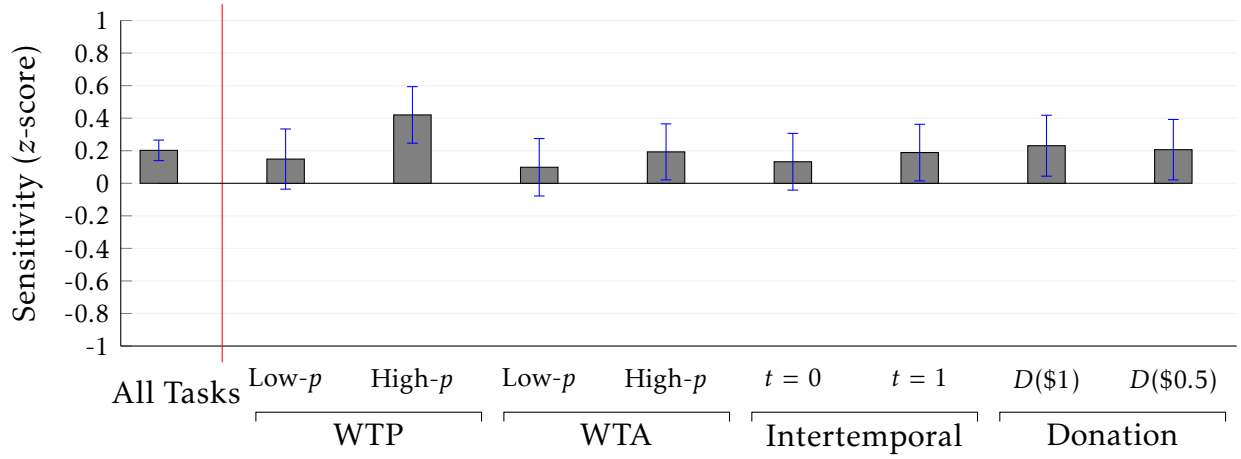
Note: This table uses data from laboratory and MTurk sessions. First half presents mean decision values with standard errors and the number of observations, for each of the demand treatment conditions, using the lab population. Second half presents mean decision values with standard errors and the number of observations, for each of the demand treatment conditions using the Mturk population.



(a) Laboratory



(b) MTurk



(c) Prolific

Figure A.1: Replicating Figure 1 of de Quidt, Haushofer and Roth (2018), Lab, MTurk, and Prolific Samples

Note: This figure measures the sensitivity of participant decisions to demand treatments for each decision. The size of each bar represents the difference between (standardized) mean decision values in the *Positive* and *Negative* demand treatments. 95 percent confidence intervals are also reported.

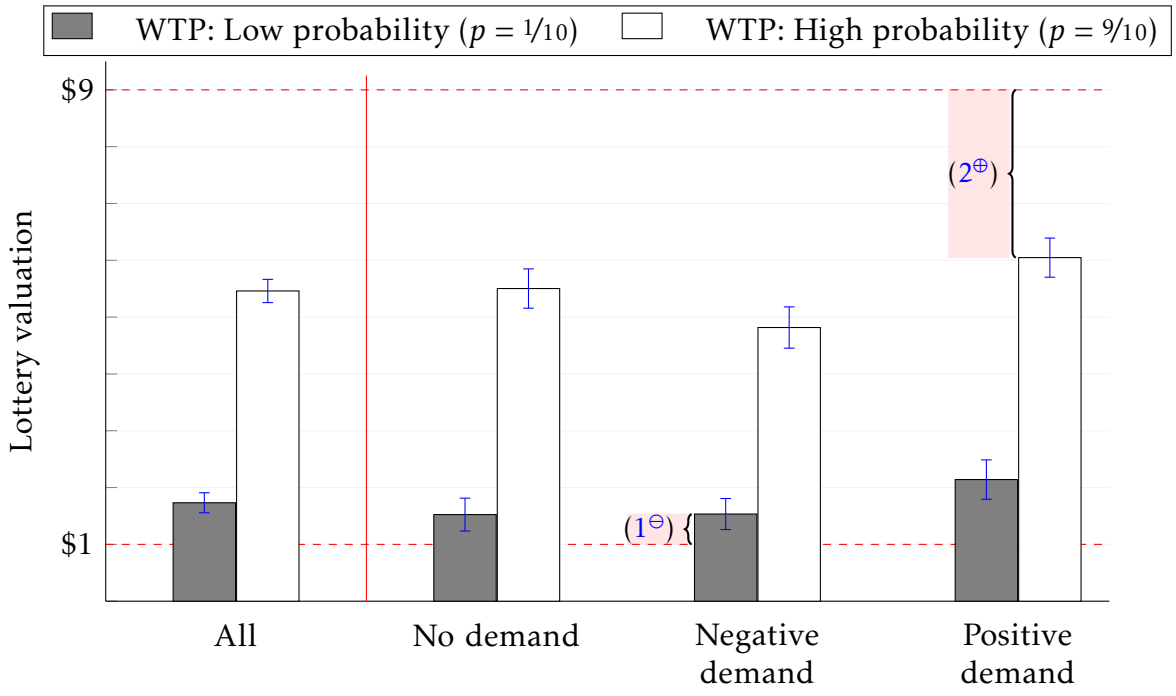


Figure A.2: Probability Weighting – MTurk Results

Note: This figure uses data from Amazon MTurk sessions. It presents mean decisions and 95 percent confidence intervals. Decision values are scaled up by 5x to compare to laboratory sample.

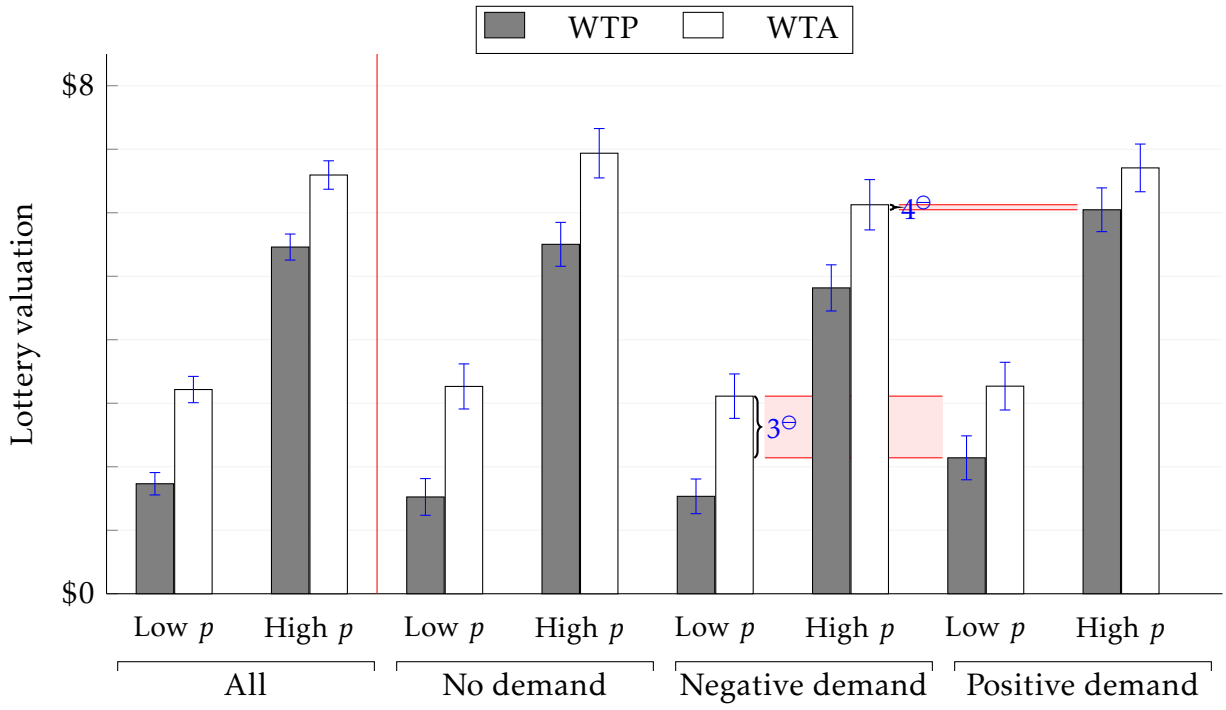


Figure A.3: Endowment Effect – MTurk Results

Note: This figure uses data from Amazon MTurk sessions. It presents mean decisions and 95 percent confidence intervals. Decision values are scaled up by 5x to compare to laboratory sample.

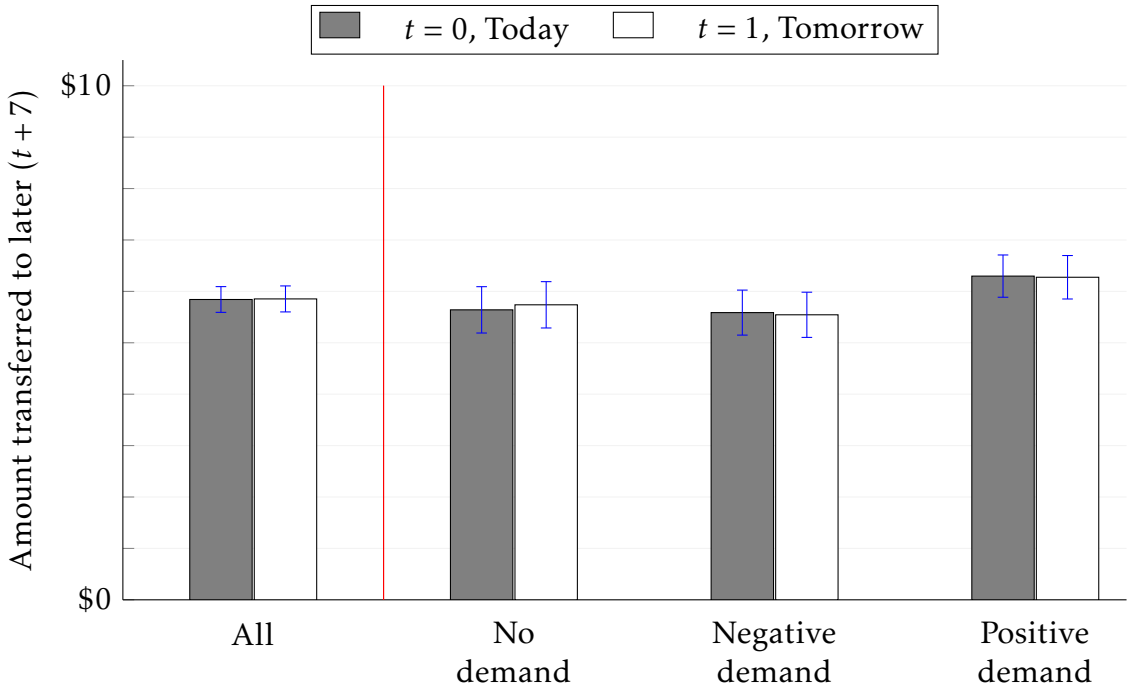


Figure A.4: Time Inconsistent Preferences – MTurk Results

Note: This figure uses data from Amazon MTurk sessions. It presents mean decisions and 95 percent confidence intervals. Decision values are scaled up by 5x to compare to laboratory sample.

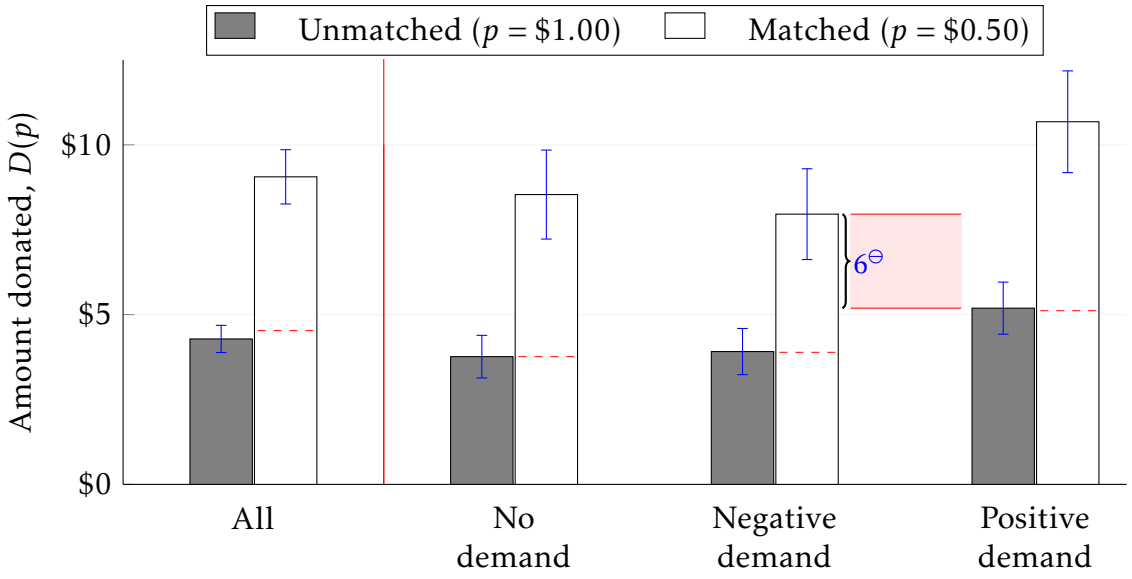


Figure A.5: Charitable Giving – MTurk Results

Note: This figure uses data from Amazon MTurk sessions. It presents mean decisions and 95 percent confidence intervals. Red dashed lines represent the average cost of the donation $p \cdot D(p)$ for relative price of giving p. Decision values are scaled up by 5x to compare to laboratory sample.

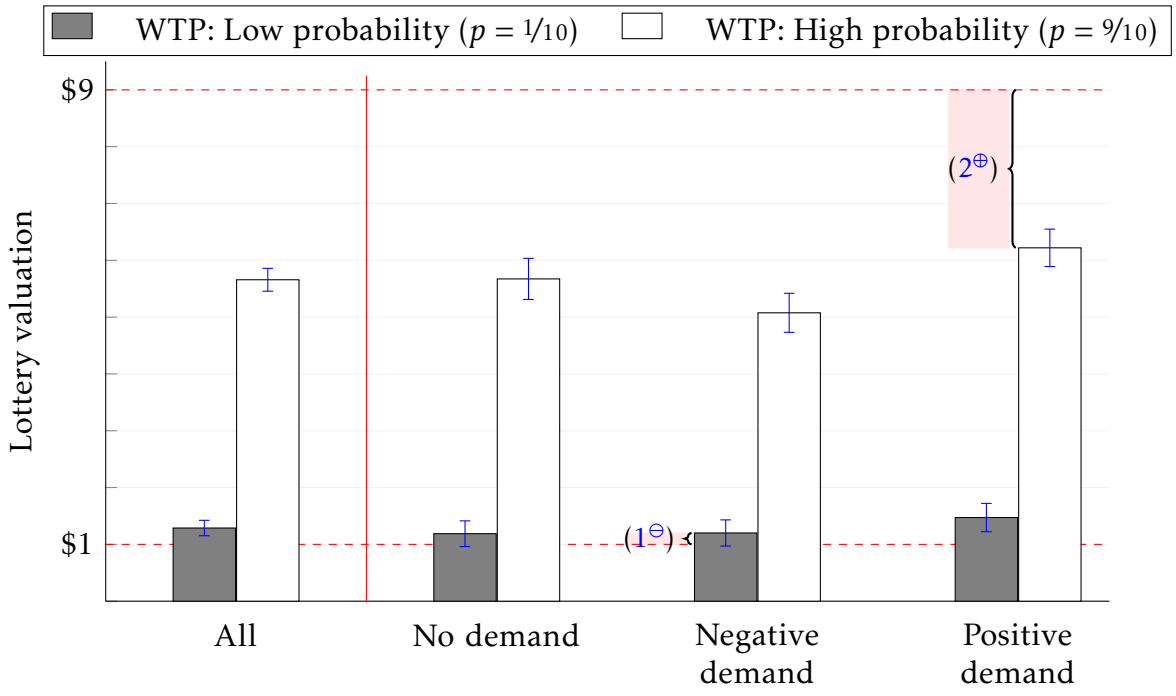


Figure A.6: Probability Weighting – Prolific Results

Note: This figure uses data from Prolific sessions. It presents mean decisions and 95 percent confidence intervals. Decision values are scaled up by 5x to compare to laboratory sample.

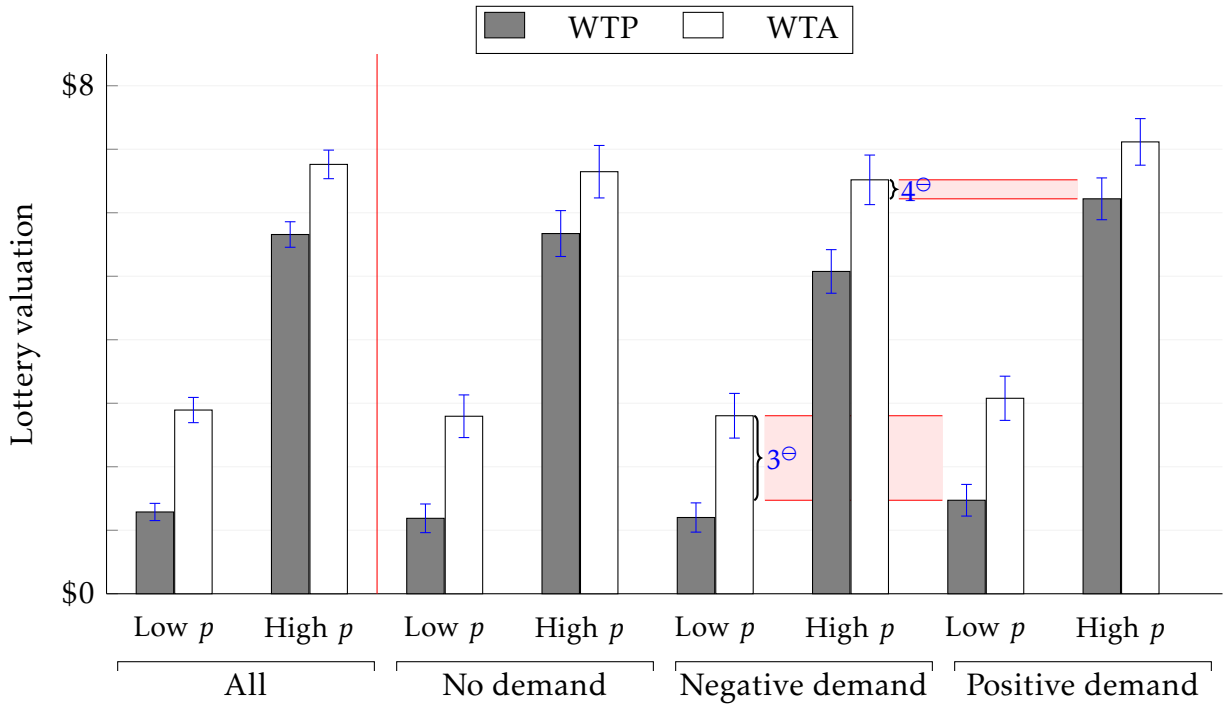


Figure A.7: Endowment Effect – Prolific Results

Note: This figure uses data from Prolific sessions. It presents mean decisions and 95 percent confidence intervals. Decision values are scaled up by 5x to compare to laboratory sample.

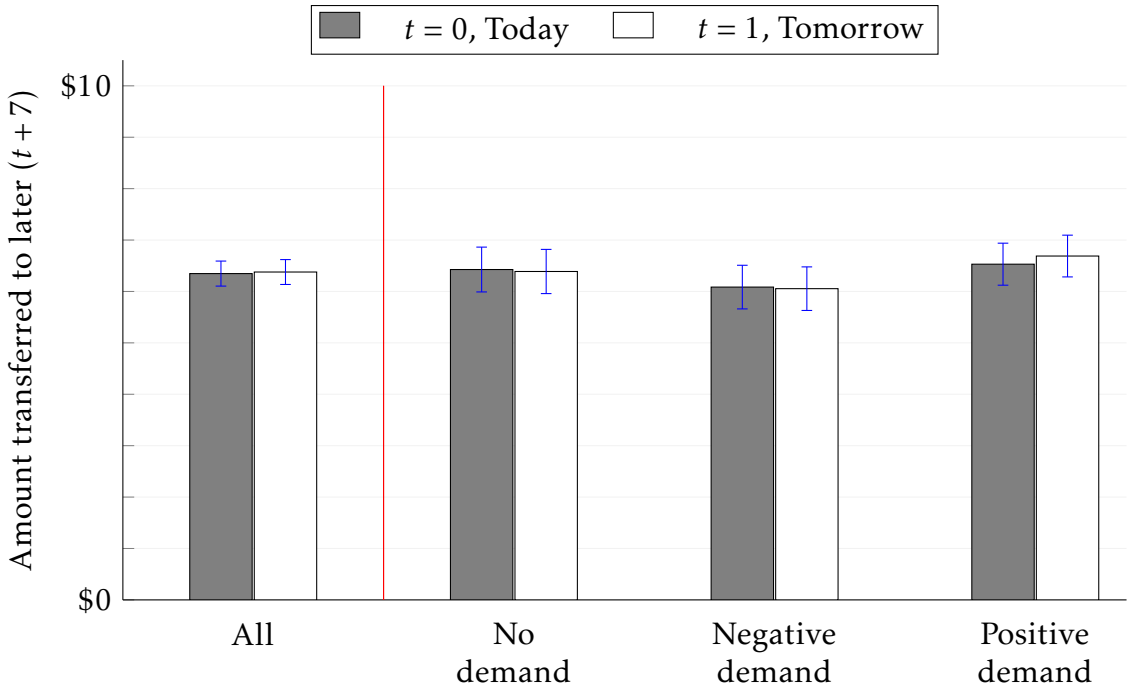


Figure A.8: Time Inconsistent Preferences – Prolific Results

Note: This figure uses data from Prolific sessions. It presents mean decisions and 95 percent confidence intervals. Decision values are scaled up by 5x to compare to laboratory sample.

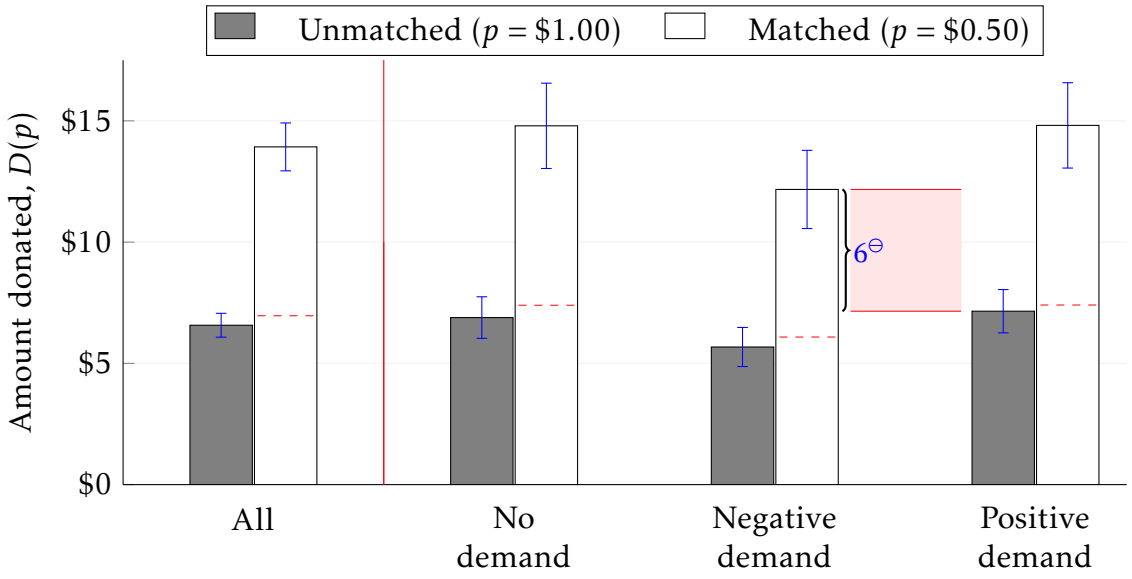


Figure A.9: Charitable Giving – Prolific Results

Note: This figure uses data from Prolific sessions. It presents mean decisions and 95 percent confidence intervals. Red dashed lines represent the average cost of the donation $p \cdot D(p)$ for relative price of giving p. Decision values are scaled up by 5x to compare to laboratory sample.

B Online Appendix: Instructions

General Introduction Screens

Full Attention Pledge

Welcome and thank you for participating in our experiment. It is important that you fully complete the study and devote your full attention to it.

During the session, I pledge to

- ☐ be available for the full time of the experiment,
- ☐ devote my full attention to the experiment and will not engage in other activities, such as browsing the internet,
- ☐ put my mobile devices in silent mode and not use them during the experiment.

You will receive your payment via Venmo. Please confirm below that you either have an account or will create one before the session begins. Please also take a moment to locate your Venmo username. You can find this by clicking in the far left or far right corner of the Venmo app.

- ○ I have a Venmo account and know my Venmo username.
- ○ I did not have a Venmo account, but I created one now.

Next

Today's study

The study is conducted by researchers at the University of Pittsburgh, and it has been approved by the University of Pittsburgh Institutional Review Board. The other people in this Zoom session are also participating in the study. You must not talk to them or communicate with them in any way.

We ask that you give us your full attention throughout the study. You must remain on Zoom and keep your video on. Please refrain from all other activities, including using your phone or browsing the internet. If we find that you are not paying attention or are violating any rules you will be dismissed from the study.

Purpose and payments

The purpose of the study is to understand individual decision making.

In the study you will be asked to complete **four** tasks, with two decisions in each task, and a brief survey. You will get a $6.00 show-up payment, a $4.00 completion payment, and payment for one of your eight decisions. All payments will be made using Venmo. An additional $0.25 will be added to payments to cover Venmo's instant transfer fee, so that you can transfer the Venmo payment to your bank account immediately.

Your total earnings will depend on your individual decisions and on chance.

Your participation is voluntary. You may discontinue participation at any time during the study. If you choose to withdraw, you will receive your show-up payment of $6.00.

Your current and future status with the University of Pittsburgh and any other benefits for which you qualify will be the same whether you participate in this study or not.

Your privacy

At the end of the study, we will ask you to fill out a secure form with your name and total payment in an online payment receipt. To ensure anonymity and to minimize any potential risk of breach of confidentiality, your name will only be used to document expenditures towards the University of Pittsburgh. Your name will never be associated with your decisions or with your answers on the survey. Neither the assistants nor the other participants will be able to link you to any of the responses you make.

We ask that you do not discuss the procedures of the study with anyone else. If you wish to lodge a complaint or concern, please contact us at alistair@pitt.edu

If you have a question, please send the researcher a private chat message over Zoom and we will answer you in private. When your questions have been answered and you are ready to proceed, please click **"Next"** to agree to participate.

Next

Introduction

Please ensure your speakers are on for the entirety of the session and the volume is turned up

You will be asked to make eight decisions in today's study.

One of these eight decisions will be randomly selected for payment.

For each decision you will be given an amount of money to begin with, and you may use that amount to make your decision. The precise instructions will be given to you prior to making each decision.

Next

Control- No Demand Treatment

Task 1 WTA - instructions

Task 1

For each decision in this task you have **$10.00 and a lottery** to begin with. You may **sell** the lottery. If you sell the lottery, you earn the $10.00 plus the price. If you do not sell the lottery, you earn $10.00 plus the outcome of the lottery.

You will first see the details for the lottery you begin with. You will then indicate the lowest amount you are willing to sell the lottery for. A price is then randomly selected. If this price is greater than or equal to your lowest-acceptable amount you will sell the lottery at that price. If the price is less than your lowest-acceptable amount, then you will not sell the lottery.

You will not know the price when you indicate the lowest amount you are willing to sell the lottery for. The price is randomly determined and can be as low as $0.01 and as high as $10.00, or any number in between.

It is in your interest to report the lowest amount you are willing to sell the lottery for. This secures that you sell the lottery when the price is greater than or equal to the amount you are willing to sell for, and that you do not sell the lottery otherwise.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 1

For each decision in this task you have **$10.00 and a lottery** to begin with. You may **sell** the lottery. If you sell the lottery, you earn the $10.00 plus the price. If you do not sell the lottery, you earn $10.00 plus the outcome of the lottery.

You will first see the details for the lottery you begin with. You will then indicate the lowest amount you are willing to sell the lottery for. A price is then randomly selected. If this price is greater than or equal to your lowest-acceptable amount you will sell the lottery at that price. If the price is less than your lowest-acceptable amount, then you will not sell the lottery.

You will not know the price when you indicate the lowest amount you are willing to sell the lottery for. The price is randomly determined and can be as low as $0.01 and as high as $10.00, or any number in between.

It is in your interest to report the lowest amount you are willing to sell the lottery for. This secures that you sell the lottery when the price is greater than or equal to the amount you are willing to sell for, and that you do not sell the lottery otherwise.

Next

Task 1 WTA – Decision Screens

Task 1: Decision 1

To begin, you have **$10.00** and a lottery with a **10% chance of winning $10.00**. You may **sell** the lottery.

Please use the slider below to indicate the lowest amount you are willing to sell the lottery for. Remember the price is randomly determined between $0.01 and $10.00.

$6.20 is the lowest amount I am willing to sell the lottery for.

Outcome:

If the price is less than $6.20: You do not sell the lottery and earn $10.00 plus the outcome of the lottery.
If the price is greater than or equal to $6.20: You sell the lottery and earn $10.00 plus the price.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 1: Decision 1

To begin, you have **$10.00** and a lottery with a **10% chance of winning $10.00**. You may **sell** the lottery.

Please use the slider below to indicate the lowest amount you are willing to sell the lottery for. Remember the price is randomly determined between $0.01 and $10.00.

$6.20 is the lowest amount I am willing to sell the lottery for.

Outcome:

If the price is less than $6.20: You do not sell the lottery and earn $10.00 plus the outcome of the lottery.
If the price is greater than or equal to $6.20: You sell the lottery and earn $10.00 plus the price.

Next

Task 1: Decision 2

To begin, you have **$10.00** and a lottery with a **90% chance of winning $10.00**. You may **sell** the lottery.

Please use the slider below to indicate the lowest amount you are willing to sell the lottery for. Remember the price is randomly determined between $0.01 and $10.00.

$4.25 is the lowest amount I am willing to sell the lottery for.

Outcome:

If the price is less than $4.25: You do not sell the lottery and earn $10.00 plus the outcome of the lottery.
If the price is greater than or equal to $4.25: You sell the lottery and earn $10.00 plus the price.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 1: Decision 2

To begin, you have **$10.00** and a lottery with a **90% chance of winning $10.00**. You may **sell** the lottery.

Please use the slider below to indicate the lowest amount you are willing to sell the lottery for. Remember the price is randomly determined between $0.01 and $10.00.

$4.25 is the lowest amount I am willing to sell the lottery for.

Outcome:

If the price is less than $4.25: You do not sell the lottery and earn $10.00 plus the outcome of the lottery.
If the price is greater than or equal to $4.25: You sell the lottery and earn $10.00 plus the price.

Next

Task 2 WTA- Instructions

Task 2

For each decision in this task you have **$10.00** to begin with. You may use the $10.00 to **buy** a lottery. If you do not buy the lottery, you earn the $10.00. If you do buy the lottery, you earn $10.00 minus the price plus the outcome of the lottery.

You will first see the details for the lottery that is being offered. You will then indicate the highest amount you are willing to pay for the lottery. A price is then randomly selected. If this price is greater than the highest amount you are willing to pay, then you will not buy the lottery. If the price is less than or equal to the highest amount you are willing to pay, then you will buy the lottery.

You will not know the price when you indicate the highest amount you are willing to pay. The price is randomly determined and can be as low as $0.01 and as high as $10.00, or any number in between.

It is in your interest to report the highest amount you are willing to pay for the lottery. This secures that you buy the lottery when the price is less than or equal to the amount you are willing to pay, and that you do not buy the lottery otherwise.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 2

For each decision in this task you have **$10.00** to begin with. You may use the $10.00 to **buy** a lottery. If you do not buy the lottery, you earn the $10.00. If you do buy the lottery, you earn $10.00 minus the price plus the outcome of the lottery.

You will first see the details for the lottery that is being offered. You will then indicate the highest amount you are willing to pay for the lottery. A price is then randomly selected. If this price is greater than the highest amount you are willing to pay, then you will not buy the lottery. If the price is less than or equal to the highest amount you are willing to pay, then you will buy the lottery.

You will not know the price when you indicate the highest amount you are willing to pay. The price is randomly determined and can be as low as $0.01 and as high as $10.00, or any number in between.

It is in your interest to report the highest amount you are willing to pay for the lottery. This secures that you buy the lottery when the price is less than or equal to the amount you are willing to pay, and that you do not buy the lottery otherwise.

Next

Task 2 WTP – Decision Screens

Task 2: Decision 1

To begin, you have **$10.00**. The lottery that is being offered is a **10% chance of winning $10.00**. You may use your $10.00 to **buy** the lottery.

Please use the slider below to indicate the highest amount you are willing to pay for the lottery. Remember the lottery price is randomly determined between $0.01 and $10.00.

$5.10 is the highest amount I am willing to pay for the lottery.

Outcome:

If the price is greater than $5.10: You do not buy the lottery and earn the $10.00.
If the price is less than or equal to $5.10: You buy the lottery and earn $10.00 minus the price, plus the outcome of the lottery.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 2: Decision 1

To begin, you have **$10.00**. The lottery that is being offered is a **10% chance of winning $10.00**. You may use your $10.00 to **buy** the lottery.

Please use the slider below to indicate the highest amount you are willing to pay for the lottery. Remember the lottery price is randomly determined between $0.01 and $10.00.

$5.10 is the highest amount I am willing to pay for the lottery.

Outcome:

If the price is greater than $5.10: You do not buy the lottery and earn the $10.00.
If the price is less than or equal to $5.10: You buy the lottery and earn $10.00 minus the price, plus the outcome of the lottery.

Next

Task 2: Decision 2

To begin, you have **$10.00**. The lottery that is being offered is a **90% chance of winning $10.00**. You may use your $10.00 to **buy** the lottery.

Please use the slider below to indicate the highest amount you are willing to pay for the lottery. Remember the lottery price is randomly determined between $0.01 and $10.00.

$6.95 is the highest amount I am willing to pay for the lottery.

Outcome:

If the price is greater than $6.95: You do not buy the lottery and earn the $10.00.
If the price is less than or equal to $6.95: You buy the lottery and earn $10.00 minus the price, plus the outcome of the lottery.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 2: Decision 2

To begin, you have **$10.00**. The lottery that is being offered is a **90% chance of winning $10.00**. You may use your $10.00 to **buy** the lottery.

Please use the slider below to indicate the highest amount you are willing to pay for the lottery. Remember the lottery price is randomly determined between $0.01 and $10.00.

$6.95 is the highest amount I am willing to pay for the lottery.

Outcome:

If the price is greater than $6.95: You do not buy the lottery and earn the $10.00.
If the price is less than or equal to $6.95: You buy the lottery and earn $10.00 minus the price, plus the outcome of the lottery.

Next

Task 3 Time Preferences Instructions

Task 3

For this task you will choose how much money you want to receive at two different points in time. You will get one payment sooner and one payment later. To begin, you have **$10.00 sooner** and **$1.00 later**. You will then choose how much money to receive sooner and later by delaying some of your sooner payment to later. Any payment you delay to later earns interest.

You will receive an additional $0.25 to cover Venmo's instant transfer fee for both the sooner and the later payment, such that you can transfer your payments from Venmo to your bank account immediately after you receive each payment.

(The "Next" button will appear after the instructions are finished being read aloud.)

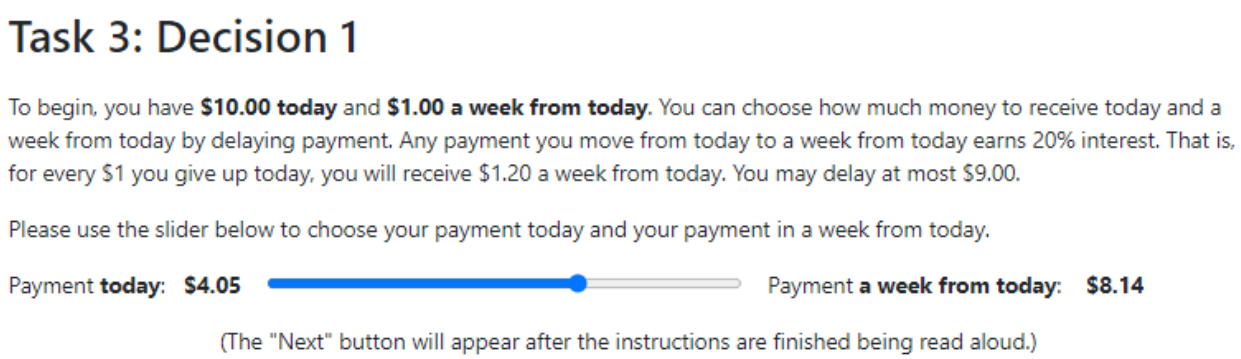
Task 3

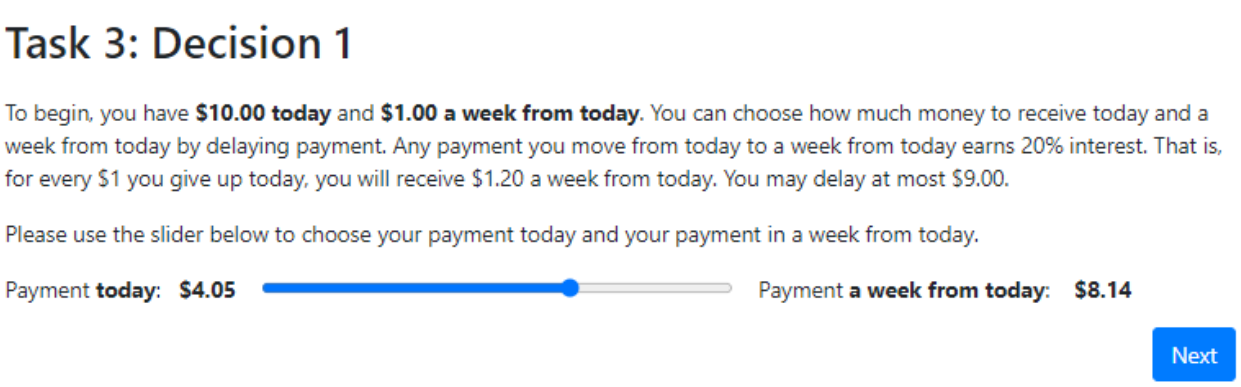
For this task you will choose how much money you want to receive at two different points in time. You will get one payment sooner and one payment later. To begin, you have **$10.00 sooner** and **$1.00 later**. You will then choose how much money to receive sooner and later by delaying some of your sooner payment to later. Any payment you delay to later earns interest.

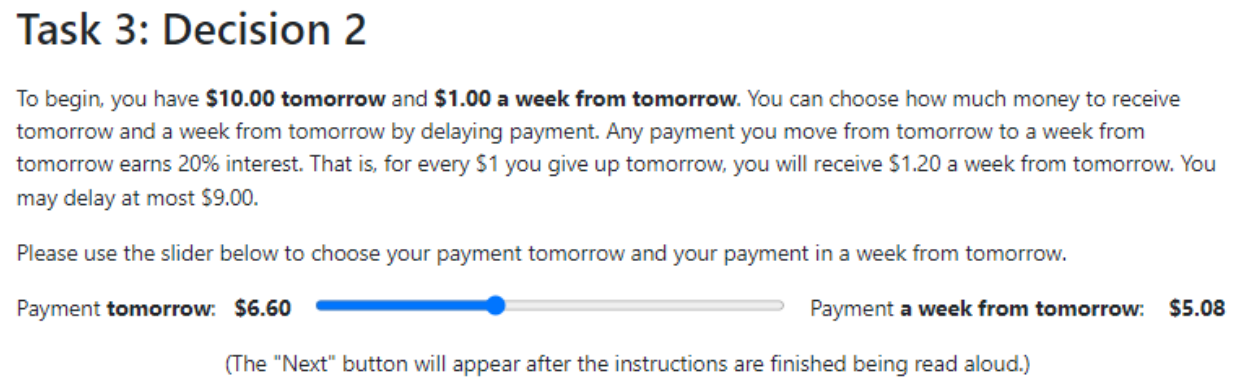
You will receive an additional $0.25 to cover Venmo's instant transfer fee for both the sooner and the later payment, such that you can transfer your payments from Venmo to your bank account immediately after you receive each payment.

Next

Task 3 Time Preferences- Decision Screens







Task 3: Decision 2

To begin, you have **$10.00 tomorrow** and **$1.00 a week from tomorrow**. You can choose how much money to receive tomorrow and a week from tomorrow by delaying payment. Any payment you move from tomorrow to a week from tomorrow earns 20% interest. That is, for every $1 you give up tomorrow, you will receive $1.20 a week from tomorrow. You may delay at most $9.00.

Please use the slider below to choose your payment tomorrow and your payment in a week from tomorrow.

Payment **tomorrow**: **$6.60** Payment **a week from tomorrow**: **$5.08**

Next

Task 4 Charitable Giving – Instructions

Task 4

For each decision in this task you will have **$20.00** to begin with. You may use the $20.00 to make a donation to the **Greater Pittsburgh Community Food Bank**. You earn any portion of the $20.00 that you do not donate.

The Greater Pittsburgh Community Food Bank feeds people in need and mobilizes our community to eliminate hunger. Your donation helps provide nutritious meals to our neighbors who struggle to put food on their tables each day.

To see the donation receipt from the Greater Pittsburgh Community Food Bank, please email to alistair@pitt.edu to see the total amount donated during this study. Details for getting an individual donation receipt will be provided at the end of the study.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 4

For each decision in this task you will have **$20.00** to begin with. You may use the $20.00 to make a donation to the **Greater Pittsburgh Community Food Bank**. You earn any portion of the $20.00 that you do not donate.

The Greater Pittsburgh Community Food Bank feeds people in need and mobilizes our community to eliminate hunger. Your donation helps provide nutritious meals to our neighbors who struggle to put food on their tables each day.

To see the donation receipt from the Greater Pittsburgh Community Food Bank, please email to alistair@pitt.edu to see the total amount donated during this study. Details for getting an individual donation receipt will be provided at the end of the study.

Next

Task 4: Decision 1

To begin, you have **$20.00**. You may use your $20.00 to donate to the Greater Pittsburgh Community Food Bank. **For every dollar you donate, the food bank receives one dollar.** You earn any portion of the $20.00 that you do not donate.

Please use the slider below to indicate how much you want to donate.

Donation: **$8.10**

Outcome:

You donate	$8.10
The Greater Pittsburgh Community Food Bank receives	$8.10
You earn	$11.90

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 4: Decision 1

To begin, you have **$20.00**. You may use your $20.00 to donate to the Greater Pittsburgh Community Food Bank. **For every dollar you donate, the food bank receives one dollar.** You earn any portion of the $20.00 that you do not donate.

Please use the slider below to indicate how much you want to donate.

Donation: **$8.10**

Outcome:

You donate	$8.10
The Greater Pittsburgh Community Food Bank receives	$8.10
You earn	$11.90

Next

Task 4: Decision 2

To begin, you have **$20.00**. You may use your $20.00 to donate to the Greater Pittsburgh Community Food Bank. We will match dollar for dollar any amount you donate. **For every dollar you donate, the food bank receives two dollars.** You earn any portion of the $20.00 that you do not donate.

Please use the slider below to indicate how much you want to donate.

Donation: **$16.65**

Outcome:

You donate	$16.65
The Greater Pittsburgh Community Food Bank receives	$33.30
You earn	$3.35

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 4: Decision 2

To begin, you have **$20.00**. You may use your $20.00 to donate to the Greater Pittsburgh Community Food Bank. We will match dollar for dollar any amount you donate. **For every dollar you donate, the food bank receives two dollars.** You earn any portion of the $20.00 that you do not donate.

Please use the slider below to indicate how much you want to donate.

Donation: **$16.65**

Outcome:

You donate	$16.65
The Greater Pittsburgh Community Food Bank receives	$33.30
You earn	$3.35

(The "Next" button will appear after the instructions are finished being read aloud.)

Positive Demand Treatment

Task 1 WTA Instructions

Task 1

For each decision in this task you have **$10.00 and a lottery** to begin with. You may **sell** the lottery. If you sell the lottery, you earn the $10.00 plus the price. If you do not sell the lottery, you earn $10.00 plus the outcome of the lottery.

You will first see the details for the lottery you begin with. You will then indicate the lowest amount you are willing to sell the lottery for. A price is then randomly selected. If this price is greater than or equal to your lowest-acceptable amount you will sell the lottery at that price. If the price is less than your lowest-acceptable amount, then you will not sell the lottery.

You will not know the price when you indicate the lowest amount you are willing to sell the lottery for. The price is randomly determined and can be as low as $0.01 and as high as $10.00, or any number in between.

It is in your interest to report the lowest amount you are willing to sell the lottery for. This secures that you sell the lottery when the price is greater than or equal to the amount you are willing to sell for, and that you do not sell the lottery otherwise.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 1

For each decision in this task you have **$10.00 and a lottery** to begin with. You may **sell** the lottery. If you sell the lottery, you earn the $10.00 plus the price. If you do not sell the lottery, you earn $10.00 plus the outcome of the lottery.

You will first see the details for the lottery you begin with. You will then indicate the lowest amount you are willing to sell the lottery for. A price is then randomly selected. If this price is greater than or equal to your lowest-acceptable amount you will sell the lottery at that price. If the price is less than your lowest-acceptable amount, then you will not sell the lottery.

You will not know the price when you indicate the lowest amount you are willing to sell the lottery for. The price is randomly determined and can be as low as $0.01 and as high as $10.00, or any number in between.

It is in your interest to report the lowest amount you are willing to sell the lottery for. This secures that you sell the lottery when the price is greater than or equal to the amount you are willing to sell for, and that you do not sell the lottery otherwise.

Next

Task 1 Decision Screens

Task 1: Decision 1

To begin, you have **$10.00** and a lottery with a **10% chance of winning $10.00**. You may **sell** the lottery.

Please use the slider below to indicate the lowest amount you are willing to sell the lottery for. Remember the price is randomly determined between $0.01 and $10.00.

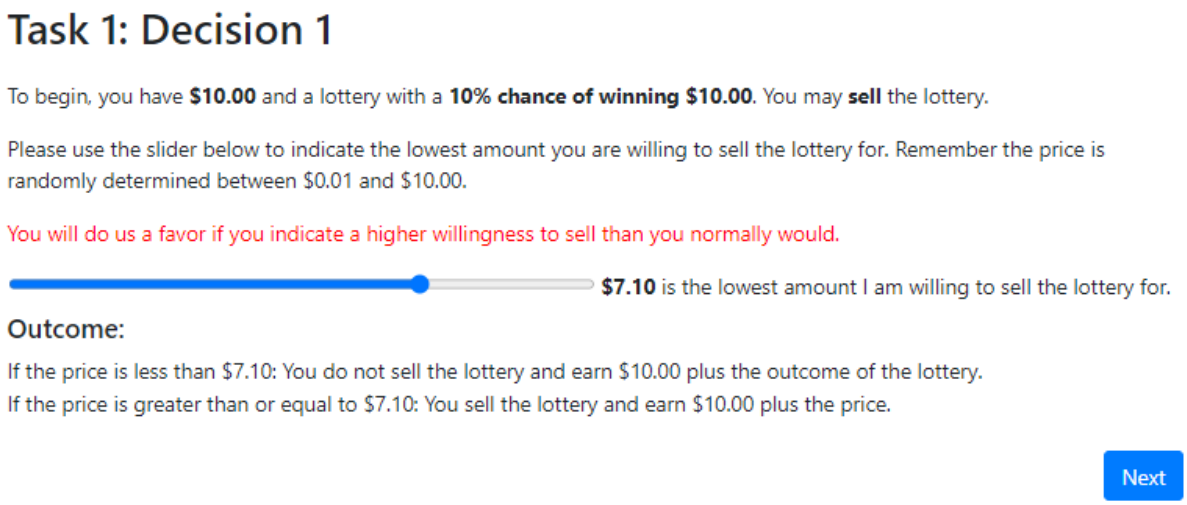
You will do us a favor if you indicate a higher willingness to sell than you normally would.

$7.10 is the lowest amount I am willing to sell the lottery for.

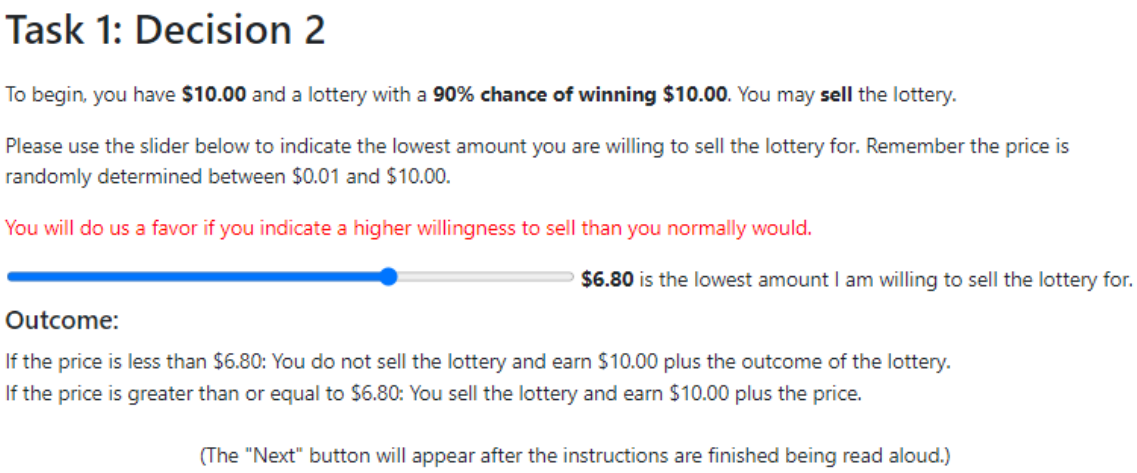
Outcome:

If the price is less than $7.10: You do not sell the lottery and earn $10.00 plus the outcome of the lottery.
If the price is greater than or equal to $7.10: You sell the lottery and earn $10.00 plus the price.

(The "Next" button will appear after the instructions are finished being read aloud.)



Task 1 WTA Decision Screens



Task 1: Decision 2

To begin, you have **$10.00** and a lottery with a **90% chance of winning $10.00**. You may **sell** the lottery.

Please use the slider below to indicate the lowest amount you are willing to sell the lottery for. Remember the price is randomly determined between $0.01 and $10.00.

You will do us a favor if you indicate a higher willingness to sell than you normally would.

$6.80 is the lowest amount I am willing to sell the lottery for.

Outcome:

If the price is less than $6.80: You do not sell the lottery and earn $10.00 plus the outcome of the lottery.
If the price is greater than or equal to $6.80: You sell the lottery and earn $10.00 plus the price.

Next

Task 2- WTP instructions

Task 2

For each decision in this task you have **$10.00** to begin with. You may use the $10.00 to **buy** a lottery. If you do not buy the lottery, you earn the $10.00. If you do buy the lottery, you earn $10.00 minus the price plus the outcome of the lottery.

You will first see the details for the lottery that is being offered. You will then indicate the highest amount you are willing to pay for the lottery. A price is then randomly selected. If this price is greater than the highest amount you are willing to pay, then you will not buy the lottery. If the price is less than or equal to the highest amount you are willing to pay, then you will buy the lottery.

You will not know the price when you indicate the highest amount you are willing to pay. The price is randomly determined and can be as low as $0.01 and as high as $10.00, or any number in between.

It is in your interest to report the highest amount you are willing to pay for the lottery. This secures that you buy the lottery when the price is less than or equal to the amount you are willing to pay, and that you do not buy the lottery otherwise.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 2

For each decision in this task you have **$10.00** to begin with. You may use the $10.00 to **buy** a lottery. If you do not buy the lottery, you earn the $10.00. If you do buy the lottery, you earn $10.00 minus the price plus the outcome of the lottery.

You will first see the details for the lottery that is being offered. You will then indicate the highest amount you are willing to pay for the lottery. A price is then randomly selected. If this price is greater than the highest amount you are willing to pay, then you will not buy the lottery. If the price is less than or equal to the highest amount you are willing to pay, then you will buy the lottery.

You will not know the price when you indicate the highest amount you are willing to pay. The price is randomly determined and can be as low as $0.01 and as high as $10.00, or any number in between.

It is in your interest to report the highest amount you are willing to pay for the lottery. This secures that you buy the lottery when the price is less than or equal to the amount you are willing to pay, and that you do not buy the lottery otherwise.

Next

Task 2 WTP Decision Screens

Task 2: Decision 1

To begin, you have **$10.00**. The lottery that is being offered is a **10% chance of winning $10.00**. You may use your $10.00 to **buy** the lottery.

Please use the slider below to indicate the highest amount you are willing to pay for the lottery. Remember the lottery price is randomly determined between $0.01 and $10.00.

You will do us a favor if you indicate a higher willingness to buy than you normally would.

$3.05 is the highest amount I am willing to pay for the lottery.

Outcome:

If the price is greater than $3.05: You do not buy the lottery and earn the $10.00.
If the price is less than or equal to $3.05: You buy the lottery and earn $10.00 minus the price, plus the outcome of the lottery.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 2: Decision 1

To begin, you have **$10.00**. The lottery that is being offered is a **10% chance of winning $10.00**. You may use your $10.00 to **buy** the lottery.

Please use the slider below to indicate the highest amount you are willing to pay for the lottery. Remember the lottery price is randomly determined between $0.01 and $10.00.

You will do us a favor if you indicate a higher willingness to buy than you normally would.

$3.05 is the highest amount I am willing to pay for the lottery.

Outcome:

If the price is greater than $3.05: You do not buy the lottery and earn the $10.00.
If the price is less than or equal to $3.05: You buy the lottery and earn $10.00 minus the price, plus the outcome of the lottery.

Next

Task 2: Decision 2

To begin, you have **$10.00**. The lottery that is being offered is a **90% chance of winning $10.00**. You may use your $10.00 to **buy** the lottery.

Please use the slider below to indicate the highest amount you are willing to pay for the lottery. Remember the lottery price is randomly determined between $0.01 and $10.00.

You will do us a favor if you indicate a higher willingness to buy than you normally would.

$5.35 is the highest amount I am willing to pay for the lottery.

Outcome:

If the price is greater than $5.35: You do not buy the lottery and earn the $10.00.
If the price is less than or equal to $5.35: You buy the lottery and earn $10.00 minus the price, plus the outcome of the lottery.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 2: Decision 2

To begin, you have **$10.00**. The lottery that is being offered is a **90% chance of winning $10.00**. You may use your $10.00 to **buy** the lottery.

Please use the slider below to indicate the highest amount you are willing to pay for the lottery. Remember the lottery price is randomly determined between $0.01 and $10.00.

You will do us a favor if you indicate a higher willingness to buy than you normally would.

$5.35 is the highest amount I am willing to pay for the lottery.

Outcome:

If the price is greater than $5.35: You do not buy the lottery and earn the $10.00.
If the price is less than or equal to $5.35: You buy the lottery and earn $10.00 minus the price, plus the outcome of the lottery.

Next

Task 3 Time Preferences Instructions

Task 3

For this task you will choose how much money you want to receive at two different points in time. You will get one payment sooner and one payment later. To begin, you have **$10.00 sooner** and **$1.00 later**. You will then choose how much money to receive sooner and later by delaying some of your sooner payment to later. Any payment you delay to later earns interest.

You will receive an additional $0.25 to cover Venmo's instant transfer fee for both the sooner and the later payment, such that you can transfer your payments from Venmo to your bank account immediately after you receive each payment.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 3

For this task you will choose how much money you want to receive at two different points in time. You will get one payment sooner and one payment later. To begin, you have **$10.00 sooner** and **$1.00 later**. You will then choose how much money to receive sooner and later by delaying some of your sooner payment to later. Any payment you delay to later earns interest.

You will receive an additional $0.25 to cover Venmo's instant transfer fee for both the sooner and the later payment, such that you can transfer your payments from Venmo to your bank account immediately after you receive each payment.

Next

Task 3 Time Preferences Decision Screens

Task 3: Decision 1

To begin, you have **$10.00 today** and **$1.00 a week from today**. You can choose how much money to receive today and a week from today by delaying payment. Any payment you move from today to a week from today earns 20% interest. That is, for every $1 you give up today, you will receive $1.20 a week from today. You may delay at most $9.00.

Please use the slider below to choose your payment today and your payment in a week from today.

You will do us a favor if you choose more payment in a week from today than you normally would.

Payment **today**: **$4.90** Payment **a week from today**: **$7.12**

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 3: Decision 1

To begin, you have **$10.00 today** and **$1.00 a week from today**. You can choose how much money to receive today and a week from today by delaying payment. Any payment you move from today to a week from today earns 20% interest. That is, for every $1 you give up today, you will receive $1.20 a week from today. You may delay at most $9.00.

Please use the slider below to choose your payment today and your payment in a week from today.

You will do us a favor if you choose more payment in a week from today than you normally would.

Payment **today**: **$4.90** Payment **a week from today**: **$7.12**

Next

Task 3: Decision 2

To begin, you have **$10.00 tomorrow** and **$1.00 a week from tomorrow**. You can choose how much money to receive tomorrow and a week from tomorrow by delaying payment. Any payment you move from tomorrow to a week from tomorrow earns 20% interest. That is, for every $1 you give up tomorrow, you will receive $1.20 a week from tomorrow. You may delay at most $9.00.

Please use the slider below to choose your payment tomorrow and your payment in a week from tomorrow.

You will do us a favor if you choose more payment in a week from tomorrow than you normally would.

Payment **tomorrow**: **$5.20** Payment **a week from tomorrow**: **$6.76**

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 3: Decision 2

To begin, you have **$10.00 tomorrow** and **$1.00 a week from tomorrow**. You can choose how much money to receive tomorrow and a week from tomorrow by delaying payment. Any payment you move from tomorrow to a week from tomorrow earns 20% interest. That is, for every $1 you give up tomorrow, you will receive $1.20 a week from tomorrow. You may delay at most $9.00.

Please use the slider below to choose your payment tomorrow and your payment in a week from tomorrow.

You will do us a favor if you choose more payment in a week from tomorrow than you normally would.

Payment **tomorrow**: **$5.20** Payment **a week from tomorrow**: **$6.76**

Next

Task 4 Charitable Giving Instructions

Task 4

For each decision in this task you will have **$20.00** to begin with. You may use the $20.00 to make a donation to the **Greater Pittsburgh Community Food Bank**. You earn any portion of the $20.00 that you do not donate.

The Greater Pittsburgh Community Food Bank feeds people in need and mobilizes our community to eliminate hunger. Your donation helps provide nutritious meals to our neighbors who struggle to put food on their tables each day.

To see the donation receipt from the Greater Pittsburgh Community Food Bank, please email to alistair@pitt.edu to see the total amount donated during this study. Details for getting an individual donation receipt will be provided at the end of the study.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 4

For each decision in this task you will have **$20.00** to begin with. You may use the $20.00 to make a donation to the **Greater Pittsburgh Community Food Bank**. You earn any portion of the $20.00 that you do not donate.

The Greater Pittsburgh Community Food Bank feeds people in need and mobilizes our community to eliminate hunger. Your donation helps provide nutritious meals to our neighbors who struggle to put food on their tables each day.

To see the donation receipt from the Greater Pittsburgh Community Food Bank, please email to alistair@pitt.edu to see the total amount donated during this study. Details for getting an individual donation receipt will be provided at the end of the study.

Next

Task 4 Charitable Giving Decision Screens

Task 4: Decision 1

To begin, you have **$20.00**. You may use your $20.00 to donate to the Greater Pittsburgh Community Food Bank. **For every dollar you donate, the food bank receives one dollar.** You earn any portion of the $20.00 that you do not donate.

Please use the slider below to indicate how much you want to donate.

You will do us a favor if you donate more than you normally would.

Donation: **$9.25**

Outcome:

You donate	$9.25
The Greater Pittsburgh Community Food Bank receives	$9.25
You earn	$10.75

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 4: Decision 1

To begin, you have **$20.00**. You may use your $20.00 to donate to the Greater Pittsburgh Community Food Bank. **For every dollar you donate, the food bank receives one dollar.** You earn any portion of the $20.00 that you do not donate.

Please use the slider below to indicate how much you want to donate.

You will do us a favor if you donate more than you normally would.

Donation: **$9.25**

Outcome:

You donate	$9.25
The Greater Pittsburgh Community Food Bank receives	$9.25
You earn	$10.75

Next

Task 4: Decision 2

To begin, you have **$20.00**. You may use your $20.00 to donate to the Greater Pittsburgh Community Food Bank. We will match dollar for dollar any amount you donate. **For every dollar you donate, the food bank receives two dollars.** You earn any portion of the $20.00 that you do not donate.

Please use the slider below to indicate how much you want to donate.

You will do us a favor if you donate more than you normally would.

Donation: **$4.80**

Outcome:

You donate	$4.80
The Greater Pittsburgh Community Food Bank receives	$9.60
You earn	$15.20

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 4: Decision 2

To begin, you have **$20.00**. You may use your $20.00 to donate to the Greater Pittsburgh Community Food Bank. We will match dollar for dollar any amount you donate. **For every dollar you donate, the food bank receives two dollars.** You earn any portion of the $20.00 that you do not donate.

Please use the slider below to indicate how much you want to donate.

You will do us a favor if you donate more than you normally would.

Donation: **$4.80**

Outcome:

You donate	$4.80
The Greater Pittsburgh Community Food Bank receives	$9.60
You earn	$15.20

Next

Negative Demand Treatment

Task 1 WTA Instructions

Task 1

For each decision in this task you have **$10.00 and a lottery** to begin with. You may **sell** the lottery. If you sell the lottery, you earn the $10.00 plus the price. If you do not sell the lottery, you earn $10.00 plus the outcome of the lottery.

You will first see the details for the lottery you begin with. You will then indicate the lowest amount you are willing to sell the lottery for. A price is then randomly selected. If this price is greater than or equal to your lowest-acceptable amount you will sell the lottery at that price. If the price is less than your lowest-acceptable amount, then you will not sell the lottery.

You will not know the price when you indicate the lowest amount you are willing to sell the lottery for. The price is randomly determined and can be as low as $0.01 and as high as $10.00, or any number in between.

It is in your interest to report the lowest amount you are willing to sell the lottery for. This secures that you sell the lottery when the price is greater than or equal to the amount you are willing to sell for, and that you do not sell the lottery otherwise.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 1

For each decision in this task you have **$10.00 and a lottery** to begin with. You may **sell** the lottery. If you sell the lottery, you earn the $10.00 plus the price. If you do not sell the lottery, you earn $10.00 plus the outcome of the lottery.

You will first see the details for the lottery you begin with. You will then indicate the lowest amount you are willing to sell the lottery for. A price is then randomly selected. If this price is greater than or equal to your lowest-acceptable amount you will sell the lottery at that price. If the price is less than your lowest-acceptable amount, then you will not sell the lottery.

You will not know the price when you indicate the lowest amount you are willing to sell the lottery for. The price is randomly determined and can be as low as $0.01 and as high as $10.00, or any number in between.

It is in your interest to report the lowest amount you are willing to sell the lottery for. This secures that you sell the lottery when the price is greater than or equal to the amount you are willing to sell for, and that you do not sell the lottery otherwise.

Next

Task 1 WTA Decision Screens

Task 1: Decision 1

To begin, you have **$10.00** and a lottery with a **10% chance of winning $10.00**. You may **sell** the lottery.

Please use the slider below to indicate the lowest amount you are willing to sell the lottery for. Remember the price is randomly determined between $0.01 and $10.00.

You will do us a favor if you indicate a lower willingness to sell than you normally would.

$7.80 is the lowest amount I am willing to sell the lottery for.

Outcome:

If the price is less than $7.80: You do not sell the lottery and earn $10.00 plus the outcome of the lottery.
If the price is greater than or equal to $7.80: You sell the lottery and earn $10.00 plus the price.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 1: Decision 1

To begin, you have **$10.00** and a lottery with a **10% chance of winning $10.00**. You may **sell** the lottery.

Please use the slider below to indicate the lowest amount you are willing to sell the lottery for. Remember the price is randomly determined between $0.01 and $10.00.

You will do us a favor if you indicate a lower willingness to sell than you normally would.

$7.80 is the lowest amount I am willing to sell the lottery for.

Outcome:

If the price is less than $7.80: You do not sell the lottery and earn $10.00 plus the outcome of the lottery.
If the price is greater than or equal to $7.80: You sell the lottery and earn $10.00 plus the price.

Next

Task 2 WTP Instructions

Task 2

For each decision in this task you have **$10.00** to begin with. You may use the $10.00 to **buy** a lottery. If you do not buy the lottery, you earn the $10.00. If you do buy the lottery, you earn $10.00 minus the price plus the outcome of the lottery.

You will first see the details for the lottery that is being offered. You will then indicate the highest amount you are willing to pay for the lottery. A price is then randomly selected. If this price is greater than the highest amount you are willing to pay, then you will not buy the lottery. If the price is less than or equal to the highest amount you are willing to pay, then you will buy the lottery.

You will not know the price when you indicate the highest amount you are willing to pay. The price is randomly determined and can be as low as $0.01 and as high as $10.00, or any number in between.

It is in your interest to report the highest amount you are willing to pay for the lottery. This secures that you buy the lottery when the price is less than or equal to the amount you are willing to pay, and that you do not buy the lottery otherwise.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 2

For each decision in this task you have **$10.00** to begin with. You may use the $10.00 to **buy** a lottery. If you do not buy the lottery, you earn the $10.00. If you do buy the lottery, you earn $10.00 minus the price plus the outcome of the lottery.

You will first see the details for the lottery that is being offered. You will then indicate the highest amount you are willing to pay for the lottery. A price is then randomly selected. If this price is greater than the highest amount you are willing to pay, then you will not buy the lottery. If the price is less than or equal to the highest amount you are willing to pay, then you will buy the lottery.

You will not know the price when you indicate the highest amount you are willing to pay. The price is randomly determined and can be as low as $0.01 and as high as $10.00, or any number in between.

It is in your interest to report the highest amount you are willing to pay for the lottery. This secures that you buy the lottery when the price is less than or equal to the amount you are willing to pay, and that you do not buy the lottery otherwise.

Next

Task 2 WTP Decision Screens

Task 2: Decision 1

To begin, you have **$10.00**. The lottery that is being offered is a **10% chance of winning $10.00**. You may use your $10.00 to **buy** the lottery.

Please use the slider below to indicate the highest amount you are willing to pay for the lottery. Remember the lottery price is randomly determined between $0.01 and $10.00.

You will do us a favor if you indicate a lower willingness to buy than you normally would.

$4.80 is the highest amount I am willing to pay for the lottery.

Outcome:

If the price is greater than $4.80: You do not buy the lottery and earn the $10.00.
If the price is less than or equal to $4.80: You buy the lottery and earn $10.00 minus the price, plus the outcome of the lottery.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 2: Decision 1

To begin, you have **$10.00**. The lottery that is being offered is a **10% chance of winning $10.00**. You may use your $10.00 to **buy** the lottery.

Please use the slider below to indicate the highest amount you are willing to pay for the lottery. Remember the lottery price is randomly determined between $0.01 and $10.00.

You will do us a favor if you indicate a lower willingness to buy than you normally would.

$4.80 is the highest amount I am willing to pay for the lottery.

Outcome:

If the price is greater than $4.80: You do not buy the lottery and earn the $10.00.
If the price is less than or equal to $4.80: You buy the lottery and earn $10.00 minus the price, plus the outcome of the lottery.

Next

Task 2: Decision 2

To begin, you have **$10.00**. The lottery that is being offered is a **90% chance of winning $10.00**. You may use your $10.00 to **buy** the lottery.

Please use the slider below to indicate the highest amount you are willing to pay for the lottery. Remember the lottery price is randomly determined between $0.01 and $10.00.

You will do us a favor if you indicate a lower willingness to buy than you normally would.

$6.60 is the highest amount I am willing to pay for the lottery.

Outcome:

If the price is greater than $6.60: You do not buy the lottery and earn the $10.00.
If the price is less than or equal to $6.60: You buy the lottery and earn $10.00 minus the price, plus the outcome of the lottery.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 2: Decision 2

To begin, you have **$10.00**. The lottery that is being offered is a **90% chance of winning $10.00**. You may use your $10.00 to **buy** the lottery.

Please use the slider below to indicate the highest amount you are willing to pay for the lottery. Remember the lottery price is randomly determined between $0.01 and $10.00.

You will do us a favor if you indicate a lower willingness to buy than you normally would.

$6.60 is the highest amount I am willing to pay for the lottery.

Outcome:

If the price is greater than $6.60: You do not buy the lottery and earn the $10.00.
If the price is less than or equal to $6.60: You buy the lottery and earn $10.00 minus the price, plus the outcome of the lottery.

Next

Task 3 Time Preferences Instructions

Task 3

For this task you will choose how much money you want to receive at two different points in time. You will get one payment sooner and one payment later. To begin, you have **$10.00 sooner** and **$1.00 later**. You will then choose how much money to receive sooner and later by delaying some of your sooner payment to later. Any payment you delay to later earns interest.

You will receive an additional $0.25 to cover Venmo's instant transfer fee for both the sooner and the later payment, such that you can transfer your payments from Venmo to your bank account immediately after you receive each payment.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 3

For this task you will choose how much money you want to receive at two different points in time. You will get one payment sooner and one payment later. To begin, you have **$10.00 sooner** and **$1.00 later**. You will then choose how much money to receive sooner and later by delaying some of your sooner payment to later. Any payment you delay to later earns interest.

You will receive an additional $0.25 to cover Venmo's instant transfer fee for both the sooner and the later payment, such that you can transfer your payments from Venmo to your bank account immediately after you receive each payment.

Next

Task 3 Time Preferences Decision Screens

Task 3: Decision 1

To begin, you have **$10.00 today** and **$1.00 a week from today**. You can choose how much money to receive today and a week from today by delaying payment. Any payment you move from today to a week from today earns 20% interest. That is, for every $1 you give up today, you will receive $1.20 a week from today. You may delay at most $9.00.

Please use the slider below to choose your payment today and your payment in a week from today.

You will do us a favor if you choose less payment in a week from today than you normally would.

Payment **today**: **$3.45** Payment **a week from today**: **$8.86**

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 3: Decision 1

To begin, you have **$10.00 today** and **$1.00 a week from today**. You can choose how much money to receive today and a week from today by delaying payment. Any payment you move from today to a week from today earns 20% interest. That is, for every $1 you give up today, you will receive $1.20 a week from today. You may delay at most $9.00.

Please use the slider below to choose your payment today and your payment in a week from today.

You will do us a favor if you choose less payment in a week from today than you normally would.

Payment **today**: **$3.45** Payment **a week from today**: **$8.86**

Next

Task 3: Decision 2

To begin, you have **$10.00 tomorrow** and **$1.00 a week from tomorrow**. You can choose how much money to receive tomorrow and a week from tomorrow by delaying payment. Any payment you move from tomorrow to a week from tomorrow earns 20% interest. That is, for every $1 you give up tomorrow, you will receive $1.20 a week from tomorrow. You may delay at most $9.00.

Please use the slider below to choose your payment tomorrow and your payment in a week from tomorrow.

You will do us a favor if you choose less payment in a week from tomorrow than you normally would.

Payment **tomorrow**: **$3.95** Payment **a week from tomorrow**: **$8.26**

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 3: Decision 2

To begin, you have **$10.00 tomorrow** and **$1.00 a week from tomorrow**. You can choose how much money to receive tomorrow and a week from tomorrow by delaying payment. Any payment you move from tomorrow to a week from tomorrow earns 20% interest. That is, for every $1 you give up tomorrow, you will receive $1.20 a week from tomorrow. You may delay at most $9.00.

Please use the slider below to choose your payment tomorrow and your payment in a week from tomorrow.

You will do us a favor if you choose less payment in a week from tomorrow than you normally would.

Payment **tomorrow**: **$3.95** Payment **a week from tomorrow**: **$8.26**

Next

Task 4 Charitable Giving Instruction

Task 4

For each decision in this task you will have **$20.00** to begin with. You may use the $20.00 to make a donation to the **Greater Pittsburgh Community Food Bank**. You earn any portion of the $20.00 that you do not donate.

The Greater Pittsburgh Community Food Bank feeds people in need and mobilizes our community to eliminate hunger. Your donation helps provide nutritious meals to our neighbors who struggle to put food on their tables each day.

To see the donation receipt from the Greater Pittsburgh Community Food Bank, please email to alistair@pitt.edu to see the total amount donated during this study. Details for getting an individual donation receipt will be provided at the end of the study.

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 4

For each decision in this task you will have **$20.00** to begin with. You may use the $20.00 to make a donation to the **Greater Pittsburgh Community Food Bank**. You earn any portion of the $20.00 that you do not donate.

The Greater Pittsburgh Community Food Bank feeds people in need and mobilizes our community to eliminate hunger. Your donation helps provide nutritious meals to our neighbors who struggle to put food on their tables each day.

To see the donation receipt from the Greater Pittsburgh Community Food Bank, please email to alistair@pitt.edu to see the total amount donated during this study. Details for getting an individual donation receipt will be provided at the end of the study.

Next

Task 4 Charitable Giving Decision Screens

Task 4: Decision 1

To begin, you have **$20.00**. You may use your $20.00 to donate to the Greater Pittsburgh Community Food Bank. **For every dollar you donate, the food bank receives one dollar.** You earn any portion of the $20.00 that you do not donate.

Please use the slider below to indicate how much you want to donate.

You will do us a favor if you donate less than you normally would.

Donation: **$7.60**

Outcome:

You donate	$7.60
The Greater Pittsburgh Community Food Bank receives	$7.60
You earn	$12.40

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 4: Decision 1

To begin, you have **$20.00**. You may use your $20.00 to donate to the Greater Pittsburgh Community Food Bank. **For every dollar you donate, the food bank receives one dollar.** You earn any portion of the $20.00 that you do not donate.

Please use the slider below to indicate how much you want to donate.

You will do us a favor if you donate less than you normally would.

Donation: **$7.60**

Outcome:

You donate	$7.60
The Greater Pittsburgh Community Food Bank receives	$7.60
You earn	$12.40

Next

Task 4: Decision 2

To begin, you have **$20.00**. You may use your $20.00 to donate to the Greater Pittsburgh Community Food Bank. We will match dollar for dollar any amount you donate. **For every dollar you donate, the food bank receives two dollars.** You earn any portion of the $20.00 that you do not donate.

Please use the slider below to indicate how much you want to donate.

You will do us a favor if you donate less than you normally would.

Donation: **$12.50**

Outcome:

You donate	$12.50
The Greater Pittsburgh Community Food Bank receives	$25.00
You earn	$7.50

(The "Next" button will appear after the instructions are finished being read aloud.)

Task 4: Decision 2

To begin, you have **$20.00**. You may use your $20.00 to donate to the Greater Pittsburgh Community Food Bank. We will match dollar for dollar any amount you donate. **For every dollar you donate, the food bank receives two dollars.** You earn any portion of the $20.00 that you do not donate.

Please use the slider below to indicate how much you want to donate.

You will do us a favor if you donate less than you normally would.

Donation: **$12.50**

Outcome:

You donate	$12.50
The Greater Pittsburgh Community Food Bank receives	$25.00
You earn	$7.50

Next

End of the Experiment Screens

Questionnaire

Please fill out the following questionnaire.

What is your age?

What gender do you identify with?

○ Female ○ Male ○ Other

What is your race/ethnicity?

○ Asian ○ Black ○ Caucasian ○ Hispanic ○ Other

What is the highest degree you've earned so far?

○ High School or GED ○ Bachelor ○ Masters ○ Ph.D. ○ None/Other

What year of study are you?

○ Freshman ○ Sophomore ○ Junior ○ Senior ○ Graduate Student
○ Other

What is your major?

○ Arts ○ Business ○ Humanities ○ Natural Sciences ○ Social Sciences
○ Physical Sciences ○ Other

What is your native language?

○ English ○ Other

When did you move to the US?

○ Born in the US ○ Moved prior to age 5 ○ Age 5 - 10 ○ Age 11 - 15
○ Age 16-20 ○ After age 20

SUBMIT

Payment

Earnings from your decisions

Task 3, Decision 1 has been randomly selected for your payment.

For this decision, you had to choose how much money to receive today and a week from today.

You chose to receive $4.05 today and $8.14 a week from today.

Your payment schedule

Date	Payment	Note
Today (after the session)	$14.30	$4.05 + $6.00 show-up payment + $4.00 completion payment + $0.25 Venmo instant transfer fee coverage
A week from today (Mar. 02, 2022)	$8.39	$8.14 + $0.25 Venmo instant transfer fee coverage

Today's payment

Your payment code is **60069**.

Please follow THIS LINK to fill out your payment receipt with your name, the date, your 7-digit student ID, your e-mail address, and your Venmo ID. Please double-check your earnings and your payment code which are auto-populated into the form.
After you fill out the receipt, you are free to leave the session and exit the Zoom meeting.

You will be paid after the session. Please e-mail mal303@pitt.edu if you have not received your payment within the next two hours.

Payment in a week from today

We will transfer the $8.39 to your Venmo account in a week from today (Mar. 02, 2022).
You will receive a copy of your payment receipt via e-mail. Please contact mal303@pitt.edu if you do not receive your payments on those days.