Poking Holes and Adding Points in Dictator Games

James C. Cox
Georgia State University
jccox@gsu.edu

Cary Deck
University of Alabama
Chapman University
cary.deck@ua.edu

Laura Razzolini
University of Alabama
lrazzolini@ua.edu

Vjollca Sadiraj
Georgia State University
vsadiraj@gsu.edu

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Abstract

Deviations from choices predicted by self-regarding preferences have regularly been observed in standard dictator games. Such behavior is *not* inconsistent with conventional preference theory or revealed preference theory, which accommodate other-regarding preferences. By contrast, experiments in which giving nothing is *not* the least generous feasible act produce data that *is* inconsistent with conventional preference theory including social preference models and suggest the possible relevance of reference point models. Two such models are the reference-dependent theory of riskless choice with loss aversion and choice monotonicity in moral reference points. Our experiment includes novel treatments designed to challenge both theoretical models of reference dependence and conventional rational choice theory by poking holes in or adding to the dictator's feasible set along with changes to the initial endowment of the players. Our design creates tests that at most one of these models can pass. However, we do not find that any of these models fully capture behavior. In part this result is due to our observing behavior in some treatments that differs from previous experiments for reasons attributable to implementation differences across studies.

JEL Codes: C7, C9, D9

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1. Introduction

Dictator games are the simplest of games in which replicable deviations from choices predicted by self-regarding ("selfish") preferences have been observed. In a meta-analysis, Engel (2011) reports that more than 60 percent of dictators pass positive amounts of money to recipients in traditional dictator games in which "giving nothing" is the least generous feasible act. Such behavior is *not* inconsistent with conventional preference theory (Hicks 1946; Samuelson 1947; Debreu 1959; textbooks) or revealed preference theory (Afriat 1967; Varian 1982; Andreoni and Miller 2002; textbooks), which accommodate other-regarding preferences.[1] The observation of non-selfish behavior did, however, motivate the development of early models of social preferences such as inequality aversion (Fehr and Schmidt 1999; Bolton and Ockenfels 2000), quasi-maximin (Charness and Rabin 2002), convex altruism (Andreoni and Miller 2002), and ego-centric altruism (Cox and Sadiraj 2007) that are consistent with data from many types of social preferences games. Such models are, however, not compelling because direct tests of their implications lead to a rejection (e.g. Deck 2001; Cox and Sadiraj 2012; Korenok et al, 2013; Cox et al. 2025).

By contrast, experiments in which giving nothing is *not* the least generous feasible act (e.g., List 2007; Bardsley 2008; Cappelen et al. 2013) produce data that *is* inconsistent with conventional preference theory (including as a special case, social preferences models like those mentioned above) and suggest the possible relevance of reference point models. One such influential model that is consistent with data from various experiments is the reference-dependent theory of riskless choice with loss aversion (Tversky and Kahneman 1991).[2] A more recent model with choice monotonicity in moral reference points can rationalize data from games where the dictator can take or give money (Cox et al. 2025), as well as data from public good games that were anomalous to theory for 25 years (Cox et al. 2023). One goal of this paper is to test whether these reference-dependent models are consistent with data from newly designed experiments.

Our experiment includes novel treatments designed to challenge both theoretical models of reference dependence and conventional rational choice theory by *removing* some give opportunities from the interior of the give-only set ("poking holes") or *adding* an inefficient take

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[1] With conventional preference theory, self-regarding preferences include "commodity vectors" such as numbers of my hot dogs and my hamburgers whereas other-regarding preferences include commodity vectors such as numbers my hamburgers and your hamburgers.

[2] For an extension of the Tversky and Kahneman (1991) model see Koszegi and Rabin (2006).

opportunity to the dictator's give-only feasible set ("adding points").[3] We also include a take-only treatment as well as a give-only baseline. While previous studies have added or removed outcomes to or from the feasible set, this has been done at the boundaries and not in the interior of the feasible set.[4] In comparison to the baseline, the treatment in which we remove interior choices while keeping other aspects of the decision task identical allows us to stress test conventional rational choice theory (Chernoff 1954; Arrow 1959; Sen 1971, 1986), the moral reference point model (Cox et al. 2023, 2025) and Tversky and Kahneman's (1991) loss aversion in a riskless choice model. In comparison to the baseline, the treatment in which we add to the dictator's give-only feasible set an efficiency-decreasing take opportunity allows us to discriminate between the moral reference point model and the other two theoretical models (loss aversion and rational choice). In comparison to the baseline, the take-only treatment allows us to discriminate between rational choice theory and the two reference point models.[5] Thus, our design creates tests that at most one of the three models can pass.

2. Dictator Games and Testable Implications

2.1 Dictator Games

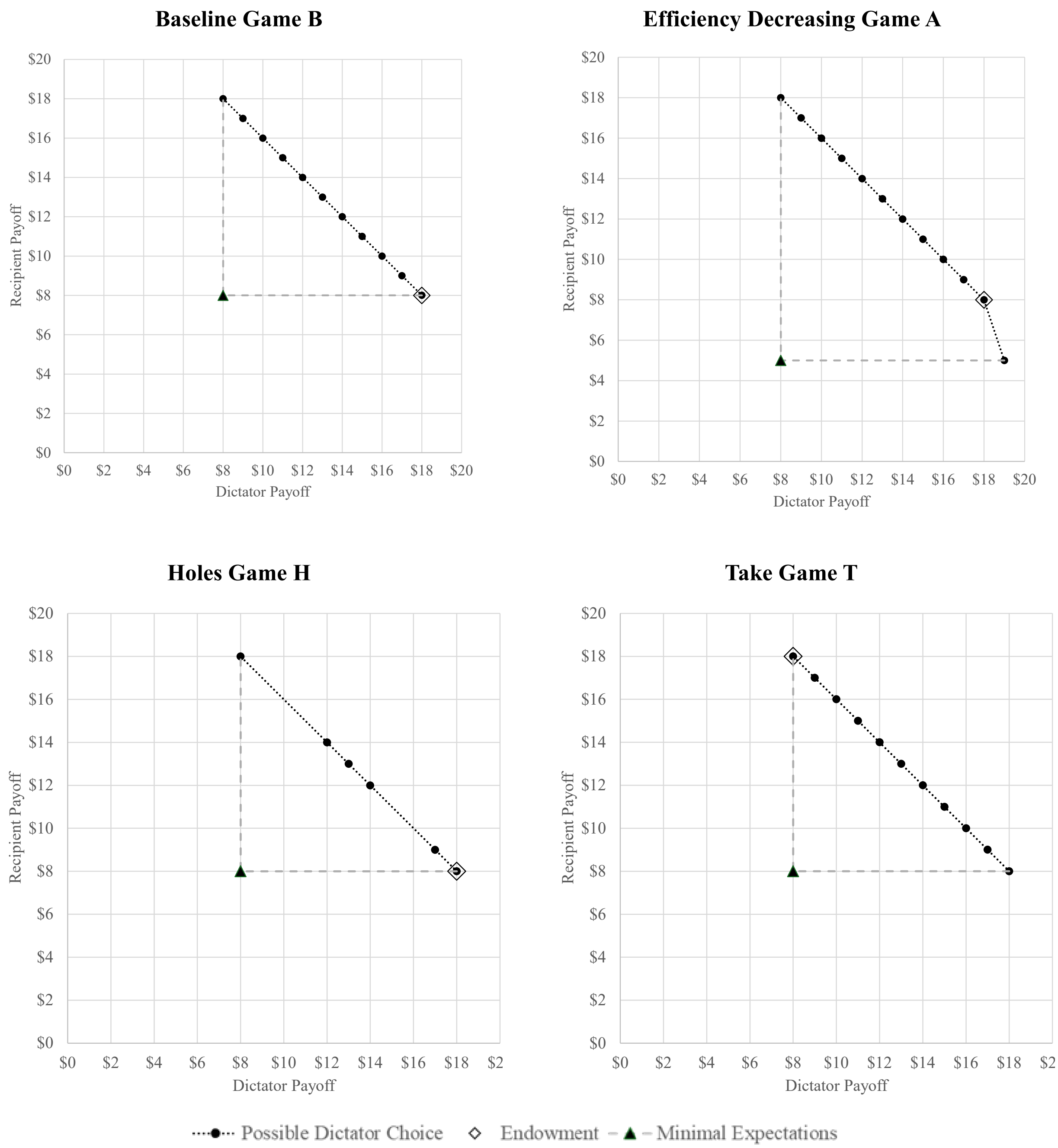
For each of the four games we describe, Figure 1 gives a graphical representation of the choice set, payoffs, endowments, and minimal expectations point. In the baseline Game B, the dictator's e_d and recipient's e_r endowments are $(e_d, e_r) = (\$18, \$8)$ and the dictator can give to the recipient any amount $g \in \{\$0, \$1, \dots, \$10\}$. The dictator's payoff is $e_d - g$ and the recipient's payoff is $e_r + g$. In the holes Game H, the endowments are the same as in Game B, but the dictator can only give an amount in the restricted set $\{\$0, \$1\} \cup \{\$4, \$5, \$6\} \cup \{\$10\}$. Compared to the set of actions

[3] Most previous dictator experiments with take opportunities were efficiency-preserving. Among few studies that include efficiency-decreasing takes is the second mover dictator control treatment for the moonlighting game (Cox et al. 2008).

[4] Deck and Razzolini (2019) conducted an experiment introducing holes in the dictator's give-only feasible set. That work, which evolved into the current paper, is discussed in detail below.

[5] Flage (2024) reports a meta-analysis of behavior in take-only dictator games and argues that they elicit more generous behavior than give-only dictator games. This result is consistent with reference dependent model with loss aversion (Tversky and Kahneman 1991), as well as choice monotonicity in moral reference points (Cox, et al. 2025).

Figure 1. Four Dictator Games



available to the dictator in the baseline, in Game H the action set has “holes” at {\$2, \$3} and {\$7, \$8, \$9}. In the take Game T, endowments are $(e_d, e_r) =$ (\$8, \$18) and the dictator can “give” the recipient any amount $g \in \{-\$10, \$-9, \ldots, \$0\}$.[6] In the “adding an efficiency-decreasing take opportunity” Game A, the endowments are the same as in the baseline, but the dictator’s choices are the same as in Game B with the addition of one ($3) taking opportunity, $g \in \{-\$3, \$0, \$1, \ldots \$10\}$. Further, in Game A, the recipient’s payoff is $e_r + g$, while the dictator’s payoff is $e_d - g$ if $g \geq 0$ and is $e_d - \frac{g}{3}$ otherwise. That is, Game A differs from Game B only by the inclusion of an additional option where the dictator can increase their own payoff by $1 by reducing the recipient’s payoff by $3 as compared to the initial endowments.

2.2 Testable Implications

The fundamental property of rational choice theory (RC) is contraction consistency, also known as Property α (Sen 1971). That property postulates that an alternative that is chosen from a set F and is available in some subset G of F will be chosen from G as well. For singleton (one element) finite choice sets, Property α is equivalent to rationality, the necessary and sufficient condition for existence of a complete and transitive order relation. Conventional preference theory and unconditional social preferences models are special cases of RC. Since Games B and T have the same set of possible payoffs to the dictator and recipient (same ordered pairs), RC implies that choices (in terms of payoffs) will be the same in the two treatments. Possible payoffs in Game H are a proper subset of those in Game B, hence contraction consistency implies that the frequency of observed choices of each option that is feasible in both treatments will be no lower in Game H than in Game B. Similarly, since the possible payoffs in Game B are a proper subset of those in Game A, contraction consistency again implies that the frequency of observed choices of each option that is feasible in both treatments will be no lower in Game B than in Game A.

The Monotonicity in Moral reference points (MM) model postulates choice monotonicity with respect to endowments and minimal expectations payoffs. The minimal expectations payoff identifies the payoff a player receives when the other player is receiving their maximum payoff.

[6] Note that taking and giving are equivalent actions in terms of final payoffs. Korenok, Miller and Razzolini (2013) also analyze giving and taking in dictator games in which the actions generate equivalent final payoffs. They find that while structurally the choices and payoffs are equivalent, behaviorally such games are not. They find that not taking is not equivalent to giving, as “recipients tend to earn more as the amount the dictator must take to achieve a given final payoff increases” (2013, p. 489).

The endowments and minimal expectations payoffs are shown in Figure 1 for each game. Games B and T have the same minimal expectations payoffs but different endowments. The endowment in Game T is more favorable to the recipient than the endowment in Game B, therefore MM predicts dictators' choices in Game T will be more generous for the recipient than the choices in Game B. Games B and H have the same minimal expectations payoffs and endowments, therefore MM has the same predictions for these two games as RC. Games B and A have the same endowments but the minimal expectations payoff in Game A is less favorable to the recipient than in Game B, therefore MM predicts dictators' choices in Game A will be less generous to the recipient than in Game B.

The Tversky and Kahneman (TK) model incorporates loss aversion with respect to the status quo, which is the starting endowment in each of our games.[7] Games B and H have the same endowments, as do Games B and A, therefore TK has the same predictions as RC when comparing games H and A with Game B. The endowment in Game B is (\$18, \$8) and the endowment in Game T is (\$8, \$18) and loss aversion has the following implications for the dictator's choice. The set of options in the payoff space in both games is $F = \{(m, y) | m + y = \$26, m \in \{\$8, \$9, \dots, \$18\}\}$, where m is the dictator's money payoff and y is the recipient's money payoff. Consider any two points $x = (m, y) \in F$ and $z = (m - d, y + d) \in F$, for some positive d. Note that in the space (m, y), z is northwest of x (when m is on the horizontal axis); z represents a more generous outcome than x for the recipient. The TK model of loss aversion implies that x is more likely to be chosen over z in Game B than in Game T.[8] With respect to the first dimension (own-money, m), in Game B, z offers an additional loss in the amount of d as compared to x. In Game T, x offers an additional gain of d as compared to z. A difference between two disadvantages (in the first dimension of z and x) in Game B is weighted more than the difference between two advantages (in the first dimension of x and z) in Game T. Hence, x is more likely to be preferred over z in Game B than in Game T. On the other hand, with respect to the second dimension (other's-money, y), in Game B, z offers an additional gain of d as compared to x, whereas in Game T, x offers an additional loss of d *as*

[7] Tversky and Kahneman (1991, pg. 1046).

[8] As stated in Tversky and Kahneman (1991, p.1045): "Loss aversion implies that the same difference between two options will be given greater weight if it is viewed as a difference between two disadvantages (relative to a reference state) than if it is viewed as a difference between two advantages."

compared to *z*. By loss aversion, *z* is more likely to be preferred over *x* in Game T than in Game B.

The testable implications of theoretical models with our experiment are summarized as follows:

Comparison of Games B and H:

RC – no reduction in H of the frequency of any admissible outcome in B
MM – no reduction in H of the frequency of any admissible outcome in B
TK – no reduction in H of the frequency of any admissible outcome in B

Comparison of Games B and T:

RC – no change in the frequency of any admissible outcome
MM –more generous outcomes toward the recipient should be observed in T
TK –more generous outcomes toward the recipient should be observed in T

Comparison of Games B and A (this separates MM from the other two models):

RC – no reduction in B of the frequency of any admissible outcome in A
MM –less generous outcomes toward the recipient should be observed in A
TK – no reduction in B of the frequency of any admissible outcome in A

Thus, the comparison between Games B and T distinguishes the RC model from both MM and TK models, while the comparison between Games B and A distinguishes the MM model from both RC and TK. Comparing Games B and H provides a stress test of each of the models.[9]

3. Experimental Design and Procedures

We implement a between-subjects design with 440 participants. Each subject was randomly assigned to play a single game in a single role, and this was known to the subjects before the game was played. Thus, we have four treatments – defined by the game that was used to determine payments. Our decision to assign a fixed role differs from the standard approach taken in many studies where all subjects make decisions as if they were the dictator, before learning the actual role used in the final payment. While such an approach allows the researcher to collect twice as much data for the same cost and number of subjects, it introduces an issue in that a subject may consider outcomes that could arise if they were the recipient when making a dictator's decision. This could affect the determination of a reference point in the MM or KT models, for example.

[9] A less generous behavior in Game T as compared to Game B or a more generous behavior in Game A than in Game B would be evidence against all three models.

Similarly, one could use the strategy method and allow subjects to make multiple dictatorial decisions to facilitate greater data collection, but again this could introduce a confound, as a subject may or may not consider each game in isolation even if only one is randomly selected for payment. Our choice to have subjects play a single game in a single role eliminates these issues.

Subjects were recruited for a 30 minute experiment and promised $5 for registering for a session and showing up to the laboratory on time. As was explained in the instructions, this participation payment was included in the payoffs from the game; hence, none of the possible payoffs shown in Figure 1 involve either player earning less than $5.[10] By incorporating the participation payment into the payoffs of the game, we eliminate the concern that some subjects view these amounts in isolation, while others view them together. Additionally, no alternative currency, like Francs or ECU, was used. Instead, all monetary values were denoted in $US.

After making the single decision that completely determined their own payoff and the payoff of the recipient in the game, dictators were asked what they believed recipients expected the dictator to do. They then completed a survey that elicited information about the subjects' sex at birth, major of study, GPA, race, religion, previous experiences with helping classmates, giving money to strangers, and doing voluntary work for charities. After completing the survey, dictators were paid in private and dismissed from the experiment. Subjects in the role of a recipient made no incentivized decision, but were asked what they expected the dictator in their game would do.[11] They also completed the same survey as dictators. Once a recipient finished the survey, they were informed of the dictator's decision and then paid in private before being dismissed from the study. Table A.1 in Appendix A reports the survey responses from dictators and recipients across treatments.

The number of subjects per treatment was chosen in advance to provide sufficient power to make the comparisons indicated in the previous section. Each of the planned tests involves comparing treatment B to another treatment. Two common sampling designs when means of k treatments are compared to one baseline control group are the balanced design and the square-root sampling. We use the square-root sampling, in which n subjects in each treatment are compared to $n\sqrt{k}$ subjects in the baseline control group. The square-root sampling design is more efficient with

[10] Appendix B contains copies of the instructions and the survey.
[11] Recipients were told that dictators would not learn their responses.

40 observations in each treatment and 70 observations in the baseline.[12] Testing the contraction consistency axiom by comparing treatments B and H requires more than comparing means; it involves comparing multiple outcomes, namely choice frequencies at six common feasible payoff allocations in the two games. To improve power for this test, the number of observations in H is increased from 40 to 70.[13]

All sessions were run on computers in TIDE Lab at the University of Alabama. The software was developed at the Experimental Economics Center at Georgia State University. Multiple treatments were conducted at each session and the software randomly assigned roles and treatments while maintaining balance in the number of observations collected in each treatment.

4. Data Analysis

Across all treatments, average earnings were \$15 for dictators and \$11 for recipients. Consistent with previous studies, dictator choices are predominantly other-regarding, with purely selfish choices accounting for only 23 percent of dictators (50 out of 220). About 32 percent of dictators choose the equal-payoff allocation and 40 percent choose non-selfish allocations with the higher payoff to the dictator. Only 10 dictators (4.6 percent) made choices that are inconsistent with ego-centric altruism.[14]

In Section 4.1 we compare dictator choices in Treatments B and H. As explained in Section 2, this comparison focuses on the relative frequency with which specific actions are taken. Thus, this analysis is based on logistic regression and the results either support or reject all three theoretical models under investigation. By contrast, the comparisons of Treatments T and A to Treatment B pertain to the generosity of dictators and are designed to distinguish between behaviors predicted by the various models. Hence, this analysis, presented separately in Section 4.2, relies on comparing the average payoff of the dictator between treatments.

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[12] In our design $k = 3$. For 80% power with 95% confidence, $n = 40$ allows us to detect approximately a 0.75 standard deviation difference in means between each treatment and the baseline (Liu 1997). With $n = 40$ and $k = 3$, the number of dictator observations required for B is $n\sqrt{k} = 70$.

[13] Until decisions from 40 dictators had been collected for each treatment, all four treatments were run in each session. After that, only the B and H treatments were run in a session. The number of pairs in one treatment during a session differed by at most one from the number of pairs in another treatment being conducted at the same session.

[14] Cox and Sadiraj (2007) define ego-centric altruism as preference for (a, b) over (b, a) if a > b, where the first and second coordinates are my money payoff and other's money payoff, respectively. It should be noted that in every treatment in our experiment, except Treatment A, for each allocation (a, b) with a > b its mirror allocation, (b, a) is also feasible. Since the sum of dictator and recipient payoffs is always \$26, an implication of ego-centric altruism is no choice to the left of column "\$13" in Tables 2 and 4 (below), that is no dictator would leave the experiment with less than \$13. Similarly, ego-centric altruism predicts that no dictator will receive less than \$13 in Treatment A.

4.1 Holes Effect on Choices

Table 2 shows the distribution of 140 dictator choices in Treatments B and H. The top-row entries denote the possible dictators' payoff at each observed choice. The dictator's and recipient's payoffs always sum to $26 in these two treatments. In both treatments, the most frequent choice is $13 ($g = \$10$, equal-payoff for both parties), followed by the most selfish payoff, $18 ($g = \$0$).

Recall that set of possible payoffs in Treatment H is a proper subset of the set of possible payoffs in Treatment B, with the same minimal expectations payoff and the same initial endowment. As stated in Section 2, all three theories, RC, MM and TK, predict no treatment effect for dictators whose own chosen final payoff in Treatment B is in the set {$8, $12, $13, $14, $17, $18}, which is also feasible in Treatment H.[15] It follows that in Table 2, no frequency in the bottom row (Treatment H) should be smaller than the respective frequency in the top row (Treatment B). Data from our experiment exhibit the predicted pattern for five out of the six allocations, but not for the equal payoff allocation with own (dictator's) payoff amount $13, chosen by 40 percent of dictators in B and by 33 percent of dictators in H.

Table 2. Distributions of Dictators' Own Payoff Choices in Treatments B and H

Treatment (N)	**$8**	**$9**	**$10**	**$11**	**$12**	**$13**	**$14**	**$15**	**$16**	**$17**	**$18**
B (70)	.03	0	0	.01	.01	.40	.06	.17	.07	.06	.19
H (70)	.03				.01	.33	.19			.20	.24

Notes. N is the number of observations.

For statistical inferences we use logit regression (see Appendix A.1 for multinomial logit). The number of observations at choices with own payoffs $8 and $12 is small and identical (2 and 1, respectively) in both Treatments B and H. Therefore, we focus on the four remaining common allocations, with dictator payoffs in the set {$13, $14, $17, $18}. Table 3 reports logit estimated coefficients of Treatment H effect. All four estimated coefficients are either not statistically

[15] Neither RC nor MM theory makes any predictions about what people, who choose from allocations {$9, $10, $11, $15, $16} in Treatment B, would do in Treatment H, and therefore there is no prediction for treatment effect about the mean or the median.

different from 0 or significantly positive.[16] We conclude that Treatment B and H data are consistent with the RC rational choice theory (Sen 1971, 1986), the MM moral reference point model (Cox et al. 2023, 2025) and the TK model (Tversky and Kahneman 1991).

Table 3. Logit Regressions for Four Common Allocations in Treatments B and H

	Equal Allocation ($13, $13)		Allocation ($14, $12)		Allocation ($17, $9)		Selfish Allocation ($18, $8)	
Coefficient for Treatment H	-0.309	-0.307	1.325*	1.337*	1.417**	1.494*	0.341	0.326
(p-value)	(0.382)	(0.406)	(0.028)	(0.036)	(0.018)	(0.024)	(0.413)	(0.436)
{adj. p-value}	{0.590}	{0.623}	{0.072}	{0.093}	{0.044}	{0.072}	{0.590}	{0.623}
Demographic Controls	no	yes	no	yes	no	yes	no	yes
N	140	140	140	140	140	140	140	140

Notes. The analysis is based on Logit regression with robust standard errors. The dependent variable in each set of regressions is a binary variable that takes the value 1 if a subject selected the specified allocation and is 0 otherwise. A negative estimated coefficient for Treatment H would be inconsistent with RC, MM, and TK theories. Demographic controls include the seven survey responses reported in Table A.1 in Appendix A. p-values in parentheses with Romano-Wolf adjusted p-values in braces. N is the number of observations. * and ** denote significance at the 5% and 10% level, respectively. Results from the Multivariate regression are similar. Estimated coefficients are: -0.07 (p-value = 0.384) for outcome ($13,$13), 0.13 (p-value = 0.020) for outcome ($14,$12), 0.14 (p-value = 0.011) for outcome ($17,$9) and 0.06 (p-value = 0.414) for outcome ($18,$8).

4.2 Endowment and Inefficient Feasible Option Effects on Choices

Recall that, compared to the baseline, Treatment T preserves the feasible set of payoff allocations but changes the initial endowments from ($18, $8) to ($8, $18), while Treatment A preserves the initial endowments, ($18, $8) and adds a new payoff allocation, ($19, $5) to the feasible set of payoffs. We first report on the empirical validity of the relevant hypotheses stated in Section 2.

The average dictator payoff is $14.6 in Treatment B, $15 in Treatment H, $15.5 in Treatment T, and $15.7 in Treatment A. Linear estimates of treatment effects on dictator payoffs in Treatments H, T and A relative to dictator payoffs in the baseline B are: 1.10 (p-value = 0.016) for Treatment A, 0.79 (p-value = 0.112) for Treatment T and 0.39 (p-value = 0.325) for Treatment

[16] Appendix A.2 reports estimated margins for the multinomial regression.

H.[17] Hence, compared to the baseline B, dictators are less generous towards the recipient in Treatment A, as is predicted by MM but this behavior is inconsistent with TK. Additionally, dictators are not more generous in T, which is inconsistent with both MM and TK predictions.

The distributions of dictators' payoffs across treatments are reported in Tables 2 and 4. The noticeable bimodal behavior, indicated by the clustering of data at the equal-payoff, ($13, $13), and the selfish payoff amounts, ($18, $8), lessens the appeal of average effects for examination of behavioral response to treatments. As Treatments B and H are discussed in the previous subsection, here we focus on Treatments T, A, and B. Referring to the Kolmogorov-Smirnov test and Mann-Whitney test, using Treatment B as the control group, the former fails to reject the null hypothesis of equal distributions, whereas the latter rejects the null hypothesis in favor of less generosity in Treatments A and T relative to B.

Table 4. Distributions of Dictators' Own Payoffs in Treatments B, T and A

Treatment (N)	**$8**	**$9**	**$10**	**$11**	**$12**	**$13**	**$14**	**$15**	**$16**	**$17**	**$18**	**$19**	**p-value vs. Baseline**	
B (70)	.03	0	0	.01	.01	.40	.06	.17	.07	.06	.19		**KS**	**KW**
T (40)	0	.03	0	0	.03	.30	0	.13	.13	0	.40		0.193	0.053
A (40)	0	0	0	0	.03	.20	.13	.15	.13	.10	.18	.10	0.129	0.0195

Notes. N is the number of observations. Allocation ($19, $5) corresponding to column "$19" is not available in B and T. The last two columns report two-sided p-values according to the Kolmogorov-Smirnov and Mann-Whitney tests, respectively, for equality of distributions in B versus the relevant treatment.

Based on our analysis, data from Treatments B and A offer some support for choice monotonicity in minimal expected payoffs, as postulated by MM. In contrast, data from Treatments B and T are inconsistent with choice monotonicity in the initial endowments, as expected under both MM and TK. These conclusions are supported by further exploratory data analysis reported in Appendix A. Two summary data patterns are: (1) Treatments affect all three common quartiles of distributions of dictators' payoffs;[18] (2) Treatment T elicits more selfishness

[17] Linear regression (with robust standard errors) of dictators' payoffs using data from Treatment T (40 subjects), Treatment A (40 subjects), Treatment B (70 subjects) and Treatment H (70 subjects). Regressors include dummies for Treatments H, T, and A and demographic variables.

[18] The (1^{st}, 2^{nd}, 3^{rd}) quartiles are ($13, $14, $16) in B, ($13, $16, $18) in T and ($14, $15.5, $18) in A.

than Treatment B, whereas Treatment A induces less preference for equal-payoff allocation than Treatment B.

5. Discussion

The experimental results presented in the previous section cast doubt on both the MM and TK models. This naturally leads to the question of whether other models can explain the pattern of dictator behavior that we observe.[19] One prominent model of fairness was introduced by Rabin (1993). In this model, perceived kindness is defined relative to the average of the lowest and the highest payoffs that the dictator can provide to the recipient. Treatment A preserves the recipient's highest payoff, $18, but it decreases the recipient's lowest payoff from $8 to $5, hence the average payoff decreases from $13 to $11.5. Thus, allocating $12 to the recipient is a kind choice in Treatment A (as it exceeds 11.5), but not in Treatment B (where it falls short of $13). Indeed, as compared to Treatment A, in Treatment B twice as many recipients received $13 (40 percent in B compared to 20 percent in A) and about half as many received $12 (6 percent in B and 13 percent in T). Perceived kindness suggests less generosity to the recipient in Treatment A than in B, that is, a higher payoff for the dictator in Treatment A than in B. As reported in section 4.2, this is consistent with the data. However, in Treatments B and T the average payoff to the recipient is the same ($13 as the lowest and the highest payoffs are $8 and $18) and the feasible set is also the same. An application of Rabin's model to dictator games would imply choices in Treatments B and T are drawn from the same distribution.[20] Selfish choices double from 19 percent in Treatment B to 40 percent in Treatment T (p-value = 0.014, Pearson's chi-squared test), casting doubt on Rabin's model.

The negative conclusion that we draw regarding MM and TK is driven by dictators not being more generous in Treatment T than in B, games with identical opportunity sets but different endowments. The nominal *increase* in average dictator payoffs that we observe when going from a "give" decision to a "take" decision differs from the significant *decrease* that is predicted by MM and TK models and has been observed in past studies (e.g. Korenok, Millner, Razzolini 2013,

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[19] See Appendix A for implications of the observed data for the guilt aversion model (Battigalli and Dufwenberg 2022).

[20] One might argue that allocating less than $12 to the recipient could be perceived as more unkind in Treatment T (act of taking) than in Treatment B (act of giving). If so, a dictator who received disutility from being perceived as unkind, should allocate more to the recipient in Treatment T than in B, an implication of which is larger dictator payoff in B than in T. We don't observe this in our experiment, as indicated by second and the third quartiles of dictator payoff distributions reported in a preceding footnote.

2017; Oxoby and Spraggon 2008; Flage 2024).[21] To understand why our results differ we consider the difference in design choices between our study and previous studies. Common to all these studies is the starting design feature of identical opportunity sets and different endowment points. Our study, however, includes the participation fee in the salient payoffs from the game as clearly explained to the subjects. Additionally, our Treatment T guarantees the recipient to end with a final payoff of \$8 when facing the maximum take of \$10 ($g = -\$10$). On the other hand, in many taking games in the literature, the recipient's final salient payoff corresponding to the maximum possible take is \$0, as the participation payment is a separate payment. We speculate that the larger level of taking that we observe in our Treatment T as compared to previous studies is attributable to this design feature. Any amount taken by the dictator may not appear to be hurting the recipient as much, given the larger minimum salient payoff guaranteed by the participation fee incorporated into the game final payoff. One might assume that accounting for the participation payment would also lead dictators to give less in the baseline, thus preserving the relative ranking of dictator outcomes in Treatments T and B. However, if the level of shame or guilt takers experience is driven by how bad the other person's ending position is, while givers need to give just a modest amount to receive any intrinsic benefit from giving, then incorporating the participation payment in the salient payoff could generate the observed reversal.

Finally, we consider the H treatment. As we poke holes in the baseline opportunity set, the rate at which the dictator chose the equal split outcome fell from 40% in Treatment B to 33% in Treatment H while rational choice (RC) theory, moral monotonicity (MM) model, and Tversky-Kahneman (TK) model all predict that the propensity to choose a particular option in the Baseline should not decrease if holes are poked in its feasible set. The location of the hole that precludes the dictator from giving away \$2 or \$3 is deliberate. While such choices are rarely selected in standard dictator games, their absence from feasible choices was expected to change how subjects perceive the remaining available options.[22] Specifically, this hole creates a separation between

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[21] It should be noted that the MM model was developed in part to explain the observed patterns in the listed papers. Some other studies (Dreber et al 2013; Kettner and Wittman 2016; Grossman and Eckel 2015) fail to find a difference in outcomes between giving and taking games. Of these studies, the first two use procedures that tend to increase the dictator's feeling of ownership on the money to be divided (in both studies the dictator possess and touches the money), while in the latter study dictators choose not between giving and taking but among different payoff pairs (Korenok, Millner, Razzolini 2017).

[22] The hole that precludes the dictator to give \$7, \$8, or \$9 is not expected to have much effect since those choices are rarely observed in dictator games and are unlikely to change the perception of what is selfish and what is generous.

selfish actions (giving away \$0 or \$1) and generous actions (giving away \$4 or more), whereas without a hole there is less discontinuity between generosity and selfishness. Thus, inserting the hole is expected to lead dictators to give \$4 rather than \$5, since \$4 is more clearly in the generous set of actions with the hole. This was the logic behind the design of Deck and Razzolini (2019), who conducted a hand run experiment inserting holes in the dictator's opportunity set. Those experiments used the same subject pool as the current study, but the participation payments were paid separately from the salient payoffs, which involved allocating \$10.[23] In their Experiment 1, a between-subjects experiment, every subject acted as the dictator before being informed of their actual role. They found that the percentage of subjects giving \$5, which was half of the available money, fell from 38% to 29% when the possibility to give \$2 or \$3 was removed by inserting a hole.[24] The reported one-sided p-value associated with a two-sample proportion test for this comparison is 0.094.

Combining data from our experiment and Experiment 1 of Deck and Razzolini (2019), 39 percent of 206 dictators shared half of the money by giving away \$5 when they could have shared any amount from \$0 to \$5, but only 31 percent of 136 dictators shared \$5 when they could not have shared \$2 or \$3. The resulting one-sided p-value for a two sample proportions test is 0.0668.[25] These considerations provide suggestive evidence that calls into question the validity of both the MM and TK models, as well as the contraction consistency property of rational choice theory, challenging standard approaches to modeling decision making.

6. Conclusions

We report an experiment with treatments designed to stress-test rational choice theory and alternative reference point models.[26] Rational choice (RC) theory (e.g. Chernoff 1954; Arrow

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[23] Subjects who participated in that study were not eligible to participate in the current study.

[24] In Experiment 1, Deck and Razzolini (2019) run two treatments, to compare the effects of inserting a single hole versus two holes in the dictator opportunity set. Sixty-six subjects participated in each of those treatments. Seventy subjects participated in a no holes baseline where the dictator could allocated \$10 in any integer amount. In the single hole treatment, dictators could not transfer \$6, \$7, \$8, or \$9. The two holes treatment included the transfer restrictions of the one hole treatment and also did not allow the dictator to transfer \$2 or \$3. Deck and Razzolini (2019) also report an Experiment 2 that involves the same treatments as their Experiment 1, but uses a with-in subject design to provide direct evidence of people changing their choices as irrelevant options were removed. They find that 53% of subjects selected different allocations at least once when their preferred outcome selected remained after a hole was inserted.

[25] Regression with the dependent variable that equals 1 for equal payoffs and 0 otherwise and dummy regressors for Holes treatments (i.e. giving \$2 and \$3 not feasible) and for data from Deck and Razzolini (2019) shows no effect of the data source (two-sided p-value = 0.61), but a marginal effect of Holes (one-sided p-value = 0.059).

[26] Reference point models are *not* part of rational choice theory because reference points can introduce intransitivity.

1959; Sen 1971, 1986) postulates the contraction consistency property: chosen alternatives from a set remain chosen in every subset (of the original set) that contains them. Conventional preference theory[27] and (consequentialist) social preferences models[28] are special cases of RC, so data that challenge RC must challenge the special cases. The alternative reference point models we consider are the venerable Tversky and Kahneman (1991) loss aversion in riskless choice (TK) model and the recent moral reference point model (MM) in Cox et al. (2023, 2025).

We include two novel treatments with feasible sets constructed by: poking holes to remove some give opportunities from the interior of the give-only feasible set (Treatment H); or adding a point to insert an inefficient take opportunity into the dictator's give-only feasible set (Treatment A). Our experimental design includes two treatments with the same set of feasible payoffs but different endowments that provide dictators with: opportunities to give to the recipient (Treatment B); or opportunities to take from the recipient (Treatment T).

Treatment H (holes) and Treatment B (baseline) were intended to stress-test rational choice theory and both reference point models. The three theoretical models all make the same predictions for these treatments. As reported in Section 4.1, data from Treatments B and H exhibit the predicted pattern for five out of the six relevant allocations contained in the Treatment B feasible set and its Treatment H subset. The choices in the equal-payoff ($13) column in Table 2 are inconsistent with RC, MM, and TK, but the change is not significant.

Other treatments discriminate between theories. Treatment A, compared to Treatment B, only decreases recipients' minimal expectations, inducing less generous behavior according to MM, but no effect for RC and TK. Data exhibit less generosity in A, favoring MM against RC and TK. Treatments T and B differ only in terms of mirror image endowments. Compared to Treatment B, RC predicts no Treatment T effect whereas MM and TK predict more generous choices in Treatment T. Our data suggest behavior is in the opposite direction from the predictions from both MM and TK. Data from these treatments is also inconsistent with the perceived kindness model (Rabin 1993).

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[27] For example, Hicks 1946; Samuelson 1947; Debreu 1959; textbooks.
[28] For example, Fehr and Schmidt 1999; Bolton and Ockenfels 2000; Charness and Rabin 2002; Andreoni and Miller 2002; and Cox and Sadiraj 2007.

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Appendix A

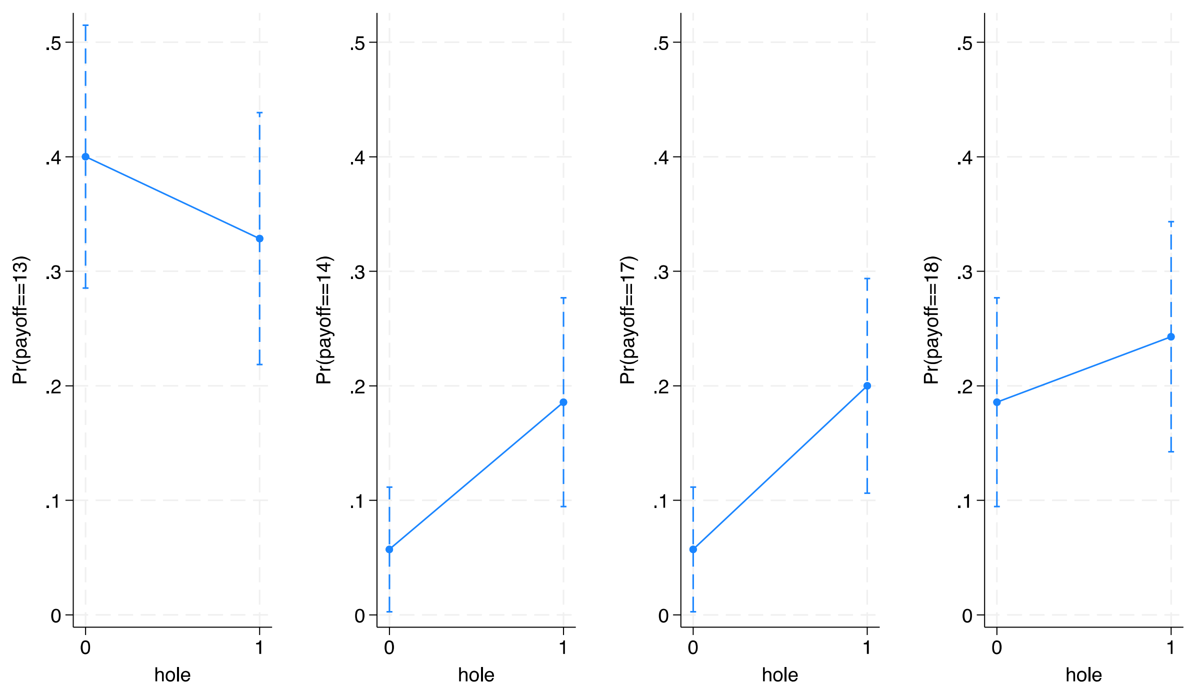
Appendix A.1

This appendix contains information referenced in the main body of the paper. Specifically, Table A.1 summarizes dictator survey responses and Figure A.1 graphs estimated treatment effects for the frequency of common outcomes in Games B and H.

Table A.1 Dictators' Survey Responses

Treatment (N obs)	Major:Econ / Business	GPA (3.75 to 4)	Female	Not Religious	Give Money to a Stranger	Volunteer Charity	Helped a Classmate
					(Often or Very Often)		
B (70)	.36	.49	.56	.24	.31	.54	.67
H (70)	.36	.53	.63	.21	.24	.57	.74
T (40)	.40	.72	.53	.25	.15	.50	.75
A (40)	.30	.72	.47	.23	.17	.60	.80

Figure A.1. Multinomial logit (Four common allocations in Treatments B and H)



A.2 Exploratory post-experiment data analysis

As part of exploratory post-experiment data analysis, we noticed two interesting patterns in distributions of dictators' payoffs in Table 4 in the main text.

First, both treatments elicit higher 2nd and 3rd quartiles. The (1st, 2nd, 3rd) quartiles of distributions of dictators' payoffs are: (13, 14, 16) in Treatment B, (13, 16, 18) in T and (14, 15.5, 18) in A. Simultaneous quantile regression report significant treatment A effect for all three quartiles, p-values are 0.019, 0.037 and 0.037. The p-values for treatment T effects on the three quartiles are 1, 0.091 and 0.012.

Second, compared to the baseline, the equal-payoff allocation is less attractive whereas the selfish allocation gains attraction in treated groups. The frequency of the equal-payoff allocation, decreases from 40 percent in Treatment B to 30 percent in T and 20 precent in A. In contrast, the frequency of selfish allocation doubles from 19 percent in B to 40 percent in Treatment T. In Treatment A, the frequency of selfish allocation is 10 percent or 28 percent depending on whether one pools observations of \$19 and \$18 (since \$19 is not available in B). Table A.2.1. reports outcomes of logit regression (with robust standard errors) of the propensity of the equal payoffs and selfish payoff allocations. Compared to the baseline B, Treatment A induces less preference for equal-payoff allocation, whereas Treatment T elicits more selfishness.

Table A.2. Logit Regressions for Equal and Selfish choices in Treatments B, T and A

Dep. Var.:	Equal Allocation		Selfish Allocation	
	(1)	(2)	(1)	(2)
Treatment T	-0.442	-0.525	1.073**	0.997*
	(0.297)	(0.253)	(0.017)	(0.042)
	{0.307}	{0.267}	{0.030}	{0.079}
Treatment A	-0.981*	-1.218**	-0.719	-0.759
	(0.035)	(0.011)	(0.240)	(0.238)
	{0.099}	{0.030}	{0.257}	{0.238}
Demographics	no	yes	no	yes
Observations	150	150	150	150

Notes. Logit regression with robust standard errors. The omitted category is the baseline, Treatment B. The dependent variable in the first two columns is a binary variable that takes value 1 if the equal-payoff allocation is chosen. The dependent variable in the two right columns is a binary variable that takes value 1 if the dictator chooses allocation (\$18, \$8) in B and T and (\$19, \$5) in A. If (\$18, \$8) in Treatment A is included in the selfish category then the estimated coefficient for Treatment A is positive, 0.5 but remains statistically insignificant (p-value=0.3). Demographics include the same survey responses as reported in Table A.1 above. p-values in parentheses, Romano-Wolf adjusted p-values in braces.

A.3 Data Analysis: Implications for Guilt Aversion Models

Data collected during the survey includes dictators' beliefs about recipients' expectations. There are two concerns about these data: (1) beliefs were elicited after the decisions were made, so they may reflect a desire to self-justify decisions; and (ii) they were not incentivized. For these reasons we are reluctant to include the discussion below in the main text.

According to guilt aversion model (Battigalli and Dufwenberg, 2022) the dictator experiences disutility if their allocation to the recipient falls short of the amount the dictator believes the recipient expects to receive. The model predicts dictators' choices to be either the most selfish or the believed amounts, but not more than the latter.[29] We look at non-selfish choices.

Table A.4.1 shows the distribution of dictators' choices across three categories: "Same as expected" category includes observations where the dictator's decision and the reported belief are the same; "More than expected" indicates that the observed dictator's choice was more generous to the recipient than the dictator's reported belief; "Less than expected" category include cases where the dictator's choice was less generous to the recipient than the dictator's reported belief. "More than expected" observations are consistent with feel-good (or a positive "self-image" concern) but inconsistent with guilt aversion model. This is the most populated category in all treatments.

Overall, 27 percent of observations ("Same as expected" category) are consistent with guilt aversion (or ex-post rationalization), 52 percent ("More than expected" category) are inconsistent with guilt aversion, but consistent with "feel-good" motivation and 21 percent ("Less than expected" in Table A.3) are consistent with a non-linear version of guilt aversion model.

[29] A non-linear version model can accommodate interior choices.

Table A.3 (Non-selfish) Dictators Decisions compared to Beliefs

	Treatment				All Treatments
Allocating to the Recipient	**B**	**H**	**T**	**A**	
More than expected	.40	.53	.625	.64	.52
Same as expected	.32	.30	.25	.17	.27
Less than expected	.28	.17	.125	.19	.21
Nr of (non-selfish) Obs.	57	53	24	36	170

Appendix B: Subject Instructions and Survey

This Appendix provides the subject instructions and survey.

INSTRUCTIONS

Common in treatments B and H

In this study, you will be randomly paired with one other person here today. One person in a pair will be randomly selected to be a Decider. The other person in the pair will be a Recipient.

What do you know?
You and the person you are paired with will not be told each other's identity. You will know the amounts of money you and your paired person are endowed with. The endowed money includes the participation payment for this study.

What is the decision task?
If you are a Decider then you make **one, and only one,** decision in this study. You will decide how much of your endowed money to give to the Recipient.
If you are a Recipient, then you make **no** decision in this study.

What is your payment for this study?
If you are a Decider, your payment is your endowed money minus the money you give to the Recipient.
If you are a Recipient, your payment is your endowed money plus the money the Decider gives you.

There will be **no additional payment** associated with this study.

Finish Reading Instructions

TREATMENT B

DECIDER Screen

You have been randomly selected by the computer to be the Decider.

You are endowed with **$18** and your paired Recipient is endowed with **$8**. You can give to the Recipient any one of the following dollar amounts: {$0, $1, $2, $3, $4, $5, $6, $7, $8, $9, $10}.

Please make your choice by clicking on one of the rows in the table below.

I give to the Recipient	I get paid	The Recipient gets paid
$0	$18	$8
$1	$17	$9
$2	$16	$10
$3	$15	$11
$4	$14	$12
$5	$13	$13
$6	$12	$14
$7	$11	$15
$8	$10	$16
$9	$9	$17
$10	$8	$18

Submit

RECIPIENT Screen

You have been randomly selected by the computer to be the Recipient.

You are endowed with **$8** and your paired Decider is endowed with **$18**. The Decider can give to you any one of the following dollar amounts: {$0, $1, $2, $3, $4, $5, $6, $7, $8, $9, $10}.

While you are waiting for the Decider to make a decision, please click on one of the rows in the table below to indicate what you expect the Decider to give you. The Decider will **not** be informed of your response.

I expect the Decider will give	Resulting in me being paid	Resulting in the Decider
$0	$8	$18
$1	$9	$17
$2	$10	$16
$3	$11	$15
$4	$12	$14
$5	$13	$13
$6	$14	$12
$7	$15	$11
$8	$16	$10

I expect the Decider will give	Resulting in me being paid	Resulting in the Decider
$9	$17	$9
$10	$18	$8

Submit

TREATMENT H

DECIDER Screen

You have been randomly selected by the computer to be the Decider.

You are endowed with **$18** and your paired Recipient is endowed with **$8**. You can give to the Recipient any one of the following dollar amounts: {$0, $1, $4, $5, $6, $10}.

Please make your choice by clicking on one of the rows in the table below.

I give to the Recipient	I get paid	The Recipient gets paid
$0	$18	$8
$1	$17	$9
$4	$14	$12
$5	$13	$13
$6	$12	$14
$7	$11	$15
$8	$10	$16
$9	$9	$17
$10	$8	$18

Submit

RECIPIENT Screen

You have been randomly selected by the computer to be the Recipient.

You are endowed with **$8** and your paired Decider is endowed with **$18**. The Decider can give to you any one of the following dollar amounts: {$0, $1, $4, $5, $6, $10}.

While you are waiting for the Decider to make a decision, please click on one of the rows in the table below to indicate what you expect the Decider to give you. The Decider will **not** be informed of your response.

I expect the Decider will give	Resulting in me being paid	Resulting in the Decider
$0	$8	$18
$1	$9	$17
$4	$12	$14
$5	$13	$13
$6	$14	$12
$10	$18	$8

Submit

TREATMENT T

In this study, you will be randomly paired with one other person here today. One person in a pair will be randomly selected to be a Decider. The other person in the pair will be a Recipient.

What do you know?
You and the person you are paired with will not be told each other's identity. You will know the amounts of money you and your paired person are endowed with. The endowed money includes the participation payment for this study.

What is the decision task?
If you are a Decider then you make **one, and only one,** decision in this study. You will decide how much of the Recipient's endowed money to take for yourself.

If you are a Recipient, then you make **no** decision in this study.

What is your payment for this study?
If you are a Decider, your payment is your endowed money plus the money you take from the Recipient.

If you are a Recipient, your payment is your endowed money minus the amount the Decider takes from you.

There will be **no additional payment** associated with this study.

Finish Reading Instructions

DECIDER Screen

You have been randomly selected by the computer to be the Decider.

You are endowed with **$8** and your paired Recipient is endowed with **$18**. You can take from the Recipient any one of the following dollar amounts: {$0, $1, $2, $3, $4, $5, $6, $7, $8, $9, $10}.

Please make your choice by clicking on one of the rows in the table below.

I take from the Recipient	I get paid	The Recipient gets paid
$0	$8	$18
$1	$9	$17
$2	$10	$16
$3	$11	$15
$4	$12	$14
$5	$13	$13
$6	$14	$12
$7	$15	$11
$8	$16	$10
$9	$17	$9
$10	$18	$8

Submit

RECIPIENT Screen
You have been randomly selected by the computer to be the Recipient.

You are endowed with **$18** and your paired Decider is endowed with **$8**. The Decider can take from you any one of the following dollar amounts: {$0, $1, $2, $3, $4, $5, $6, $7, $8, $9, $10}.

While you are waiting for the Decider to make a decision, please click on one of the rows in the table below to indicate what you expect the Decider to give you. The Decider will **not** be informed of your response.

I expect the Decider will take from me	Resulting in me being paid	Resulting in the Decider being paid
$0	$18	$8
$1	$17	$9
$2	$16	$10
$3	$15	$11
$4	$14	$12
$5	$13	$13
$6	$12	$14
$7	$11	$15
$8	$10	$16
$9	$9	$17
$10	$8	$18

Submit

TREATMENT A

In this study, you will be randomly paired with one other person here today. One person in a pair will be randomly selected to be a Decider. The other person in the pair will be a Recipient.

What do you know?
You and the person you are paired with will not be told each other's identity. You will know the amounts of money you and your paired person are endowed with. The endowed money includes the participation payment for this study.

What is the decision task?
If you are a Decider then you make **one, and only one,** decision in this study. You will decide how much of your endowed money to give to the Recipient or, alternatively, whether you will take an amount from them.

If you are a Recipient, then you make **no** decision in this study.

What is your payment for this study?
If you are a Decider, your payment is either your endowed money minus the money you give to the Recipient or your endowed money plus the amount you take from the Recipient.

If you are a Recipient, your payment is either your endowed money plus the money the Decider gives you or your endowed money minus the amount the Decider takes from you.

There will be **no additional payment** associated with this study.

Finish Reading Instructions

DECIDER Screen
You have been randomly selected by the computer to be the Decider.

You are endowed with **$18** and your paired Recipient is endowed with **$8**. You can take $3 from the Recipient to increase your payoff by $1. Alternatively, you can give to the Recipient any one of the following dollar amounts: {$0, $1, $2, $3, $4, $5, $6, $7, $8, $9, $10}.

Please make your choice by clicking on one of the rows in the table below.

I take from the Recipient	I get paid	The Recipient gets paid
$3	$19	$5

OR

I give to the Recipient	I get paid	The Recipient gets paid
$0	$18	$8
$1	$17	$9
$2	$16	$10
$3	$15	$11
$4	$14	$12

I give to the Recipient	I get paid	The Recipient gets paid
$5	$13	$13
$6	$12	$14
$7	$11	$15
$8	$10	$16
$9	$9	$17
$10	$8	$18

Submit

RECIPIENT Screen

You have been randomly selected by the computer to be the Recipient.

You are endowed with **$8** and your paired Decider is endowed with **$18**. The Decider can take $3 from you to increase their payoff by $1. Alternatively, The Decider can give to you any one of the following dollar amounts: {$0, $1, $2, $3, $4, $5, $6, $7, $8, $9, $10}.

While you are waiting for the Decider to make a decision, please click on one of the rows in the table below to indicate what you expect the Decider to give you. The Decider will **not** be informed of your response.

I expect the Decider will take from me	Resulting in me being paid	Resulting in the Decider being paid
$3	$5	$19

OR

I expect the Decider will give me	Resulting in me being paid	Resulting in the Decider being paid
$0	$8	$18
$1	$9	$17
$2	$10	$16
$3	$11	$15
$4	$12	$14
$5	$13	$13
$6	$14	$12
$7	$15	$11
$8	$16	$10
$9	$17	$9
$10	$18	$8

Submit

Questionnaire

Thank you very much for participating in this study. We would like to ask you a few questions. Your privacy is protected because your name and CWID will never be connected with your responses.

1. What is your intended or declared major?
   - Economics
   - Business Administration, Finance, Accounting
   - Biological Sciences
   - Math, Computer Sciences, or Physical Sciences
   - Social Sciences or History
   - Does not apply
   - Other Fields
2. What is your current grade point average?
   - Between 3.75 and 4.0 GPA
   - Between 3.25 and 3.74 GPA
   - Between 2.75 and 3.24 GPA
   - Between 2.25 and 2.74 GPA
   - Between 1.75 and 2.24 GPA
   - Between 1.25 and 1.74 GPA
   - Less than 1.25
   - Have not taken courses for which grades are given.
3. What is your gender?
   - Female

- Male
- Non-binary

4. What is your race?
   - Asian
   - Black/African American
   - White
   - Other
5. What is your religious affiliation?
   - Christian
   - Buddhist
   - Hindu
   - Jewish
   - Muslim
   - Other
   - I am not religious
6. People are usually out for only their own good
   - Disagree Strongly
   - Disagree Slightly
   - Agree Slightly
   - Agree Strongly
7. Most people inwardly dislike putting themselves out to help other people
   - Disagree Strongly
   - Disagree Slightly

- Agree Slightly
- Agree Strongly

8. I have given money to a stranger who needed it (or asked me for it)
   - Never
   - Once
   - More than once
   - Often
   - Very often
9. I have done volunteer work for charity
   - Never
   - Once
   - More than once
   - Often
   - Very often
10. I have helped a classmate who I did not know that well with an assignment when my knowledge was greater than his or hers
    - Never
    - Once
    - More than once
    - Often
    - Very often

<u>Question 11 varies between Deciders and Recipients and across Treatments</u>

Treatment B

Decider

11. What amount do you believe the Recipient expected the Decider to give to them? Please click on one of the options below to indicate your belief.

    GIVE: ○ 0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10

Recipient

11. The Decider was asked, what amount they believe you (the Recipient) expected the Decider to give to you? What do you believe the Decider's answer to this question was? Please click on one of the options below to indicate your belief.

    GIVE: ○ 0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10

Treatment H

Decider

11. What amount do you believe the Recipient expected the Decider to give to them? Please click on one of the options below to indicate your belief.

    GIVE: ○ 0 ○ 1 ○ 4 ○ 5 ○ 6 ○ 10

Recipient

11. The Decider was asked, what amount they believe you (the Recipient) expected the Decider to give to you? What do you believe the Decider's answer to this question was? Please click on one of the options below to indicate your belief.

    GIVE: ○ 0 ○ 1 ○ 4 ○ 5 ○ 6 ○ 10

Treatment T

Decider

11. What amount do you believe a Recipient expected the Decider to take from them? Please click on one of the options below to indicate your belief.

    TAKE: ○ 0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10

Recipient

11. The Decider was asked, what amount they believe you (the Recipient) expected the Decider to take from you? What do you believe the Decider's answer to this question was? Please click on one of the options below to indicate your belief.

TAKE: ○ 0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10

Treatment A

Decider

11. What amount do you believe a Recipient expected the Decider to take from or give to them? Please click on one of the options below to indicate your belief.

TAKE: ○ 3
Or

GIVE: ○ 0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10

Recipient

11. The Decider was asked, what amount they believe you (the Recipient) expected the Decider to take from or give to you? What do you believe the Decider's answer to this question was? Please click on one of the options below to indicate your belief.

TAKE: ○ 3
Or

GIVE: ○ 0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10