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What Others Choose Not to Do Matters In Trust-based Exchange

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Abstract

Many economic interactions are characterized by "all-or-nothing" action spaces that may limit the demonstrability of intended trust. We investigate whether restricting investment opportunities to all-or-nothing options affects the investment rate and propensity to reciprocate. We do this by manipulating the investor's action space in two versions of the trust game. In the *all-or-nothing* game the investor can invest either $10 (all) or $0 (nothing), while in the *continuous* game the investor can invest any amount between $10 and $0. In both games, the trustee receives the tripled investment and then can return any amount to the investor. Results indicate that investments are higher in the *all-or-nothing* game than in the *continuous* game. However, higher investments in the *all-or-nothing* game do not lead to higher returns. To the contrary, conditional on $10 investments, on average trustees return less in the *all-or-nothing* game. Although the *all-or-nothing* action space results in greater wealth overall, it also appears to "backfire" for investors who do not benefit from the increased wealth. These results support the proposition that humans perceive intentions not only by evaluating what others do but also by evaluating what others choose not to do.

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1. Introduction

Trust and trustworthiness are fundamental to an efficient economy, where (i) trust is demonstrated by willfully ceding resources or control to another, making them vulnerable, with the expectation that the other intends to reciprocate and not be opportunistic, and (ii) trustworthiness is demonstrated by not succumbing to opportunism so as to reciprocate the resources or control that another has vested with trust. Interactions that require trust involve a basic dilemma where self-interest and safety are traded off with the potential benefits that arise from a trust-based reciprocity relationship.

Prior research on trust games shows that trust generates trustworthiness: the more an investor voluntarily invests from his endowment, the more likely the trustee is to reciprocate by voluntarily returning discretionary income generated by the investment (e.g., Reuben *et al.*, 2009). Ostrom and Walker (2003) review continuous trust games, modeled after Berg *et al.* (1995) and find that larger amounts tend to generate positive returns on investment. Fehr *et al.* (1996) and Falk and Gächter (2002) find similar results in gift exchange games. An important implication of these findings is that investors engaged in a trust-base exchange relationship can maximize their expected returns by increasing their investments to sufficiently high levels.

Two questions motivate our study. First, can we generate more investment by restricting the investor's choice set to an all-or-nothing (either investing or keeping their entire endowment) option? Second, if we can generate higher investment using all-or-nothing restrictions, will that higher investment also lead to higher reciprocity? Results addressing these questions are of interest to managers, social and financial planners, and behavioral economists for a couple of reasons. First, economic institutions often restrict individual decisions, making it important to know whether such restrictions are efficient. The increasingly popular practice of intentionally

manipulating people's "choice architecture" (Münscher *et al*., 2015) has led to documented economic improvements for both investors and trustees, making it of great interest to social and financial planners (Thaler and Sunstein, 2012). Second, many behavioral economists use and refer to results of "trust games" with highly restricted action spaces (e.g., only two or three options), considering these equivalent to "trust games" with more continuous action spaces. An improved understanding of how trust game environments affect trust and reciprocity should be of great importance to many, given the explosion in literature making the "trust game" a very popular topic of study (for reviews see Johnson and Mislin, 2011; Balliet and Van Lange, 2013).

While restriction of investment and contribution options is a strategy pursued by entrepreneurs generating venture capital and by fundraisers soliciting donations, it is unclear whether restrictive choice designs reliably raise net transfers in the laboratory.[2] In the context of a threshold public goods game, for example, Cadsby and Maynes (1999) find lower levels of contribution when participants are provided binary rather than continuous action spaces. On the other hand, in the context of linear public goods games Gangadharan and Nikiforakis (2009) do not find differences in levels of contribution using binary (i.e., 0 or 10) versus integer (i.e., 0, 1, …, 10) action spaces. Given these conflicting findings it is not clear how restricting investment options would impact investments in a trust game.

Whether more restricted investment options affect reciprocity is a second important question motivating this research. Although the implicit hypothesis is well founded and compelling (i.e., if investments are raised, positive returns will increase), a few studies suggest that the

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[2] A minimum investment (e.g., $25,000) is typically required for an angel investor to be able to invest in a company (Sudek, 2006). Minimum "pledges" are also common requirements to support projects on www.kickstarter.com, the world's largest funding platform. Experimental studies using *appeals scales* (a form of choice architecture manipulation), demonstrate that fundraisers can increase net donations by suggesting discrete contribution levels (Doob and McLaughlin, 1989; Schibrowsky and Peltier, 1995; Desmet and Feinberg, 2003).

relationship between investment rate and reciprocity may not be so straightforward: if investment does not provide much information about intentions of the investor, trustees may not reciprocate (e.g., Rabin, 1993; Falk and Fischbacher, 1998; Dufwenberg and Kirchsteiger, 2004; Bacharach *et al*., 2007). We suggest that the granularity of the investor's action space affects demonstration of intended trust in its ability to reveal that the investor has forgone available alternatives to secure some portion of their endowment and avoid the downside risk otherwise associated with investment. Investment demonstrated in an environment of more (fewer) alternatives provides the trustee a clearer (more ambiguous) indication of intended trust.

To better understand how restriction of investor action space affects investments and returns, we examine behavior in two versions of the trust game inspired by the original Berg *et al.* (1995) "investment game" and the Bolle (1998) "rewarding trust game". In both versions, the investor receives a $10 endowment and then makes an investment decision. In the *continuous* version, the investor can invest nothing or any amount (in increments of $0.01) of the $10 endowment, while in the *all-or-nothing* version the investor can invest either $0 or $10.[3] In both versions, the un-endowed trustee receives the tripled amount of the investment and then can return any amount back to the investor.[4] This design allows us to compare equally unrestricted trustee reciprocity between versions. We find that investments are higher in the *all-or-nothing* game than in the *continuous* game ($7.71 versus $5.50). However, when investment is limited to a two-choice option, as in the *all-or-nothing* game, reciprocity decreases. On average trustees who receive $30 income (from $10 investment) return less in the *all-or-nothing* game than in the *continuous* game ($10.03 versus $12.71). These results suggest that investor action space restriction affects trustee

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[3] Our *continuous* game is quasi-continuous: investors could select an amount to the penny exactly. As such, they had 1,001 options available in the range $0-$10.

[4] In Berg *et al*. (1995) the trustee was symmetrically endowed with $10. Other research has used asymmetric endowments in the trust game (Glaeser *et al.,* 2000; Xiao and Bicchieri, 2010; Reitz *et al.,* 2014.).

reciprocation: although trustees use investment amounts to index intended trust and reciprocate based on this, by restricting the investor's alternatives to an all-or-nothing action space – we restrict his ability to clearly demonstrate intended trust. Our results support the proposition that humans perceive intentions not only by evaluating *what others do* but also by evaluating *what others choose not to do*.

2. Experimental Design and Procedures

The experiment was conducted at Chapman University's Economic Science Institute (ESI). A total of 248 participants were recruited from a participant pool consisting primarily of undergraduate students and randomly assigned to a single session. There were seven sessions of the *continuous* treatment (N = 152) and four of the *all-or-nothing* treatment (N = 96). Those who had participated in trust-based experiments at ESI were excluded. Participants were seated at visually isolated workstations and interacted with each other anonymously over a local computer network. The experiment was programmed and conducted using z-Tree (Fischbacher, 2007).

Each of eleven sessions consisted of 18 to 24 participants, lasted approximately 35 minutes, and was sequenced as follows. First, an experimenter read the instructions aloud while each participant followed along with their own copy of the instructions. The instructions explained the experimental procedures and payoffs used in the experiment (see Appendix). After finishing the instructions, participants were given five minutes to write down their answers to several questions to ensure that they understood the instructions (see Appendix). Participants' answers remained confidential. After participants completed the quiz, the experimenter distributed a printed copy of the correct quiz answers. The experimenter privately answered any questions regarding the experimental procedures.

The computer randomly assigned participants into pairs and each participant within a pair was randomly assigned a role, labeled person 1 for the investor and person 2 for the trustee. Each participant was paid $7 for participation and the payoffs from the trust game after signing a receipt. On average subjects earned $9.75 in addition to their participation payment.

3. Predictions

There are several differences that we might expect when comparing behavior in the *continuous* treatment and the *all-or-nothing* treatment. First, we expect to see differences in investors' behavior. Substantial heterogeneity in investments is well documented in trust games with continuous action space (e.g., Johnson and Mislin, 2011; Balliet and Van Lange, 2013). Most investors choose to invest something between $0 and $10, with a minority investing $0 or the full endowment of $10 (Ostrom and Walker, 2003).

In the original Berg *et al.*, (1995) trust game, investment was uniform over the 11 choices ($0, $1, $2, …, $10). When the action space for investments is reduced to all-or-nothing options, we might reasonably expect investors who would have made a relatively low investment in the *continuous* treatment to invest $0 in the *all-or-nothing* treatment, while investors who would have made a relatively high investment in the *continuou*s treatment to invest $10 in the *all-or-nothing* treatment. If the remaining investors also round up or down accordingly, then total investment should be equal across treatments, similar to contributions levels in Gangadharan and Nikiforakis' (2009) public goods game. Alternatively, investors might round down, similar to contributions in Cadsby and Maynes' (1999) threshold public goods game. However, we predict investment will increase, similar to Eckel and Wilson (2004), who find that in the context of binary trust games 80

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percent of investors send the full amount.[5] This prediction is based on List's (2007) work examining action space changes in the dictator game, where participants tend to avoid the most selfish choice available, which in the *all-or-nothing* treatment, is to transfer nothing.[6]

Prediction 1: Investment in the *all-or-nothing* treatment is higher than in the *continuous* treatment.

We also expect to see differences in trustees' behavior. It is well documented in experimental research that when trusted, trustees act as if motivated by reciprocity (Berg *et al*., 1995; Fehr *et al*., 1996; Falk and Gächter, 2002). Models of reciprocity include outcome-based models and intention-based models. Outcome-based models focus on distribution concerns such as inequality, efficiency, and fairness. Agents in such models are assumed to care not only about their own payoff but also about other agents' payoffs (e.g., Fehr and Schmidt, 1999; Bolton and Ockenfelds, 2000). The intention-based models focus on concerns such as kindness, guilt, and reputation. Agents in such models who are assumed to care about non-monetary hedonic experience (e.g., Charness and Dufwenberg, 2006; Battigalli and Dufwenberg, 2007) and perceived intentions (e.g., Rabin, 1993; Segal and Sobel, 1999; Dufwenberg and Kirchsteiger, 2004), will repay investors' perceived kindness (i.e., intended trust in our settings) with higher reciprocity. Reciprocal behavior can often be consistent with both outcome-based and intention-based models of reciprocity. Although both types of models have found significant support in the

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[5] Since Eckel and Wilson (2004) both (i) restrict the investor and trustee action space and (ii) frame the amount sent by the investor as a "loan" – the reason for increased investment is unclear.

[6] Camerer (2003, 57, table 2.4) reports that across dictator games, where the participants can send some portion of endowments to another, approximately 40% send zero. List (2007) examines a game where the action space increases, the dictator can take from in addition to giving to another, and find a comparable percentage of participants choose the most selfish option.

literature (Charness and Rabin, 2002; Falk *et al.,* 2008), intention-based models better explain behavior in trust games (e.g., Nelson, 2002; McCabe *et al*., 2003; Cox *et al.,* 2008). [7]

Given that the demonstration of intention matters, we might expect trustees in the *continuous* treatment to behave differently than in the *all-or-nothing* treatment. Investors who invest $10 in the *continuous* treatment demonstrate the highest level of intended trust, because they could have invested less (say $7 or $8) but chose to go "all-in" ($10). While the demonstration of intended trust is likely to be reciprocated with a high return (Fehr *et al*., 1996; Falk and Gächter, 2002; Ostrom and Walker, 2003), investors who invest all $10 in the *all-or-nothing* treatment cannot clearly demonstrate that they intended to have the highest level of trust in the trustee, because their only alternative is to invest nothing.[8] As such, the amount invested in the *all-or-nothing* treatment is a less convincing demonstration of intended trust. Consequently, conditional on investment of $10, we should expect lower returns in the *all-or-nothing* treatment than in the continuous treatment.

Prediction 2: Conditional on investment of $10, the average return in the *all-or-nothing* treatment is lower than in the *continuous* treatment.

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[7] However, in some intention based-models the perceived kindness of an action is measured by comparing the perceiver's payoff against a benchmark. This benchmark is a convex combination of the highest and lowest payoff alternative actions that could have transpired (e.g. Rabin, 1993; Dufwenberg and Kirchsteiger, 2004). In our experimental setting, the highest and lowest payoffs to the trustee occur when the investor invests everything or nothing, respectively. As such, these particular models cannot distinguish between the perceptions of kindness between treatments when the investor invests everything.

[8] Falk *et al.* (2003) find that in ultimatum games the rejection rate by the second mover of a proposed distribution (80/20) differs depending upon the alternative(s) the first mover had (i.e., a single 20/80 alternative versus both 20/80 and 50/50 alternatives). The authors claim that the intention behind the proposal is assessed in light of the options foregone, as the second mover was more likely to reject the 80/20 split when the proposer could have offered an equal division. Nelson (2002) and Charness and Rabin (2002) report similar results.

4. Results

No significant differences were found between sessions of a given treatment (seven for the *continuous* treatment and four for the *all-or-nothing* treatment), so we report the combined results. Figure 1 displays a bubble plot of the amount sent and returned in both treatments. There is substantial variability in individual behavior. On average, investors in the *continuous* treatment invest $5.50 (SE = 0.43, N = 76) and trustees return $5.86 (SE = 0.67), resulting in earnings of $10.35 (SE = 0.36) and $10.65 (SE = 0.76), respectively. Return on investment (ROI) is -0.12 (Mdn = 0.00, SE = 0.07, N=64).[9] These results are consistent with previous findings of Berg *et al.* (1995). In the *all-or-nothing* treatment, on average investors invest $7.71 (SE = 0.61, N = 48) and trustees return $7.73 (SE = 0.95), resulting in average earnings of $10.02 (SE = 0.73) for the investors and $15.40 (SE = 1.42), for the trustees. ROI is 0.00 (Mdn = 0.00, SE = 0.09, N=37).

Because investments, earnings and ROI in the two treatments have different variances, we use the two-sample robust rank-order test for difference between treatments. The robust rank order test is an alternative to the Mann-Whitney-Wilcox test for non-normal samples with unequal variances that does not assume equal variances, equal shape, or normality (Feltovich, 2003).

Result 1: In the *continuous* treatment return on investment (ROI) is increasing in the amount invested.

Figure 1 illustrates that in the *continuous* treatment investments of $6 or less generate average returns smaller than the investment, yielding negative ROI (M = -0.527, SEM = 0.083). However, investments larger than $6 on average generate positive ROI (M = 0.2014, SEM = 0.069). A simple OLS regression, where the independent variable is the investment and the dependent variable is ROI, confirms that the relationship is significant ($\beta = 0.71$, $t(62) = 7.91$, $p <$

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[9] ROI is defined as return minus investment divided by investment, and is not defined when investment is zero.

0.01, N = 64, F(1,62) = 62.50, Adj. R^2 = 0.494). A quadratic OLS regression, where the dependent variable is the return and the independent variable is investment, results in better fit (N = 76, F(2,73) = 154.19, Adj. R^2 = 0.809, Bayesian information criterion (BIC) = 369.58) than a linear model of investment (N = 76, F(1,74) = 243.00, Adj. R^2 = 0.767, BIC = 380.32). The increase in Adj. R^2 is significant (F(1,73) = 16.03, p < 0.001). This quadratic regression is illustrated in Figure 1.

Result 2: Investment in the *all-or-nothing* treatment is higher than in the *continuous* treatment.

Consistent with Prediction 1, investment is higher in the *all-or-nothing* treatment (Mdn = $10.0, SE = 0.61) than in the *continuous* treatment (Mdn = $5.5, SE = 0.43) based on the robust rank-order test (U = 3.236, p < 0.001). In the *continuous* treatment fewer investors (58%) invest $5 or more, compared to the *all-or-nothing* treatment (77%), a significant difference according to Fischer's exact test (p = 0.034, N_1 = 48, N_2 = 76). Finally, there is very little difference in the proportion of $0 investments between the *all-or-nothing* treatment and the *continuous* treatment (23% versus 16%). Fisher's exact test indicates the difference is not significant (p = 0.349, N_1 = 48, N_2 = 76).

Despite the increase in investment, investor's earnings in the *all-or-nothing* treatment (Mdn = $10.0, SE = 0.73) and the *continuous* treatment (Mdn = $10.0, SE = 0.36) do not differ (U = 0.782, p = 0.217). The increase in wealth created by increased investment is captured by trustees who earn more (U = 3.425, p < 0.001) in the *all-or-nothing* treatment (Mdn = $15.0, SE = 1.42) than trustees in the *continuous* treatment (Mdn = $12.62, SE = 0.76).

Result 3: Conditional on investment of $10, the average ROI is lower in the *all-or-nothing* treatment than in the *continuous* treatment.

Consistent with Prediction 2, conditional on investment of $10, the average ROI in the *all-or-nothing* treatment is 0.00 (SE = 0.09, N = 37), which is lower than the ROI of 0.27 (SE = 0.08, N = 21) in the *continuous* treatment (U = 1.611, p = 0.053). Figure 2 illustrates the distribution of returns conditional on investment of $10 by treatment. In the *all-or-nothing* treatment, 19% of trustees return $0, 8% of trustees return less than $10, 24% return exactly $10, and 49% return more than $10. In contrast, in the *continuou*s treatment only 5% of trustees return $0, 24% return exactly $10, and 71% return more than $10. The proportion of $10 investments earning a ROI greater than zero is lower in the *all-or-nothing* treatment (73%) than in the *continuous* treatment (95%) based on Fisher's exact test (p = 0.036, N_1 = 37, N_2 = 21).

5. Discussion and Conclusion

The original study of Berg *et al*. (1995) documented that trustees tend to return an amount greater than invested to those who invest more than $5, but return less than the amount invested to those who do not. Others, including Ben-Ner and Putterman (2009), Johnson and Mislin (2011), and Rietz *et al.* (2015), report observing this pattern. In the *continuous* treatment there is a positive relationship between the amount invested and the ROI. This is consistent with our conjecture that maximal investment in the *continuous* treatment serves as less ambiguous indication of maximal trust (encouraging trustee reciprocation) while maximal investment in the *all-or-nothing* treatment is more ambiguous. Accordingly, our findings show that returns on maximal investments in the *all-or-nothing* treatment are lower than in the *continuous* treatment.

If reciprocity was purely motivated by distributional concerns (Fehr and Schmidt, 1999; Bolton and Ockenfelds, 2000), we would expect trustees to return some amount regardless of perceptions of investor trust intention. Accordingly we would expect equivalent reciprocity between treatments – but this is clearly not what is observed. However, the logic behind intention-

based theories of reciprocity, that perceived kindness (i.e. trust) is repaid with kindness (i.e. a profitable return), is consistent with our results.

Our results might also be explained by reciprocity concerns informed with treatment specific reference points. If experimental games effectively invoke extra-laboratory "real world" problems for participants, even experimentally naïve participants aware of local norms could form reasonable expectations about others' game behaviors. A number of experiments have documented that participants on average have correct expectations about the behavior of others (e.g., Guerra and Zizzo, 2004; Casari and Cason, 2009; Bellemare *et al.,* 2010; Sheremeta and Shields, 2013). Conditional on "correct expectations", a trustee who received an investment of $10 in the *continuous* treatment may have considered it a relatively large investment compared to a prior, perhaps one close to the average investment of $5.50 observed in our *continuous* treatment. It may be that trustees reciprocated relatively large investments with greater returns because they considered those investments indicative of high trust. Likewise, trustees who received $10 in the *all-or-nothing* treatment may not have been as impressed, considering it not to necessarily be indicative of high trust, and so reciprocated relatively less. However, we want to note that an important aspect of our data does not support this correct expectations hypothesis. When examining investments greater than $7 in the *continuous* treatment (i.e., a similar difference from the average as between maximal and average investments in the all-or-nothing treatment), the ROI is still greater (Mdn = 0.40) than from $10 investments in the *all-or-nothing* treatment (Mdn = 0.00) based on the two-sample robust rank-order test (U = 1.626, p = 0.052). Our results are consistent with an alternative reference point perspective informed by Kimbrough and Vostroknutov's (2015) model of norm-dependent utility. Their model suggests that normative behavior will change depending upon features of treatment environments. For example, people

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may be expected to 'invest all' in the *all-or-nothing* case, but 'invest something' in the *continuous* case. Indeed, our results are consistent with this hypothesis.

In summary, our study provides clear support for the hypothesis that when coarse-grained action spaces, such as all-or-nothing investment options, are introduced, people are more likely to invest everything – increasing average investment. As a result of this increased investment, those who would have invested less given the opportunity are now among the greater pool of "all-in" investors. While amounts invested appear to demonstrate differential levels trust, the all-or-nothing action space obfuscates demonstrable trust, making the all-in investor's intention more ambiguous. Although the all-or-nothing action space does produce a higher average investment, resulting in greater welfare, it also appears to "backfire" for investors who do not share in the increased wealth.

Most studies measuring trust employ variants of either the continuous version of the trust game of Berg *et al.* (1995) or the binary version of the trust game of Güth *et al.* (1997). There are many early examples of often-cited studies (Camerer and Weigelt, 1988; Dasgupta, 1988; Kreps, 1990), as well as more recent studies (Malhotra and Murnighan, 2002; Schniter *et al.,* 2013), referring to games with binary choices as "trust games". While the aforementioned research furthers understanding of trust and reciprocity, our results demonstrating disparate behavior between different trust games suggest caution should be taken when extending results from one game to the other. Furthermore, while the fundamental determinants motivating trust and reciprocity in binary trust games should correspond to determinants of trust and reciprocity observed in continuous games, the degree to which these determinants actually motivate trust and reciprocity should depend on the granularity of the action space useful for signaling the calibration of internal motivations.

Finally, we conclude by noting hat, while the procedure better suited for eliciting the relationship between trust and reciprocity is often called the "investment game", the procedure that does not appear as well suited is usually called the "trust game".[10] Although binary or limited option "trust games" may be more appealing to implement due to the convenience of procedural simplification and enhanced statistical power, we suggest that variants of the Berg *et al.* (1995) continuous "investment game" are better suited for investigating the relationship between demonstrable trust and trustworthiness.

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[10] Though useful, the convention of referring to the continuous game as the "investment game" and the binary game as the "trust game" is not widely adopted. For example, Johnson and Mislin (2011) report the results from 162 replications of Berg *et al.* (1995) in a meta-analysis, labeling the replications "trust games" and excluding games where the participants made binary choices.

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Figure 1: Bubble Plots of Investment and Return by Treatment
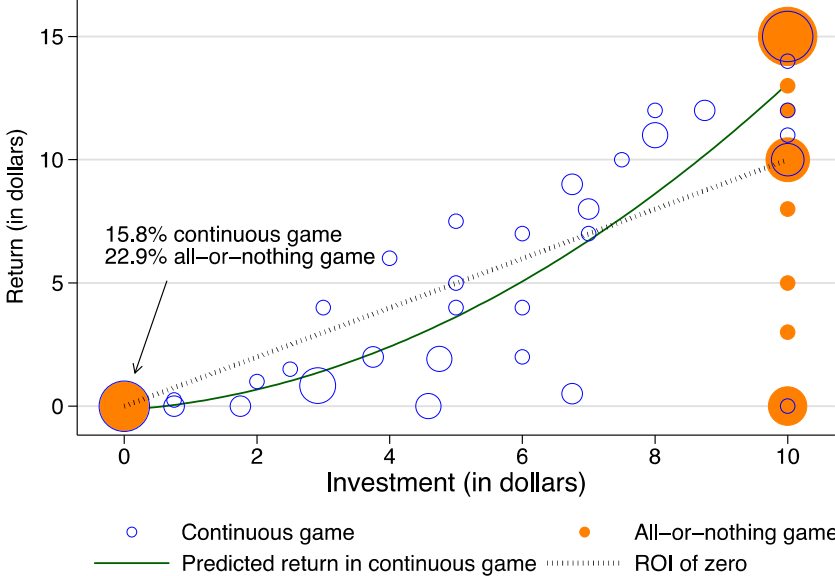
Note: Observations are plotted with bubbles, where the relative size indicates the proportion of observations in the treatment. The smallest bubble plotted represents approximately 1.5 percent and the largest bubble plotted approximately 33 percent.

**Figure 2: Distribution of Returns Conditional on Investment of $10 by Treatment**
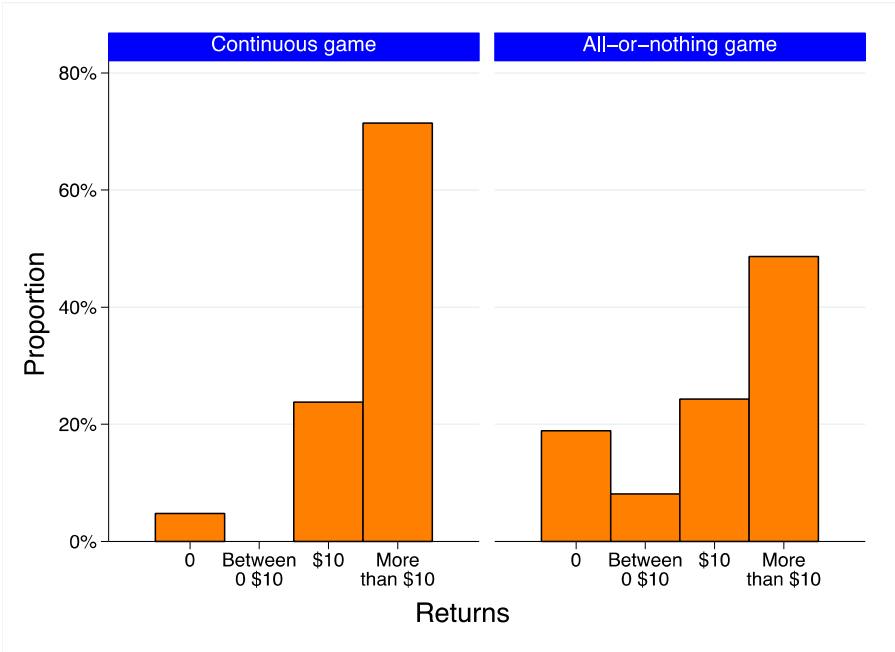
Appendix – Instructions for the Continuous (All-or-nothing) Treatment

This is an experiment in the economics of decision-making. Various research agencies have provided funds for this research. The currency used in the experiment is experimental dollars, and they will be converted to U.S. Dollars at a rate of 1 experimental dollar to 1 dollar. At the end of the experiment your earnings will be paid to you in private and in cash. It is very important that you remain silent and do not look at other people's work. If you have any questions, or need assistance of any kind, please raise your hand and an experimenter will come to you. If you talk, laugh, exclaim out loud, etc… you will be asked to leave and you will not be paid. We expect, and appreciate, you adhering to these policies.

The participants in today's experiment will be randomly assigned into two-person groups. In addition to the group assignment each participant will also be randomly assigned to a specific type in the group, designated as Person 1 or Person 2. You and the other participant in your group will make choices that will determine your payoffs. The experiment consists of two decision stages.

In stage 1, Person 1 receives $10 and then decides how many dollars to send to Person 2. Person 1 can send none, more than none, or all of the $10 to Person 2. […For the all-or-nothing game, this sentence read "Person 1 receives $10 and then decides whether to send either $0 or $10 to Person 2"…]. The amount sent by Person 1 is tripled before reaching Person 2. In stage 2, Person 2 decides how many of the dollars they received to send back to Person 1. Person 2 can send back none, more than none, or all of the amount received back to Person 1. At that point the experiment is over. Next we describe in details the decisions made by both persons in each stage of the experiment.

Stage 1: Person 1 receives $10 and then decides how many dollars to send to Person 2. Person 1 can send none, more than none, or all of the $10. […For the all-or-nothing game, this sentence read "Person 1 receives $10 and then decides whether to send either $0 or $10 to Person 2"…]. Person 1 enters the amount sent to Person 2 in the box labeled "The amount sent by Person 1" below [Figure A1 was shown after this paragraph]. Person 1 keeps any amount that is not sent to Person 2. The amount sent by Person 1 is tripled before reaching Person 2.
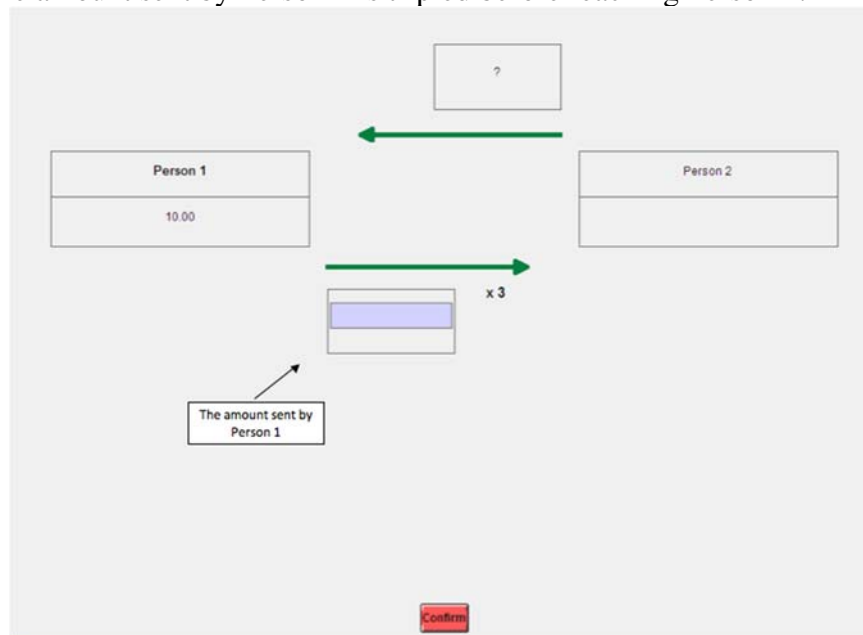
Stage 2: After learning the amount sent by Person 1, Person 2 decides how many dollars to send back to Person 1. Person 2 can send back none, more than none, or all of the amount in Person 2's account at that time. Person 2 enters the amount sent back to Person 1 in the box labeled "The amount sent back by Person 2" below [Figure A2 was shown after this paragraph]. The amount sent back by Person 2 is NOT multiplied. Person 2 keeps any amount that is not sent back to Person 1.
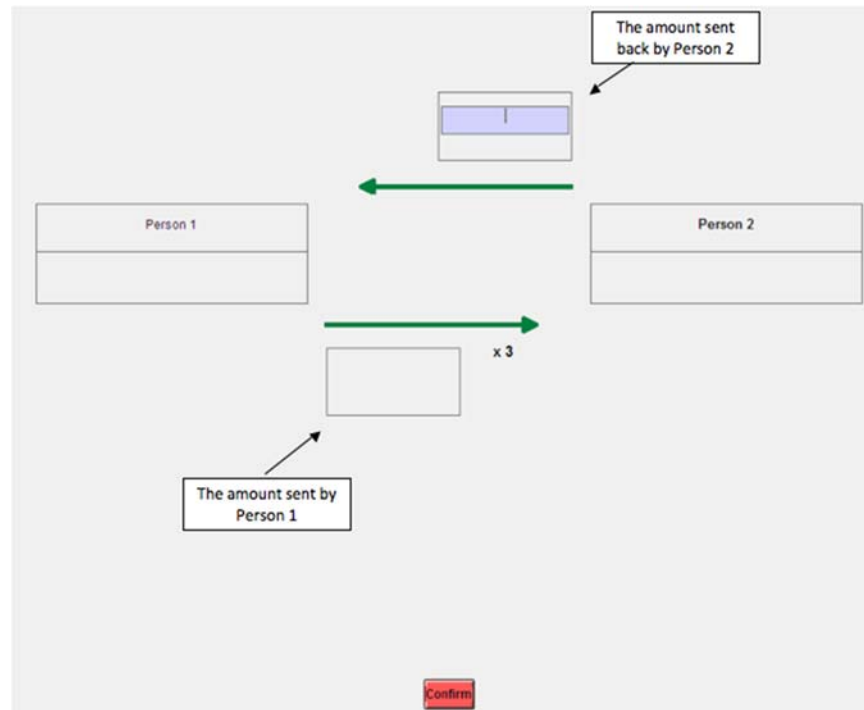
Finally, at the end of the Stage 2 the total earnings are reported to each person. Person 1's earnings will equal $10 less the amount sent to Person 2 plus the amount sent back by Person 2. Person 2's earning will equal three times the amount sent by Person 1 less the amount sent back to Person 1. Please record the decisions and your earnings on your record sheet under the appropriate heading.

SUMMARY

The computer will assign you and one other participant to a two-person group, consisting of Person 1 and Person 2. In stage 1, Person 1 receives $10 and then decides how many dollars to send to Person 2. […For the all-or-nothing game, this sentence read "Person 1 receives $10 and then decides whether to send either $0 or $10 to Person 2"…]. Person 1 can send none, more than none, or all of the $10. The amount sent by Person 1 is tripled. In stage 2, Person 2 decides how many dollars to send back to Person 1. Person 2 can send back none, more than none, or all of the amount in Person 2's account at that time. At the end of Stage 2 the total earnings are reported to each person. This experiment is now over and your earnings will be part of the total you will be paid.

QUIZ

Before starting, we want you to answer some questions regarding the experiment to be sure you understand what will follow. After five minutes an experimenter will return to privately review your answers. Afterwards you will participate in the experiment only one time.

1. True or false: the amount sent by Person 1 is tripled before reaching Person 2's account.
2. True or false: the amount sent back by Person 2 is tripled before reaching Person 1's account.
3. What is the largest amount Person 1 can send to Person 2?
4. What is the smallest amount Person 1 can send to Person 2?
5. If Person 1 sent $4.20 to Person 2, what is largest amount Person 2 can send back to Person 1?
6. If Person 1 sent $9.00 to Person 2, what is smallest amount Person 2 can send back to Person 1?
7. True or false: If Person 1 sends something to Person 2, then Person 2 has to send something back to Person 1.
8. True or false: you will participate in this experiment only one time.

For the *all-or-nothing* game, questions 3 through 7 were:
3. What are the only two possible amounts Person 1 can send to Person 2?
4. If Person 1 sent $0 to Person 2, what is the smallest amount Person 2 can send back to Person 1?
5. If Person 1 sent $10 to Person 2, what is the smallest amount Person 2 can send back to Person 1?
6. If Person 1 sent $10 to Person 2, what is the largest amount Person 2 can send back to Person 1?
7. True or false: If Person 1 sends $10 to Person 2, then Person 2 has to send something back to Person 1.