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Do People Keep Socially Unverifiable Promises?

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Abstract: Previous research has suggested that communication and especially promises increase cooperation in laboratory experiments. This has been taken as evidence for internal motivations such as guilt aversion or preference for promise keeping. The original goal of this paper was to examine promises under a double blind payoff procedure to test the alternative explanation that promise keeping was due to external influence and reputational concerns. We find no evidence that communication increases the overall level of cooperation in our double blind experiment. However, our results are due in part to the high level of cooperation that we observe, leading us to conduct additional single blind conditions. Ultimately, we find no evidence that communication or payoff procedures impact aggregate cooperation.

JEL classification: C70; C91

Key words: Anonymity, experiment, promises, partnership, guilt aversion, psychological game theory, trust, lies, social distance, behavioral economics, hidden action.

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1. INTRODUCTION

Anecdotal and scientific evidence suggest that promises – commitments to perform a certain action – are a powerful tool in increasing levels of cooperation.[1] What makes people keep their promises and why do their recipients trust them? In a widely cited paper, Charness and Dufwenberg (2006, p. 1579; hereafter C&D) argue that "The evidence is consistent with people striving to live up to others' expectations so as to avoid guilt." Drawing upon the literature on psychological game theory (Geanakoplos et al., 1989; Battigalli and Dufwenberg, 2008), C&D (p. 1579) model, "A guilt-averse player [as one who] suffers from guilt to the extent he believes he hurts others relative to what they believe they will get. Therefore, he is motivated by his *beliefs about others' beliefs."* Thus, guilt aversion is an internal influence not reliant on external enforcement. Other explanations such as lie aversion and preference for promise keeping (see e.g. Braver, 1995; Ellingsen and Johannesson, 2004; Gneezy, 2005; Demichelis and Weibull, 2008; Kartik, 2009; Miettinen, 2008; Ostrom, Walker, and Gardner, 1992; Sutter, 2009; Vanberg, 2008) have been forwarded as well, but these explanations are also based upon internal motivation.

To test the conjecture that promise keeping is driven by guilt aversion, C&D employ a game with hidden action. While C&D provide evidence that promises strengthen beliefs about one's cooperation and that these promises are often kept, their experimental design also allows for an alternative explanation. In particular, their experiments were conducted using a standard single-blind (or low social distance) protocol in which the players did not know the identity of their counterpart, but the experimenter *did*. Further, the experimenter *could* observe both the message and the act before paying the participant in person. Therefore, the C&D experiments as well as follow up studies by Vanberg (2008) and Ellingsen, et al. (2010) cannot distinguish whether the observed behavior is due to an internal motivation such as guilt or lie aversion or due to external influences acting through shame or reputational concerns.

[1] See e.g. Bicchieri and Lev-On (2007), Charness and Dufwenberg (2006), Ellingsen and Johannesson (2004), Kerr and Kaufmann-Gilliland (1994), Ostrom, Walker, and Gardner (1992), Sally (1995), Servátka, Tucker, and Vadovič, (2011).

The distinction between internal and external motivations for behavior is potentially quite important for extrapolating to behavior outside the lab. Previous research with related games has shown that subjects often behave differently when the experimenter *can* identify who took which action (single-blind) as compared to when the experimenter *cannot* (double-blind).[2] Hoffman et al. (1996) found that dictators acted in a far more selfish manner under double-blind procedures than under any of the other treatments they considered. Cox and Deck (2005) report the results of a binary trust game using both single- and double-blind procedures. With single-blind procedures, they replicate the results of McCabe and Smith (2000) that approximately 75% of second movers are trustworthy. However, under double-blind procedures only 25% of the subjects are trustworthy. Such a radical change in behavior clearly demonstrates the impact that observability by the experimenter may have on behavior where trust is involved.[3]

Guilt aversion, lie aversion and preference for promise keeping predict no difference in communication effects on cooperation under single-blind and double-blind procedures since they all rely on internal motivation, making the presence of a third party irrelevant. However, if people are mainly motivated by reputational concerns, aversion to shame and/or other external influences, then observability by a bystander might have profound implications on their behavior and on communication itself. To determine if behavior observed in C&D is due to internal or external factors, we conduct a series of experiments using the hidden action trust game of C&D with and without messages using a double-blind procedure. The design of those experiments is presented in section 2. As a prelude to the results, which are presented in section 3, we find evidence suggesting that messages are not effective at increasing cooperation when behavior is not observable. However, the level of cooperation we observe is

[2] Single-blind refers to the anonymity between the subjects whereas double-blind refers to the anonymity between subjects and between the subjects and the experimenter. This terminology differs from other disciplines such as the medical field where double-blind is taken to mean that the experimenter does not know to which treatment an experimental unit is assigned. For this reason, in the literature the procedures we use are sometimes referred to as single anonymous and double anonymous, respectively.

[3] A recent paper by Barmettler, et al. (2011) has questioned the appropriateness of the experimental designs in previous studies comparing double-blind and single-blind payoff procedures. Based upon experiments reported in that paper, the authors argue that payoff procedures do not affect behavior to the degree previously believed.

quite high leading us to conduct additional experiments using a single-blind protocol as described in section 4. Rather than replicating previous results, we find 1) no evidence that messages increase cooperation under this protocol and 2) no evidence that the payoff procedures impact cooperation in this game. Section 5 looks at the effects of specific types of messages, with the main result being that promises and non-promise messages are correctly interpreted as signals of trustworthiness. A final section contains concluding remarks.

2. EXPERIMENTAL DESIGN AND PROCEDURES FOR DOUBLE BLIND EXPERIMENTS

C&D introduce a simple hidden action trust game. In this game Player **A** can choose *Out* yielding both players $5. Alternatively, **A** can choose *In*, in which case Player **B** determines both players' payoffs. If **B** chooses *Don't Roll* then **A** earns $0 and **B** earns $14. If **B** chooses *Roll* then **B** earns $10 and **A** earns $0 if a die roll ends up on 1 and earns $0 otherwise. The payoff structure is shown in Table 1. Critically, both players know that the action of **B** is never directly revealed to **A**. Thus, **A** cannot determine if a $0 payoff is due to **B**'s selfish act or bad luck.

Table 1. Hidden Action Trust Game as Shown to Subjects

	A Receives	B Receives
A chooses OUT	$5	$5
A chooses IN, B chooses DON'T ROLL	$0	$14
A chooses IN, B chooses ROLL, die = 1	$0	$10
A chooses IN, B chooses ROLL, die = 2, 3, 4, 5, or 6	$12	$10

To investigate the power of messages, C&D compare treatments in which prior to **A** making a decision, the matched **B** either can or cannot send a message to **A**. The result is that in the absence of messages 44% of **B** s act cooperatively while 67% active cooperatively when messages can be sent, a statistically significant difference (p-value = 0.037).

Our study explores whether people keep promises due to social or reputational concerns, stemming from the fact that the experimenters themselves observed both the messages that were sent and the actions that were actually taken. In an attempt to rule out this social

enforcement explanation, we conducted a between subjects experiment with and without messages similar to those of C&D except that we implement a double-blind payoff procedure.[4]

As subjects entered the lab, they drew slips indicating if they were in the **A** role or **B** role. **B**s sat in the back half of the lab and **A**s sat in the front half of the lab. Each person was seated at an individual workstation with privacy dividers. Instructions were then handed out and all questions were answered publicly.[5] The payoff procedure was explained in the experiment instructions to subjects in the Message Condition as follows, with a similar statement for the No Message Condition.

> *Each of you will receive a "code." The code will be written on your response form. The purpose of this code is so that the experimenters can insure that any message sent by B is received by the paired A. The code also allows the experimenters to insure that your payoff is based on your action and the action of the person with whom you are paired while maintaining that no participant will ever know the identity of the person with whom he or she is paired.*
>
> *The code you receive will also be on a "key." After the experiment is completed, you will be able to receive your cash payment in a sealed envelope from a locked mailbox, located in another room here in the lab. The envelopes will be identical on the outside, so that no one, including the experimenter, will ever know the decision, message, or payoff of any participant. To protect your anonymity, you should place the coded key in your pocket once you receive it. After you have collected your payoff envelope, there will be a container into which everyone will drop their keys.*

After the instructions were completed, a large curtain was partially drawn so that everyone could verify the procedures while visually separating the two types. Identical envelopes with coded mailbox keys and coded response forms were placed in a large box and taken around the **B** half of the lab. Subjects drew out a single envelope, but waited to open it until the experimenters had returned to the **A** side. In the No Message Condition, **B** subjects made their

[4] While C&D also elicit subjects' beliefs (in order to test for guilt aversion), we do not include such elicitation in our experiment as our main focus is on internal vs. external enforcement of promises rather than testing guilt aversion under double-blind procedures or discriminating between various models of internal motivation.
[5] Appendix 1 contains the experiment instructions.

decisions, placed the mailbox key in their pocket, and then returned the response form into the envelope. In the Message Condition, **B** subjects also wrote a message to **A** in the provided space if they so chose before placing their form back in the envelope. After **B**s finished, they dropped their envelopes back into the large box.

In the Message Condition, the completed envelopes from **B**s were then shuffled and opened in view of both groups, but from a distance that ensures no subject could see the decisions on the forms. Messages were cut off from the **B** forms, and stapled to coded response forms for **A**s. The forms were then placed in envelopes along with a coded mailbox key. **A**s then selected an envelope from a box of envelopes and waited for the experimenters to return to the **B** side before opening the envelopes, placing the keys into their pockets, making their decisions, and returning the forms into the envelopes. In the No Message Condition, **B** envelopes were left sealed and **A**s selected an envelope from a box of envelopes containing mailbox keys and response forms. As in the other condition, they waited for the experimenters to return to the **B** side before opening the envelopes, placing the keys into their pockets, making their decisions, and returning the forms into the envelopes. When everyone was done, the experimenters determined the payoffs for each player[6], placed the money in plain envelopes, and placed the envelopes in the coded mailboxes in another room in the lab. Subjects privately opened their mailboxes, collected their earnings envelopes, and left the lab.

A total of 186 undergraduate students participated in this study at the Behavioral Business Research Laboratories at the University of Arkansas. Participants received a $5 participation payment in addition to their salient earning from the game.

[6] Following C&D, the subjects were informed in advance that a die would be rolled for each pair regardless of what actions were actually taken so that one could not infer what actions had been taken from the noise.

3. DOUBLE BLIND EXPERIMENT RESULTS

Table 2 compares behavior between our two double-blind conditions. The percentage of **A**s who choose *In* is similar in both conditions (60% in the No Message Condition and 64% in the Message Condition, p-value = 0.689).[7] The striking feature is that the percentage of **B**s who choose *Roll* is virtually indistinguishable between two conditions: 67% versus 68% (p-value =0 .877). These results suggest that messages do not impact behavior with a double blind protocol, thus calling into question that internal motivation, be it guilt aversion, preference for promise keeping or some other factor, is driving the results that have been reported previously.

Table 2. Observed Aggregate Behavior and Comparison Between Double-Blind Conditions

	No Message Condition	Message Condition	z-statistic	p-value
Percent of **A**s Choosing In	60% (=29/48)	64% (=29/45)	0.401	0.689
Percent of **B**s Choosing Roll	67% (=32/48)	68% (=30/44)	0.155	0.877

One subject in **B** role did not make a choice to *Roll* or *Don't Roll* in the Message Condition.

If we had observed relatively low levels of cooperation by **B**s, then our findings regarding the impact of communication would also be consistent with the previous literature on double blind payoff procedures: observation by the experimenter leads to more pro-social behavior as compared to the data in C&D. However, this is not what we find. The frequency of choosing *Roll* by **B**s in both our double blind Message Condition and No Message Condition is the same as the 67% observed by C&D in their single blind with messages sessions and significantly higher than the 44% that they observe without messages (which is an upper bound on what we anticipated finding *a priori*).

4. INVESTIGATION OF THE IMPACT OF MESSAGES IN SINGLE BLIND EXPERIMENTS

One possible explanation for the lack of difference in cooperation levels in our experiment and that of C&D is that subject pool differences may be driving the behavior. If our subject pool is

[7] A two sample proportion test is the same as chi-squared test when there are only two categories.

relatively more cooperative than the one used by C&D then the similarity in cooperation between our Message Condition and theirs despite the difference in the payoff procedure could be a simple coincidence. If a smaller social distance influences subjects to act in a more pro-social way, we might find even higher rates of cooperation in single-blind Message Condition using our subject pool. Such a finding would confirm our conclusion in the previous section that messages need external verification to be effective. Therefore, we conducted additional experiments following a single blind procedure to explore this possibility and provide a replication of C&D.[8]

Before describing the results from the single blind conditions, we consider the implications of some other possible outcomes from our replication. We might find substantially more cooperation both with and without messages in our single-blind replication suggesting that messages are not effective in increasing cooperation regardless of their observability. Such a finding would be consistent with Ellingsen, et al. (2010) who find little evidence to support guilt aversion.[9] While such a result would be inconsistent with C&D, it would be consistent with the behavioral literature comparing double-blind and single-blind procedures. Another possibility, suggested by Barmettler, et al. (2011), is that we find no difference between double-blind and single-blind procedures meaning cooperation remains at two-thirds in both single-blind conditions. Alternatively, we could replicate the level of cooperative behavior observed in C&D suggesting messages are effective when external observability is possible. Although, if we do replicate such behavior, it would suggest that a double-blind procedure with no messages actually leads to *greater* cooperation in this setting, a result that would be puzzling. Of course, observed behavior might not fit any of these cases.

As argued by Barmettler, et al. (2011) previous comparisons between single-blind and double-blind procedures tend to emphasize the payoff procedures in double-blind, but not single-blind.

[8] The replication is not perfect as the lab facility, appearance of the experimenters, time of day, and countless other factors differ between the studies.

[9] In a separate paper Charness and Dufwenberg (2010) report that the effect of messages may not be robust as they fail to replicate their previous results when only certain predetermined messages are permissible.

This asymmetry may create a demand effect for the subjects and encourage people to act more selfishly in double-blind experiments (see Zizzo, 2010 for a discussion of experimenter demand effects). Therefore, we are careful to keep the attention paid to the payoff procedures similar between our single-blind and double-blind experiments. It is worth noting that emphasizing the connection between one's actions and one's identity may create a demand effect for more cooperative behavior and thus differences between our two payoff procedures may be greater than if we followed the typical procedure for single-blind experiments of leaving the payoff process opaque. For the Message Condition in the single-blind protocol, the text describing the payoff procedure was changed to the following.

> *Each of you will receive a "code." The code will be written on your response form. The purpose of this code is so that the experimenters can insure that any message sent by B is received by the paired A. The code also allows the experimenters to insure that your payoff is based on your action and the action of the person with whom you are paired while maintaining that no participant will ever know the identity of the person with whom he or she is paired.*
>
> *The code you receive will also be on a "key." After the experiment is completed, each person will be called by name to collect their money. You will be able to receive your cash payment from the experimenter by privately showing your key to the experimenter so the experimenter knows how much money you earned. At this point your earnings will be recorded beside your name on the sign-in sheet you already completed.*

A similar change in the instructions was made for the No Message Condition. In all other respects our single-blind procedures were identical to the double-blind procedures described above including the drawing of roles, the envelope procedures, and subjects receiving their earnings in an adjoining room.

A total of 106 new subjects were recruited from the same subject pool as the used for the double-blind experiments to participate in these conditions,[10] the results of which are reported in Table 3.

[10] The lab maintains a database of approximately 2000 volunteers.

Table 3. Observed Aggregate Behavior and Comparison Between Single-Blind Conditions

	No Message Condition	Message Condition	z-statistic	p-value
Percent of **A**s Choosing In	75% (=18/24)	76% (=22/29)	-0.073	0.942
Percent of **B**s Choosing Roll	63% (=15/24)	64% (=18/28)	-0.133	0.894

Based on the data in Table 3, we find no evidence that messages affect behavior using a single-blind procedure for players in either role (p-values = 0.942 and 0.894 for **A**s and **B**s, respectively). That is, we do not replicate the effectiveness of messages reported in C&D. While we observe similar behavior in the Message Condition as that reported by C&D (p-values = 0.845 and 0.838 for **A**s and **B**s, respectively), we observe a marginally higher frequency of choosing *In* and *Roll* than they report (one sided p-values = 0.056 and 0.077 for **A**s and **B**s, respectively).[11] Further, the behavior is similar to that which we observed in the double-blind procedure (p-values = 0.300 and 0.732 for **A**s and **Bs** respectively with messages and p-values = 0.220 and 0.726 for **A**s and **Bs** respectively without messages). That is, consistent with Barmettler, et al. (2011) and contrary to previous research, we do not find any effect of social distance on cooperation whether communication is possible or not.

5. THE IMPACT OF MESSAGE TYPE ON BEHAVIOR

Up to this point, we have focused on the aggregate effect of **B** having the opportunity to send a message to **A**. We now turn to the specific content of the messages, which are shown in Appendix 2 for both our double-blind and single-blind sessions. To evaluate each we employed

[11] For this comparison we use one-sided test due to the fact that our main reason for running the single-blind replication of C&D is that our No Message double-blind session generated more cooperation than their No Message single-blind condition. In all other comparisons we simply report two sided p-values because the two items being compared are so similar nominally. Strictly speaking, the tests between the Message and No Messages conditions have one-sided alternative hypotheses that Messages increase cooperation, but reporting one-sided tests are deemed unnecessary given the overwhelming lack of significance in the two-sided tests.

three coders to rate each message as being a promise, a non-promise message, or blank.[12] The coders received the instructions for our double blind conditions, instructions on the coding procedure, and a typed transcript of the messages. Coders went through each message individually and were paid $20 for the task. Our coders also went through the relevant messages from C&D. This allows us to make a direct comparison about the effectiveness of messages in the three cases without introducing variation due to the way coders interpret messages. While our coders generally agreed with the evaluations in C&D there were some differences, as indicated in Appendix 2. In the remainder of the paper, all references to message types are based upon the opinions of our coders and we restrict attention to cases where our coders had unanimous agreement. Table 4 evaluates behavior conditional on message type across the three message conditions.

Table 3. Behavior Conditional on Message Type

	Our Double-Blind			Our Single-Blind			C&D Single-Blind		
Message Type	Promise	Blank	Other	Promise	Blank	Other	Promise	Blank	Other
Percent of Messages	24%	48%	29%	35%	44%	22%	64%	11%	25%
A In	8	9	9	8	5	4	20	1	6
A Out	2	11	3	0	5	1	3	3	3
Percent of **A**s choosing In	80%	45%	75%	100%	50%	80%	87%	25%	67%
B Roll	8	9	10	4	5	3	17	3	5
B Don't Roll	1	11	2	3	5	2	6	1	4
Percent of **B**s choosing Roll	90%	45%	83%	57%	50%	60%	74%	75%	56%

We exclude observations for which the three coders did not agree. Assigning the observed behavior according to the majority opinion of the message type does not substantially change the results. In subject pairs in which one of the players did not make a move, the player who did act is included in this analysis as long as the message was unambiguous to the coders.

[12] Houser and Xiao (2011) point out that the researcher coding in C&D is potentially problematic and employ a coordination game to evaluate subjects' messages. While Houser and Xiao's method has its advantages, previous literature on communication uses third party coders to analyze content (see for example Neuendorf, 2002).

The results in Table 3 reveal several interesting patterns. First, we do not see any evidence that subjects who make promises are more likely to be choose *Roll* as compared to those who send non-promise messages (74% versus 56%, p-value = 0.314) or do not send messages at all (74% versus 75%, p-value = 0.963) in the C&D data. Our single blind replication finds the same pattern, albeit with small sample sizes (57% versus 60%, p-value = 0.921 and 57% versus 50%, p-value = 0.772, respectively). While, we do find that a promise increases the likelihood that **B** will play cooperatively as compared to a blank message (90% versus 45%, p-value = 0.026), the effect holds for non-promise messages relative to blank messages as well (83% versus 45%, p-value = 0.033) and there is no difference in behavior based upon whether the message is a promise or not (90% versus 83%, p-value = 0.719).

What we do find is that **A**s believe that **B**s will keep their promises. In all three cases the percentage of **A**s choosing *In* is greatest after receiving a promise and is statistically deferent from when no message is received (80% versus 45%, p-value = 0.068 in our double-blind condition; 100% versus 50%, p-value = 0.019 in our single-blind condition; 87% versus 25%, p-value = 0.006 in C&D). However, non-promise messages are not viewed differently than promises in any of the three cases (80% versus 75%, p-value = 0.781 in our double-blind condition; 100% versus 80%, p-value = 0.188 in our single-blind condition; 87% versus 67%, p-value = 0.186 in C&D).

Although there is not much difference in behavior between the three conditions conditional on message type[13], there appears to be a substantial difference in the types of messages that are sent. In both our single-blind and our-double blind sessions, the modal message type was blank whereas the modal message type in C&D was a promise. A test rejects the null hypothesis that the distribution of message types is the same in the three cases (χ^2 [4 d.f.] = 16.727, p-value = 0.002). Casual inspection of the messages (see Appendix 2) also suggests that messages tended to be longer in C&D than in our study.

[13] In fact, no pairwise comparison of **A** or **B** behavior conditional on message type between any two of the three data sets is statistically significantly.

6. CONCLUSIONS

Recently, researchers have been focusing on how communication in general and promises in particular can lead to cooperative outcomes in laboratory experiments. For example, C&D conduct an innovative experiment to explore guilt aversion as modeled using psychological game theory. While they report behavior consistent with people keeping promises because of an internal motivation to not let others down, their experimental design leaves open the alternative explanation that behavior is driven by reputational concerns. In fact, current conventional wisdom based upon laboratory evidence suggests subject observability by the experimenter leads to more cooperative behavior than under "double-blind" procedures.

We set out with a simple experimental design, a variation of C&D with and without the possibility of sending messages, to test if promises were effective in increasing cooperation in a double-blind environment. We found that the ability to send messages did not increase cooperation, suggesting the effectiveness of promises is due to reputational concerns that can be enforced by an observer (experimenter). This result is not surprising given the existing literature on double-blind versus single-blind environments; however, what we do find surprising is the considerable amount of cooperation under our double-blind procedures. In fact, we found as much cooperation as C&D found in their single-blind study.

The high level of cooperation that we observed in our original design led us to conduct two additional conditions (single-blind payoff procedures with and without messages) ultimately yielding a complete 2x2 design. The observed behavior in the single-blind conditions was similar to what we found in our double-blind conditions. Thus, based upon our four conditions we conclude that the ability to send messages does not improve aggregate trustworthiness, contrary to previous findings. We also conclude that the double-blind or single-blind payoff procedure does not impact behavior, contrary to previous findings but consistent with recent work by Barmettler, et al. (2011). Like Barmettler, et al. (2011) we take special care to place comparable emphasis on the payoff procedure in both cases, as opposed to previous studies which have tended to focus subject attention on the payoff procedures only in the double-blind payoff procedure.

One possible way to explain our findings is that the incremental effects on cooperation of things like messages and observability are decreasing in the overall level of cooperation. That is, the level of trustworthiness that we observe in the double-blind, No Message condition may already be so high (67%), that there is not much room for messages or single-blind payoff procedures to increase it. Why we observe so much cooperation in the double-blind, No Message condition is an open question as compared to C&D, but one possible explanation is subject pool differences. We have at least some evidence of such differences based upon the messages that are sent. While behavior is similar in our study and in C&D conditional on message type, we find relatively fewer subjects actually sending messages in our study. This pattern is consistent with their subjects (correctly) anticipating little cooperation in the absence of messages and ours (correctly) anticipating relatively high levels.

We feel that our paper highlights at least two important areas for further scientific investigation. First, it is important to explore the robustness of experimental results regarding the impact of messages. While we do not replicate the behavior of C&D this could be due to direct subject pool differences, diminishing returns to cooperation enhancing devices, sampling error, or some yet unidentified factor. More evidence and replication is required before we can confidently distinguish between a corroborated conclusion and either type-1 or type-2 statistical error. Second, the issue of double-blind versus single-blind payoff procedures needs to be reconsidered given that recent evidence is counter to what has become received wisdom.

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Appendix 1: Subject Instructions

The base instructions for the double-blind No Message condition. Text in --( )—and --[ ]-- highlight changes made for conditions with messages and single-blind conditions, respectively.

INSTRUCTIONS

Thank you for participating in this session. The purpose of this experiment is to study how people make decisions in a particular situation. Feel free to ask us questions as they arise, by raising your hand. Please do not speak to other participants during the experiment.

You will receive $5 for participating in this session. You may also receive additional money, depending on the decisions made (as described below). Upon completion of the session, this additional amount will be paid to you (as described below).

During the session, you will be paired with another person. However, no participant will ever know the identity of the person with whom he or she is paired.

Decision Tasks

In each pair, one person will have the role of A, and the other will have the role of B. The amount of money you earn depends on the decisions made in your pair.

On the designated decision sheet, each person A will indicate whether he or she wishes to choose IN or OUT. If A chooses OUT, A and B each receive $5. We will collect these sheets after the choices have been indicated. Next, each person B will indicate whether he or she wishes to choose ROLL or DON'T ROLL (a die). Note that B will not know whether A has chosen IN or OUT; however, since B's decision will only make a difference when A has chosen IN, we ask B's to presume (for the purpose of making this decision) that A has chosen IN.

If A has chosen IN and B chooses DON'T ROLL, then B receives $14 and A receives $0. If B chooses ROLL, B receives $10 and a six-sided die is rolled to determine A's payoff. If the die comes up 1, A receives $0; if the die comes up 2–6, A receives $12. (All of these amounts are in addition to the $5 show-up fee.) This information is summarized in the chart below:

	A Receives	B Receives
A chooses OUT	$5	$5
A chooses IN, B chooses DON'T ROLL	$0	$14
A chooses IN, B chooses ROLL, die = 1	$0	$10
A chooses IN, B chooses ROLL, die = 2, 3, 4, 5, or 6	$12	$10

--(*A Message*

Prior to the decision by A concerning IN or OUT, B has an option to send a message to A. Each B receives a blank sheet, on which a message can be written, if desired. We will allow time as needed for people to write messages, then these will be collected. Please print clearly if you are B and you wish to send a message to A.

In these messages, no one is allowed to identify him or herself by name or number or gender or appearance. (The experimenter will monitor the messages. Violations, as determined by the experimenter, will result in B receiving only the $5 show-up fee, and the paired A receiving the average amount received by other A's.) Other than these restrictions, B may say anything that he or she wishes in this message. If B does not wish to not send a message, B should simply write an "X" in the space provided.)--

Payoff Procedures

Each of you will receive a "code." The code will be written on your response form. The purpose of this code is --(so that the experimenters can insure that any message sent by B is received by the paired A. The code also allows the experimenters)-- to insure that your payoff is based on your action and the action of the person with whom you are paired while maintaining that no participant will ever know the identity of the person with whom he or she is paired

The code you receive will also be on a "key." After the experiment is completed, you will be able to receive your cash payment in a sealed envelope from a locked mailbox, located in another room here in the lab. The envelopes will be identical on the outside, so that no one, including the experimenter, will ever know the decision --(, message,)-- or payoff of any participant. To protect your anonymity, you should place the coded key in your pocket once you receive it. After you have collected your payoff envelope, there will be a container into which everyone will drop their keys.

--[The code you receive will also be on a "key." After the experiment is completed, each person will be called by name to collect their money. You will be able to receive your cash payment from the experimenter by privately showing your key to the experimenter so the experimenter knows how much money you earned. At this point your earnings will be recorded beside your name on the sign-in sheet you already completed.]--

You have the role of A Your code_____

Please circle your choice of (1) IN or (2) OUT and then place this form back in the envelope. You must circle exactly one choice.

(1) IN

A receives $0 & B receives $14 if B chooses DON'T ROLL
A receives $0 & B receives $10 if B chooses ROLL & die = 1
A receives $12 & B receives $10 if B chooses ROLL & die = 2,3,4,5 or 6

or

(2) OUT

A receives $5 & B receives $5

You have the role of B Your code_____

Please circle your choice of (1) DON'T ROLL or (2) ROLL and then place this form back in the envelope. You must circle exactly one choice.

(1) DON'T ROLL

A receives $5 & B receives $5 if A chooses OUT
A receives $0 & B receives $14 if A chooses IN

or

(2) ROLL

A receives $5 & B receives $5 if A chooses OUT
A receives $0 & B receives $10 if A chooses IN and B chooses ROLL & die = 1
A receives $12 & B receives $10 if A chooses IN and B chooses ROLL & die = 2,3,4,5 or 6

You have the role of B Your code_____

Please circle your choice of (1) DON'T ROLL or (2) ROLL and then place this form back in the envelope. You must circle exactly one choice.

(1) DON'T ROLL

A receives $5 & B receives $5 if A chooses OUT
A receives $0 & B receives $14 if A chooses IN

or

(2) ROLL

A receives $5 & B receives $5 if A chooses OUT
A receives $0 & B receives $10 if A chooses IN and B chooses ROLL & die = 1
A receives $12 & B receives $10 if A chooses IN and B chooses ROLL & die = 2,3,4,5 or 6

The experimenter will cut this page along the dashed line and only the bottom portion will be sent to A, if you choose to send a message. Place an "X" in the provided space if you do not wish so send a message to A.

✂----------

You may print a message to your paired A below if you wish.

Appendix 2: Coder Instructions and Subject Messages

a/b in the Code column denotes that the three coders wee split and that two coded the messages as a and 1 coded the message as b. In the table with the messages from Charness and Dufwenberg (2006), an * denotes that a majority of our coders evaluated the message differently than did C&D.

Coder Instructions

Purpose: To study how communication affects the play of the game.

Game: Refer to the attached instructions for the experiment.

Coding Rules:

(1) The unit of observation is a single message.

(2) If a message contains the relevant category of content, enter the appropriate category code.

"0" a blank message

"1" a promise or statement of intention of the action the message's sender will take (The senders actions are limited to Roll and Don't Roll)

"2" a message that is not blank, but does not contain a promise or statement of intention of the action the messenger's sender will take.

(3) You should **independently** code all messages. Do not discuss with anyone about which statements should fall into which categories.

(4) Your job is to capture the content of the message as sent rather than why it was sent or what effect it had. Think of yourself as a "coding machine."

You will be paid **$20** for coding all messages. Thank you.

Messages in Our Double-Blind Condition

ID	B action	A action	Code	Message
1	Roll	In	1	I'm Going to choose to roll. You have a one in six chance of making 12. Like me, if your in this study, you probably need the money. Choose IN, I guess you can't Tell but I'm not trying to decieve you.
2	Roll	Out	0	
3	-	In	1	I will not choose the Don't Roll option so feel free to go with the 5/6 odds for the dice roll.
4	Roll	Out	2	Your move
5	Roll	In	2/1	If you pick "in" every time, and I pick roll every time we will both win the highest amount of money safely. For every 6 rolls if you pick in you have a 1/6 chance of getting $0 & a 5/6 Chance of getting $12.00. It's in our best interest to pick "in" and Roll every time.
6	Roll	In	1	Look, we'll both make a lot more money if you go in and I roll every time. I will roll every time, so if you go in we'll both make off pretty good.
7	Roll	Out	2	There is more of a chance for both of us to make more if you always choose in, Odds are in both our Favors iF you choose in.
8	Don't Roll	Out	0	
9	Don't Roll	Out	0	
10	Don't Roll	In	1	I'm In it to Roll with it.
11	Roll	In	2	Trust me and choose ~~to roll~~ to be in. It is the best odds for both of us, even if you make more money
12	Don't Roll	In	2	I' am B and I wish to send a message to A. You should ~~Roll~~ choose in
13	Roll	Out	0	
14	Roll	In	2	Stay In
15	Roll	In	0	
16	Don't Roll	Out	0	
17	Roll	In	1	I chose to roll the die. Gives you a 83% chance at $12 extra dollars if you want to go IN.
18	Roll	In	0	
19	Roll	In	1	I chose to roll
20	Don't Roll	In	0	
21	Roll	In	2	Choose IN - You won't be sorry.
22	Roll	Out	0	
23	Roll	In	1	PLEASE choose "IN" because I am choosing to "ROLL" - this is the best option for both of us together.
24	Roll	In	0	
25	Roll	In	2	INNER
26	Don't Roll	Out	0	
27	Roll	Out	1	If you choose In, I'll choose roll. Gives us both to make more money, which seems fair. Go Team!
28	Roll	In	0	

29	Don't Roll	Out	0	
30	Roll	In	2	Choose In
31	Don't Roll	Out	0	
32	Don't Roll	In	0	
33	Don't Roll	In	0	
34	Roll	In	1/2	Lets Roll 5/6 chance of making more money
35	Roll	In	1	I CHoSE To RoLL.
36	Roll	In	0	
37	Don't Roll	Out	0	
38	Roll	In	2	IN
39	Roll	Out	2	If you choose to go in, we can both walk away with something hopefully!
40	Roll	In	0	
41	Roll	In	1/2	If you are willing to take a 5/6 chance of getting more than 5, I'm in.
42	Roll	In	2	There is no good or evil. Only power, and those too weak to seak it.
43	Don't Roll	Out	0	
44	Roll	Out	1	Hi! Im choose Roll
45	Don't Roll	In	2	Hey buddy, I think should choose IN because

Messages in Our Single-Blind Condition

ID	B action	A action	Code	Message
1	Roll	In	2	THE CHANCES ARE WORTH IT TO BE "IN".
2	Roll	Out	0	
3	Roll	In	2	Choose In the chances are higher ~~to~~ for positive gains than none. ~~5~~ 5/6 for gain. You've got nothing to lose.
4	Roll	Out	0	
5	Roll	Out	2	IN (***triple underlined***)
6	Don't Roll	In	0	
7	Roll	In	1	You better have chosen IN, because I'm rolling a 6 baby!
8	Don't Roll	In	0	
9	Roll	In	0	
10	Don't Roll	In	1	Choose <u>IN</u> I will choose <u>Roll</u> You have a 5 in 6 chance of getting $12 dollars. I'm happy with getting <u>$10</u>.
11	Roll	In	1	I promise to select Roll
12	Don't Roll	Out	0	
13	Don't Roll	In	2	good luck :) let's do it.
14	Roll	In	1	I am going to roll everytime. Every thing will be ***single unknown scratched out character*** okay.
15	Roll	In	2/1	Choose IN, we'll both win.

16	Don't Roll	In	0	
17	Roll	In	2/1	I want to maximize our shared profit :)
18	Roll	In	1/2	If you choose "IN" and I choose "Roll" the most money will be aquired for the both of us.
19	Roll	In	1	Roll
20	Roll	Out	0	
21	Don't Roll	In	0	
22	Roll	In	1/2	im down to pick roll if you want to pick in. Doesn't matter to me. :) <-- helps us both?
23	Don't Roll	In	1	I will roll no matter what you may choose.
24	Roll	In	2/1	I'm not greedy, I'm choosing the option to get the most for both of us.
25	Roll	Out	0	
26	Don't Roll	In	2	Choose IN and we will both have A better chance of making more money. Obviously.
27	Roll	Out	2/1	Go IN, your chances at $12 is 5/6!
28	Don't Roll	In	1	Okay, the best choice for both of us looks like if you choose In. That way you have a 5/6 chance of getting $12 and I am happy with $10. If you chose IN I will choose ROLL.
29	-	In	1	Choose IN, Either way I am going to Roll the die thus I will either get 1 or 2,3,4,5,6 The chane of us getting more $ is greater if we are both in (***subject did not indicate a decision on the form***)

Relevant Messages in Charness and Dufwenberg (2006)

ID	B action	A action	Our Code	Their Code	Message
1	Don't Roll	Out	2	2	Please choose In so we can get paid more.
2	Don't Roll	In	1	1	Choose in, I will roll dice, you are 5/6 likely to get 2,3,4,5, or 6 → $12. This way both of us will win something.
3	Don't Roll	In	2	2	If you stay in, the chances of the die coming up other than 1 are 5 in 6 – pretty good. Otherwise, we'd both be stuck at $5. (If you opt out)
4	Roll	Out	2	2	I have to do laundry tonight and I really don't want to do it! But I don't have any clean underwear left and I don't want to go commando tommorrow. We'll see what I decide tonight. This man acts funny doesn't he? But he seems cool, he's quite a character. All this mystery is kinda cool.
5	Roll	In	1	1	If you will choose "In", I will choose to roll. This way, we both have an opportunity to make more than $5! J
6	Roll	Out	0	0	

7	Roll	In	1/2	1	If I roll a 2-6 (you'll know when you receive the $, you will give $5.00 to a stranger. [[[then there is a line, under which is written "Sign here if you are so kind]]] Thanks. You'll still be gaining more than if I had chosen Don't roll.
8	Roll	In	1	1	The fairest thing to do is if you opt "IN". Then I will proceed to choose "roll." That way you and I have 5/6 chances to make money for the both of us. That's much better than just making $5 each. Increases both our chances. Thanks.
9	Don't Roll	In	1	1	Choose In and I will Roll You have my word
10	Roll	In	2	2	**Good luck** I do not know what I'm going to do, so I have no hints on how to advise you on choosing "in" or "out." Though it would be beneficial for me to pick don't roll and hope you pick "in", I also like to give you a chance to gain some cash. Who knows?
11	Don't Roll	In	2/1	2	What's up? Good luck on your decision. Choose whatever. If you choose "out," you get only $10 total. If you choose "In," you can get $17 total instead of only $10. 7 bucks is a lot of money!
12	Don't Roll	In	1	1	Hey. OK I think that the best way for both of us to make a profit is for you to choose IN and for me to roll. That way we both make some money. There's no point in me not rolling because that would give you and me less profit. So I'm a roller if you're in J
13	Roll	In	2	2	take a risk
14	Roll	Out	1*	2	If you choose IN the first round and then I will choose Don't Roll at first. I will get $14 but then after that I will choose roll each time after the 1st role. Chances are most likely you will get $12 and I will get only $10. I will the only take 7 rolls for you to get even with me. That way we both leave with a good amount of money. Hope you have a great evening and that this works out for both of us. J
15	Roll	In	1	1	If you choose in I'll roll. Why? If you choose out, we walk out with $10 each. If you choose IN & I choose IN then both of us coin. So it's a compromise. By agreeing to this I guarantee myself more $ than risking you choose out. So if you choose out I get $10 ($5 diff.) if you choose in I get $15 vs. $19 ($4 diff.). that's why
16	Don't Roll	Out	0	0	
17	Roll	Out	0	0	
18	Roll	In	2/1*	1	Choose "In" so we can both make some $$ What are the chances me rolling a 1? I'll try my best.
19	Roll	Out	1	1	I'm going to roll.
20	Roll	In	1	1	I'll choose roll.
21	Don't Roll	In	1	1	I will choose roll.
22	Roll	In	1	1	I'm going to choose roll
23	Roll	In	1	1	choose in, & I'll roll.
24	Roll	In	1	1	You can have the 2 extra dollars. I'll be nice and choose to roll. J

25	Roll	In	0	0	
26	Don't Roll	In	1	1	Hey, choose in and I will roll. You have to like your odds that I will roll a 2,3,4,5, or 6. 5/6 odds ain't bad.
27	Roll	In	1	1	If you choose "In", I'll choose Roll and you've got a 5/6 chance of getting $12.
28	Roll	In	2	2	Stay IN, I really need the money.
29	Don't Roll	Out	2/1	2	If you choose IN, and I roll, the chances of our getting the most $ are very high. The likelyhood of my rolling a 1 is small compared to the chances of rolling a 2-6. So we both get cash.
30	Roll	In	1	1	Hi, well I'm going to Roll so you have at least a shot for more money. I hope it works out.
31	Don't Roll	Out	1/2*	2	Hopefully I'll make a lucky role.
32	Roll	In	1	1	It's much more likely that I'll roll a 2-6 and thus get more money then if we don't roll or choose out. I promise that I won't cheat you and that I'll choose to roll. J
33	Roll	Out	2	2	Tee hee, this is kinda Twilight Zone – ism; Why not "go for it", eh? I hope you have a lovely evening as well.
34	Roll	In	1/2*	2	Hello fair stranger, anonymous partner … Choose whatever you want. Far be it from me to influence your decision, but I think you should choose "in" and I should choose "roll" and we should take the chance at both earning as much as we can. 5 chances out of 6 say it'll work, and I'm totally broke, looking to rake in stray cash however I can. I feel the luck in the air. I don't really have much else to say. Hope you're doing well, whoever you are. Yes. That's all. Random note from random human
35	Don't Roll	In	2	2	Both of 'us' can earn.
36	Roll	In	1	1	Ok. You're probably thinking, lets chose out, and I'll at least get 5 bucks. But… …Chose 'IN', and I WILL chose to roll. The probability that I will roll a 2,3,4,5, or 6 is pretty high, and I think worthy of trying for. (I have no way of assuring you that I will roll … but, its probably worth going for, you'll get $12 for finding out, where I could get $10.) x. I WILL ROLL
37	Roll	In	1	1	I <u>will roll</u>, so if you stay in, you've got a 5/6 chance of getting 12. If you don't mind the risk, if you stay in we'll both probably get more than $5 … Pretty cool to get money, eh? I'm kinda bored. Hope you've had a great day so far! My country Tis of Thee Sweet Land of Liberty Of Thee I sing. Land where my fathers died Land of the Pilgrim's Pride On every mountainside Let freedom ring. George W. Bush wants you to go in! Bin Laden says "out"! ☺
38	Don't Roll	In	1	1	Lets together get the most $ out of this that we can. -- >you 12 0 0 5 me 10 10 14 5 I promise not to do this one. ^ I promise I will choose to roll. You can have the extra $2 bucks. It's good karma. Thanks. I will choose ROLL in any case considering I will get the same amount no matter what you choose, as long as you choose IN. please excuse the awful handwriting. I'm trying

39	Roll	In	1	1	I'm choosing ROLL, which gives you a chance to get $12 instead of $5, so stay. It's a risk, but you could end up getting a lot more.
40	Roll	In	1	1	If you choose in then I'm going to choose roll. This gives you a 5/6 chance of getting 12 dollars. That is 7 more than if you choose out. Since the money is free anyway – why not believe me. I'm don't lie – I promise I will choose roll.
41	Don't Roll	In	2	2	If you choose IN you have the best opportunity to make the most money. You have a 5/7 chance of making more money! So IN would be your best bet. Cheers. ☺
42	Roll	Out	1	1	Choose IN. I promise I'll ROLL.