# Essays on promises, trust and disclosure

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# Essays on Promises, Trust and Disclosure

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# Contents

# Chapter 1

# Disclosing Advisor's Interests Neither Hurts nor Helps[1] [2]

**Abstract**

We set up an experiment to study whether disclosure of the advisor's interests can foster truthfulness and trust. We measure how advisors expect decisionmakers to react to their advice in order to distinguish between strategic and moral reactions to disclosure by advisors. Results indicate that advisors do not expect decision makers to react drastically to disclosure. Also, we do not find support for the moral licencing effect of disclosure. Overall, we fail to reject the null hypotheses that deceptive advice and mistrust are equally frequent with as without disclosure.

## 1.1 Introduction

Conflicting interests may provide advisors with incentives to give biased advice. Insurance agents, for example, may be led by the commissions they receive on different products and not just by the interests of their customers. Besides the interests of their patients, physicians may be affected by their relationship with

[1] This paper is co-authored with Jan Potters.

[2] We thank Dirk Engelmann, George Loewenstein, participants at the 2012 ESA Annual meeting, the M-BEES 2012 at the Maastricht University, the "Deception, Incentives, and Behavior" conference at UC San Diego, and the Netspar "Economics and Psychology of life cycle decision-making" meeting in Amsterdam, the editor (Uri Gneezy) of the special issue 'Deception, Incentives, and Behavior' of the Journal of Economic Behavior and Organization and two anonymous referees for helpful comments and discussions. Financial support from Netspar is gratefully acknowledged.

pharmaceutical companies.[3] One of the solutions suggested to mitigate such problems is that advise recipients be informed about matters that present a potential conflict of interest. Mandatory disclosure rules exist in many domains, including accounting, retail finance, medicine, and academia.[4]

In this paper, we test how disclosure affects advisors and advice recipients in a simple sender-receiver game based on Gneezy's (2005) deception experiment. The receiver has to choose between two options without knowing the associated payoffs. The sender knows the payoffs of each option, and sends a message stating which option is better for the receiver. In our baseline treatment, the receiver has no information on the sender's payoffs (as in Gneezy, 2005). In our disclosure treatment, the receiver is informed about the sender's payoffs for each of the two options. Comparing the two treatments allows us to see how disclosure affects the sender's advice and how the receiver uses the advice.

Interestingly, previous experimental studies have suggested that disclosing conflict of interests may actually hurt advice recipients (Cain et al., 2005, Cain et al., 2011, Inderst et al., 2010, Koch and Schmidt, 2009, Rode, 2010). With disclosure, advisors bias their advice more than they do without disclosure, and advice recipients fail to account for this sufficiently. As a result, disclosure makes advice recipients worse off compared to no disclosure. Cain et al. (2005, 2011) provide two possible explanations for the increased exaggeration by advisors. One is moral licensing, according to which advisors find it less unethical to send deceptive messages once their own interests are revealed. An alternative explanation is that the increased bias is strategically motivated to compensate for the anticipated reaction to disclosure by the advisees. An important feature of our experiment is that we measure the beliefs of the sender about the receiver's reaction to her messages. This allows us to distinguish between the two reasons for why senders might change their advice in response to disclosure, since the sender's beliefs provide us with a direct measure of the strategic motive.[5]

We also run a treatment in which disclosure is not automatic but must be requested by the receiver. This treatment is inspired by circumstances in which

[3]Numerous experiments also show that a substantial portion of subjects deceive an uninformed party when doing so gives a higher payoff (see, for example, Gneezy, 2005, Sutter, 2009, Angelova and Regner, 2013, Danilov et al., 2013, and Sheremeta and Shields, 2013)

[4]For example, the Insurance Conduct of Business sourcebook in the UK requires "a firm to provide its customers with details about the amount of any fees other than premium monies for an insurance mediation activity" (FSA, 2012, Section 4.3.1), and the EU Market in Financial Instruments Directive (MiFID) has similar provisions.

[5]Another feature of our design is that with disclosure the receiver knows the sender's interests but not that there is a conflict of interest. Our experiment shares this feature with de Meza et al. (2011). An alternative approach, used in most other experimental studies, is that disclosure uncovers the conflict of interest between the sender and the receiver. See Li and Madarasz (2008) for a theoretical analysis.

clients have to explicitly ask for disclosure.[6] In line with the 'hidden costs of control' (Falk and Kosfeld, 2006), we hypothesize that solicited disclosure is particularly prone to increase the moral license to deceive felt by the sender.

## 1.2 Experimental Design and Procedure

Our design is based on the two player sender-receiver game from Gneezy (2005). The sender observes payoffs to both players associated with two options, Option A and Option B, and sends one of the two possible messages to the receiver:

Message 1: "Option A will earn you more money than option B."

Message 2: "Option B will earn you more money than option A."

After receiving the message from the sender, the receiver chooses one of the two options and both players are paid according to the chosen option. In our *No disclosure* treatment, as in Gneezy (2005), the only information available to the receiver is the message sent by the sender. The receiver observes neither the payoffs to the sender nor the payoffs to himself. In the *Disclosure* treatment in addition to the message sent by the sender the receiver observes the payoffs to the sender for each option but not the payments to himself. Thus, the only difference between the two treatments is that the receiver observes the sender's interests in the *Disclosure* treatment but not in the *No disclosure* treatment.

We also implement a treatment where the receiver decides whether the interests of the sender should be disclosed. The sender is informed about this decision before she sends a message. With this treatment we want to test if leaving the decision to disclose the potential conflicts of interest to the receiver leads to different outcomes. We call this the *Endogenous* treatment. Depending on the receiver's decision whether or not to have the sender's interests disclosed we will have two conditions: *Endogenous No Disclosure* and *Endogenous Disclosure*. For convenience, we call the latter two 'treatments' instead of 'conditions' in what follows. Thus, overall we have four treatments: *No disclosure*, *Disclosure*, *Endogenous No Disclosure*, and *Endogenous Disclosure*.

Moreover, we implement two different payoff structures (Low Incentive and High Incentive) to test whether the effect of diclosure depends on the magnitude of the conflict of interest. The receiver's reaction to disclosure could be more drastic if with disclosure the receiver observes that the sender has a strong incentive to recommend one option rather than the other. If this is anticipated correctly by the sender, then the sender's (strategic) reaction to disclosure could also depend on his/her incentives to lie. In addition, if the senders recommend an option by

[6]For example, the Insurance Conduct of Business Sourcebook in the UK requires "that an insurance intermediary must, on a commercial customer's request, promptly disclose the commission that it and any associate receives in connection with the policy (FSA, 2012, Section 4.4.1).

comparing the expected benefit of lying to its (moral) cost, then the magnitude of the moral licensing effect of disclosure could also depend the incentives of the sender. Table 1.1 provides details of both payoff structures.

Table 1.1: Low and High Incentive payoff structures

| | | Payoff to | |
|---|---|---|---|
| Payoff structure | Option[a] | Sender | Receiver |
| Low incentive | A | 8 | 3 |
| | B | 6 | 6 |
| High incentive | A | 15 | 5 |
| | B | 5 | 15 |

[a] In this table Option A gives higher payoff to the sender. In the experiment the option with higher payoff for the sender could be either A or B.

Importantly, we also measure beliefs of the sender about the receiver reaction to each of the possible messages. After choosing a message, the sender guesses how likely it is that the receiver in her pair will follow Message 1 and Message 2 (i.e. also for the message that is not sent). To be able to incentivize sender guessing for both messages we ask the receivers to make a choice conditional on each message (i.e. the strategy method). Appendix B (Section 1.7) gives more details.

The experiment was ran in September 2011 at Centerlab, Tilburg University. Subjects were students recruited via email. Upon arrival subjects were seated behind partitioned workstations and randomly assigned one of the two roles, player 1 (the sender) or player 2 (the receiver), and formed a pair with one of the participants in the other role. The experiment was computerized using the Z-tree software (Fischbacher, 2007). To increase the number of observations each subject played the game twice in the same role but with different partners, and subjects were informed about this. No feedback was provided after the first period was played. Each subject played both the low incentive and the high incentive payoff structures. Those who played the low incentive payoff structure in the first period played the high incentive payoff structure in the second period and vice versa. The order was randomized. As mentioned above we also randomized which of the two options gave a higher payoff to the sender. At the end of the second period subjects were provided with feedback for both periods. One of the periods was randomly selected and subjects were paid their earnings in that period.[7]

[7]The reason we ran two periods was not to test how the effect of disclosure depends on experience. As mentioned in the main text by running the experiment for two periods we want to increase the number of observations in our experiment. No feedback is provided to subjects

The experiment lasted for approximately 40 minutes and subjects earned 8.9 euros on average. In total 170 students participated in 9 sessions. We ran 2 sessions (18 pairs) in the *No Disclosure* treatment, 3 sessions (31 pairs) in the *Disclosure* treatment, and 4 sessions (36 pairs) in the *Endogenous* treatment. More sessions were run in the *Endogenous* treatment because this treatment would be split into two treatments depending on the decisions of the receivers.[8]

## 1.3 Hypotheses

In this section we analyse how the disclosure of the sender's interests to the receiver might affect each party. We discuss moral licensing (Cain et al. 2005, 2011) and strategic effects of disclosure. Without loss of generality, we assume that Option A gives a higher payoff to the sender than Option B.

We start by analysing sender behavior in the *No Disclosure* treatment. The sender can send either the deceptive message (Message A: "Option A will earn you more money than Option B") or the truth-telling message (Message B: "Option B will earn you more money than Option A"). We assume that there is a cost, $c$, to the sender of sending the deceptive message (Gneezy 2005).[9] The expected payoff from sending each message for the sender is:

$$E(\pi|\text{ deceptive message }) = p_A * \pi_A + (1 - p_A) * \pi_B - c, \tag{1.1}$$

$$E(\pi|\text{ truthtelling message }) = p_B * \pi_A + (1 - p_B) * \pi_B. \tag{1.2}$$

after the first period. Note that our design is not very suitable to study the role of experience. The interests of the sender and the receiver are always misaligned. If subjects play the game for many rounds and receive feedback at the end of each round they could be able to figure out that the interests of the sender and the receiver are always misaligned.

[8]How about the power of our test? If we hypothesize that in the endogenous treatment 2/3 of the receivers will ask for disclosure and 1/3 will not, then in total we will have 60 sender messages with no disclosure (36+1/3*72) and 110 with disclosure (62+2/3*72). If we hypothesize that the deception rate under no disclosure is about 0.44 (based on the two closest treatments in Gneezy, 2005) and that it increases by 50% to 0.66 with disclosure, then the power of our test for the effect of disclosure is almost 80% (two-sided test, no continuity correction). An effect size of 50% is not unreasonable. Cain et al (2011) find that disclosure decreases the rate at which advisors consider exaggeration to be unethical from 5.4 to 3.6 on a 7-point scale (study 2) and that it increases advisor exaggeration from $31,351 to $51,562 (study 3).

[9]Alternatively, lying costs can depend on the guilt from letting the receiver down (i.e., the larger the difference between the receiver's payoff expectation and the actual outcome, the higher the cost of lying is). However, note that in our experiment receivers do not observe their potential payoffs. In view of this, it would be impossible to measure what receiver's payoff expectations are and how they change with disclosure. Hence, if we assume that moral licensing works through the expectations, we would not be able to test the predictions of our model.

$p_A(p_B)$ denotes the probability that the receiver will choose Option A conditional on receiving Message A (Message B) and $\pi_A(\pi_B)$ stands for the sender's payoff of Option A (Option B). From equations (1.1) and (1.2) it follows that the sender will lie whenever

$$(p_A - p_B)(\pi_A - \pi_B) \geq c \tag{1.3}$$

In what follows, we call the expression on the left hand side of equation (1.3) the *expected benefit of lying*. By equation (1.3), the sender will lie whenever the *expected benefit of lying* is larger than the cost of lying.

Cain et al.(2005, 2011) argue that once the interests of advisors are revealed, advisors find lying less immoral. In our setup this implies that the cost of lying, c, decreases with disclosure. From equation (1.3), for given *expected benefit of lying*, $(p_A - p_B)(\pi_A - \pi_B)$, a decrease in $c$ should make deception more likely. Thus, we can formulate the following hypothesis:

*Moral Licensing Hypothesis*: *Controlling for the expected benefit of lying, the deception rate increases with disclosure.*

In Appendix A (Section 1.6) we present a theoretical analysis to study the impact of disclosure on $p_A$, $p_B$, and $(p_A - p_B)(\pi_A - \pi_B)$. Note that with disclosure the receiver observes the option that is in the sender's self interest (Option A) and the option that is not (Option B) and the sender knows this. Let $p_A^D$ and $p_B^D$ stand for $p_A$ and $p_B$ in the *Disclosure* treatment. Our theoretical analysis shows that in equilibrium we have $p_A^D < p_A$ and $p_B^D = 0 < p_B$. Once disclosed, the sender's self-interest message A is less likely to be followed by the receiver. On the other hand, if the sender advises the option that is not in her self interest, the receiver follows this advice. The model shows that the effect of disclosure on the *expected benefit of lying* is ambiguous and can go in either direction depending on the distribution of lying costs of the senders. This is why we do not formulate a specific hypothesis regarding the strategic effect of disclosure. For the empirical analysis we can rely on the sender's subjective beliefs about $p_A$ and $p_B$.

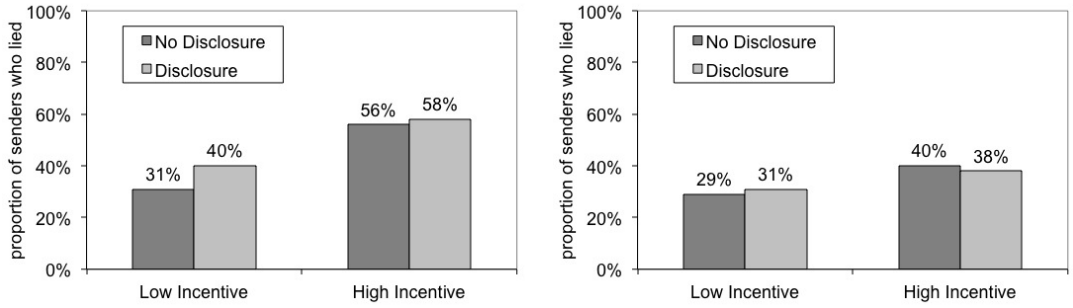
For the endogenous treatment, with disclosure one would expect the moral licensing effect to become more pronounced. The experimental literature has shown that signalling mistrust can backfire for the mistrusting party (see, for example, Falk and Kosfeld 2006). A request by the receiver to have the sender's interests revealed, may be perceived by the sender as a signal of mistrust. We expect that this will increase the importance of the moral licensing argument relative to the exogenous disclosure case.

## 1.4 Results[10]

### 1.4.1 Sender behavior

Panel (a) of Figure 1.1 reports deception rates in the *No Disclosure* and the *Disclosure* treatments. Disclosure increases the deception rate by 9% with the Low Incentive payoffs and by 2% with the High Incentive payoffs. None of the differences is significant, though (p=0.56 for Low Incentive and p=0.86 for High Incentive, two-tailed Chi-square tests). Thus, we do not observe a significant increase in sender deception rates with disclosure.

Panel (a) also shows that senders lie more with High Incentive payoffs than with Low Incentive payoffs both in the *No disclosure* and the *Disclosure* treatments. The differences are marginally significant for each treatment separately and highly significant for combined data (p=0.06 for *No disclosure* treatment, p=0.09 for *Disclosure* treatment and p=0.01 for both treatments combined, one-tailed McNemar tests for matched pairs)[11]. Gneezy (2005) and Sutter (2009) also show that senders lie more the higher the incentives to do so.




(a) Exogenous Disclosure

(b) Endogenous disclosure

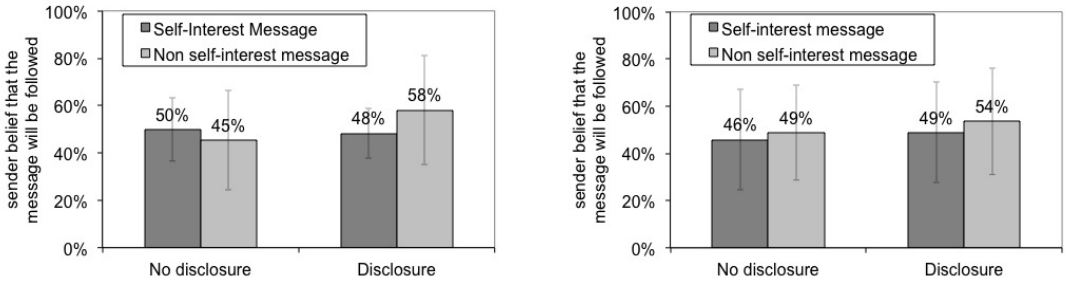
Figure 1.1: The impact of disclosure on the frequency of lies.

Next, we discuss the results for the *Endogenous* treatment. In 55 out of 72 cases receivers asked to reveal the sender's interests. This results in 17 observations in the *Endogenous No Disclosure* treatment and 55 observations in the *Endogenous Disclosure* treatment. Panel(b) of Figure 1.1 shows that senders do not lie more when the receivers request disclosure of the sender's interests (p=0.89 for the Low Incentive payoffs, and p=0.93 for the High Incentive payoffs, two-tailed Chi-square tests). Contrary to what we expected, the senders do

[10]We excluded five observations from the analysis. See Appendix B (Section 1.7) for detailed explanation.

[11]The High Incentive payoff structure in the *No Disclosure* treatment is the same as Treatment 3 in Gneezy (2005). We observe a deception rate (0.56) similar to Gneezy (2005) in this case (0.52).

not "punish" the receivers for asking to reveal their interests. Overall, the results with respect to the effect of disclosure are similar to the exogenous case.




(a) Low Incentive (b) High Incentive

Figure 1.2: Average sender beliefs about the receiver following the messages (with descriptive error bars for standard deviation).

In Figure 1.2 we report average beliefs of the senders about the receiver's reaction to each of the messages. In the *No Disclosure* treatment, one would not expect any difference in the receiver reaction to the self-interest message and the non-self interest message (because the receiver does not know which message is in the sender's self-interest). We observe small differences in beliefs in the *No Disclosure* treatment. Interestingly, with disclosure senders do not expect drastic changes in the receiver's reaction to the messages. Senders expect that receivers are slightly more likely to follow the non-self interest message than the self-interest message. This difference, however, is significant only for the Low Incentive payoffs (p=0.04, one-tailed, Wilcoxon matched-pairs signed-rank test). Another interesting observation is that senders think that receivers are as likely to follow the sender's self-interest message with disclosure as any of the two messages with no disclosure. In other words, senders do not expect that receivers will mistrust a message which is in the sender's self-interest, once these interests are revealed to the receiver.

In Table 1.2 we report results of a probit regression analysis of our combined experimental data for senders. The regression reported in column (1) reiterates that disclosure, whether exogenous or endogenous, does not significantly affect the likelihood of deception. The regression in column (2) includes the *expected benefit of lying* to test for the moral licensing argument suggested by Cain et al. (2005, 2011). The *expected benefit of lying* for each sender is calculated as $(p_A - p_B)(\pi_A - \pi_B)$, using the sender's stated beliefs that the receiver will follow each of the two messages (see Appendix B (Section 1.7) for the full distribution of the expected benefit of lying under no disclosure and disclosure). If disclosure provides a moral license to deceive, then controlling for the *expected benefit of lying* senders should lie more in the *Disclosure* treatment than in the *No disclosure* treatment.

Table 1.2: Probit Regression Analysis - Sender Behavior[a]

| Variables | (1) | (2) | (3) |
|---|---|---|---|
| Disclosure | 0.05 | 0.0003 | -0.01 |
| | (0.13) | (0.09) | (0.09) |
| High Incentive | 0.15** | 0.16*** | 0.17*** |
| | (0.06) | (0.06) | (0.05) |
| 2nd period | -0.01 | | |
| | (0.06) | | |
| Endogenous | -0.10 | | |
| | (0.16) | | |
| Endogenous*Disclosure | -0.04 | | |
| | (0.19) | | |
| Expected benefit of lying | | 0.03 | 0.06** |
| | | (0.02) | (0.03) |
| Expected benefit of lying*Disclosure | | | -0.06 |
| | | | (0.04) |
| Log pseudolikelihood | -110.09 | -110.14 | -108.94 |
| Wald chi-square | 8.53 | 9.18** | 10.60** |

[a] The dependent variable is 1 if the sender sent an untruthful message and 0 otherwise. Number of observations is 167. Average marginal effects are reported. Robust standard errors (clustered by subject) are in parentheses. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively. Constants are omitted.

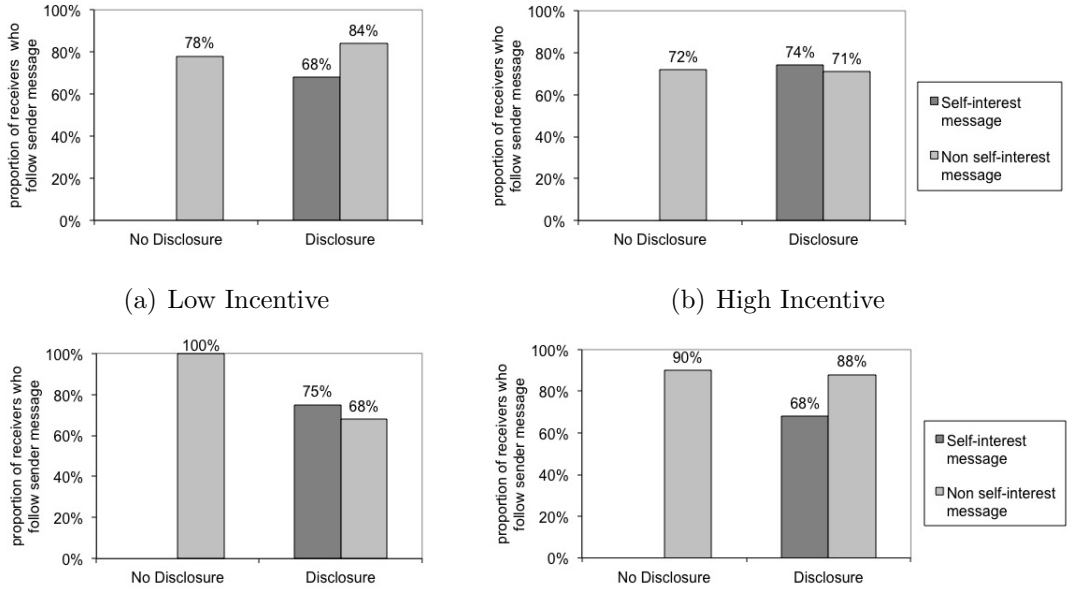
However, we observe no effect of disclosure even when we control for the *expected benefit of lying*. Hence, we find no support for the moral licensing argument. Note that the coefficient of the *expected benefit of lying*, although positive, does not achieve statistical significance (p=0.11). In column (3) we interact the *expected benefit of lying* with the disclosure dummy. The coefficient on the *expected benefit of lying* becomes significant (p=0.03) and the interaction variable is negative but insignificant (p=0.13). This suggests that, with disclosure, senders are less likely to base their decision on the perceived private benefits of deception than without disclosure.

### 1.4.2 Receiver behavior

As mentioned above we asked receivers to make a choice conditional on each message they might receive from the sender. In Panels (a) and (b) of Figure 1.3 we report the proportion of receivers who follow the sender's message in the *No Disclosure* and *Disclosure* treatments for each payoff structure separately.

From the figure we observe that in the *Disclosure* treatment with the Low

Incentive payoffs the sender's self-interest message is followed slightly less than the messages in the *No Disclosure* treatment. The difference is not significant, though (78% vs 68%, p=0.45, two-tailed Chi-squared). With the High Incentive payoffs the sender's self-interest message is actually followed a bit more than the messages in the *No Disclosure* treatment (74% vs 72%). Remarkably, with disclosure a substantial faction of the receivers do not follow the sender's advice even when it is not self-interested (16% of the receivers with the Low Incentive payoffs and 29% of the receivers with the High Incentive payoffs). One reason may be that some receivers want to reward the sender for being honest. Moreover, the sender's self-interest message is not followed less with the High Incentive payoffs than with the Low Incentive payoffs (74% with High Incentive payoffs vs 68% with Low Incetive payoffs). This suggests that the magnitude of the potential conflict of interest does not make a difference for receiver trust.




(a) Low Incentive

(b) High Incentive

(c) Endogenous Treatment Low Incentive

(d) Endogenous Treatment High Incentive

*Note: For the No Disclosure treatment in the sender self interest message column we report the average of the following rates of the sender's self-interest and non self-interest messages. For the Disclosure treatment the rates are shown separately.*

Figure 1.3: The proportion of receivers who follow the sender's message with and without disclosure.

Finally, we have 17 observations in the *Endogenous No Disclosure* treatment and 53 observations in the *Endogenous Disclosure* treatment. Panels (c) and (d) of Figure 1.3 report the receiver behavior in both treatments. When receivers do

not ask to disclose the sender's interests, they almost always follow the advice the sender sends. With endogenous disclosure, on the other hand, the receiver following rates are lower.

## 1.5 Conclusion

In this paper, we explore the effects of disclosing advisors' interests in a simple setup with binary choices. We fail to reject the null hypothesis that the senders are equally (un)truthful with and without disclosure. In addition, we do not find support for the moral licensing effect of disclosure. Controlling for the senders' beliefs about the private material benefits of lying, deception rates do not increase with disclosure. If anything, disclosure renders senders less responsive to their own gains from lying. Moreover, the rate at which the receivers follow the sender's advice is also not affected by the disclosure of sender interests our experiment.

We also test what happens when the decision to disclose or not to disclose the sender's interests is left to the receivers. Senders do not punish receivers for disclosing sender's interests and the receivers who do not reveal sender's interests are more likely to follow sender's advice than the receivers who do look at sender's interests. This suggests that there is a substantial fraction of gullible advisees, who are particularly vulnerable to deceptive advisors.

To summarize, we do not find any perverse effects of disclosure in our setup as reported in the literature. However, our results also show that disclosure of potential conflicts of interests is not likely to help advice recipients. This suggests that other measures are necessary to protect advice recipients from biased advice

## 1.6 Appendix A: Model

In this section we present a theoretical analysis of the sender-receiver game with and without disclosure. Our main goal is to analyse the strategic effect of disclosing the sender's interests to the receiver on sender deception rate. The results show that, unlike the moral licensing effect, the strategic effect of disclosure on sender deception rate is ambiguous (i.e. can go in either direction).

There are two players: the sender (she) and the receiver (he). The receiver has to choose one of two options, Option A or Option B, but does not observe the payoffs. The sender observes the payoffs to both players for each option and sends one of the two possible messages: m = A ("Option A will earn you more than Option B"), and m = B ("Option B will earn you more than Option A").

### 1.6.1 States

There are four possible states: AA, AB, BA, and BB, where the first letter shows the option that gives the highest payoff to the sender and the second letter denotes the option that gives the highest payoff to the receiver. For example, at state AA Option A gives a higher payoff than Option B for both the sender and the receiver. To simplify analysis, for both the sender and the receiver we normalize payoffs such that the higher payoff is 1 and the lower payoff is 0.[12]

### 1.6.2 Senders

As mentioned above the sender observes the state and sends one of the two possible messages to the receiver. We assume that the sender incurs a cost, $c$, from lying (sending the untruthful message). The cost of lying differs among senders and has a cumulative distribution function $F(c)$. Taking into account the cost of lying, the sender sends the message that gives her the highest expected payoff.

By $\sigma_t$ we denote the proportion of senders who send Message A when the state is t. We assume that $\sigma_{AA} = 1$ and $\sigma_{BB} = 0$, i.e., that the senders send the truthful message when the interests are aligned. As will be seen later, given the equilibrium strategies of the receiver, the sender has no incentive to deviate from these strategies. By symmetry, $\sigma_{AB} = 1 - \sigma_{BA}$. For simplicity we will denote $\sigma_{AB}$, the proportion of senders who lie, by $\sigma$ in what follows.

In the analysis of the sender behavior below, without loss of generality, we will assume that Option A gives a higher payoff to the sender than Option B.

### 1.6.3 Receivers

We assume that the receiver's prior belief that Option A gives him a higher payoff than Option B is $\frac{1}{2}$. Given that A and B are just labels without intrinsic meaning this seems appropriate. The receiver also holds a prior belief that the interests are aligned. This is not merely a matter labeling. It will depend on receiver's (homegrown) beliefs about whether interests are typically aligned or not. Here it is unlikely that the receiver will assign 50-50 chances to each possibility, and

[12]We assume that even in the no disclosure case the receiver knows that the sender higher payoff option gives 1 to the sender and the sender lower payoff option gives 0 to the sender. An alternative way is to assume that the sender payoffs for the higher and the lower payoff options are drawn from some distribution and the receiver forms an expectation based on this distribution. In this case there will be an additional effect of the disclosure, the receiver will know the exact size of the sender payoffs. We do not consider this effect because it complicates our model and does not change our main conlcusion that the strategic effect of disclosure can go either way.

different receivers may well have different beliefs in this respect. Therefore, we let $\alpha$ denote the prior belief that the interests are aligned (that the state is either AA or BB). This gives the receiver's prior belief of being at each state: $\frac{1}{2}\alpha$ for state AA, $\frac{1}{2}(1-\alpha)$ for state AB, $\frac{1}{2}(1-\alpha)$ for state BA, and $\frac{1}{2}\alpha$ for state BB. We assume that $\alpha$ may differ across the receivers and is drawn from a distribution $G(\alpha)$.

As the game proceeds the receiver updates his beliefs using Bayes rule. By $\beta_A$ we denote the receiver's belief that Option A is better for him than Option B conditional on receiving Message A and by $\beta_B$ we denote the receiver's belief that Option A is better for him than Option B conditional on receiving Message B. In the analysis below, we assume that conditional on the message sent by the sender the receiver chooses the option that gives him the highest expected payoff.

### 1.6.4 Equilibrium with No Disclosure

We start by calculating the receiver's belief that A is the higher payoff option conditional on receiving Message A from the sender. By Bayes rule:

$$\beta_A = \frac{Pr((t = AA \text{ or } t = BA) \cap m = A)}{Pr(m = A)}$$
$$= \frac{1 * Pr(t = AA) + (1-\sigma) * Pr(t = BA)}{1 * Pr(t = AA) + (1-\sigma) * Pr(t = BA) + \sigma * Pr(t = AB) + 0 * Pr(t = BB)} \tag{1.4}$$

This gives $\beta_A = \alpha + (1-\alpha)(1-\sigma)$. The receiver's expected payoff from choosing Option A conditional on receiving Message A is $\beta_A * 1 + (1-\beta_A) * 0 = \beta_A$. Likewise, the expected payoff from choosing Option B conditional on receiving Message A is $\beta_A * 0 + (1-\beta_A) * 1 = 1 - \beta_A$. This means that the receiver will follow Message A when $\beta_A \geq 1 - \beta_A$ and will not follow otherwise. Substituting for $\beta_A$ and rearranging, we have that the receivers with $\alpha \geq 1 - \frac{1}{2\sigma}$ will follow the sender message. This gives $1 - G(1 - \frac{1}{2\sigma})$ as the proportion of receivers who follow message A. Note that as the proportion of senders who lie, $\sigma$, increases, the proportion of receivers who follow the message decreases and vice versa. By symmetry, the proportion of receivers who follow message B is equal to the proportion of receivers who follow message A.

Next, we analyze senders. Without loss of generality, we consider the case where Option A gives a higher payoff to the sender than Option B and will derive $\sigma (= \sigma_{AB} = 1 - \sigma_{BA})$, the probability that the sender sends the deceitful message $m = A$. Let $p_A$ denote the probability that the receiver will choose Option A conditional on receiving message A and $p_B$ the probability that the receiver will choose Option A conditional on message B. From above we have that

$p_A = 1 - G(1 - \frac{1}{2\sigma})$ and $p_B = G(1 - \frac{1}{2\sigma})$ because it is equal to the complementary probability of $p_A$ by symmetry.

The sender lies whenever the expected payoff of lying minus the cost of lying is higher than the expected payoff of sending the truthful message. The sender receives $p_A - c$ from lying and the expected payoff of sending the truthful message is $p_B$. This means the sender lies when $(p_A - p_B) - c > 0$ or $c < p_A - p_B$. Thus, we have

$$\sigma = F(p_A - p_B). \tag{1.5}$$

Note that from above we also have that

$$p_A - p_B = 1 - 2G(1 - \frac{1}{2\sigma}) \tag{1.6}$$

By solving equations (1.5) and (1.6) simultaneously we can find the equilibrium values of $\sigma$ and $p_A - p_B$. In Figure 1.4 we illustrate the equilibrium in ($\sigma$, $p_A - p_B$) plane for the case when $\alpha$ is uniformly distributed between 0 and 1 and $c$ is uniformly distributed between 0 and $\frac{3}{4}$.

More generally, when $F$ and $G$ are continuous and $F(1) > 0$, the system of equations above has a solution. To see this, note that by substituting (1.6) in (1.5) and rearranging we can rewrite equation (1.5) as $\sigma - F(1 - 2G(1 - \frac{1}{2\sigma})) = 0$. Let $f(\sigma) = \sigma - F(1 - 2G(1 - \frac{1}{2\sigma}))$, then $f(\sigma)$ is continuous on the interval $\sigma = (0.1]$ because $F$ and $G$ are continuous. At $\sigma = 1$ we have $f(1) \geq 0$. Also, $\lim_{\sigma \to 0^+} f(\sigma) = -F(1) < 0$. It follows from the intermediate value theorem that for some $\sigma \in (0, 1]$, $f(\sigma) = 0$.

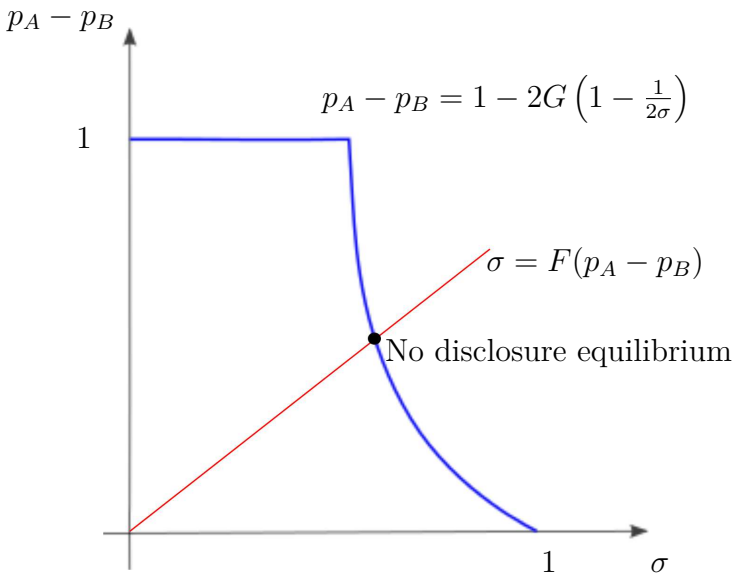



Figure 1.4: No Disclosure Equilibrium

### 1.6.5 Equilibrium with Disclosure

Since the sender gets a higher payoff from Option A than from Option B, with disclosure the receiver knows that the state is either AA or AB. We start by calculating $\beta_A^D$ and $\beta_B^D$ using the Bayes rule.

$$\begin{aligned} \beta_A^D &= \frac{Pr(t = AA \cap m = A)}{Pr(m = A)} \\ &= \frac{1 * Pr(t = AA)}{1 * Pr(t = AA) + \sigma^D * Pr(t = AB)} = \frac{\alpha}{\alpha + \sigma^D(1 - \alpha)}, \end{aligned} \tag{1.7}$$

and

$$\begin{aligned} \beta_B^D &= \frac{Pr(t = AA \cap m = B)}{Pr(m = B)} \\ &= \frac{0 * Pr(t = AA)}{0 * Pr(t = AA) + (1 - \sigma^D) * Pr(t = AB)} = 0. \end{aligned} \tag{1.8}$$

Thus, with disclosure the non self-interest message is revealing. Similar to the *No Disclosure* case, the receiver will follow Message A when $\beta_A^D \geq (1 - \beta_A^D)$ and will not follow otherwise. This means that with disclosure the receiver follows the sender's self interest message when $\alpha \geq 1 - \frac{1}{1+\sigma^D}$. On the other hand, all receivers will follow message B because $\beta_B^D \leq (1 - \beta_B^D)$.

The sender will send the message that gives her the higher expected payoff (taking into account the cost of lying). Similar to the *No Disclosure* case, let $p_A^D$ denote the probability that the receiver will choose Option A conditional on receiving message A and $p_B^D$ the probability that the receiver will choose Option A conditional on receiving message B. We have that $p_A^D = 1 - G(1 - \frac{1}{1+\sigma^D})$ and $p_B^D = 0$. This gives us

$$p_A^D - p_B^D = 1 - G(1 - \frac{1}{1 + \sigma^D}). \tag{1.9}$$

The sender will lie to the receiver when $c \leq p_A^D - p_B^D$. Thus, the proportion of senders who lie with disclosure is given by equation

$$\sigma^D = F(p_A^D - p_B^D). \tag{1.10}$$

Solving equations (1.9) and (1.10) one can find the equilibrium values of $\sigma^D$ and $p_A^D - p_B^D$. As an example, in Figure 1.5 we show graphically the equilibria with and without disclosure for the specific functional forms of $G(\alpha)$ and $F(c)$ we assumed above. More generally, when $F$ and $G$ are continuous the system

of equations above has a solution. The proof is similar to that illustrated for the No Disclosure case. Note that for the given $G$ the impact of the disclosure on the proportion of senders who lie depends on the shape of the cumulative distribution function, $F$, and can go in either direction. In the example we draw the proportion of senders who lie increases with disclosure.

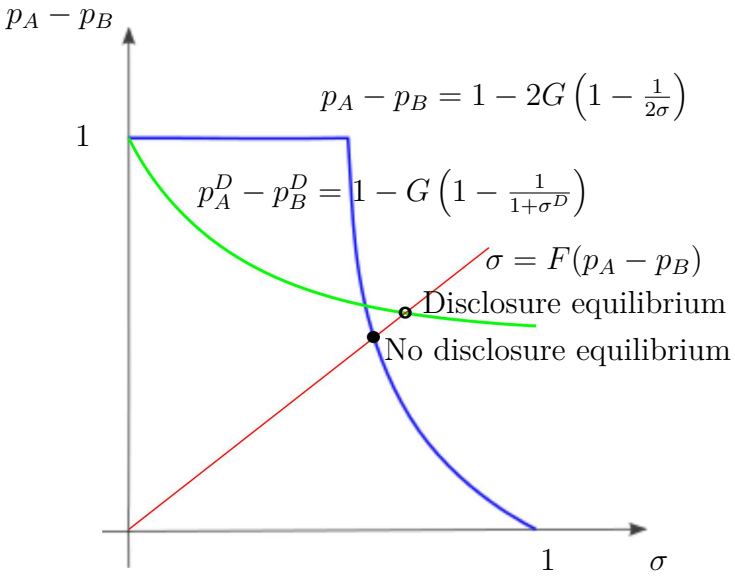



Figure 1.5: No Disclosure and Disclosure equilibria

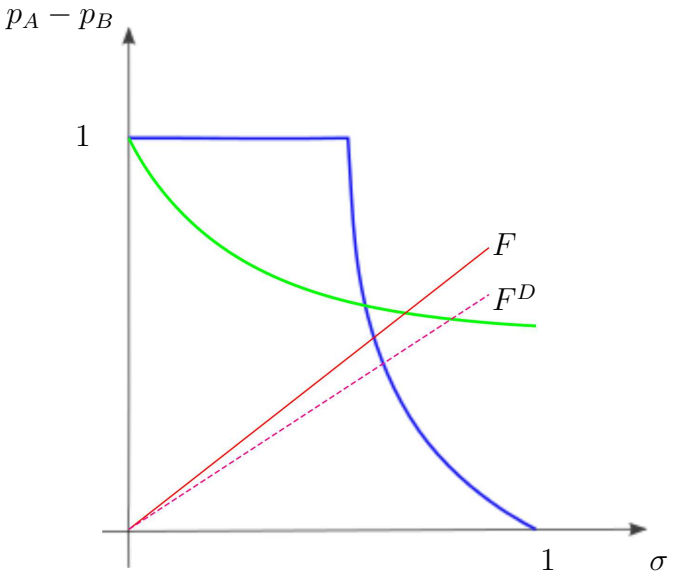



Figure 1.6: The Moral Licensing effect

We can also illustrate the moral licencing effect in our model. Let $F^D$ be the cumulative distribution function of lying costs with disclosure. Assume that with disclosure senders find lying morally more acceptable than without disclosure. This can be captured by assuming that for given $c$ we have $F(c) \leq F^D(c)$. In other words, the cumulative distribution function $F^D$ first order stochastically dominates $F$. This means that the graph of equation (7) will move to the right and this will increase the proportion of senders who lie. In Figure 1.6 we illustrate the moral licensing effect assuming that $c$ is distributed uniformly between 0 and $\frac{3}{4}$ without disclosure and uniformly between 0 and $\frac{5}{8}$ with disclosure.

Our model shows that the strategic effect of disclosure (i.e., the shift in the best response of the receiver) can cause the rate of deception to go either way, while moral licensing (i.e., the shift in the best response function of the sender) will unambiguously cause deception to increase. Hence, the strongest evidence for the relevance of moral licensing is when the observed benefit of deception (measured by $p_A - p_B$) goes down, while the observed rate of deception ($\sigma$) goes up. After all, this means that moral licensing is so strong that it compensates the strategic effect of disclosure. On the other hand, the evidence for moral licensing would be very weak indeed if we would observe that the benefit of deception increases with disclosure, while the rate of deception ($\sigma$) does not. Either case is informative. In all cases, however, conclusions depend on whether the effect of disclosure on the net benefit of deception is correctly anticipated by the sender. This reiterates that it is important to measure the beliefs of the sender to be able to draw correct inferences.

## 1.7 Appendix B: Additional results

### 1.7.1 Data limitations

As mentioned in the main text in total 5 observations were removed from the analysis. We excluded three second-round observations for senders due to an input error in the parameter table of the Z-tree. Due to this error, these three senders played High Incentive payoff structure in both periods. We exclude their second period choices from the analysis below, because all the other senders who played High Incentive payoff structure in the second period played Low Incentive payoff structure in the first period. We do not exclude the first period choices by these 3 senders as these are comparable to the first period choices by the other senders who played High Incentive in the first period. Note there was no error in the input for receivers and thus no observations are excluded for receivers. In addition, one of the subjects in the receiver role participated previously in our pilot session. We exclude the decisions made by this receiver (2 observations).

### 1.7.2 Belief elicitation

As mentioned in the main text we elicited sender beliefs about the receiver reaction to each the possible messages. For each message, senders choose one of the five columns as shown in Table 1.3. Let p denote the belief that the receiver will follow the message. Assuming risk-neutrality and that the sender is an expected utility maximizer, the sender will prefer column (1) over column (2) (also over all other columns) if $1.3p + 0.4(1-p) > 1.2p + 0.7(1-p)$, that is, if $p > 0.75$. Similarly, the second column will be chosen if $0.60 < p < 0.75$, the third column will be chosen if $0.40 < p < 0.60$ and so on. To convert column choices to beliefs we took the midpoints of intervals, i.e, 87.5%, 67.5%, 50%, 37.5%, and 12.5%.

Table 1.3: Belief Elicitation

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Your guess | Almost certainly will follow | Probably will follow | Not sure | Probably will not follow | Almost certainly will not follow |
| Your bonus if the receiver (would) follow your message | €1.30 | €1.20 | €1.00 | €0.70 | €0.40 |
| Your bonus if the receiver (would) not follow your message | €0.40 | €0.70 | €1.00 | €1.20 | €1.30 |

### 1.7.3 Histograms - Expected benefit of lying

Histograms for the *expected benefit of lying* with and without disclosure are shown in Figure 1.7. The histograms show that with disclosure we do not observe any drastic changes in expected benefit of lying. Mean expected benefit of lying is slightly higher with disclosure than with no disclosure.

### 1.7.4 Receiver regression analysis

Table 1.4 reports probit regression results for the receivers. As mentioned in the main text we asked receivers to choose one of the options for each available message. In the regressions below the dependent variable is a dummy equal to 1 if the receiver followed the message and 0 otherwise. Number of observations is 336. Average marginal effects are reported. Robust standard errors (clustered

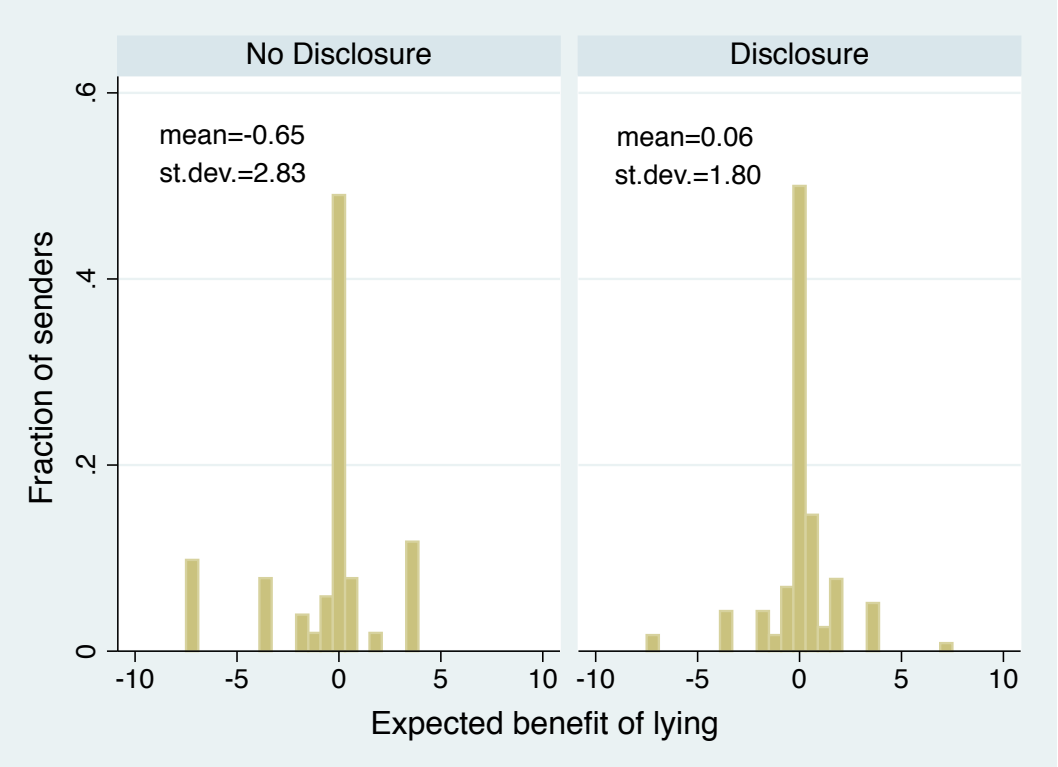



Figure 1.7: The distribution of the expected benefit of lying with and without disclosure. The data is combined for Low and High Incentive payoffs and includes Endogenous treatment.

by subject) are reported in the parentheses. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively. Constants are omitted.

## 1.8 Appendix C: Instructions

### 1.8.1 Treatment No Disclosure

**General Instructions**

Thank you for participating in this experiment. The experiment consists of two rounds. In each round, you will be paired with one other participant. In each pair, one person will have the role of player 1, and the other will have the role of player 2. Your role will be the same in each of the two rounds. The participant in the other role will be different in round 1 and round 2. No participant will ever know the identity of his or her counterpart in any round.

Table 1.4: Probit Regression Analysis - Receiver Behavior

| Variables | (1) | (2) |
|---|---|---|
| Disclosure | -0.01 | 0.01 |
| | (0.10) | (0.11) |
| High Incentive | -0.10 | -0.05 |
| | (0.09) | (0.11) |
| 2nd period | -0.06 | -0.06 |
| | (0.04) | (0.04) |
| Endogenous | 0.28* | 0.28* |
| | (0.15) | (0.15) |
| Sender self interest mes. | 0.05 | 0.11 |
| | (0.07) | (0.13) |
| Disclosure*High Incentive | 0.11 | 0.07 |
| | (0.10) | (0.14) |
| Disclosure*Endogenous | -0.28* | -0.28* |
| | (0.16) | (0.16) |
| Disclosure*Sender self int. mes. | -0.10 | -0.16 |
| | (0.09) | (0.15) |
| High Inc.*Sender self int. mes. | | -0.11 |
| | | (0.15) |
| Disclosure*High Inc.*Sender self int. mes. | | 0.08 |
| | | (0.18) |
| Log pseudolikelihood | -177.06 | -176.86 |
| Wald chi-square | 9.75 | 9.80 |

At the end of the experiment, one of the two rounds will be chosen at random. The amount of money you earn in this experiment will be equal to your payments in the chosen round. These payments depend on the decisions made in your pair in that round. The money you earn will be paid to you privately and in cash at the end of the experiment.

You are not allowed to talk or communicate to other participants. If you have a question, please raise your hand and I will come to your table.

**(Player 1 instructions)**

**You are player 1**

In each round, two possible monetary payments will be available to you and your counterpart in that round. These payment options are labeled Option A and Option B. Note that the payments corresponding to Option A and Option B are not necessarily the same in round 1 and round 2. At the beginning of the round

you will see the payments to you and your counterpart for Option A and Option B on your computer screen.

The choice rests with the other participant who will have to choose either Option A or Option B. The only information your counterpart will have is information sent by you in a message. That is, he or she does not know the monetary payments associated with each option.

After you are informed about the payments corresponding to Options A and Options B, you can choose one of the following two messages to send to your counterpart:

Message 1: "Option A will earn you more money than Option B."

Message 2: "Option B will earn you more money than Option A."

Your message will be sent to your counterpart, and he or she will choose either Option A or Option B. This is done as follows. Before your counterpart receives your message, he or she has to decide which option (A or B) he or she wants to choose in case you send Message 1 and which option (A or B) he or she wants to choose in case you send Message 2. After your message is sent, the option chosen by your counterpart (Option A or Option B) is implemented.

Your message will be sent to your counterpart as soon as all participants in the experiment have entered their decisions.

To repeat, in each round your counterpart's choice will determine the payments of that round. Note however that your counterpart will never know what his or her payment was in the option not chosen (that is, he or she will never know whether your message was true or not). Moreover, he or she will never know your payments of the different options.

You and your counterpart will not get any information on the outcomes of the first round until after the second round is finished. Once the two rounds are over, one of the rounds will be chosen randomly and the outcome of that round will determine your payments.

At certain points during the experiment you will have an opportunity to earn a small bonus by making guesses about what your counterpart will choose. You will receive more information on your screen.

**(Player 2 instructions)**

**You are player 2**

In each round, two possible monetary payments are available to you and your counterpart in the round. These payment options are labeled Option A and Option B. The actual payments depend on the option you choose. We show the two payment options on the computer screen of your counterpart for that round, that is, he or she knows his or her own payments and also your payments for Option A and Option B. Note that the payments corresponding to Option A

and Option B are not necessarily the same in round 1 and round 2. The only information you will have is the message your counterpart for that round sends to you. Two possible messages can be sent:

Message 1: "Option A will earn you more money than Option B."

Message 2: "Option B will earn you more money than Option A."

Before you receive the message, you will be asked which option (A or B) you want to choose in case you receive Message 1, and which option (A or B) you want to choose in case you receive Message 2.

You will receive the message of your counterpart as soon as all participants in the experiment have entered their decisions.

To repeat, in each round your counterpart for the round will send one of two possible messages to you. You decide which choice you want to make in that case: Option A or Option B. Your choice will determine the payments for the round. You will never know what payments were actually offered in the option not chosen (that is, whether the message sent by your counterpart was true or not). Moreover, you will never know the payments to your counterpart in the two options.

You and your counterpart will not get any information on the outcomes of the first round until after the second round is finished. Once the two rounds are over, one of the rounds will be chosen randomly and the outcome of that round will determine your payments.

### 1.8.2 Treatment Disclosure

**General Instructions**

Thank you for participating in this experiment. The experiment consists of two rounds. In each round, you will be paired with one other participant. In each pair, one person will have the role of player 1, and the other will have the role of player 2. Your role will be the same in each of the two rounds. The participant in the other role will be different in round 1 and round 2. No participant will ever know the identity of his or her counterpart in any round.

At the end of the experiment, one of the two rounds will be chosen at random. The amount of money you earn in this experiment will be equal to your payments in the chosen round. These payments depend on the decisions made in your pair in that round. The money you earn will be paid to you privately and in cash at the end of the experiment.

You are not allowed to talk or communicate to other participants. If you have a question, please raise your hand and I will come to your table.

**(Player 1 instructions)**

**You are player 1**

In each round, two possible monetary payments will be available to you and your counterpart in that round. These payment options are labeled Option A and Option B. Note that the payments corresponding to Option A and Option B are not necessarily the same in round 1 and round 2. At the beginning of the round you will see the payments to you and your counterpart for Option A and Option B on your computer screen.

The choice rests with the other participant who will have to choose either Option A or Option B. Your counterpart knows *your* payments for Option A and Option B, but does not know her or his *own* payments for Option A and Option B. The only other information your counterpart will have is a message sent by you.

After you are informed about the payments corresponding to Options A and Options B, you can choose one of the following two messages to send to your counterpart:

Message 1: "Option A will earn you more money than Option B."

Message 2: "Option B will earn you more money than Option A."

Your message will be sent to your counterpart, and he or she will choose either Option A or Option B. This is done as follows. Before your counterpart receives your message, he or she has to decide which option (A or B) he or she wants to choose in case you send Message 1 and which option (A or B) he or she wants to choose in case you send Message 2. After your message is sent, the option chosen by your counterpart (Option A or Option B) is implemented.

Your message will be sent to your counterpart as soon as all participants in the experiment have entered their decisions.

To repeat, in each round your counterpart's choice will determine the payments of that round. Note however that your counterpart will never know what his or her payment was in the option not chosen (that is, he or she will never know whether your message was true or not).

You and your counterpart will not get any information on the outcomes of the first round until after the second round is finished. Once the two rounds are over, one of the rounds will be chosen randomly and the outcome of that round will determine your payments.

At certain points during the experiment you will have an opportunity to earn a small bonus by making guesses about what your counterpart will choose. You will receive more information on your screen.

**(Player 2 instructions)**

**You are player 2**

In each round, two possible monetary payments are available to you and your counterpart in the round. These payment options are labeled Option A and Option B. The actual payments depend on the option you choose. We show the two payment options on the computer screen of your counterpart for that round, that is, he or she knows his or her own payments and also your payments for Option A and Option B. Note that the payments corresponding to Option A and Option B are not necessarily the same in round 1 and round 2.

In each round you will know the payments of your counterpart for Option A and Option B, but you will not know what your own payments for Option A and Option B. The only information you will have about your payments is the message your counterpart for that round sends to you. Two possible messages can be sent:

Message 1: "Option A will earn you more money than Option B."

Message 2: "Option B will earn you more money than Option A."

Before you receive the message, you will be asked which option (A or B) you want to choose in case you receive Message 1, and which option (A or B) you want to choose in case you receive Message 2.

You will receive the message of your counterpart as soon as all participants in the experiment have entered their decisions.

To repeat, in each round your counterpart for the round will send one of two possible messages to you. You decide which choice you want to make in that case: Option A or Option B. Your choice will determine the payments for the round. You will never know what payments were actually offered in the option not chosen (that is, whether the message sent by your counterpart was true or not).

You and your counterpart will not get any information on the outcomes of the first round until after the second round is finished. Once the two rounds are over, one of the rounds will be chosen randomly and the outcome of that round will determine your payments.

### 1.8.3 Treatment Endogenous Disclosure

**General Instructions**

Thank you for participating in this experiment. The experiment consists of two rounds. In each round, you will be paired with one other participant. In each pair, one person will have the role of player 1, and the other will have the role of player 2. Your role will be the same in each of the two rounds. The participant in the other role will be different in round 1 and round 2. No participant will ever know the identity of his or her counterpart in any round.

At the end of the experiment, one of the two rounds will be chosen at random. The amount of money you earn in this experiment will be equal to your payments

in the chosen round. These payments depend on the decisions made in your pair in that round. The money you earn will be paid to you privately and in cash at the end of the experiment.

You are not allowed to talk or communicate to other participants. If you have a question, please raise your hand and I will come to your table.

**(Player 1 instructions)**

**You are player 1**

In each round, two possible monetary payments will be available to you and your counterpart in that round. These payment options are labeled Option A and Option B. Note that the payments corresponding to Option A and Option B are not necessarily the same in round 1 and round 2. At the beginning of the round you will see the payments to you and your counterpart for Option A and Option B on your computer screen.

The choice rests with the other participant who will have to choose either Option A or Option B. Your counterpart does not know her or his own payments for Option A and Option B. The only information your counterpart will have is a message sent by you.

After you are informed about the payments corresponding to Options A and Options B, you can choose one of the following two messages to send to your counterpart:

Message 1: "Option A will earn you more money than Option B."

Message 2: "Option B will earn you more money than Option A."

Your counterpart can request that *your* payments for Option A and Option B are revealed to him or her. You will be informed whether or not your counterpart made this request before you decide which message to send. Note that your counterpart will still not know his or her *own* payments for Option A and Option B if he or she enters the request.

Your message will be sent to your counterpart, and he or she will choose either Option A or Option B. This is done as follows. Before your counterpart receives your message, he or she has to decide which option (A or B) he or she wants to choose in case you send Message 1 and which option (A or B) he or she wants to choose in case you send Message 2. After your message is sent, the option chosen by your counterpart (Option A or Option B) is implemented.

Your message will be sent to you counterpart as soon as all participants in the experiment have entered their decisions.To repeat, in each round your counterpart's choice will determine the payments of that round. Note however that your counterpart will never know what his or her payment was in the option not chosen (that is, he or she will never know whether your message was true or not).

You and your counterpart will not get any information on the outcomes of the first round until after the second round is finished. Once the two rounds are over, one of the rounds will be chosen randomly and the outcome of that round will determine your payments.

At certain points during the experiment you will have an opportunity to earn a small bonus by making guesses about what your counterpart will choose. You will receive more information on your screen.

**(Player 2 instructions)**

**You are player 2**

In each round, two possible monetary payments are available to you and your counterpart in the round. These payment options are labeled Option A and Option B. The actual payments depend on the option you choose. We show the two payment options on the computer screen of your counterpart for that round, that is, he or she knows his or her own payments and also your payments for Option A and Option B. Note that the payments corresponding to Option A and Option B are not necessarily the same in round 1 and round 2. The only information you will have about your payments is the message your counterpart for that round sends to you. Two possible messages can be sent:

Message 1: "Option A will earn you more money than Option B."

Message 2: "Option B will earn you more money than Option A."

You can request that the payments of your counterpart for Option A and Option B are revealed to you. Your counterpart will be informed whether or not you made this request before he or she decides about the message to you. Note that you will still not know your own payments for option A and option B if you enter the request.

Before you receive the message, you will be asked which option (A or B) you want to choose in case you receive Message 1, and which option (A or B) you want to choose in case you receive Message 2.

You will receive the message of your counterpart as soon as all participants in the experiment have entered their decisions.

To repeat, in each round your counterpart for the round will send one of two possible messages to you. You decide which choice you want to make in that case: Option A or Option B. Your choice will determine the payments for the round. You will never know what payments were actually offered in the option not chosen (that is, whether the message sent by your counterpart was true or not).

You and your counterpart will not get any information on the outcomes of the first round until after the second round is finished. Once the two rounds are over, one of the rounds will be chosen randomly and the outcome of that round will determine your payments.

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# Chapter 2

# Testing the Internal Consistency Explanation of Promise Keeping[1] [2]

**Abstract**

We implement a trust game in which the trustee can write a free-form pre-play message for the trustor. The twist in our design is that there is a 50% probability that the message is delivered to the trustor and a 50% probability that the message is replaced by an empty sheet. We find that, even when messages are not delivered, trustees who make a promise are more likely to act trustworthy than those who do not make a promise. We run a control treatment with restricted (non-promise) communication to test whether the correlation between promises and trustworthiness is causal in the sense that promises create a commitment. The results show that the absence of promises does not decrease average cooperation rates. This indicates that promises do not cause trustworthiness, they are just more likely to be sent by cooperators than by non-cooperators. We also find that both trustees who make a promise and those who do not make a promise are more likely to be trustworthy if their message is delivered to the trustor. This suggests that communication increases trustworthiness irrespective of the content of messages.

[1] This paper is co-authored with Jan Potters.

[2] We thank three anonymous referees and the editor of *Experimental Economics* (Jacob Goeree) for helpful comments and suggestions. We also thank Gary Charness and Martin Dufwenberg for filling us in on the details about their procedure, and Marta Serra Garcia, participants at the TIBER seminar at Tilburg University, the 2010 WISE conference at Xiamen University, the M-BEES 2011 at Maastricht University and the 2011 ESA Annual Meeting for helpful comments.

## 2.1 Introduction

Promises are often found to foster trust and cooperation (Belot et al. 2010; Vanberg 2008; Bicchieri and Lev-On 2007; Charness and Dufwenberg 2006; Sally 1995; Ostrom et al. 1992; Orbell et al. 1988). A prime explanation for the impact of promises is that they create a commitment. Many people who express an intention to cooperate feel bound to comply with that intention (Ellingsen and Johannesson 2004; Kerr and Kaufman-Gilliland 1994; Vanberg 2008). In the present paper we further explore the nature and force of this commitment. Specifically, we examine whether a promise has commitment power because the promisor makes it or because the promisee learns about it.

A preference for promise-keeping may derive from a more general preference for consistency (see Ellingsen and Johannesson 2004, who also cite relevant psychology literature). If a person has expressed that she will do X, not doing X creates an inconsistency which the person may want to avoid. To preserve consistency the person needs to keep her word or not express her intention in the first place.[3] Whether or not a person's statement (promise) is consistent with the person's action does not depend on whether someone else may be affected by the statement or even learns about it. From this perspective one may hypothesize that the commitment effect of a promise is 'internal' rather than 'social'. What counts for the individual is that she has expressed an intention to do something; as a consequence she prefers to take an action which matches that intention. In what follows, we will call this the *internal consistency explanation* for promise keeping. An alternative interpretation of the commitment-based explanation for promise-keeping is that people feel obliged to fulfill verbal contracts and agreements (Vanberg 2008). This conceptualization of the commitment seems to require, not only that the promisor made the promise, but also that the promisee learns about it. We will call the alternative explanation the *social obligation explanation* for promise keeping.

Our aim is to test the *internal consistency* hypothesis that promises generate commitment because they are stated, irrespective of whether someone else can be affected by them. Such a test requires that we analyze the effect of a promise on the promisor in a setting in which it cannot affect another person. We do this by tweaking the experimental design of the trust game by Charness and Dufwenberg (2006). Trustees had an opportunity to write a pre-play free-form message to trustors. The essence of our design is that a message written by the trustee was delivered to the trustor with probability $\frac{1}{2}$.[4] When writing a message

[3] A preference for consistency is also in line with an aversion towards lies (see, e.g., Gneezy 2005; Lundquist et al. 2009; Erat and Gneezy 2012; Lopez-Perez and Spiegelman 2013). Serra Garcia et al. (2013) suggest, however, the preference for promise-keeping is even stronger than the preference for truth-telling.

[4] Our randomization of message delivery is similar to Vanberg's (2008) random replacement

the trustee knew that it might not be delivered to the trustor. After the message was written, a random draw was made and the trustee learned whether his or her message would be delivered or not. Thus, in our experiment 50% of the trustees wrote a message that was not delivered to the trustors. The messages written by the other 50% were delivered to their respective trustors. Within both groups some trustees made a promise and some did not make a promise.

The results show that trustees who made a promise were significantly more likely to act trustworthy than trustees who did not make a promise. Conditional on messages being delivered, promisors were 12% more likely to act trustworthy than non-promisors (54% versus 42%); conditional on messages not being delivered, promisors were 21% more likely to act trustworthy than non-promisors (35% versus 14%). The latter result may suggest that promises create a commitment even when not delivered. A caveat, of course, is that promises are endogenous. It may be that trustworthy trustees are more likely to make a promise than untrustworthy trustees, in which case self-selection drives the difference between promisors and non-promisors rather than a preference for internal consistency. To distinguish between these two alternative explanations of our data, we ran a control treatment similar to our original treatment but in which B players were not allowed to write a promise. It turned out that in this control treatment trustees were at least as trustworthy as they were in the treatment in which they could write promises. These results suggest that the correlation between promises and trustworthiness was due to self-selection rather than the commitment value of promises.

Moreover, the results of our original treatment show that a written promise was more likely to be kept if it was delivered to the trustor (54%) than if it was not (35%) and trustees who did not make a promise were more likely to be trustworthy if their message was delivered (42%) than if it was not (14%). Thus, the fact that a message was delivered enhanced trustworthiness irrespective of whether or not a promise was made. This suggests that the positive impact of communication on cooperation does not always depend on promises.

## 2.2 Experimental Design and Procedure

### 2.2.1 Experimental Design

To generate observations of trustee messages which can affect trustors, as well as messages which cannot, we introduce a twist to the trust game employed by Charness and Dufwenberg (2006). This trust game is described in Figure 2.1. There are two players in this game, A and B. First, A chooses to play *In* or *Out*.

of partners.

Next, B chooses *Roll* or *Don't Roll* a six sided die. If A chooses *Out*, then B's choice is irrelevant and both players get 5 Euros. If A chooses *In* and B chooses *Don't Roll*, A receives 0 and B receives 14 Euros. Finally, if A plays *In* and B plays *Roll*, then B gets 10 Euros and rolls a six sided die to determine the payoff to A. A receives 12 Euros with probability $\frac{5}{6}$ and 0 with probability $\frac{1}{6}$.

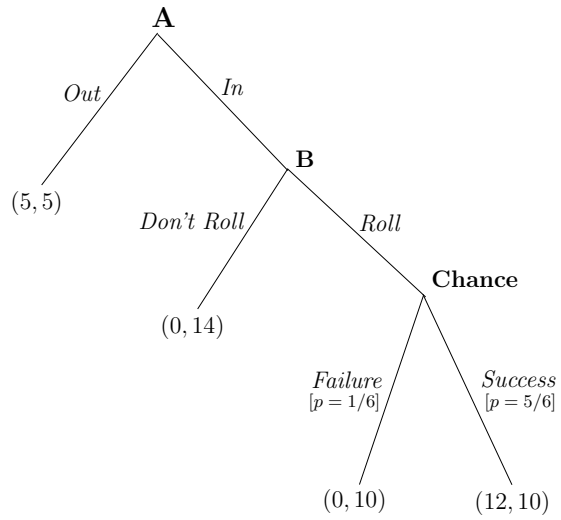


Figure 2.1: Trust game of Charness and Dufwenberg (2006)

As in Charness and Dufwenberg (2006), we allow B to write a pre-play message to A. However, in our design with probability $\frac{1}{2}$ a message written is not delivered to A. This is known to both A and B. After writing a message, B learns whether his message will be delivered to A or not from the outcome of a random draw. If A receives no message, A knows that the message by B was not chosen to be delivered. The timeline for the pre-play message stage is shown in Figure 2.2. After the pre-play message stage, the trust game depicted above is played. Instructions are provided in Appendix A (Section 2.5).

With this design, we obtain observations of messages from B which are delivered to A and observations of messages from B which are not delivered to A. In what follows we call the former the *Message delivered* condition and the latter the *Message not delivered* condition. Within each condition there will be some Bs who make a promise to *Roll* and some who do not make a promise to *Roll*.

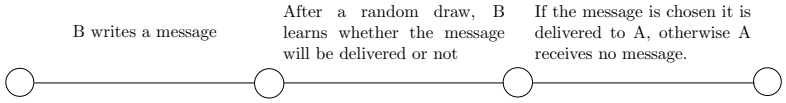


Figure 2.2: Timeline of the pre-play message stage

Several experiments have shown that when given the opportunity to send

pre-play messages subjects who send a promise to be trustworthy are more likely to cooperate than subjects who do not send such a promise (see, for example, Charness and Dufwenberg 2006, Ellingsen et al. 2004, and Vanberg 2008). We expect to replicate this result in our *Message delivered* condition which is similar to the *Messages (5,5)* treatment in Charness and Dufwenberg (2006).

We hypothesize a similar effect of promises in the *Messages not delivered* condition under the *internal consistency* explanation. This derives from the supposition that Bs value consistency between their statements and their actions, irrespective of whether A can be affected by the promise. More formally, let $y$ be the decision which can be $R$(oll) or $D$(on't roll); let $m$ be the message; which can be a promise to roll ($m = P$) or no promise to roll ($m = N$). Let $d$ denote whether the message is delivered ($d = 1$) or not ($d = 0$). Let $u(y; m, d)$ be the sender's preferences. We can formulate:

**Hypothesis 1** (*internal consistency* hypothesis): Since for both $d = 0$ and $d = 1$, $u(y = D; m = P, d) < u(y = D; m = N, d)$, it is hypothesized that B players who make a promise to Roll ($m = P$) are more likely to Roll ($y = R$) than B players who do not make such a promise ($m = N$), irrespective of whether the message is delivered ($d = 1$) or not ($d = 0$).

The *social obligation* explanation suggests that a promise does not create a commitment in the *Messages not delivered* condition but only in the *Message delivered* condition. Or formally,

**Hypothesis 2** (*social obligation* hypothesis): Since $u(y = D; m = P, d) = u(y = D; m = N, d)$, when $d = 0$, and $u(y = D; m = P, d) < u(y = D; m = N, d)$, when $d = 1$, it is hypothesized that B players who make a promise to Roll ($m = P$) are more likely to Roll ($y = R$) than B players who do not make such a promise ($m = N$), if and only if the message is delivered ($d = 1$).

### 2.2.2 Experimental Procedure

The experiment was conducted at the CenterLab, Tilburg University. Subjects were students recruited via email invitations. 12 sessions were conducted with a total of 260 participants (there were 20 subjects per session in 7 sessions, and 24 subjects per session in 5 sessions). Average earnings were around 11 Euros per session (including a 3 Euros show-up fee). The duration of each session was approximately one hour.

Subjects were seated behind visually partitioned workstations. At the beginning the instructions were distributed and read aloud. Questions were answered privately. Half of the subjects were assigned the role of A and the other half the role of B. Each A was matched with a B to form a pair. Sheets with identification numbers and a letter B on top were distributed to all Bs. Each B knew his or her identification number, but no other subject did. We allowed enough

time for all Bs to write a message to A in his or her pair. If B did not want to write a message he or she could circle the letter B on top of the sheet. After all Bs finished writing a message and put their message sheets face down, the experimenter collected all message sheets. The experimenter quickly checked the compliance of the messages with anonymity rules. Then, the identification numbers of all Bs were shuffled and exactly half of them were randomly chosen and publicly revealed. With this procedure it was common knowledge to both A and B whether the message was delivered or not. The messages of those Bs whose numbers were chosen were distributed to the respective As. The message sheets of Bs whose messages were not chosen were replaced by empty sheets. Thus, in all pairs A received a sheet, either empty or with a message, depending on whether a message was chosen to be delivered in that pair or not. Note that an empty sheet was different from a delivered message without text, since the latter had the letter B circled on top. The identity of subjects in pairs was not revealed at any time.

After the messages were delivered to the respective As, the game depicted in Figure 2.1 was played using the strategy method. That is B chose *Roll* or *Don't Roll* before knowing A's choice for *In* or *Out*. Unlike the pre-play message stage, the actual game stage was computerized using the Z-tree software (Fischbacher 2007). Subjects entered choices on their screens. After choices were made by all As and Bs the experimenter approached each B to roll a die. To ensure anonymity all Bs rolled a die irrespective of their choice and entered the outcome of the die roll on their screen. The game was played for one round only. After the payoffs were realized subjects were paid privately and in cash.

Finally, we elicit subjects' expectations to control for beliefs and to test the predictions under the expectations based guilt aversion explanation for promise keeping suggested by Charness and Dufwenberg (2006). According to this explanation, by sending a promise to act cooperatively one increases the expectations of his/her partner that the cooperative action will, in fact, be chosen. This increase in expectations of the partner, in turn, makes one feel guiltier in case he/she were to choose the non-cooperative action. Thus, the attractiveness of the non-cooperative action diminishes when a promise is made. We closely followed Vanberg (2008) in revealing beliefs of players with some minor differences to ensure that A would not be able to infer whether B rolled or not from the payoff received for guessing. For details see Appendix B (Section 2.6).

## 2.3 Results

In total we obtained observations for 130 pairs, 65 pairs each in the *Message not delivered* condition and in the *Message delivered* condition. We hired three research assistants to code each message as a promise or no promise. Coder

Instructions are provided in Appendix D (Section 2.8). For our analysis we classified messages based on the majority decision by coders (109 out of 130 decisions were unanimous). The Cohen's Kappa for the intercoder agreement is 0.75 (fixed-marginal kappa) which is usually considered a good level of agreement. The classification is available in Appendix C (Section 2.7). For both conditions combined, 89 out of 130 Bs (65%) made a promise to *Roll*: 43 out of 65 Bs (67%) in the *Message not delivered* condition and 46 out of 65 Bs (63%) in the *Message delivered* condition.

Table 2.1
PROMISES AND *Roll* RATES[a]

| | B's *Roll* rate | | | |
|---|---|---|---|---|
| Condition | Promise | No Promise | Z stat | Row total |
| Message not delivered | 15/43 (35%) | 3/22 (14%) | 1.81** | 18/65 (28%) |
| Message delivered | 25/46 (54%) | 8/19 (42%) | 0.90 | 33/65 (51%) |
| Z stat | 1.84** | 2.05** | — | 2.69*** |
| Column total | 40/89 (45%) | 11/41 (27%) | 1.97** | 51/130 (42%) |

[a] The Z stat reflects two sample proportion test for the two populations. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively for one tailed test.

Table 2.1 presents *Roll* rates by Bs who made a promise and by Bs who did not for each condition separately and for the combined data. For the combined data, the *Roll* rates are higher for those who made a promise (45%) than for those who did not (27%) and this difference is statistically significant. In the *Message delivered* condition the difference in *Roll* rates is 12%, but it is statistically insignificant. This difference is smaller than that obtained for the *Messages* (5,5) treatment in Charness and Dufwenberg (2006) (12% vs. 19%). In the *Message not delivered* condition the *Roll* rates by Bs are significantly higher for those who made a promise (35%) than for those who did not (14%).

These results also show that for trustees who made a promise the *Roll* rates were significantly higher if a promise was delivered to the trustor than if it was not (54% vs 35%). Clearly, a delivered promise was more likely to be kept than an undelivered promise. Note, however, that there was also a positive effect of

messages being delivered on *Roll* rates of trustees who did not make a promise (42% vs 14%). In other words, we observe increased *Roll* rates with message delivery (communication) not only for trustees who made a promise but also for trustees who did not make a promise. We find this result surprising given that the effect of communication on cooperation has been largely attributed to promises.[5] Even if we consider blank messages only, we observe a highly significant increase in *Roll* rates due to message delivery (4 out of 7, 57%, when delivered compared to 0 out of 10, 0%, when not delivered, p=0.015, two-tailed Fisher exact test).[6] For the remaining *no promise* messages, the Roll rates are slightly and insignificantly higher with delivery than without delivery (4 out of 12, 33%, when messages are delivered and 3 out of 12, 25%, when messages are not delivered, Z stat=0.45, p=0.65, two-tailed proportions test).

In Table 2.2 we report the estimates from linear probability model regressions. In these regressions the coefficients on the *Promise* dummy show the effect of making a promise when messages are not delivered and the coefficients on the *Message Delivered* dummy show the effect of messages being delivered for subjects who did not make a promise. Importantly, the estimated coefficients of these two dummy variables of interest are hardly affected when we control for the second order beliefs of trustees in the regression reported in column 2. (p=0.090 in column 1 vs. p=0.096 in column 2 for the *Promise* dummy and p=0.058 in column 1 vs p=0.060 in column 2 for the *Message delivered* dummy). This means that the correlation between promises and *Roll* rates in the *Messages not delivered* condition and the effect of messages being delivered on nonpromisors can not be explained by changes in second-order beliefs of trustees. The effect of promise delivery versus non delivery can be measured by adding the coeffi-

[5]Previous studies have found little evidence for a positive impact of impersonal, game-irrelevant (non-promise) communication on cooperation (see, e.g., Bouas and Komorita 1996, Mulford et al. 2008, and Bicchieri et al. 2010). Buchan et al. (2006) show that *personal* game-irrelevant communication marginally increases trustworthiness relative to *impersonal* game-irrelevant communication (from 28% to 34%) and Roth (1995) finds that *personal* game-irrelevant face-to-face communication increases average offers and acceptance rates relative to anonymous no communication treatment in ultimatum games. Note, however, that we do not allow subjects to reveal any personal information that could identify them in their messages.

Furthermore, in these studies in the 'irrelevant' communication phase subjects either do not know about the game they will play later or are not allowed to discuss the game and thus, can not make a promise to cooperate. In our setup, on the other hand, subjects self-select into 'irrelevant' communication. If at all, one would expect a weaker effect of 'irrelevant' (non-promise) communication in our setup than in these studies.

[6]One possible explanation for the effect of messages being delivered in our experiment could be that message sheet delivery by itself, irrespective of its content, strengthens a mutual feeling of 'closeness' between the trustee and the trustor. The fact that something (a sheet of paper) that was in the trustee's possession is later in the trustor's hands may create some commonality and reduce social distance.

Table 2.2
ESTIMATES OF REGRESSIONS[a]

| Variables | (1) Roll | (2) Roll |
|---|---|---|
| Promise | 0.21* | 0.20* |
| | (0.12) | (0.12) |
| Message delivered | 0.29* | 0.27* |
| | (0.15) | (0.14) |
| Promise x Message delivered | -0.09 | -0.12 |
| | (0.18) | (0.17) |
| Second-order belief | | 0.14*** |
| | | (0.03) |
| Constant | -0.14 | -0.25 |
| | (0.10) | (0.14) |

[a] Standard errors are in parentheses. Number of observations is 108 for both regressions. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively.

cients on the *Message delivered* dummy and the interaction dummy. This effect is marginally significant when we don't control for second order beliefs (F(1, 126)=3.74, p=0.055) and becomes insignificant when we control for second-order beliefs (F(1, 126)=2.34, p=0.128). Finally, the effect of making a promise when messages are delivered can be measured by adding the coefficients on the *Promise* dummy and the interaction dummy. This effect is not significant both when we do not and do control for second-order beliefs (F(1, 125)=0.89, p=0.346 when we do not control for second order beliefs and F(1, 125)=0.39, p=0.533 when we control for second-order beliefs). Some additional results on beliefs are reported in Appendix B (Section 2.6).

At first glance, the fact that in the *Message not Delivered* condition subjects who made a promise were more likely to *Roll* than subjects who did not make a promise suggests that making a promise creates a commitment even when it is not delivered.[7] However, this correlation is prone to an endogeneity problem.

[7]It might be argued that when messages were not delivered promises might be correlated with trustworthiness not because of a cost of breaking a promise per se but because the messages were observed by the experimenter. While our experimental procedures were not double blind, it was practically impossible for the experimenter to remember all messages sent by trustees and then map them to individuals and choices. Note that the messages were handwritten while the choices for the trust game were entered on the computer screen. This was made clear to subjects in instructions. Additional evidence is provided by Deck et al. (2013). The authors run a single-blind and a double-blind protocols of the trust game with pre-play messages of

Table 2.3
RESTRICTED VS. UNRESTRICTED COMMUNICATION - *Roll* RATES[ab]

| | B's *Roll* rate | | | |
|---|---|---|---|---|
| Treatment | D | ND | Z stat | Row total |
| Unrestricted communication | 33/65 (51%) | 18/65 (28%) | 2.69*** | 51/130 (39%) |
| Restricted communication | 11/21 (52%) | 10/22 (45%) | 0.45 | 21/43 (49%) |
| Z stat | -0.13 | -1.54 | — | 1.11 |

[a] The Z stat reflects two sample proportion test for the two populations. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively for one tailed test. 'D' stands for *Message Delivered* condition and 'ND' stands for *Message not Delivered* condition.
[b] In the *Restricted Communication* treatment three subjects violated the rules of the pre-play message stage by writing a promise. We exclude the choices made by these subjects from the analysis.

Specifically, it is possible that those who make a promise are more likely to be trustworthy not because they are affected by a promise made but because trustworthy trustees are more likely to make a promise than untrustworthy ones.

To clarify this issue, we ran a new treatment with restricted communication in which B players were not allowed to send the trust game related messages (hence, B players could not make a promise). In all other respects, this treatment was identical to our original treatment with unrestricted communication. We call this new treatment *Restricted Communication* and our original treatment *Unrestricted Communication*. If undelivered promises create commitment, we expect higher *Roll* rates in the *Messages not Delivered* condition of the *Unrestricted communication treatment* than in the *Messages not Delivered* condition of the *Restricted communication treatment* because promises can be made in the former case but not in the latter case.

Table 2.3 reports *Roll* rates by condition both for the *Restricted communication* treatment and for the *Unrestricted communication* treatment. The absence of promises in the *Restricted Communication* treatment does not result in lower *Roll* rates both when messages are delivered and when they are not delivered. Promises, whether delivered or undelivered, do not create commitments for those who make a promise, it is just that those who will *Roll* make a promise.

Charness and Dufwenberg (2006) and find no difference between the two protocols. This result suggests that 'an experimenter effect' is not an issue in the trust game with pre-play messages.

On the one hand, these results also seem to be in line with the hypothesis that the effect of communication does not depend on promises. On the other hand, somewhat surprisingly message delivery causes only a small increase in *Roll* rates in the *Restricted communication* treatment. This result may be due to the small sample size. Alternatively, the mere fact that messages are restricted may reduce the impact of their delivery.

Table 2.4
PROMISES AND *In* RATES[a]

| | A's *In* rate | | | |
|---|---|---|---|---|
| Condition | Promise | No Promise | Z stat | Combined |
| Message not delivered | 20/65 (31%) | | — | 20/65 (31%) |
| Message delivered | 34/46 (74%) | 9/19 (47%) | 2.06** | 43/65 (66%) |

[a] The Z stat reflects two sample proportion test for the two populations. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively for one tailed test.

Finally, Tables 2.4 and 2.5 report results for As. From Table 2.4 one can see that in the *Unrestricted Communication* treatment As were more likely to play *In* when they received a promise (74%) than when they received a message with no promise (47%). In addition, As were more likely to play *In* when they received a message without a promise (47%) than when they received no message at all (31%), although this difference is only marginally significant with a one-tailed test (Z stat=1.34, two sample proportion test, p<0.09, one tailed). This result seemed to suggest that A players are to a certain degree also affected by non-promise communication. Any form of communication might decrease the social distance between the players and increase trust. However, the data in Table 2.5 shows that in the *Restricted Communication* treatment A players do not trust B players more when they receive a (non-promise) message than when they do not receive any message at all. Overall, the results for A players show that receiving a promise from the trustee substantially increases trust by A players relative to receiving non-promise message or not receiving any message.

## 2.4 Discussion

Our results suggest that promises do not cause trustworthiness, they are just more likely to be sent by trustworthy players than by untrustworthy ones. Note

Table 2.5
RESTRICTED VS. UNRESTRICTED COMMUNICATION - *In* RATES[a]

| | A's *In* rate | | | |
|---|---|---|---|---|
| Treatment | D | ND | Z stat | Row total |
| Unrestricted communication | 43/65 (66%) | 20/65 (31%) | 4.04*** | 63/130 (48%) |
| Restricted communication | 7/21 (33%) | 6/22 (27%) | 0.43 | 21/43 (30%) |
| Z stat | 2.65*** | 0.31 | — | 2.09** |

[a] The Z stat reflects two sample proportion test for the two populations. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively for one tailed test. 'D' stands for *Message Delivered* condition and 'ND' stands for *Message not Delivered* condition.

though that this does not rule out a preference for internal consistency. Our study does not address why players do (not) make a promise. We cannot exclude that players do not make a promise due to a reluctance to make a statement that is inconsistent with their prospective behavior. Therefore, as a reviewer suggested, it is possible that the behavior of an untrustworthy would change if a promise could somehow be 'extracted'. Evidence from other experiments, however, speaks against that possibility. Belot et al. (2010) and Charness and Dufwenberg (2010) find that cooperation does not increase with promises that are elicited by a third party. Moreover, in the third chapter of this thesis we analyze how promise elicitation by A players from B players affects trustworthiness. We find that almost all B players make a promise when asked to do so by the A players. Still, overall trustworthiness is not higher than in a treatment with one way communication from B player to A player, where promises are volunteered and much less frequent. These results suggest that promises do not increase trustworthiness and do not act as a commitment.

It is possible that not making a promise in the *Unrestricted communication* treatment is different from not making a promise in the *Restricted communication* treatment. Then, compared to the *Restricted communication* treatment, allowing for promises in the *Unrestricted communication*, might increase *Roll* rates among those who make a promise and decrease *Roll* rates among those who do not. This might be leading to similar aggregate *Roll* rates across treatments, even though behavior is affected by the message sent. Our data cannot rule out this possibility. Still, if promisors feel committed by their message, increasing the rate of promises should increase trustworthiness. However, the evidence discussed in

the previous paragraph indicates that an increase in (elicited) promises does not lead to an increase in trustworthiness.

Finally, we find that the effect of communication on trustworthiness cannot be attributed to promises. Message delivery matters even for those who do not make a promise in the *Unrestricted Communication* treatment and also trustworthiness rates in the *Restricted Communication* treatment are as high as the rates in the *Unrestricted communication* treatment. In fact, even trustees who sent blank messages were more likely to cooperate when their message was delivered than when it was not. These results suggest that message delivery by itself, irrespective of content, strengthens a feeling of 'closeness' between the trustee and the trustor. The fact that something (a sheet of paper) that was in the trustee's possession is later in the trustor's hands may create some commonality and reduce social distance (Hoffman et al. 1996 and Bohnet and Frey 1999). Still, these results are somewhat surprising given that previous studies have found little evidence for a positive impact of impersonal, game-irrelevant (non-promise) communication on cooperation. For instance, Bouas and Komorita (1996), Mulford et al. (2008), Bicchieri et al. (2010), and He et al. (2014) all find a positive effect of unrestricted communication on cooperation rates relative to no communication or restricted communication, but only He et al. (2014) find that restricted communication (weakly) increases cooperation relative to no communication.[8] One notable difference, however, is that communication in all these studies is bilateral while in our experiment it is unilateral. This could explain why unrestricted communication is more effective than restricted communication in these studies. Note that in our study we observe significantly higher trust rates by A players with *Unrestricted communication* than with *Restriction communication* when messages are delivered. Hence, the existence of promises affects the receiving party but not the sender. Even though promises do not lead to higher *Roll* rates, they do lead to more frequent cooperative *In/Roll* outcomes. Possibly, when trustors can also send messages to trustees, the difference between unrestricted and restricted communication also becomes larger. Players can then be mutually affected by the promise received from the other player (rather than by the promise sent by themselves). Hence, the difference between restricted and unrestricted communication may be affected by whether communication is unilateral or bilateral. This implies that our results are not necessarily incongruent with those of others.

[8]Buchan et al. (2006) show that personal game-irrelevant communication marginally increases trustworthiness relative to impersonal game-irrelevant communication and Roth (1995) finds that personal game-irrelevant face-to-face communication increases average offers and acceptance rates relative to an anonymous no communication treatment in ultimatum games. However, we do not allow subjects to reveal any information that could identify them and anonymity is preserved in our experiment.

## 2.5 Conclusion

The experiment reported in this paper was aimed to test whether promise keeping can be explained by a preference for being *(internally) consistent* irrespective of the promise's effect on one's partner. To address this question we introduced a twist to the trust game of Charness and Dufwenberg (2006) with pre-play messages. With 50% probability a message written by the trustee was not delivered to the trustor. We find that when messages were not delivered trustees who made a promise were more likely to be trustworthy than trustees who did not make a promise. We ran a control treatment to test whether this result was causal in the sense that a promise creates a commitment. The results of our control treatment do not lend support to this interpretation of promise keeping. It appears that the correlation between promises and trustworthiness is driven by self-selection. We also find that message being delivered increased trustworthiness both by promisors and nonpromisors. This result is surprising given that the effect of pre-play messages on cooperation has been largely attributed to promises in the literature.

## 2.6 Appendix A: Instructions

We tried to stay as close as possible to the instructions in Charness and Dufwenberg (2006). Major differences between our instructions and those used by Charness and Dufwenberg (2006) are highlighted. Changes made for the *Restricted Communication* treatment are shown in brackets and highlighted.

**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 €3 for participating in this session. You may also receive additional money, depending on the decisions made (as described below). Upon completion of the session, your money will be paid to you individually and privately.

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. Those sitting behind desks 1-12 have the role of A; those sitting behind desks 13-24 are B.

By clicking a button on the computer screen, each person A will indicate whether he or she wishes to choose IN or OUT. If A chooses OUT, then A and B each receives €5. Next, each person B will indicate whether he or she wishes to 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 a decision) that A has chosen IN.

If A chooses IN and B chooses DON'T ROLL, then B receives €14 and A receives €0. If A chooses IN and B chooses ROLL, then B receives €10 and rolls a six-sided die 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 €3 show up-fee.)

**Note that to conceal the identity of Bs who choose DON'T ROLL, every B will roll a die after making a choice. However, the outcome of a die roll will be irrelevant for those who choose DON'T ROLL.**

The information on payoffs 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 |

*Pre-play message stage*

Prior to the decision by A and B 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 allow time as needed for people to write messages, then these will be collected. Please write clearly if you wish to send a message to A.

In these messages, no one is allowed to identity him or herself by name or number or gender or appearance. (The experimenter will monitor the messages. Violations - experimenter discretion - will result in B receiving only the show-up fee, and the paired A receiving the average amount received by other A's.) Other than these restrictions, B may say anything he or she wishes in this message. If you wish to not send a message, simply circle the letter B at the top of the sheet.

[***The preceding paragraph was replaced with the following text in the Restricted Communication treatment***:

***In these messages, no one is allowed to identity him or herself by name or number or gender or appearance. Also, it is not allowed to mention or discuss anything related to the current experiment,***

***such as, the decisions A and B have to make or the payoffs. (The experimenter will monitor the messages. Violations - experimenter discretion - will result in B receiving only the show-up fee, and the paired A receiving the average amount received by other A's.) Other than these restrictions, B may say anything he or she wishes in this message, such as news, sports, weather, music, fashion, your studies, etcetera. If you wish to not send a message, simply circle the letter B at the top of the sheet.***]

**When B has completed the message, he or she should put it face down on the table. The experimenter will then collect the message and check it.**

**Important: After all messages have been collected, exactly half of them will be randomly chosen by the experimenter. The messages not chosen will be replaced with empty sheets (i.e., without the letter B on top). Then, the experimenter will distribute the messages and empty sheets to the corresponding As. If A receives an empty sheet, it means that the message by B in his or her pair was not selected to be delivered. The identification numbers of all messages chosen will be written on the whiteboard so that each B knows whether or not his or her message will be delivered to A.**

***Bonus for guessing***

**At some point during the experiment, you can earn a bonus of up to €1.50 by correctly guessing a decision or outcome. You will receive the necessary information on your screen.**

***Information***

**Each player will know only her or his own earnings at the end of the experiment. Other than what can be concluded from these earnings, you will not receive any other information.**

## 2.7 Appendix B: Belief elicitation and some additional results

As mentioned in the main text, we measured beliefs of As and Bs during the experiment. In measuring beliefs we followed Vanberg(2008) with some minor differences. To elicit first-order beliefs, after As made a choice to play *In* or *Out*, we asked them to guess the actual payoff of the trust game in case they chose *In* or what would be their payoff had they chosen *In* in case they chose *Out*. Note that unlike Vanberg (2008) we asked A to guess the (would be) payoff of the game rather than the choice by B. We wanted to prevent A from being able to infer

Table 2.6
Belief Elicitation

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Your guess | Almost certainly €0 | Probably €0 | Not sure | Probably €12 | Almost certainly €12 |
| Your bonus if you (would) receive €0 | €1.30 | €1.20 | €1.00 | €0.70 | €0.40 |
| Your bonus if you (would) receive €12 | €0.40 | €0.70 | €1.00 | €1.20 | €1.30 |

B's choice from the bonus payment for guessing.[9] Each A was shown a screen with the explanation of the task, and the information shown in Table 2.6, and was asked to choose one of the five columns from the table. Each column shows bonus payments that depend on the (would be) final payoff of the trust game. This way we elicited first-order beliefs of A regarding the (would be) outcome of the game.[10] [11]

To elicit second-order beliefs of Bs, they were shown the screen that was shown to A and invited to guess the column chosen by A. For the correct guess B earned a bonus of €1.50.

Below we report some additional results on beliefs not reported in the main text.

Table 2.7 reports average beliefs for As and Bs depending on the condition and choices made. In both conditions, the average beliefs of As who played *In* were higher than those of As who played *Out*. The differences are significant at

[9]This is not a problem in Vanberg (2008) because in his experiment subjects played for eight rounds and different rounds were randomly chosen for game payoff and guessing bonus payments.

[10]Let $p$ denote the trustor's belief that he/she will receive €12 as the final payoff for the game. Assuming risk-neutrality and that the trustor is an expected utility maximizer, the trustor will choose column (5) over column (4) (also over all other columns) if $1.3p + 0.4(1 - p) > 1.2p + 0.7(1 - p)$, that is, if $p > 0.75$. Similarly, the fourth column will be chosen if $0.60 < p < 0.75$, the third column will be chosen if $0.40 < p < 0.60$ and so on. To convert column choices to beliefs we took the midpoints of intervals, i.e, 87.5% for the fifth column, 67.5% for the fourth column, 50% for the third column, 37.5% for the second column, and 12.5% for the first column.

[11]We did not consider hedging to be a problem. Blanco et al.(2010) show that hedging is not a problem in a game similar to ours. Their game is very similar to our trust game and in addition they use much higher payoffs for belief elicitation task than we do. In our study the payment for belief elicitation task is substantially smaller than the payment for the decision task.

Table 2.7
Choices and Beliefs[a]

| | A's average guess | | | B's average guess | | |
|---|---|---|---|---|---|---|
| Condition | *In* | *Out* | Z stat | *Roll* | *Don't Roll* | Z stat |
| Message not delivered | 47% | 41% | 1.52* | 59% | 44% | 2.46*** |
| | (20) | (45) | | (18) | (47) | |
| Message delivered | 51% | 42% | 1.38* | 61% | 45% | 3.06*** |
| | (43) | (22) | | (33) | (32) | |

[a] The Z stat reflects the Wilcoxon rank sum test. The number of observations is shown in parentheses. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively for one tailed test

the 10% level as shown in the table. Moreover, in both conditions, the average guesses of Bs who chose *Roll* were higher than those of Bs who chose *Don't Roll*. The differences are statistically significant. Similar results are reported in Charness and Dufwenberg (2006).

Table 2.8 shows average guesses by As and Bs in each condition, depending on whether a promise was sent or received. One can see that in the *Message not delivered* condition average second-order beliefs of Bs did not depend on whether a promise was sent or not. Thus, promises were not correlated with beliefs. This shows that the impact of promises in the *Message not delivered* condition cannot be explained by a change in second-order beliefs.

Table 2.8
Promises and Beliefs[a]

| | A's average guess | | | B's average guess | | |
|---|---|---|---|---|---|---|
| Condition | P | NP | Z stat | P | NP | Z stat |
| Message not delivered | 43% | | — | 49% | 47% | 0.34 |
| | (65) | | | (43) | (22) | |
| Message delivered | 49% | 46% | 0.96 | 55% | 49% | 1.06 |
| | (46) | (19) | | (46) | (19) | |

[a] The Z stat reflects the Wilcoxon rank sum test. The number of observations is shown in parentheses. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively for one tailed test

## 2.8 Appendix C: List of messages

In the table below, C = Coding, S = Status, P = Promise, NP = No Promise, D = Delivered, ND = Not Delivered, R = *Roll*, and DR = *Don't Roll*.

Table 2.9 - Messages from B

| Sess. | ID | Message | C | S | Choice |
|---|---|---|---|---|---|
| | | **Unrestricted Communication treatment** | | | |
| 1 | 11 | I will roll Please choose in, I won't be as lame as to lie to you to make myself 4 euro richer and you 12 euro poorer | P | ND | R |
| 1 | 12 | | NP | D | DR |
| 1 | 13 | Dear person A, I hope you receive this message I wrote for you,especially because it isn't my greatest hobby to write. I would like to encourage you to choose IN. At least I can speak for myself that I will always choose for Roll, and I think every B will do. Because then our common win is the greatest. And it has been proven that decisions based on fear are less rational and productive than decisions based on trust. So, especially because we're both on the university, we should choose for the greatest common win. I will. Good luck and have a nice day. | P | D | DR |
| 1 | 14 | | NP | ND | DR |
| 1 | 15 | I am committed to do everything in my power so that BOTH of us can earn more than €5. | P | ND | R |
| 1 | 16 | I will choose ROLL, please choose IN | P | ND | DR |
| 1 | 17 | Dear A player, I know there is a risk in this game and we don't know each other, But if you choose IN I promise I will ROLL so that we can both maximize our chances to win more. Please trust me. I will commit to my word. Player B | P | D | R |
| 1 | 18 | Hello partner! Of course I will send you a message, just because we are partners and we want the best for each other. But now, let's come to the point. I propose that you decide IN and I will definitely promise to ROLL the die, so that your chance of getting paid will be bigger than when I DON'T ROLL. Good Luck, I hope we can trust each other! your partner , B. | P | D | R |

*continued on next page*

Table 2.9 - *continued*

| Sess. | ID | Message | C | S | Choice |
|---|---|---|---|---|---|
| 1 | 19 | I will choose ROLL for sure that goes into the benefit of both of us. You can trust me. So you can choose IN. | P | ND | R |
| 1 | 20 | I will choose ROLL because this will give 100% more than if you choose OUT. Please choose IN so we can both have more earnings :). I am cool with you earning 2,- more since I will also get a lot more than just the 5,- ! | P | D | DR |
| 2 | 13 | Please choose IN. I 'll choose Roll definitely. So we could win-win. I know that it is still take the risk for you. But I think 5/6 possibility for €12 is much better than €5, isn't it? | P | D | DR |
| 2 | 14 | | NP | D | R |
| 2 | 15 | I will choose Roll, die=5 | P | D | DR |
| 2 | 16 | Hello A, If you choose IN I'll choose Roll, so you have more chance of earning money, and I do too! Don't think negative, because that will have an negative outcome as well! (If you choose don't roll you'll probably earn less than when you choose Roll) I hope you make the right decision! B | P | D | DR |
| 2 | 17 | Hello. We can cooperate so that we have both have a nice pay-off. If you choose IN, than I will promise to choose to roll the die. Because your chance will be 5/6 to get €12, I think this is a good option for you too! :) Because that is the maximum amount you can earn! I hope we will have a good co-operation!:) Bye. | P | D | DR |
| 2 | 18 | For the better outcome, I will choose Roll. Your payoff will depend on the Die number. Otherwise, we will both receive €5. | P | D | R |
| 2 | 19 | I wish we could do it best. I wish you trust me. Money is important, but is not everything. I know you are facing a bigger risk. But have faith, my friend. I trust that your choice will make everything good. | NP | ND | R |
| 2 | 20 | Let's play! I don't want to stay here a whole hour for just 5 EUR. You have a 5 out of 6 chance to get 12 EUR. And I am willing to sacrifice 4 EUR (get 10 instead of 14) in order to get 5 more (get 10 instead of 5). We play together, we both win more! It's always like that at these experiments! Good luck and thanks in advance for making the right choice!:) | P | ND | R |
| 2 | 21 | Dear My Pair A, If you play IN, you can trust me that I choose ROLL. So, let our luck determine our earnings. By 5/6 luck, you can get 12 Euro. Love B | P | ND | R |
| 2 | 22 | I believe in win-win And U? | NP | ND | R |
| 2 | 23 | | NP | ND | DR |
| 2 | 24 | Please choose IN, I won't cheat by choosing DON'T ROLL. I promise that I will choose ROLL. We don't want to end up with only 5 euro, right? If you choose in, and I choose roll, there is ONLY 1/6 probability that you'll get €0. But there's 5/6 prob that you'll get €10. So please choose IN | P | ND | DR |

*continued on next page*

Table 2.9 - *continued*

| Sess. | ID | Message | C | S | Choice |
|---|---|---|---|---|---|
| 3 | 11 | This is a typical prisoner dilemma, if you know economics. Best result only possible if we trust each other. I always rely on trust in these experiments and will do the same this time, despite the fact that there is a little risk for me if I decide to throw a dice (and no risk for you). I will ROLL. Decide to trust me or not. | P | ND | R |
| 3 | 12 | | NP | D | R |
| 3 | 13 | Dear A: Please choose IN! because then the total gain for us will be maximum. It's good for everyone. Here is the outcome; If you choose Out, then total gain will only minimum amount. If you choose In, and B choose Roll, you have large possibilities to gain 12. It's quite high! Best B | NP | D | DR |
| 3 | 14 | The reason that we came here is to deal with risk, and also earn some money. If you decide to stop that means that we both have 5 €. So we're both equal. BUT we can go for more and I mean that the 4th alternative sounds nice because you receive 7€more, this requires risk. In the end , you choose what you think is better. We both study economics or business so we both know when we're better off. Good luck with your decision. | NP | ND | DR |
| 3 | 15 | I will choose roll. I hope that you'll choose IN. That's fair for both of us. In that case, we'll have the same expected income (€10). That's better than the case that we only receive €5 each. Best regards | P | ND | R |
| 3 | 16 | Hello A if you choose to be In, I will choose to roll the die, then you have a 5/6 chance of receiving €12,- if you don't choose in, you only get €5,- we will help each other thanx | P | D | R |
| 3 | 17 | | NP | ND | DR |
| 3 | 18 | maximize both side's payoff | NP | ND | DR |
| 3 | 19 | I promise I will choose to Roll. So you are choosing between 1) Expected return = €5*100%=€5 2) Expected return = €12*5/6= €10. If I were you, I will surely choose the one with higher expected return. Anyway, you can make any choice you like. Just remember that I will certainly Roll. | P | D | R |
| 3 | 20 | If you choose in, I would be glad to choose Roll, maximizing our overall profit. In fact since you give the chance to win additional 5 euro when you choose IN. I won't have the incentive to deprive of your opportunity of earning 12 euro as return. | P | D | R |

*continued on next page*

Table 2.9 - *continued*

| Sess. | ID | Message | C | S | Choice |
|---|---|---|---|---|---|
| 4 | 13 | Good morning! | NP | D | DR |
| 4 | 14 | Hi A, Please choose for "IN" so I can choose for "ROLL" and we might both earn a nice amount of money. B | P | D | DR |
| 4 | 15 | The best situation for both of us is that you choose in, I choose roll the die. Then the total payoff is maximized. This game theory problem can be solved if we cooperate. I don't have the incentive to get 4 more to let you get nothing. So this is what I'm trying to say. Please think about getting "IN"!:) | P | D | R |
| 4 | 16 | It's a waste of time if we all earn €5. Also, it's not fair for you to earn nothing. So, you IN. I will ROLL. And let God decide. | P | ND | R |
| 4 | 17 | Apparently, no matter what your choice is, €5 is at least what I can get from. But of course I would like to ask you choose "In", not only because I can be better off, so do you. Since the chance of getting "die=1" is only 1/6, which is very small, and as a reward for what you choose, I can promise to choose "Roll". Then your payoff can be doubled, so will mine. Everybody is happy :P. | P | ND | DR |
| 4 | 18 | It's better off that I choose Roll while you choose IN, even if it might mean I may end up earning less €14. but it's better than getting €5 (It's not a trick!). I know A would choose Out for safety, even If you might get 0 for die but it's a low probability. | NP | ND | DR |
| 4 | 19 | Hi, please choose IN!!! If you choose IN. I promise I will choose ROLL. As €10 is better than €5. And for me there is no difference of what the die will be. But for you, if you choose IN, you'll have the 5/6 possibility to get €12. It's the result of gain off. | P | ND | DR |
| 4 | 20 | I will choose to roll. Hope you can choose In. | P | ND | DR |
| 4 | 21 | Always chooses In and I will chooses Roll. Then we can get the highest payoff. Good luck with two of us! Lol! | P | D | R |
| 4 | 22 | If you A want to get better payoff. Please trigger to choose "IN"! Let's Roll! | P | D | R |
| 4 | 23 | It's okay for me to have a Revenue of €10 (at least €5 higher than a revenue of €5) So I will choose to roll the die. | P | ND | DR |
| 4 | 24 | If you choose IN. I will choose ROLL. Trust me!!! | P | D | R |
| 5 | 11 | In order to get higher payment for you and me both, I suggest you choose "in". If you choose in, you don't need to worry about I will choose "Don't Roll". In the end of the experiment, I promise the result can only be win-win. | P | ND | R |

*continued on next page*

Table 2.9 - *continued*

| Sess. | ID | Message | C | S | Choice |
|---|---|---|---|---|---|
| 5 | 12 | I will choose Roll and I do not mind If A even get higher payment. | P | ND | R |
| 5 | 13 | I hope you will choose IN, I 'll roll and both if us have the benefit from cooperation. Better cooperation, better earning. | P | ND | R |
| 5 | 14 | I think it is a good idea to choose "IN" for A. Then I will choose "ROLL". | P | D | R |
| 5 | 15 | I would like to cooperate. | NP | D | R |
| 5 | 16 | If u choose in and the die comes up 2-6 u will receive €12 and I €10. So it is a win/win for both of us. Good luck. | NP | D | DR |
| 5 | 17 | Please choose in, and I promise to roll the die. You'll have a great chance to receive €12. That's a good result for both of us. | P | D | R |
| 5 | 18 | Hope you choose "IN" great chance for both of us to get more money. | NP | ND | DR |
| 5 | 19 | I am a person who really cares about fairness. So, no matter what you choose, I will choose ROLL. This is the most profitable and fair decision that I can make for the benefit of us both. | P | ND | DR |
| 5 | 20 | | NP | D | R |
| 6 | 11 | You choose IN, I choose ROLL. You have 5/6 chance almost guaranteed. We both go home happy instead of only €5. | P | ND | DR |
| 6 | 12 | I will choose "ROLL". | P | ND | R |
| 6 | 13 | I will Roll the dice, since €10>€5 | P | ND | DR |
| 6 | 14 | Let's win some money! | NP | D | DR |
| 6 | 15 | I am usually in advantage case I know. But if you wanna DO BUSINESS with ME for BOTH of US have a chance to earn HIGHER, Please choose IN. I WILL ROLL THE DICE!!! Why? Because; 8.5 or 10 or 14. The differences are not so much in this case for me to cheat you. Believe in me or not depends on you. Once again, I WILL ROLL, no matter what your choice is. Thank. | P | ND | DR |
| 6 | 16 | Let's cooperate!!! Both of us can gain more!! Thanks! | NP | D | DR |
| 6 | 17 | Pls choose IN, and I will choose to ROLL. In this case , you have a much higher return, say, €12 than €5. As for me, both €14 and €10 are much better than €5. So hope you choose IN, and both of us get a win-win. Thank you. | P | D | DR |
| 6 | 18 | Dear friend, please choose IN. I promise you I will choose to ROLL. You can trsut me, I don't want you to leave with "0" money. We are all in need of money in the end. In case you choose IN there is a very very big possibility that you get €12, and we go home both happy. It is much better than just €5. So choose IN :) | P | D | R |

*continued on next page*

Table 2.9 - *continued*

| Sess. | ID | Message | C | S | Choice |
|---|---|---|---|---|---|
| 6 | 19 | I am ready to give Four Euro's up, your choice. | P | D | R |
| 6 | 20 | Hello, If you get this message accept my assurance that I gonna ROLL and this will increase your A's average income. I'd like to write my ANR and name so that you'd be sure, but unfortunately I can't. | P | ND | DR |
| 7 | 11 | Do what you want. | NP | ND | DR |
| 7 | 12 | A choosing IN and B choosing roll creates - a chance of 100% for B to get 10 euros - a chance of about 83% for A to get 12 euros | NP | D | R |
| 7 | 13 | | NP | D | DR |
| 7 | 14 | "Life is a rollercoaster, then it drops" | NP | ND | DR |
| 7 | 15 | Do not choose OUT | NP | D | DR |
| 7 | 16 | | NP | ND | DR |
| 7 | 17 | I will choose ROLL. When you choose IN we both have a big opportunity to receive 10euro(me) or 12 euro (you if die=2,3,4,5,6). A smile. | P | D | DR |
| 7 | 18 | | NP | D | DR |
| 7 | 19 | | NP | ND | DR |
| 7 | 20 | | NP | ND | DR |
| 8 | 11 | Choose IN please, I'll Roll then. | P | ND | DR |
| 8 | 12 | Let's cooperate to have the best outcome with an expected revenue of 12*1/6+10=20euro which means you choose IN and I choose roll | P | ND | R |
| 8 | 13 | If you choose IN than I will choose Roll. So we both have a good pay-off (unless the die =1) | P | ND | DR |
| 8 | 14 | I will choose to Roll the die, so that you have more than 80% chances to get 12 euros :). Choose IN, it's only a game. | P | D | R |
| 8 | 15 | | NP | D | R |
| 8 | 16 | When you will choose IN, I will choose to roll the die. | P | ND | R |
| 8 | 17 | I will definitely choose Roll, if you choose IN. | P | ND | DR |
| 8 | 18 | To get more payoffs we could cooperate. I will not choose "Don't Roll", which gives you incentive to chosse In. Then you will get expected payoff of 10 euros, which is definitely better than receiving only 5 euros for both of us. You should consider it carefully. | P | D | DR |
| 8 | 19 | Please choose IN | NP | D | R |
| 8 | 20 | If you choose IN and I choose Roll it's a fair game for both. | NP | D | DR |
| 9 | 13 | You choose IN and I will choose Roll, that means you have the chance of 5/6 to receive 12 euros and I will receive 10 euros, while if you choose OUT your expected return may be 5 euros. | P | D | DR |

*continued on next page*

Table 2.9 - *continued*

| Sess. | ID | Message | C | S | Choice |
|---|---|---|---|---|---|
| 9 | 14 | I will choose Roll. You should choose IN to earn 12 euros. | P | ND | DR |
| 9 | 15 | It is better for us if you choose IN because I will choose Roll and if that your expected earning will higher than choosing Out, you wstill have 5/6 chances to get 12. | P | D | R |
| 9 | 16 | If you choose IN , I promise I will choose the option Roll. | P | ND | DR |
| 9 | 17 | Strategy don't roll strictly dominates Rollfor B. Thus B may choose "Roll" as optimal strategy. | NP | D | DR |
| 9 | 18 | hey! I'll Roll, for sure! | P | D | R |
| 9 | 19 | In order to benefit both of us in this experiment, I think we can choose "in" and "Roll". | NP | D | R |
| 9 | 20 | | NP | ND | DR |
| 9 | 21 | A -> IN => B-> ROLL ==> Ex(Ra) = 10$, RB=10$. | NP | ND | DR |
| 9 | 22 | I promise I will choose Roll. | P | ND | DR |
| 9 | 23 | Whatever the decision you made, you will earn 3 euro just participating this session. Then; if you choose OUT you will earn extra 5 euro but if you go on to IN option; there is a high probability to earn 12 euro extra since after rolling die 5/6 prob->get 12 euro, 1/6 prob -> get 0 euro. -> Thus; just try your chance and go IN option at the end the max will be 12+3=15 euro(max) but in out option you will get (max) only 5 euro and since money is as if an extra in any case take risk and choose IN. | NP | D | R |
| 9 | 24 | I think win-win is better! Die=1 only has 1/6 probability, maybe we can try it! The best strategy is cooperation! | NP | ND | DR |
| 10 | 13 | Hi, If you choose IN, I promiss I will choose Roll. When I don't ask this, you will probably choose OUT SO IT'S FOR YOU MUCH BETTER AND FOR ME TOO. You can trust me, I will choose 'roll, but I understand that you may be hesitate about this. However, I am honest :-) | P | ND | DR |
| 10 | 14 | I decided to Roll a die, let's make our common outcome bigger! | P | ND | R |
| 10 | 15 | The win-win situation should be u choose IN and I choose Roll. Your expected return would be 12*5/6=10, twice as much as you can earn by choosing Out! Trust me, 14 euros and 10 euros makes no difference to me, I will choose Roll. | P | D | R |
| 10 | 16 | You IN, I Roll we are both better off. | P | ND | DR |
| 10 | 17 | B will roll | P | D | DR |
| 10 | 18 | I will choose ROLL. Please trust me and choose IN so that you have a good chance to earn 12 euros instead of 5 euros. | P | ND | DR |
| 10 | 19 | Please choose in and I will chose Roll. There is 5/6 probability for you to earn 12 euros. | P | D | R |
| 10 | 20 | I have a proposal. If you choose In. I promise! I will choose Roll so it's a 5/6 chance that if I roll the die , you will receive 12 euros, and I will receive 10 euros. | P | D | DR |

*continued on next page*

Table 2.9 - *continued*

| Sess. | ID | Message | C | S | Choice |
|---|---|---|---|---|---|
| 10 | 21 | Hi A, I think you should choose In! I promise you that I will Roll the die, the chance that I will throw 2,3,4,5, or 6 is really high. I think we both get the best out of this test then. Greetz B. | P | D | DR |
| 10 | 22 | Hi, I will choose Roll THE DIE. In this case you will have a 5/6 chance of getting 12euros (on top of the 3 euros). I will choose Roll because if you choose IN, It will give me 5 euros extra. Kind regards, B | P | ND | DR |
| 10 | 23 | Hi, The best chance of getting + 10 euros is to roll the dice and you choose IN. Chance of getting 12 euros for you and 10 euros for me is than 5/6. That would be fair. | NP | ND | DR |
| 10 | 24 | If you choose IN, I promise I will choose Roll, because in that case we both can earn more. | P | D | DR |
| 11 | 11 | Hello player A, maybe it is good to discuss our strategy. I think option IN and ROLL is the best one for us with the highest maximum total payoff. However, if you are afraid of me not choosing ROLL, I understand that as well. Good luck. | NP | D | DR |
| 11 | 12 | Hey! How about you choose OUT first and then I will choose ROLL. Therefore, you have relatively high probability to earn more. This is a win-win strategy I think. Trust me! Otherwise, you may poorly obtain €5 in the end! | P | ND | DR |
| 11 | 13 | It's a win-win if In and ROLL has been choosen | NP | ND | DR |
| 11 | 14 | I don't know whether you will choose "IN" or "OUT", but as a B, I will choose "ROLL", since the odds that you get >€5 is 5/6 (die = 2, 3, 4, 5, 6). Let's benefit each other; and I hope that you choose "IN" in the beginning. Thanks. | P | D | R |
| 11 | 15 | Please choose IN, and then I will roll a die. Then you receive €12 and I receive €10. Otherwise we only receive 5-5 euros. | P | D | DR |
| 11 | 16 | I will choose ROLL. | P | ND | NR |
| 11 | 17 | | NP | ND | DR |
| 11 | 18 | I will choose Roll so both of us earn money. | P | ND | DR |
| 11 | 19 | Choose "IN" and I promise to choose "rolling". | P | D | R |
| 11 | 20 | I WILL ROLL | P | D | DR |
| 12 | 13 | I am rolling dice. | P | D | R |
| 12 | 14 | Hey, if you want to go IN, and I'll definitely ROLL so we both get higher income than 5. I know it's a risk but better to take 12 and 10 than go home with 5. The chances of you getting 12 are pretty high so just think about it. | P | ND | DR |
| 12 | 15 | This is not a game in which one of us can 'win' and the other 'lose'. We can both help each other here, and in the end there will not be a 'winner' or a 'loser', but the outcome will just reflect our trust in other human beings (or more particular: students at UvT). For you, the choice depends on whether you think there is at least a 50% chance that I can be trusted! (expected value wise), For me, the choice is between whether I want to earn 4 extra euros and fell bad that I betray someone (and lie to them in this letter) and whether I want to earn 10 euros with the feeling that someone trusted me and that I did not betray that trust, that I helped someone. I really hope you believe me when I say I care more about such feelings than about 4 euros. Please choose In you won't regret it! | P | ND | R |

*continued on next page*

Table 2.9 - *continued*

| Sess. | ID | Message | C | S | Choice |
|---|---|---|---|---|---|
| 12 | 16 | If you always choose IN and I always choose ROLL, then the chance that you get €12 is 5/6, so your average earnings is €10 every time -> just like mine! So I guess that's the best outcome for both of us. So trust me that I'll always choose ROLL, then I hope you choose IN. Good luck! | P | ND | R |
| 12 | 17 | I will pick "ROLL", So if you pick âœinâ we have a big chance of both earning a high amount. So please trust me and choose "in". | P | D | DR |
| 12 | 18 | I will choose ROLL. Then I am sure I will get at least €5,-(if you choose OUT). But I think we can both earn more than that. If you choose IN, I will choose ROLL. Then I will get €10,- and the chance for you is 80% to get €12,-. Because an amount around €10,- is what I was hoping for before this experiment, €13,- is already more than I expect. So it's up to you if you for €5.- or have a guess of 80% for €12.-. Good luck!! | P | ND | DR |
| 12 | 19 | | NP | ND | DR |
| 12 | 20 | | NP | ND | D |
| 12 | 21 | Play IN, I'll play Roll. Reasonable and fair game for both. | P | D | R |
| 12 | 22 | A, you can choose IN. Then B chooses Roll there is 5/6 chances you get €12, I get €10. | P | D | DR |
| 12 | 23 | Of course, Roll the die is much more funny for me. | NP | D | DR |
| 12 | 24 | ! A: 5/6 chance to win €12,<br>*B: €10 is ok compared to €5<br>=> In Roll | P | D | DR |

**Restricted Communication treatment**

| | | | | | |
|---|---|---|---|---|---|
| 13 | 11 | I like team sports, such as soccer and basketball. Last night the match between Arsenal and Bayern is perfect. | | ND | DR |
| 13 | 12 | | | ND | DR |
| 13 | 13 | | | D | R |
| 13 | 14 | The NBA all-star game just finished yesterday. | | ND | DR |
| 13 | 15 | | | D | DR |
| 13 | 16 | Have a nice day. :) | | D | R |
| 13 | 17 | The Dutch are doing very well at the winter Olympics, it's unbelievable? | | D | DR |
| 13 | 18 | | | D | DR |
| 13 | 19 | Enjoy the experiment | | ND | DR |
| 13 | 20 | | | ND | DR |
| 14 | 11 | Hello! Let's enjoy it! | | ND | R |
| 14 | 12 | Yolo Let's go crazy! I like this experiment but we have it goes very slow I should not write about the experiment, sorry | | D | R |

*continued on next page*

Table 2.9 - *continued*

| Sess. | ID | Message | C | S | Choice |
|---|---|---|---|---|---|
| 14 | 13 | | | D | DR |
| 14 | 14 | I study economics and I know game theory | | D | DR |
| 14 | 15 | | | ND | DR |
| 14 | 16 | Good luck with the experiment. | | ND | DR |
| 14 | 17 | Good luck and have a beautiful day. | | ND | DR |
| 14 | 18 | I am really liking the Netherlands a lot! | | ND | R |
| 14 | 19 | Research shows that cooperation between 2 opposing entities (rivalry) results in maximum profit equilibrium. | | D | R |
| 14 | 20 | | | D | R |
| 15 | 9 | | | D | R |
| 15 | 10 | Tomorrow is gonna be sunny. We can enjoy sunshine and enjoy the bright side of life. It's quite nice to have good weather in the Netherlands. | | D | DR |
| 15 | 11 | Hi! => Just to let you know, I treat others how I would like to be treated myself. Good luck! | | D | R |
| 15 | 12 | What a lovely weather today! | | ND | R |
| 15 | 13 | It is perfect game. If all of us join it. No body will get nothing. It is like amercian pool. When you play it you do not know which ball will get in to the hole. Just try it and cooperate we are the winner. Not the third people. | | ND | R |
| 15 | 14 | Life is good. | | ND | DR |
| 15 | 15 | Hi, If you choose IN I will ROLL. But feel free to choose out and we earn 5 box, it is better than nothing. (in some places people work all day long to earn 5 €) BYE :) REJECTED MESSAGE REPLACED WITH BLANK. | | ND | R |
| 15 | 16 | Great game in the Champions League last night. Arsenal vs Bayern Munich, both teams deserved to win really. What do you think? Arsenal need 3 goals in the 2nd leg to qualify. Tough. | | D | R |
| 16 | 7 | Good luck with the experiment. | | D | DR |
| 16 | 8 | Hello, I have no idea what to write in this message. I like sports and are always in for a game, especially team sports like soccer. I study business and are in the third year of my bachelors. My favourite food is italian. :) | | D | R |
| 16 | 9 | This is just a randomly chosen experimen. It might cover all the things you want, the weather today is not so cold. Students in Tilburg University like to go to the sport center during the week day, Such as joging, in-door spinning and so on. | | ND | R |

*continued on next page*

Table 2.9 - *continued*

| Sess. | ID | Message | C | S | Choice |
|---|---|---|---|---|---|
| 16 | 10 | My program is about collaboration and I believe that a good colloboration can help a team to reach the best performance. Good luck! | | ND | R |
| 16 | 11 | Hi :) How are you? | | ND | R |
| 16 | 12 | Hey! As you know, for me it is always best to Roll, since I receive 10 €anyway. Your average earnings are 10 €as well: 1/6*0 + 5/6*12 = 10. That is, as long as I Roll as well. So I think we should both get 10 €by Rolling the die. Don't worry, I won't choose "Don't Roll" because i'm pretty fine with 10+3=€13,- in 45 minutes! But €8,- each is not that much... : if you choose OUT. Let's Roll :) REJECTED AND REPLACED! | | D | DR |
| 17 | 13 | Hey! Have fun :) By the way since music is mentioned in the instructions, check out "kyga" remixes for chilling in youtube! They are worth it! E.g."Cut your teeth" is a nice remix. Good music needs to be shared! | | D | R |
| 17 | 14 | | | D | DR |
| 17 | 15 | | | D | DR |
| 17 | 16 | Life is designed by ourselves. Be motivated. | | D | DR |
| 17 | 17 | Choose Roll (die 2, 3, 4, 5, or 6) | | ND | DR |
| 17 | 18 | I am a psychology student and I like tennis! | | D | R |
| 17 | 19 | My role model person would be someone like Jesus Christ rather than someone like the wolf of Wall Street. | | ND | R |
| 17 | 20 | I would like to send A a message :) Sometimes I go to library but I think it is boring :( So I prefer to watching footballs at home :) and you? I also go to sport center twice a week! Enjoying our life ( :) ) | | ND | DR |
| 17 | 21 | Waking uo early makes your day more meaningful! | | ND | R |
| 17 | 22 | During my time in college I have learned that searching for win-win situations is the best idea. | | ND | R |
| 17 | 23 | If you choose IN, I will not screw you over, but select the die roll. So, your decision is to accept 5 €or to take a 5/6 chance to earn 12 €. Please consider that I voluntary forego 4 €to give you that choice and that it is bad for me if you choose OUT. Have a nice weekend. Best regards. (REJECTED AND ALLOWED TO WRITE A NEW MESSAGE) I like cooperation and altruism. Have a nice weekend. Best regards. | | D | R |

*continued on next page*

Table 2.9 - *continued*

| Sess. | ID | Message | C | S | Choice |
|---|---|---|---|---|---|
| 17 | 24 | It is a nice day isn't it? I wish you a nice day too. : )maybe the weather could be a bit better | | ND | DR |

## 2.9 Appendix D: Coder Instructions

### Coder Instructions

You will be paid €25 for this task. Your task is to code messages sent by participants in an experiment that was designed to study the role of communication in experimental games. Subjects played a game (that is described in instructions) in pairs. In this game one of the players (player B) can send a pre-play message to the other player (player A).

### Coding guidelines

The messages are listed in the attachment to this instructions. Please use one of the two categories listed and explained below in your coding. âœPâ â“ a promise or more generally a statement of intent to Roll by B. âœNPâ- a blank message or a message that does not contain a promise or a statement of intent to Roll.

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# Chapter 3

# Do People Ask for a Promise? And Should They?[1] [2]

**Abstract**

We setup an experiment with pre-play communication to study the impact of promise elicitation by trustors from trustees on trust and trustworthiness. When given the opportunity the majority of trustors solicit a promise from the trustee and this drives up the promise making rate by trustees to almost 100%. We find that elicited promises are more likely to be trusted than volunteered promises, but trustees who make an elicited promise are no more likely to be trustworthy than trustees who make a volunteered promise. Overall, our results seem to suggest that when given the opportunity asking for a promise is better than not asking for it because trustees who do not make a promise when not asked to do so are very unlikely to be trustworthy.

## 3.1 Introduction

Pre-play messages by trustees are often found to increase trust and trustworthiness in experimental games (see, for example, Sally 1995; Charness and Dufwenberg 2006; Bicchieri and Lev-on 2007). This effect is largely attributed to promises. Promises make trustors more trusting and trustees more trustworthy.[3] Previous studies argue that only volunteered promises are effective in enhancing trust and

[1] This paper is co-authored with Jan Potters.

[2] We thank participants at the 2012 ESA Annual meeting and seminar participants at the Rady School of Management, UC San Diego for helpful comments.

[3] It is assumed that some people who make a promise do not want to break it because of the moral cost of lying (Ellingsen and Johannesson 2004; Gneezy 2005; Charness and Dufwenberg 2006; Erat and Gneezy 2013; Gibson et al. 2013). As a consequence trustworthiness and trust rates increase with promises.

trustworthiness (see Charness and Dufwenberg 2009, and Belot et al., 2011). These studies demonstrate that promises elicited by a third party are not as effective as promises volunteered by trustees in enhancing cooperation. Belot et al. (2011) suggest that the moral cost of breaking a promise is lower when one is 'forced' to make a promise. Charness and Dufwenberg (2010) provide a different explanation based on the *expectations based guilt aversion*. They suggest that, unlike volunteered promises, elicited promises do not affect expectations by trustors and trustees that the cooperative outcome will be chosen (i.e., these promises are not believed and are not expected to be believed) and this, in turn, does not strengthen the feeling of guilt by trustees in case they break their promise.

One important feature of these studies is that promises are elicited by a third party and not by the trustor. It is not clear whether a promise elicited by the trustor from the trustee would be as ineffective as the promise elicited by a third party. In particular, unlike third-party elicitation, promise elicitation by the trustor might reveal to the trustee something about the trustor's intentions and expectations, e.g., whether the trustor is willing to trust if he/she is assured by a promise made by the trustee. As a consequence, for example, expectations might be affected differently after a promise elicited by the trustor than a promise elicited by a third party. If the trustor asks for a promise, it might suggest to the trustee that the trustor is willing to rely on a promise made by the trustee. 'Otherwise, why would the trustor ask for a promise?' the trustee might think. Some popular negotiation advice books recommend to ask for a promise from one's contracting partner. Yeung (2011) writes 'If you would like a customer to call you ... ask 'Will you call me back next week?' and get the customer to say 'yes'. If you're nearing the end of a first date, don't say 'It would be great to meet again.' Ask: 'Will you go out with me again?' And don't take no for answer. Use your charm and good humour to get a 'yes'.'

Our goal in this paper is to test whether trustors elicit a promise from trustees when given the opportunity to do so and how the behavior of trustors and trustees is affected by elicited promises compared to volunteered promises. We implement two treatments: one in which only the trustee can send a free-form pre-play message and the other one in which, first, the trustor sends a free-form message to the trustee and then, the trustee responds. To understand how elicited promises affect expectations, we measure first-order beliefs of trustors and second-order beliefs of trustees regarding the outcome of the trust game.

We find that 73% of the trustors elicit a promise from the trustee either by directly asking the trustee to make a promise or by asking trustee to cooperate. Almost all trustees (95%) make a promise in return. The analysis of beliefs data shows that trustors are more optimistic about the cooperative outcome when they elicit a promise than when they receive a voluntereed promise or no promise and this is correctly anticipated by trustees. The analysis of choice data shows

that elicited promises are trusted more than volunteered promises. Trustees, however, were no more likely to cooperate after an elicited promise than after a volunteered promise. Nevertheless, overall our results seem to suggest that asking for a promise when given the opportunity is better than not asking for it. This result is driven by the fact that trustees who do not make a promise if not asked to are very unlikely to be trustworthy.

## 3.2 Experimental Design and Hypotheses

Our experimental design is based on the trust game from Charness and Dufwenberg (2006). The game is depicted in Figure 3.1. In this game, first, A decides either to play OUT or IN. If OUT is played, then A and B get 5 euros each and the game ends. If A plays IN, then B's choice determines the payoffs. If B chooses DON'T ROLL, B gets 14 euros and A gets 0. If B chooses ROLL, B gets 10 euros and rolls a six sided die to determine the payoff to A. If the die comes up 1, then A gets 0 and if the die comes up any other number then A gets 12 euros.

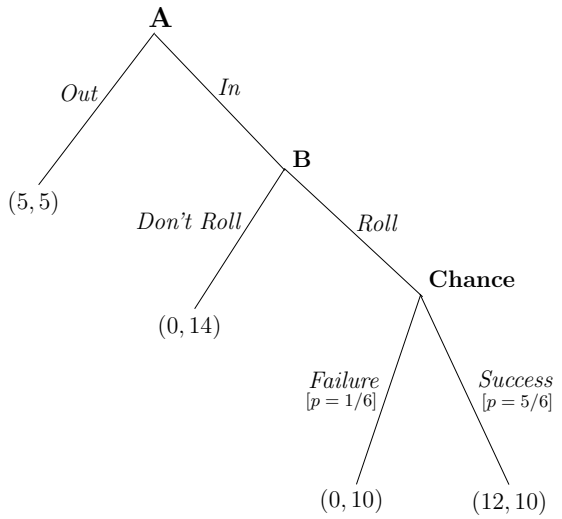


Figure 3.1: Trust game of Charness and Dufwenberg (2006)

We have two treatments: *Two-way messages* treatment and *One-way message* treatment. Our main treatment is the Two-way messages treatment. In this treatment first Player A sends a message to Player B and after player B receives the message from A he/she replies to player A. In the *One-way message* treatment only Player B sends a free-form message to Player A. It is similar to one of the treatments from Charness and Dufwenberg (2006).

As mentioned in the previous section the main feature of our design is that we let the trustor decide whether he/she wants to elicit a promise from the trustee or not. In contrast, promises are elicited by the experimenter in Charness and Dufwenberg (2010) and by the host of a TV show in Belot et al. (2010). More specifically, Charness and Dufwenberg (2010) give the trustee a choice between sending a predetermined 'I promise to choose *Roll*' message and sending a blank sheet of paper. Belot et al. (2010) analyze a dutch TV show where at the last stage of the show two participants make short speeches before playing a prisoner's dilemma. Some participants make voluntary promises during their speech. In some cases the host of the show elicits a promise from participants who do not volunteer to make a promise . There are also two other potentially important differences between our study and Belot et al. (2010). First, unlike in Belot et al. (2010), the participants in our experiment do not know each other's identity at any point of the experiment. Second, the stakes are much lower in our experiment than in the TV show studied by Belot et al. (2010).

We are interested in the following questions:

- Do people elicit a promise from their partner if they have the opportunity?
- How is the rate of promises by B players affected by whether or not A players solicit a promise?
- Are elicited promises more/less likely to be kept than voluntary promises?

We do not formulate any hypotheses regarding the first two questions. For the last question we state several competing hypotheses.

*Moral Crowding out hypothesis*: *Elicited promises are less likely to be kept than volunteered promises.*

This hypothesis is based on the assumption that 'forcing' people to make a promise crowds out the moral cost of breaking it (see Belot et al., 2011).

*Expectations based guilt aversion hypothesis: Elicited promises are more likely to be kept than volunteered promises.*

This hypothesis is based on the premise that promises elicited by one's partner, unlike promises elicited by a third party, will affect beliefs considerably. We assume that if the trustor asks for a promise then he/she is willing to rely on it and this is correctly recognized by the trustee. This, in turn, will increase the guilt from breaking a promise according to the expectations based guilt aversion explanation of promise keeping (see Charness and Dufwenberg, 2006, 2009).

## 3.3 Experimental Procedure

The experiment was run at the CREED lab, University of Amsterdam. We ran 9 sessions with 84 pairs in the Two-way messages treatment and 3 sessions with 31 pairs in the One-way message treatment. Subjects earned around 15 euros on average (including a 5 euro show-up fee). Each session lasted for about one

hour. The *One-Way message* treatment sessions were approximately ten minutes shorter than the *Two-way messages* treatment sessions.

Upon arrival, participants were seated behind visually partitioned workstations. Each subject was provided with instructions. Instructions were read aloud and questions were answered privately. Half of the subjects were assigned the role of A and the other half were assigned the role of B. To write message subjects were provided with message sheets. Each message sheet had an identification number on top of it so that the experimenter could identify where the messages should be delivered. In the Two way messages sessions, first, message sheets were distributed to As and As were given enough time to write a message to the B. After As finished writing messages, the experimenter collected the message sheets and distributed them to respective Bs. Together with the message sheet from A, Bs received an empty message sheet where they could reply to A's message. After Bs finished writing their messages, the experimenter collected the message sheets and distributed them to respective As. This concluded the pre-play message stage in the Two-way messages sessions.In the One-way message sessions message sheets were distributed to Bs only. After all Bs finished writing their messages, the experimenter collected all the message sheets. Then, each message sheet was distributed to respective A.

After the pre-play message stage was over, each pair played the game depicted in Figure 3.1. This part of the experiment was computerized using the Z-tree software (Fischbacher 2007). Note that to increase the number of observations B chose to Roll or Don't Roll before knowing A's choice (the strategy method). After Bs made a choice, the experimenter approached each B to roll a die. All Bs rolled a die to preserve anonymity.

To analyze how the content of messages change beliefs, we measured first-order beliefs of As and second-order beliefs of Bs about the cooperative outcome. After a choice to play In or Out was made, As were asked to guess their actual payoff if they chose In or their would be payoff had they chosen In in case they chose OUT by choosing one of the five columns shown in Table 3.1. Assuming risk neutrality the columns correspond, from left to right, to intervals with midpoints at probabilities 12.5%, 32.5%, 50%, 67.5%, and 87.5% of receiving €12 as payoff (see footnote 10 in Section 2.7 for more details). Note that we asked As to guess the outcome of the game rather than the choice made by B player. This was done to ensure that if A gets (or would get) €0, he/she is not able to infer from the payment for guessing whether B chose Don't Roll or B chose Roll but the die roll was a failure. To measure second-order beliefs of Bs, Bs were shown Table 3.1 and asked to guess which column was chosen by A in his/her pair.

Table 3.1
Belief Elicitation

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Your guess | Almost certainly €0 | Probably €0 | Not sure | Probably €12 | Almost certainly €12 |
| Your bonus if you (would) receive €0 | €1.30 | €1.20 | €1.00 | €0.70 | €0.40 |
| Your bonus if you (would) receive €12 | €0.40 | €0.70 | €1.00 | €1.20 | €1.30 |

## 3.4 Results

We first compare the two treatments to study how allowing the A player to send a message to the B player before B sends his/her message changes behavior and beliefs relative to the treatment in which A cannot write to B before B sends a message. We, then, analyze the content of the messages and how the changes in behavior and choices depend on the content of communication.

### 3.4.1 One-way message vs. Two-way messages

Figure 3.2 and Table 3.2 report *In* rates by As, *Roll* rates by Bs and *In&Roll* rates for both treatments. The *In* rate by As and the proportion of *In&Roll* combinations are 10%-points higher in the *Two way message* treatment than in the *One way message* treatment. The differences are not significant though (for *In* rates Z=1.03, p=0.30, two-tailed the test of proportions and for *In&Roll* combinations Z=1.02, p=0.31, two-tailed test of proportions). On the other hand, the *Roll* rate is slightly and insignificantly lower in the *Two way messages* treatment than in the *One way message* treatment (44% vs 50%) (Z=-0.56, p=0.57, the test of proportions, two-tailed).[4]

Table 3.3 compares average first-order beliefs of As and average second-order beliefs of Bs in the *One way message* treatment to respective average beliefs in the *Two way message* treatment. As are significantly more optimistic about

[4]Are subjects better at coordinating on In&Roll combinations in the Two way message treatment than in the One way message treatment? Note that if In and Roll decisions were independent the expected rates of In&Roll cominations would be 70%*44%=28.3% in the Two way message treatment and 60%*50%=30% the One way message treatment. The actual rates of In&Roll combinations are 33% and 23% respectively. While the actual rates are not significantly different from expected rates in both cases, it seems that subjects are relatively better at coordinating on In&Roll in the Two way message treatment.

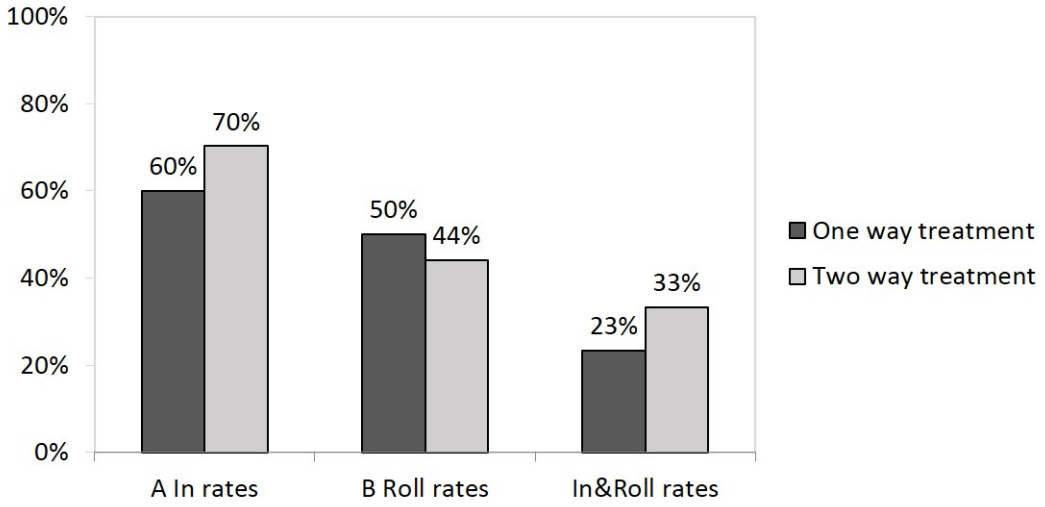


Figure 3.2: Choices made in One way message and Two way message treatments.

receiving €12 in the *Two-way message* treatment. Bs correctly guessed that As were more optimistic in the *Two-way message* treatment than in the *One-way message* treatment.

### 3.4.2 Promise Elicitation and Promise Making

A preliminary analysis of message contents revealed to us that A messages in the *Two way message* treatment can be broadly classified into three categories: messages in which A solicits a promise to *Roll* from B by asking about B's intended play or whether or not B is willing to play *Roll* (category AP in what follows), messages in which A asks, solicits, or encourages B to *Roll* (category AR in what follows), and messages in which no promise is elicited or request is made (category NA in what follows).

We recruited three research assistants to code the messages. Research assistants were asked to code each A message into one of three categories as described in the previous paragraph and each B message into one of two categories: a *promise* or *no promise*. Coder instructions are provided in Appendix B (Section 3.7). In total there were 84 A messages and 114 B messages (84 in the Two-way message treatment and 30 in the One-way message treatment).

Codings are available in Appendix C (Section 3.8). For the analysis we classify each message into one of the categories based on the majority decision by coders. There was a majority decision for each A message except one message that was coded differently by each coder (AP, AR, NA). Overall, there are 34 (41%) messages in AP category (23 out of these 34 messages were unanimously

Table 3.2
CHOICES[a]

| | Treatment | | |
|---|---|---|---|
| | Two-way messages | One-way message | Z stat |
| A's *In* rate | 59/84<br>(70%) | 18/30<br>(60%) | 1.03 |
| B's *Roll* rate | 37/84<br>(44%) | 15/30<br>(50%) | -0.56 |
| *In* & *Roll* combinations | 28/84<br>(33%) | 7/30<br>(23%) | 1.02 |

[a] The Z stat reflects the two sample test of proportions for the two populations. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively for two tailed test.

Table 3.3
BELIEFS[a]

| | Treatment | | |
|---|---|---|---|
| | Two-way messages | One-way message | Z stat |
| A's average first-order belief | 58.07<br>(25.74) | 48.58<br>(25.65) | 1.72** |
| B's average second-order belief | 61.04<br>(23.00) | 52.83<br>(22.60) | 1.78** |

[a] The Z stat reflects Wilcoxon rank sum test for the two populations. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively for one tailed test. Standard errors are reported in parentheses.

coded AP), 26 (31%) messages in AR category (12 out of 26 coded unanimously), 23 (27%) messages in NA category (20 out of 23 coded unanimously) and as mentioned above no majority decision for one A message. There were 72 (86%) B messages coded as promise (45 out of these 72 messages were coded unanimously) and 12 (14%) as no promise (10 out of 12 unanimously) the *Two way messages* treatment. In the *One way message* treatment 21 (70%) Bs made a promise (21

out of 21 unanimous) and 9 (30%) did not (7 out of 9 unanimous).[5] [6]

Table 3.4 shows the proportion of Bs who made a promise in the *One way message* treatment and in the *Two way messages* treatment depending on the content of the A message. Note that promise making rates are similar when A asks B to make a promise (AP category) and when A asks B to *Roll* (AR category) (94% vs 96%). Asking for a promise and asking to Roll were equally effective in eliciting promises from B players. Below we show that choices and beliefs are also similar for both of these categories. In view of this in what follows we will also report results for these two categories combined together.

When A chooses not to solicit a promise either by asking for it or by asking B to *Roll*, the promise making rate is 61% which is significantly lower than the rate of 95% with solicitation (AP+AR) (Z stat = 4.00, p=0.0001, two-tailed test). The promise making rate in the *One way message* treatment (in which A can not send a message) is lower than the rate in the *Two-way messages* treatment when A solicits a promise (70% vs 95%, Z stat=3.32, p=0.0009, two-tailed test) and insignificantly higher than the rate when A does not solicit a promise (70% vs. 61%, Z stat=0.69, p=0.48, two-tailed test). Overall, the results reported in Table 3.4 show that when given the opportunity 73% (61 out of 84) of trustors try to elicit a promise from the trustee and this drives up the promise making rate to almost 100%.

[5]We analyzed whether 'unanimous' promises are different from other (non 'unanimous') promises. In the *One way message* treatment 21 out of 30 messages were unanimously coded as promise. There was no message coded as promise by a majority decision. In the *Two way messages* treatment 45 messages out of 84 were unanimously coded as promise. In addition, there were 27 messages coded as promise by a majority decision. Among 58 elicited promises there are 33 'unanimous' and 25 other promises. Among 14 unsolicited promises there are 12 'unanimous' and 2 other promises. Since we have only 2 observations in the latter case, we can not draw any inferences for unsolicited promises. For elicited promises, A players are slightly more likely to play In after a 'unanimous' promise (30 out of 33 observations, 91%) than after other promises (20 out of 25 observations, 80%). The difference is not statistically significant (p=0.23, two tailed proportions test). For B player, in contrast, promise keeping rates are slightly lower for 'unanimous' promises than for other promises, 45% (15/33) vs 56%(14/25). This difference is also not significant at p=0.42 for a two tailed proportions test. Overall, since we do not observe significant differences between 'unanimous' and non 'unanimous' promises and because there are very few voluntary promises in the latter category we do not report our results separately for 'unanimous' promises.

[6]We checked whether elicited and voluntary (unsolicited) promises differ in length and found no statistically significant difference. Elicited promises in the *Two way messages* treatment contain 36.9 words on average, while the average length of unsolicited promises in the *Two way messages* treatment is 38.3 words (the difference is not significant, Z= -0.35, p=0.73, two-tailed Wilcoxon rank sum test). The average length of voluntary promises in the *One way message* treatment is 27.7 words, but it is not significantly different from the length of elicited promises in the Two way treatment (Z= 1.03, p=0.30, Wilcoxon rank sum test, two-tailed test). The difference in the length of promises between two treatments (27.7 vs 37.2) is also not significant (Z= 1.18, p=0.24, Wilcoxon rank sum test, two-tailed test).

Table 3.4
THE EFFECT OF A MESSAGES ON PROMISE MAKING RATE

| A message | B message | |
|---|---|---|
| | Promise | No Promise |
| One way message treatment | 21/30 (70%) | 9/30 (30%) |
| Two way message treatment | 72/84 (86%) | 12/84 (14%) |
| *Ask to promise (AP category)* | 32/34 (94%) | 2/34 (6%) |
| *Ask to roll (AR category)* | 25/26 (96%) | 1/26 (4%) |
| *Ask to promise + Ask to roll (AP+AR)*[a] | 58/61 (95%) | 3/61 (4%) |
| *No ask (NA)* | 14/23 (61%) | 9/23 (39%) |

[a] We add one message that was coded differently by each coder to AP+AR category because if we treat these two categories as one there is a majority decision for this message.

### 3.4.3 Choices and Beliefs

In this section, we discuss A and B players' behavior and beliefs depending on the content of communication.

Table 3.5 reports A player *In* rates for both treatments. For the *One way message* treatment the *In* rates are reported separately for A players who received a promise and for A players who did not receive a promise. For the *Two way messages* treatment the *In* rates are reported depending on the content of A messages and whether or not a promise was made by B player. Overall, in both treatments As were more trusting when they received a promise than when they did not. The effect of promises on trust by A players seems to be stronger in the Two-way message treatment.

Do As trust solicited promises more than unsolicited promises? Our results suggest that the answer is yes. First, solicited promises in the *Two way messages*

Table 3.5
PROMISES AND A *In* RATES[a]

| | A *In* rate | | | |
|---|---|---|---|---|
| | Promise | No promise | Combined | Z stat |
| One way message treatment | 14/21 (67%) | 4/9 (44%) | 18/30 (60%) | 1.14 |
| Two way message treatment | 57/72 (79%) | 2/12 (17%) | 59/84 (70%) | 4.38*** |
| *A solicits a promise (AR+AP)* | 50/58 (86%) | 1/3 (33%) | 51/61 (84%) | — |
| *Ask to promise (AP)* | 30/32 (94%) | 1/2 (50%) | 31/34 (91%) | — |
| *Ask to Roll (AR)* | 19/25 (76%) | 0/1 (0%) | 19/26 (73%) | — |
| *A does not solicit a promise (NA)* | 7/14 (50%) | 1/9 (11%) | 8/23 (35%) | 1.91** |

[a] The Z stat reflects two sample proportions test for the population of subjects who made a promise and the population of subjects who did not. We do not test for significance if one of the populations has fewer than 5 observations. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively for one tailed test.

treatment are trusted more than voluntary promises in the *One-way message* treatment (86% vs 67%, Z=1.96, p=0.05, two-tailed test). Solicited promises in the *Two way messages* treatment are also trusted more than unsolicited promises in the *Two-way messages* treatment (86% vs 50%, Z=2.99, p=0.003, two-tailed test). The fact that solicited promises are trusted more than unsolicited promises can be explained with self-selection. A players who can be easily convinced to play *In* elicit a promise and skeptical A players do not elicit a promise. Nevertheless, the results in the last row of Table 3.5 suggest that skeptical A players are also affected by promises. They are more likely to play *In* when they receive a promise than when they do not.

Table 3.6 reports beliefs data for As. The data reported in the table suggests that higher expectations in the *Two way messages* treatment are due to elicited promises. As are significantly more optimistic about the cooperative outcome after elicited promises than both after voluntary promises in the *One-way message* treatment (63.27 vs. 49.76, Z=1.64, p=0.02, one-tailed test) and in the *Two-way*

Table 3.6
PROMISES AND A'S AVERAGE FIRST-ORDER BELIEFS[a]

| | A's average first-order beliefs | | | |
|---|---|---|---|---|
| | Promise | No promise | Combined | Z stat |
| One way message treatment | 49.76 | 45.83 | 48.58 | 0.51 |
| | (26.75) | (24.17) | (25.65) | |
| Two way message treatment | 60.94 | 40.83 | 58.07 | 2.45*** |
| | (24.56) | (27.03) | (25.75) | |
| *A solicits a promise (AR+AP)* | 63.27 | 50.83 | 62.66 | — |
| | (23.64) | (31.75) | (23.91) | |
| *Ask to promise (AP)* | 68.83 | 60.00 | 68.31 | — |
| | (18.07) | (38.89) | (18.90) | |
| *Ask to Roll (AR)* | 56.70 | 32.50 | 55.77 | — |
| | (28.49) | (-) | (28.32) | |
| *A does not solicit a promise (NA)* | 51.25 | 37.50 | 45.87 | 1.22 |
| | (26.80) | (26.52) | (26.96) | |

[a] The Z stat reflects Wilcoxon rank sum test for the population of subjects who made a promise and the population of subjects who did not. We do not test for significance if one of the populations has fewer than 5 observations. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively for one tailed test. Standard errors are reported in parentheses.

*messages* treatment (63.27 vs 51.25, Z=1.64, p=0.05, one-tailed).

In Table 3.7 we report B choices according to the content of communication for both treatments. In the *Two way messages* treatment the overall *Roll* rates are higher when A players solicit a promise than when they do not (49% vs 30%). This difference, while large, is not statistically significant with a two tailed proportions test (Z = 1.54, p=0.12 for two-tailed proportions test). This can be due to a small number of observations in our NA category. The difference seems to be driven by the fact that B players who do not make a promise when As do not ask for it are very unlikely to cooperate (again, we have only 9 observations in this cell). The promise keeping rate is slightly but insignificantly higher when a promise is solicited than when it is not (50% vs 43%, Z stat=0.48, p=0.63, two-tailed test). These results suggest that asking for a promise when given the opportunity might be better than not asking for it. It is plausible that not soliciting a promise is perceived as a signal of mistrust and skepticism by the B

Table 3.7
PROMISES AND B *Roll* RATES[a]

| | B *Roll* rate | | | |
|---|---|---|---|---|
| | Promise | No promise | Combined | Z stat |
| One way message treatment | 12/21 (57%) | 3/9 (33%) | 15/30 (50%) | 1.20 |
| Two way message treatment | 35/72 (49%) | 2/12 (17%) | 37/84 (44%) | 2.06** |
| *A solicits a promise (AR+AP)* | 29/58 (50%) | 1/3 (33%) | 30/61 (49%) | — |
| *Ask to promise (AP)* | 17/32 (53%) | 1/2 (50%) | 18/34 (53%) | — |
| *Ask to Roll (AR)* | 11/25 (44%) | 0/1 (0%) | 11/26 (42%) | — |
| *A does not solicit a promise (NA)* | 6/14 (43%) | 1/9 (11%) | 7/23 (30%) | 1.61* |

[a] The Z stat reflects two sample proportions test for the population of subjects who made a promise and the population of subjects who did not. We do not test for significance if one of the populations has fewer than 5 observations. *, **, and *** denote significance at p<0.10, p<0.05, and p<0.01 respectively for one tailed test.

player and B players backfire by being untrustworthy.[7]

In the *One-way message* treatment the *Roll* rate is 50%, which is as high as when As solicit a promise in the *Two way messages* treatment. This is despite the fact that more promises are made in the latter case than in the former case. Moreover, the promise keeping rate for solicited promises is slightly but insignificantly lower than that for promises made in the *One way message* treatment (50% vs 57%, Z stat =-0.56, p=0.58, two-tailed test). Overall our data suggests that promise keeping rates do not depend much on whether a promise was elicited or not elicited by A players.

Table 3.8 reports beliefs data for B players. The data shows that overall

[7]Are subjects better at coordinating on In&Roll outcome when As solicit a promise than when As do not solicit a promise? When As solicit a promise the rate of In&Roll outcomes is 41%. This is exactly the same as the expected rate of In&Roll outcomes, if In and Roll decisions were independent, 84%(In rate) x 49%(Roll rate)=41%. When As do not elicit a promise the actual rate of In&Roll combinations is 13% which is slightly higher than the expected rate of 30%(In rate) x 35%(Roll rate)=10.5%, if In and Roll decisions were independent.

Table 3.8
PROMISES AND B'S AVERAGE SECOND-ORDER BELIEFS[a]

| | B's average second-order beliefs | | | |
|---|---|---|---|---|
| | Promise | No promise | Combined | Z stat |
| One way message treatment | 54.05 | 50.00 | 52.83 | 0.64 |
| | (23.10) | (22.47) | (22.60) | |
| Two way message treatment | 64.20 | 42.08 | 61.04 | 2.72*** |
| | (20.91) | (26.69) | (23.00) | |
| *A solicits a promise (AR+AP)* | 66.38 | 68.33 | 66.48 | — |
| | (19.26) | (18.76) | (19.09) | |
| *Ask to promise (AP)* | 69.45 | 58.75 | 68.82 | — |
| | (18.89) | (12.37) | (18.62) | |
| *Ask to Roll (AR)* | 62.40 | 87.50 | 63.36 | — |
| | (19.75) | (-) | (19.97) | |
| *A does not solicit a promise (NA)* | 55.18 | 33.33 | 46.63 | 1.90** |
| | (25.56) | (23.32) | (26.51) | |

[a] The Z stat reflects Wilcoxon rank sum test for the population of subjects who made a promise and the population of subjects who did not. We do not test for significance if one of the populations has fewer than 5 observations. *, **, and *** denote significance at $p<0.10$, $p<0.05$, and $p<0.01$ respectively for one tailed test. Standard errors are reported in parentheses.

Bs correctly guessed that As were most optimistic after a solicited promise is made. Bs might think that the trustor asked for a promise because he/she values it. Second-order beliefs for unsolicited promises are lower. Nevertheless, as discussed above promise-keeping rates are not different for solicited and unsolicited promises.

## 3.5 Conclusion

We conducted an experiment to study whether trustors elicit a promise from the trustee in the trust game and whether it is efficient to do so. In particular, we were interested in whether promises solicited by one's partner are more or less likely to be kept than volunteered promises. Our results show that a substantial portion of subjects elicit a promise when given the opportunity, but we do not find significant differences in promise keeping rate between elicited and voluntary promises. Nevertheless, our results suggest that asking for a promise when given

the opportunity might be better than not asking for it because trustworthiness is lower in the latter case. This result seems to be driven by the fact that subjects who do not make a promise when the trustor does not ask for it are very unlikely to be trustworthy (although we do not have many observations in this case). Not asking for a promise is perceived as a signal of skepticism and mistrust and trustees respond by being untrustworthy.

## 3.6 Appendix A: 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 €3 for participating in this session. You may also receive additional money, depending on the decisions made (as described below). Upon completion of the session, your money will be paid to you individually and privately.

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. Those sitting behind desks 1-12 have the role of A; those sitting behind desks 13-24 are B.

By clicking a button on the computer screen, each person A will indicate whether he or she wishes to choose IN or OUT. If A chooses OUT, then A and B each receives €5. Next, each person B will indicate whether he or she wishes to 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 a decision) that A has chosen IN.

If A chooses IN and B chooses DON'T ROLL, then B receives €14 and A receives €0. If A chooses IN and B chooses ROLL, then B receives €10 and rolls a six-sided die 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 €3 show up-fee.)

Note that to conceal the identity of Bs who choose DON'T ROLL, every B will roll a die after making a choice. However, the outcome of a die roll will be irrelevant for those who choose DON'T ROLL.

The information on payoffs 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 |

*Pre-play message stage* [**One-way message treatment**]

Prior to the decision by A and B 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 allow time as needed for people to write messages, then these will be collected. Please write clearly if you wish to send a message to A.

In these messages, no one is allowed to identity him or herself by name or number or gender or appearance. (The experimenter will monitor the messages. Violations - experimenter discretion - will result in B receiving only the show-up fee, and the paired A receiving the average amount received by other A's.) Other than these restrictions, B may say anything he or she wishes in this message. If you wish to not send a message, simply circle the letter B at the top of the sheet.

When B has completed the message, he or she should put it face down on the table. The experimenter will then collect the message and check it.

Important: After all messages have been collected, exactly half of them will be randomly chosen by the experimenter. The messages not chosen will be replaced with empty sheets (i.e., without the letter B on top). Then, the experimenter will distribute the messages and empty sheets to the corresponding As. If A receives an empty sheet, it means that the message by B in his or her pair was not selected to be delivered. The identification numbers of all messages chosen will be written on the whiteboard so that each B knows whether or not his or her message will be delivered to A.

[*Pre-play message stage* [**Two-way messages treatment**]

Prior to decision task, A and B can send written messages to each other. The structure of this is as follows: First, message sheets will be distributed to all As and we will allow enough time for A to write a message to B in his or her pair. When all As finish writing message, we will collect message sheets and deliver them to the respective Bs. After B receives and reads the message by A, he or she can write back a message to A. Message sheets will be provided to Bs. When all Bs finish writing, we will collect message sheets and deliver them to the respective As. This will conclude the pre-play message stage and you will proceed to decision task (as described above).

To summarize the pre-play message stage, first, A sends a message to B, and then after reading A's message, B sends a message to A.

In pre-play 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 - experimenter discretion - will result in you receiving only the show-up fee, and the other participant in your pair receiving the average amount received by others.) Other than these restrictions, you may say anything you wish in your message. If you wish to not write a message, simply circle the letter A (if you are A) or the letter B (if you are B) at the top of the sheet.

When you complete the message, please put your sheet face down on the table so that we know you finished your message. The experimenter will collect all message sheets when everyone is done. ]

*Bonus for guessing*

At some point during the experiment, you can earn a bonus of up to €1.50 by correctly guessing a decision or outcome. You will receive the necessary information on your screen.

*Information*

Each player will know only her or his own earnings at the end of the experiment. Other than what can be concluded from these earnings, you will not receive any other information.

## 3.7 Appendix B: Coder Instructions

**Coder Instructions**

You will be paid €25 for this task. Your task is to code messages sent by participants in an experiment that was designed to study the role of communication in experimental games. Subjects played a game (that is described in instructions) in pairs. Two different treatments were run:

- One way message treatment where only one of the players (player B) can send a pre-play message to the other player (player A),

- Two way message treatment where, first, player A sends a message to B and, then, player B replies to A's message.

**Coding guidelines**

The messages are listed for each treatment separately in the attachment to this instructions. Please use the categories listed and explained below in your coding.

For B messages in the *one way message treatment*:

**"P"** - a promise or more generally a statement of intent to Roll by B.

**"NP"** - a blank message or a message that does not contain a promise or a statement of intent to Roll.

In the *two way message treatment*

for A messages:

**"AP"**- a message that asks B about his/her intended play or whether he or she is willing to play Roll.

**"AR"**- a message that asks or solicits or encourages B to play Roll.

**"NA"**- a blank message or a message that is neither "AP" nor "AR".

for B messages:

**"P"**- a promise or more generally a statement of intent to Roll by B.

**"NP"** - a blank message or a message that does not contain a promise or a statement of intent to Roll.

## 3.8 Appendix C: List of the messages

In the table below, Ca = majority coding for the A message, Cb = majority coding for the B message, AP = A asks B about his /her intended play, AR = A asks B to *Roll*, NA = A does not ask B about his/her intended play or to *Roll*, P = Promise, NP = No Promise.

Table 3.9 - Messages from A and B in both treatments

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| | | **Two Way Messages Treatment** | | | |
| 1 | 1 | BLANK | So, I'm guessing you not sending me a message means you'll opt OUT. Too bad. I'm happy to do the trade-off of rolling for €10,- and giving you a pretty decent chance of winning €12,- instead of us both receiving just €5,-. The out-option, just as the dont-roll option are just a waiste of money. So don't do it and you'll get €7,- more! | NA | P |

*continued on next page*

Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 1 | 2 | If you agree to roll it, I promise to opt IN. DEAL? | Deal! Let's roll :-) | AR | P |
| 1 | 3 | I think I choose Out because I'm not sure you choose Roll. But you can choose Roll than I've got the risk and you get €10,- or you get €5. I've the risk for 0 or 12. So tell my why I must choose In! | You should choose In. The chance that I roll 1 is 1 to 6. The chance of rolling 2 to 6 is higher than 1. I am willing to choose Roll and roll the die. So that you have 12 €and I 10 €. It is better than having 5 €. So bottom line. I will choose ROLL and throw the die. It will be between 2 and 6 (the chance is bigger) and you have 12 €and I will have 10 €. The 2 €more you have than me is the trust you give me. P.S. 12 €is better than nothing or 5 € | AP | P |
| 1 | 4 | In my view we both earn most if you do IN and I ROLL. Is that our tactic? I will stick to that. In all cases I get a little more if I do IN so for me it does not matter if you then do OUT, but then we both get less and that is stupid, right? In short The best idea is: you->IN me -> ROLL. (Translated by Jan from dutch) | You are the one who has to choose IN or OUT :). But it is fine with me to roll the 'die'. (translated by Jan from dutch) | AR | P |
| 1 | 5 | A: Good morning. Let's have a nice game! | B: Good morning! Let's hope so. I am willing to collaborate, you too? | NA | P |
| 1 | 6 | I 'll choose IN Please state whether you will Roll. | I'll choose ROLL, because that maximizes our outcome (22€) if you choose IN. (and hopefully I'll roll something else than 1) | AP | P |

*continued on next page*

Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 1 | 7 | If you can promise me that you will choose 'roll', then I will choose for 'In'. That's a better idea than us both having 5 euros (and it will be good for your karma :p!) | OK. But if you look to the Nash equilibrium it is better for us both that you play out. But I'm ok that you play In. But I can't promise that I will play Roll. Maybe. If I've a good karma today I will play Roll for you :) | AP | NP |
| 1 | 8 | Since B will get rewarded each decision he/she made, it depends on me to choose. For this reason, my decision is clear. May the dice decise! I go for it, how about you? | My first thoughts were not to roll the dice, however since my payoff will only increase with 4 euro and yours (Ex) with 10 euro's I will be fair and roll the dice. (After your message, I would have felt too guilty to betray you. It is inspiring.) | AP | P |
| 2 | 1 | BLANK | Whatever you decide, know that I will always ROLL. Its up to you if you want to get a sure 5€or 1/6 chance 0€/ 5/6 chance 12€. If you choose IN and I ROLL, both of us will get a higher payoff. So ultimately its your choice :) | NA | P |
| 2 | 2 | Dear B, let's make a deal. I'll choose in, and you roll. We'll be both better off if we have luck with the die. Hope you won't trick me. :) | Dear A, I think it's a good idea to make a deal. I'll choose Roll, then you have only a 1/6 chance that the die come up 1. So we will be indeed better off both. (a drawing at the bottom of the page) | AR | P |
| 2 | 3 | Hi, So I think that choosing OUT would make this very boring for both, but it is the safest way to get the €5. Do you agree on choosing to roll the die and take the guess? That way we will make the greatest total profit.( you get €10 anyhow and I take the 5/6 chance of getting €10 and a small chance of getting nothing. ) Good luck! | Hey, I agree that roling the die is the best option for both and most fun. We can choose too roll and next round don't. You too good luck! | AP | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 2 | 4 | What' your decision? Roll or don't roll? Are you happy with 5 euros or do you want to have a fair game? | For me, my decision does not matter if you choose 'OUT'. So I know that my decision only matters when you choose 'IN', and that is the case when you trust I will choose 'ROLL'. I prefer to be fair and reward your trust in this case, since the payoffs (12,10) are so much larger than all the other options. I cannot credibly commit since that is against the rules, but i like to reciprocate fairness. I will choose 'ROLL'. | AP | P |
| 2 | 5 | Hey, In case we choose (IN) with combination (ROLL), we will both receive maximum profit in the long term. Thus, I choose "IN". P.S. 'DON'T ROLL' is not cool. | Yes, we are both better off if you choose IN, so the suggestion seems fair. Wish you good luck hope you'll get 2,3,4,5,or 6! :) | AR | P |
| 2 | 6 | Well, it's a trust game. Choosing OUT is not beneficial nor for me, neither for you. Even though I choose IN, my risk is way higher than yours. My suggestion is IN and Roll, what do you think, how can I trust you and not choose OUT? | Well, I don't like screwing people for a few euros. You bear all/most of the risk in the rolling, therefore I think it is fair that you get 12 if everything goes well. Since I am not allowed to identify myself it is all about trust. If I was allowed to identify myself i would give you my phone number to share the winnings if "1" is he outcome, so that there is no risk for you. Let's be positive and hope for the best. | AP | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 2 | 7 | Hi there, Do you promise to ROLL? If, yes, then I will surely choose IN. Have a nice day! :) P.S. Let's be rational and generate the biggest surplus possible. | Hi there, I am in! I will try to do my best to roll 2-6. Winning together is better. Have a nice day. | AP | P |
| 2 | 8 | Hi! I will choose IN, so you will at least earn 5 euro's more than when I choose OUT. So could you please choose roll? Good for you, good for me! :-) | Hey! Thanks for choosing IN. I will choose ROLL for you, then you have 5/6 chance to earn 12 EUROS. Bye, bye. :-) | AR | P |
| 2 | 9 | I choose In. Please Roll. Die=2,3,4,5,or 6. It's double win otherwise I will choose Out. Then you will lose at least €5. €9. | Sure. I was already planning to choose ROLL because I think it's fair that everyone gets a bit of money =) And €10,- is better than €5,- | AR | P |
| 2 | 10 | Given the setup of the experiment, A would choose OUT and B would choose DON'T ROLL. This would give €5 each. But we could increase it 2x by agreeing to play IN&ROLL. This would give you 10€for certain & me 1/6x0+5/6x12=10€. So can we agree on ROLL? :) | Hi there, I agree. For me In+ Don't Roll is the best option, but if I choose it I am the jerk type of guy. You can trust me. I will choose Roll. Now I hope you choose IN and the dice will role 2,3,4,5 or 6. We have a deal, Have a nice day. | AR | P |
| 2 | 11 | BLANK | I've seen you haven't written anything. I know that I am in the most comfortable position, but I would like to convince you. Would you like only the €5 euros extra, or would you like to get the jackpot? I swear by God's name that I 'll vote for the highest collective profit, so I will choose ROLL. Then you have a 5/6 chance to get the €12 euro extra , which make you a €17 wealthy man, but then you have to choose IN. Thank you. (I've done this experiment a lot of times and it always ends in a disappointment, so please have a little faith in this partner and please let make us rich). | NA | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 2 | 12 | I will always choose in, but if I realize you'll play don't roll too much I will always play out. If we stick to playing IN and ROLL, were both best off | Hi, I will choose Roll at all times. Please do not be tempted to choose out because 5/5 is worst that 12/10. I can truly assure you that I will not deviate, because the 4€I get more (14€-10€) will leave you nothing. I played Creed before so i know how it is to go with nothing. We are all students after all! I will definitely choose Roll :) | AR | P |
| 2 | 13 | BLANK | please choose IN. and we both have a good win. | NA | NP |
| 4 | 1 | A | BLANK | NA | NP |
| 4 | 2 | BLANK | It is better to choose in and I will choose Roll for sure, to get higher payoff. | NA | P |
| 4 | 3 | Hi there, B! Can I trust you to choose ROLL? In that case I will choose IN, so you will earn €10 instead of €5! I will get €12, but also take the change of receiving €0. And giving you €10 instead of €5 when I would choose OUT. How does that sound? : A. | Hey Fellao A! OK, I think it benefits us both if you choose IN and yea why not, I 'll choose ROLL! | AR | P |
| 4 | 4 | Makes sense for me as an A to choose "IN". Hope you choose to roll. | Sure, don't worry, I won't leave you empty handed. I 'll choose Roll. You have 5/6 of a chance to win €12,-. Good luck! | AP | P |
| 4 | 5 | Do not disappoint me. I'm taking the risk, which will make us both(hopefully) happy. Thank you. PS: no 1 please. | Let's cooperate. Wish us good luck! | AR | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 4 | 6 | Dear Bee, I've never seen you before but I love you, I know you're a good person when hearing this crazy eastern european guy explain the experiment you might have thought about screwing me over. However, this will cost you and me both, since if I receive €0,- more often then 1/6 (16%) of the times, I will have no choice then deciding to choose out, securing my .... €5,-. Let's clean these guys together! Let's f'cking cooperate!:) Love and kisses A. | Dear A, after reading you nice message I have nothing to say except that if you choose IN, I will choose ROLL. | AR | P |
| 4 | 7 | I choose 'In', if you choose 'Roll' | Thanks for your trust! I'll roll, that's a guarantee! :) | AR | P |
| 4 | 8 | Hi, If I choose IN and you choose ROLL we have a chance of 5/6 to both win more than 5€. If you die 1, I have 0 €. So that's a risk. If I choose OUT, we both have €5. But if you choose 'DONT ROLL' I win nothing. So I'll have to trust you choose ROLL. Will you choose that or do you think something else is better? | Hi, I will choose Roll, because it's a win win situation. The reason why I won't choose 'don't roll' is because the difference between Roll and don't roll is only €4 for me. It's not big. I want a win win situation, so we both have to help each other and choose In and Roll. Or we will both lose. | AP | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 4 | 9 | Dear B, Enjoy the experiment. Greetings, A. | Dear A, Thanks, you too. B | NA | NP |
| 4 | 10 | Hey unknown! How was your day till now? I think this experiment is pretty funny. I've never written notes to someone I didn't know en will never know probably. So let's make the best of it â. What will you be doing tonight? I will go to Diana Krall in concert! Oh, and I should ask if you want to roll the dice, cause then I choose in! I didn't come to not play the game :) write me back soon! xx (would be nice if this letter would be send by a white pigeon...) | Hi! Nice of you to write me such a nice message. I think this is kind of a weird experiment, but let's just get it over withâ I really don't know what to choose, but I think I will choose Roll, so we can both make some money! That would be good! Tonight, I'm going to have dinner with my sister. Have fun at your concert, and please choose 'in' :). | AR | P |
| 4 | 11 | If I choose to go IN, will you ROLL with 100% certainty? Or else you have €14 and I have noneâ So I like to go IN, you Roll? | I will ROLL THE DICE. I hope it will not turn out to be 1 so that we both get a higher payoff. | AP | P |
| 6 | 1 | Hello B, I want to choose OUT so I'm sure I will earn money (more that the participating amount of 5€), but maybe you can change my mind, if you have a good offer. Let me know, A. | Hello A,I am going to choose Roll, because if you choose Out, my choice doesn't matter anyway so I just can choose that one. But I guess I've got a bigger opportunity to earn some money if I choose Roll, because than you migh choose In and have 5/6 chance on €12. So my propose for you is to choose In, I will go for ROLL anyway, (I promise you). B. | AP | P |

*continued on next page*

Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 6 | 2 | Dear B, Let's cooperate and make sure we both end up with additional money. So, please choose roll when I decide to be in. If you're not willing to do that, I obviously will not be in. Because what are 4 euros in a lifetime? Thank you, A. | Dear A, Let's do it, the way you said :). I don't care if you get more than me as long as I get a lot too. Let's be generous & I hope the dice will be in our favour. Sincerely, B. | AR | P |
| 6 | 3 | Hi :)! Let's maximize our total profit ok? That's the best for the both of us. | Agree | AR | P |
| 6 | 4 | Convince me. | Trust me, if you want more than 5 euro's extra, because I do. Choose In, I'll roll so we both get more money. | AP | P |
| 6 | 5 | You will never choose to roll, so I'll choose out. | That's exactly what everybody assumes. I want to make more money. Choose In and I will Roll. Sounds to me like a win-win situation. | NA | P |
| 6 | 6 | You always have to choose the option Roll! | I thought you would say that, it's the best outcome for you, but I'm not entirely sure. If the die=1, you get nothing â. So, good luck! | AR | NP |
| 6 | 7 | hi, what are you going to do? Roll or don't roll? | Hi! For me it's better when you choose IN. I will receive more money. Therefore I am writing to choose roll so that you have 5/6 chance on more money too (if I choose don't roll you will choose OUT so it's better for both to choose IN ->ROLL). Let's hope for a 2,3,4,5, or 6. =) | AP | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 6 | 8 | I choose OUT | Coward | NA | NP |
| 6 | 9 | Hi, how are you doing? I want to suggest a game plan for us. We, both, will make more money if we use our common sense. This is what I was thinking:If I choose 'IN' and you choose 'ROLL', you will definitely make €10 (see payoff chart). If you then roll the die and it roll on '1', I will be unlucky, but you still €10,-. But if it will roll on '2-6', I will be more lucky to earn euro 12 and you still will earn €10. So to conclude if I choose 'IN', will you choose 'Roll'? Please let me know if we have a deal. Greetings from your partner | Hi partner, beautiful plan! We have a deal. If you choose 'IN' I will choose 'Roll'. I hope you will be lucky and that you earn €12,- (I will try my best when rolling the die). Greetings from your partner. P.S. then we also earn the euro 1,5 bonus if we both stick to our choices. | AR | P |
| 6 | 10 | I would be willing to choose IN if you can assure me that you will pick ROLL. I know this gives you a payoff that is a bit lower but I could also pick OUT and you would only get 5€. Please pick Roll and give me the chance to earn at least some money. If you don't agree or I don't think you'll stick to your word I will choose OUT to at least receive 5€. Hope you agree thanks in advance. | I will choose roll, it's the most fair I think. You will give me a chance for more money, so I will do that as well. Lets hope for a 2,3,4,5, or 6! | AR | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 6 | 11 | BLANK. | Please choose in. I will then choose roll for sure. Chance will decide if you get €12,- or €0,-, but the chances of getting €12 are of course higher. Always believe! | NA | P |
| 6 | 12 | So, you're in a better situation than I am but I am responsibly for you winning more than €5(which you certainly will if I choose 'in'.) But how can I be sure that you won't screw me and choose not to roll? If you don't come up with a good argument it certainly is better for me to be out... I do realize that you win the most by choosing not to roll. I can't do more than hoping you'll be honest... | Ok, I was going to tell number A that I would "roll" and then secretly choose "not roll", but your message has changed my mind. Of course, it is still up to you if you want to believe me, but I ask you to have a little faith. I promise I will choose "roll"! This will give you 5/6 chance to win €12,-. still 1/6 that it's nothing.... It's up to you A! | AP | P |
| 7 | 1 | Can I be sure you choose ROLL? Then I choose IN. | It is clear that IN-ROLL is the best choice, 12+10=22 compared to 5+5=10. Let's roll it. | AP | P |
| 7 | 2 | Hi, I am writing you to ask if its possible to choose ROLL. I guess there is no need to convince you that by choosing ROLL, simply cooperating we both earn. Cooperate man, cooperate :) We will both benefit if you choose ROLL. Looking forward to get back from you. Don't forget to hustle through rain, wind or tornado :) Sincerely, | Hi there! Rolling it is! I think that's clear. Enjoy the earnings. | AR | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 7 | 3 | BLANK | Hello A. Choose IN! I will choose to Roll. The expected return will be the same. For me €10, and for you (5/6x€12+1/6x€0=) €10. Don't choose OUT. That's giving money to CREED, while we as students need it! You can trust on me! Regards B. | NA | P |
| 7 | 4 | We both win on the 4th situation, with a higher probability then in all the other outcomes. Play the 4th option? | That seems to be okay with me. Let's play option 4. | AP | P |
| 7 | 5 | Can I trust you? | To just screw this experiment, they want to know how much of us will choose the Nash Eq. (5,5). I don't care about the extra 4, Just want to make their experiment biased. Your chances of getting 12 will be 5/6 and basically the same as 1/6*0+5/6*12=10. If you choose In, I can make your decision worthwhile! =) (depicts extensive form of the game.) | AP | P |
| 7 | 6 | Dear colleague, I am willing to opt "IN" as long as you choose to "Roll" the die. Please, let me know of your choice! =) Let's make everybody happy! Best regards, Partner A. | Dear partner A, I think the most fairest way to do this game is for me to reciprocate your opt in choice! I think it is best for both of us, you 'hopefully' then get €12 and I €10. So I will roll the dice. Good luck! Partner B. | AR | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 8 | 1 | Hi there, nice experiment eh? Well as you have noticed the amount of money we can earn depends on both our decisions. I have to buy a birthday present for my little brother. So it would be vry nice if I can get more from this experiment than the 5 €. My question is now- would you please choose Roll? We both can earn money!! please!the idea for the coming holidays is "Give & help each other :)my little brother would be very thankful. | Hi, I think the experiment is kind of boringâ But anyway, lucky for you I'm in the holiday spirit ;). But you better buy your brother a really awesome present now. | AR | NP |
| 8 | 2 | Will you take a risk of rolling? | Hi A, In this experiment I want the best for both of us. I will roll the dice, assuming that you'll be in. | AP | P |
| 8 | 3 | Hi! I am obviously in the worst position, since B's get between €5-14 and A's have a big chance of gettting €0. And us A's have to trust you B's! So the safe option for me would be to choose OUT and we each get €5. However, it would also be nice for you to have €10, and my fate depending on the dice, being either €0 or €12. But you can then of course fuck me and choose OUT, so it all depends on trust and if you decide to be a nice person/can live with guilt/. I hope you would like your fellow poor student to have some money as well :) what do you say? | Dear A, I am so sorry you are in the position you're in. I will chose roll no matter what you chose, and if you decide to chose In, I hope the die will be more than 1, for your sake. Best wishes, B. | AR | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 8 | 4 | Dear Mr. or Mrs. B, it seems obvious to me that you would like me to choose IN since that will lead to higher payoffs for you. There is a risk attached to this choice for me though, since it's possible that you'll choose not to roll and I 'm stuck with €0. I think the following scenario would be beneficial for the both of us: I choose IN and you choose ROLL. To persuade you I have drawn a beautiful flower for you below: (a flower is drawn) with regards, Mr. A :) this is what I will look like if you choose to roll. | Dear Mr A ( or should I say Ms?), I was very endeared by your beautiful flower. Honestly I thought about choosing don't Roll, but I don't want you to look like this :(. It's almost christmas, so I don't care that much about 2 euro's more or less. Let's follow your scenario and you can buy me a flower as a thank you afterwards (flower drawn) Kind regards, Mr or Mrs B. | AR | P |
| 8 | 5 | We don't know each other, why should I trust you that you will throw a die if I choose "In"? | I will choose Roll, because I'm already happy that you did not choose OUT. In that case we would both be worse off. I will reward you for choosing IN for that reason. | AP | P |
| 8 | 6 | Spend government money TOGETHER, so IN and Roll or do you play for yourself? :) | Hi A, I totally agree, I study economics and we discuss game theory all the time. Prediction is you will not go in because you expect me not to roll. But I will roll, because 10>5 for me and I believe in sharing the benefits! Your B. | AR | P |
| 9 | 1 | Hello, I would like to take a risk and opt for IN. seeing I do not know anything about you I will play it safe and opt for our, thereby ensuring both you and me get a fair amount of money. Greetings. | Hello, I'd prefer to maximize both of our profit. So I'd suggest you opt for In. And I'll play "Roll" anyways.Greetings. | NA | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 9 | 2 | Hey B, We can both collect a lot of money if we trust each other. I will choose IN only if you will choose to ROLL. Either way I will be taking a lot of risk by choosing IN because I can get €0,-. So I have to be sure you will ROLL, and then I will choose IN and we can both earn a lot of money. I trust you to take the right decision. Bye, A. | Hello A, You find yourself in a precarious position where u have to depend on my decisions, and granted it is a difficult position with a huge dilemma. However, due in part to your inspirational message, I am here to maximize both our earnings and will therefore choose to ROLL the dice. It will take a lot of faith on your part, but i hope to recognize you by the big smile on your face at the end. Cya, B | AR | P |
| 9 | 3 | I can choose OUT. Just to make sure that I will get any money or I can choose IN if you want to ROLLâ.. But since you're always better of when you DON'T ROLL I don't think that you will ROLL. | I CHOOSE ROLL, It is more fair. That you are A and I am B is by chance it would be fair to choose the highest amount for both ->ROLL (I won't ROLL 1). | NA | P |
| 9 | 4 | I'll choose OUT, no matter what, sorry. If you want to earn the guessing bonus I'll advise you guess that I'll choose OUT. After your message to me I can not write back, so I want to be really clear that I'm going to choose OUT. | I'm fine with that! | NA | NP |
| 9 | 5 | BLANK | BLANK | NA | NP |
| 9 | 6 | Hello | Hi there, I promise to choose Roll if you choose IN! | NA | P |
| 10 | 1 | Wassup? Maximum pay-off for each other? | Yeah, good idea, I'll roll the die. | AP | P |
| 10 | 2 | You have nothing to lose so Roll the die :) | You're right so I will roll the die! Good luck to both of us! I'll do my best. | AR | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 10 | 3 | A: €12,- B: €10,- ? DEAL? :) I hate winter :( | Deal! Seems fair, B is on the lucky side anyway. And yeah, winter sucks big time. I like snow though. | AP | P |
| 10 | 4 | I will chose IN for the experiment, hence you should choose roll because there is a high possibility to get a higher payoff for both. | I agree. I will choose ROLL. | AR | P |
| 10 | 5 | BLANK | CHOOSE IN I'LL CHOOSE ROLL BETTER FOR THE BOTH OF US! €10 BOTH OR A:€17/B:€15. | NA | P |
| 10 | 6 | I will choose for 'in', if you can promise to choose for 'ROLL'. Will you do that? It's the most fairâ.. | I will do that, let's hope it's comes out for both of us | AP | P |
| 10 | 7 | BLANK | Wow, no message for me? That means you going home with 5 euros today. Enjoy them. Just play in. send me back a message and let's go for the best option. Roll the die and go for 2-6. So we both get more than euro10. sounds good? Let me know. | NA | NP |
| 10 | 8 | Did you see AJAX YESTERDAY? Horrible game. 2 pure goals taken away from us. That ref should never wistle a game again. I'm still angry about it. What about you? | Haha, no I didn't see the game of Ajax against Real Madrid, But I heard a lot about it! I think it was not very fair! 3-0 poor Amsterdam. But how about this game?? If we play it fair, you choose In and I will choose for Roll and then we both have a high payoff :) Agree? | NA | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 10 | 9 | You have no incentive to roll. I'm gonna choose out, and we'll both lose if you can't commit to roll. | I don't care about an additional 4 euro, where your expected value is 1/6*0+5/6*12=10. Thus, I Roll. | AR | P |
| 11 | 1 | It's best for A to choose In and for B to ROLL -> maximum profit. | You are right, it leads to 12+10=22€total profit. I will choose Roll if you choose In. | AR | P |
| 11 | 2 | I will be trusting you to maximize total(!) payout and thus will always pick IN, even though telling you this gives you incentives to chose NOT ROLL but I'll leave that up to you :) to decide. | Obviously I want you to choose in since that will maximize my payoff. I feel strongly as well about maximum total payoff, since we are all students and I know how annoying it can be to walk out of this room almost empty-handed. So I will choose roll and I hope you stay in, since that will be the best outcome for both of us thenâ This will also give us the guessing bonus as an extra. | AR | P |
| 11 | 3 | BLANK | Hi A, I promiss to choose ROLL, so if you choose IN, you have 5/6 chance that you earn €12 instead of €5, and we will be both better off. :) Good luck with your decision! | NA | P |
| 11 | 4 | Hi! If I choose in, could you please Roll? The chance is 5/6 that we will both receive more money!:) OK with u?? Bye. | HI! Yes of course I will roll. We both benefit then. Hope it will not be 1:) Good luck!(and choose IN) | AR | P |
| 11 | 5 | Since it is most profitable for you to choose don't roll, whether I've chosen out or in, so I'll choose out to maximize my profit, however depending on your kindness I cannot judge whether you will choose roll or don't roll, obviously I would prefer if you would roll, thats why i'm just gonna ask you a silly question :) What song is better: a) you'll never walkalone -elvis presley b) american trilogy-elvis Presley c)hurt -elvis presley d)none e) all of 'em. good luck :) | Your logic fails in the sense that I only lose 4. But we both gain 5 if we are in. On the song part of the question: d) none of them, be more positive! 1 For the money 2 For the showââ. Lets rock! :) | NA | NP |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 11 | 6 | Convince me to choose "IN". I don't trust you. | Youre a smart person. The msg you send me was the only one I was afraid for, otherwise I would have tried to screw you over. Were here to maximize our own profit so normally I would have chosen don't roll no matter what but thanks to your message I have to roll, i only lose 4€you gain your expectation level will rise to 7 €(+1.50) if i trow i have good karma at this moment and i want to keep that so for that you can only believe this msg: I WILL ROLL. I have enough money but u have my word that i will role. no time to convince you, but i will do it thats a promise (with board games i am always lucky so i hope we work together and maximize our profits! | AP | P |

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Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 11 | 7 | Will you choose Roll when I play in? For you, the difference is only 4 euros, for me its 12 euros. On top of that, you will certainly get 10 euros when I choose in. Let's trust each otherâ. | Okay, sounds good to me I will choose 'roll' and we both get a fair amount. | AR | P |
| 11 | 8 | Hey B, The best strategy for the both of us is In & Rolling 2-6â What do you think about it? How can I be sure that you are going to Roll? Because if I'm not I'll simply choose OUT. X. | Hey A,Yes, you are right, the best is IN and Rolling 2-6, even though you get 2 euros more than me but 10 is better than 5 for me, so yes I'll choose Roll. :) XX | AP | P |
| 11 | 9 | If I choose "IN", can I rely on you to choose "ROLL"? If so, I will choose "IN" and we can maximize payoff. What is your answer? | no problem, payoff is better for me when you choose "IN" anyway. => | AP | P |
| 11 | 10 | Hey, as you know from the instructions I have 2 options: a safe- when we both get €5 or a risky one when I'm depending on you to choose Roll. Then you get sure €10. I believe that the second option is better for both of us, so I'll choose In if you choose Roll after that. Do we have a deal? | Yes, we have a deal! | AR | P |
| 11 | 11 | Good luck. | Haha thank you. Good luck to you too. I will not take advantage of your trustâ There isn't anything else to say I thinkââ | NA | NP |
| 11 | 12 | Are you going to choose "don't roll"? | No. I am going to roll the die. | AP | P |
| 11 | 13 | Hello, so I hope we can make an agreement that you choose ROLL and I choose IN. It's for me the highest chance of a good reward and for you a certain €10. If we can not make an agreement, safest for me is to choose OUT. So even though we have not met, I hope we can trust each other on this agreement :) Greetings. | You can trust on your proposal that I will choose to Roll. | AR | P |

*continued on next page*

Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| | | | **One Way Message Treatment** | | |
| 3 | 1 | | Hey, I guess I have to ask you to trust me! I will roll the dice and then you'll have a 5/6 chance of getting €12, which is a good chance. For me it makes sense to roll the dice, cause if you choose out, then I'll make €5 either way. So, please choose in and lets both make some more money! | | P |
| 3 | 2 | | Hello A! I suggest we do the IN-ROLL-option. Then we have (probably) maximum profit: you €12 and I €10. | | P |
| 3 | 3 | | There is no reason to choose out. If you're in an I roll the dice, we can both make money. So I suggest we do that, and then we both will be happy. | | P |
| 3 | 4 | | I'll roll. | | P |
| 3 | 5 | | If you choose IN my payoff is 10 euro. Therefore I can choose ROLL and we both can be better off rather than having 5 euro only. | | P |
| 3 | 6 | | We are best off if you choose IN an I ROLL and the chances we get the money is 5 out of 6. Since I can get compensated for receiving less money on each turn if I roll the die and get a 1 I will choose to ROLL every time. This, I think is the only way we all together get the most out of this game. If you prefer to make sure it's all fair, choose OUT =) | | P |

*continued on next page*

Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 3 | 7 | | I am willing to cooperate. (roll) | | P |
| 3 | 8 | | I PROMISE THAT IF YOU CHOOSE IN I WILL CHOOSE ROLL | | P |
| 3 | 9 | | BLANK | | NP |
| 3 | 10 | | Dear player A, I think that it is optimal for both of us that you choose 'IN'. I will choose 'roll' and we both end up with an expected value of euro €10*. *(5/6x12=10). I know you are in a position to block this and go home with €5, but please trust me on this. I promise I will choose 'roll'. Regards, B | | P |
| 3 | 11 | | Let's choose option IN and Roll, then we have a chance of 5 out of 6 to earn a lot of money. Trust :) | | P |
| 3 | 12 | | I will choose ROLL | | P |
| 3 | 13 | | Hi, Here's my decision: I will choose ROLL all the time if you choose IN. Note that this is the only way to get the largest benefits. And it's fair cause your expected earning is 12x5/6=10, which is exactly the same as mine. So let's do it, OK? Look forward to cooperating with You! | | P |

*continued on next page*

Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 5 | 1 | | Dear A, Gambling is everything I do. If you calculate it, the chances are better with Rolling to earn together more money. Greets, B | | P |
| 5 | 2 | | It's beneficial for both of us to work together. I won't stiff you, I'll take €10 over €5 any dayâ It's up to you though | | P |
| 5 | 3 | | BLANK | | NP |
| 5 | 4 | | In and I Roll the dice | | P |
| 5 | 5 | | The mutual outcome is higher if I role the dice, so I will do that. | | P |
| 5 | 6 | | I will choose ROLL, so please choose IN. In this case we both get an expected payoff of €10. And that is the best results for us together. | | P |
| 5 | 7 | | I'm going to choose Roll, so if you choose IN you'll have 83% chance of receiving €12. | | P |
| 5 | 8 | | Choose IN and I will choose Roll. If you r lucky to get 2-6, then both of us will get higher payoff. | | P |
| 12 | 1 | | BLANK | | NP |
| 12 | 2 | | BLANK | | NP |
| 12 | 3 | | Have fun :) | | NP |
| 12 | 4 | | I think we get the highest payoff if we cooperate. So choose IN and I will choose ROLL :) | | P |
| 12 | 5 | | It will be wise to always choose 'In', Then we will be beneficial by both. | | NP |

*continued on next page*

Table 3.9 - *continued*

| Sess. | Pair ID | A message | B message | Ca | Cb |
|---|---|---|---|---|---|
| 12 | 6 | | BLANK | | NP |
| 12 | 7 | | Cooperate for maximum outcome? | | NP |
| 12 | 8 | | I PROMISE TO ROLL THE DICE, I WANT US BOTH TO GET MOST OF THIS EXPERIMENT. I'M REALLY GOOD AT MONOPOLY, THERE'S A LOW CHANCE I GET 1 :) Thanks. Player B | | P |
| 12 | 9 | | BLANK | | NP |

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