# Online Appendix to "Intention-Based Reciprocity and Signaling of Intentions"

May 22, 2017

## Contents

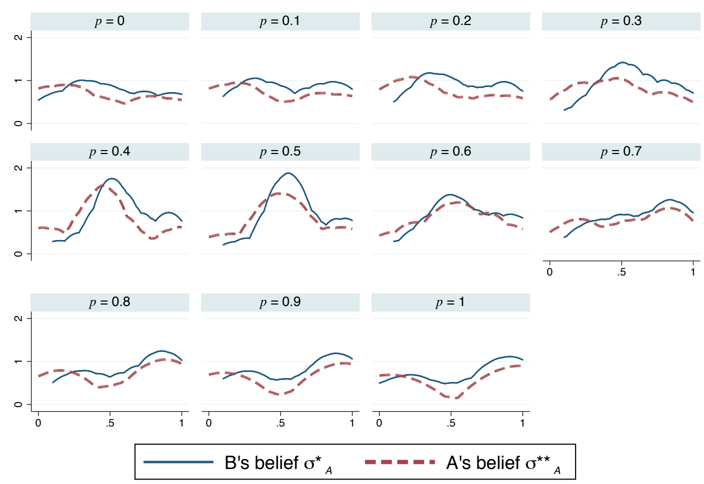
# A Supplemental analysis to the main text

## A.1 More on the distribution of beliefs

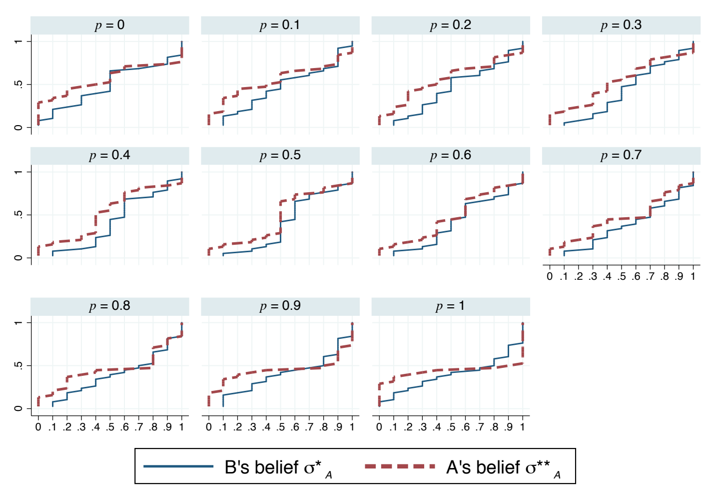
The main text reports mean beliefs and kernel density estimates for low, medium and high values of $p$. Here I present the complete breakdown by value of $p$. To facilitate the reading of both the mode and the median, Panel (a) shows the PDFs for each value of $p$ (kernel density estimates), while Panel (b) presents the CDFs. Results from Kolmogorov-Smirnov tests show that the distributions of beliefs for A and B are significantly different only for $p \in \{0.1, 0.2, 0.4\}$.

Figure 1: Belief distributions by value of $p$

(a) Probability Density Functions




(b) Cumulative Distribution Functions



The following table presents a breakdown of belief patterns for A and B into 5 categories (see discussion in Section 4.2 of the main text). The first two categories correspond to subjects who reported the same beliefs regardless of the amount of noise; I separate subjects based on whether they thought that A was most likely to choose *Out* ($\tilde{\sigma}_A = \bar{\sigma} < \frac{1}{2}$) or most likely to choose *In* ($\tilde{\sigma}_A = \bar{\sigma} \geq \frac{1}{2}$).[1] The next two categories correspond to subjects with weakly increasing or decreasing beliefs; for instance, $(0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1)$ or $(0, 0.1, 0.1, 0.3, 0.3, 0.3, 0.3, 0.6, 0.6, 0.6)$. The last category groups all subjects with non monotone beliefs.

Table 1: Distribution of individual belief patterns

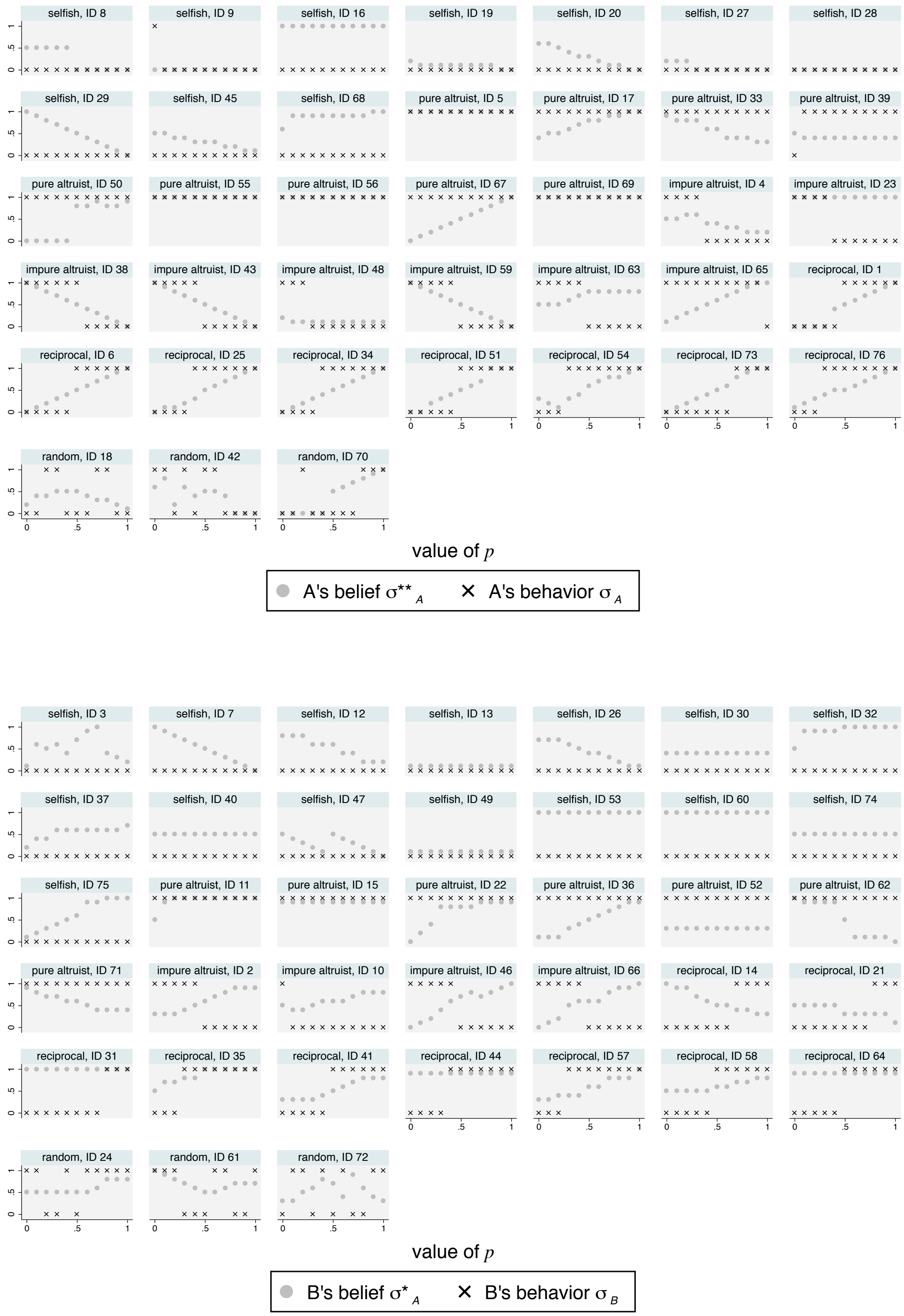
| Belief pattern $\tilde{\sigma}_A \in \{\sigma_A^*, \sigma_A^{**}\}$ | % of A players (freq) | % of B players (freq) | Total % (freq) |
|---|---|---|---|
| $\tilde{\sigma}_A = \bar{\sigma} < \frac{1}{2}$ for all $p$ | 5.3 (2/38) | 10.5 (4/38) | 7.9 (6/76) |
| $\tilde{\sigma}_A = \bar{\sigma} \geq \frac{1}{2}$ for all $p$ | 15.8 (6/38) | 21.1 (8/38) | 18.4 (14/76) |
| $\frac{\partial \tilde{\sigma}_A}{\partial p} \leq 0$ ($< 0$ for some $p$) | 31.6 (12/38) | 18.4 (7/38) | 25.0 (19/76) |
| $\frac{\partial \tilde{\sigma}_A}{\partial p} \geq 0$ ($> 0$ for some $p$) | 34.2 (13/38) | 34.2 (13/38) | 34.2 (26/76) |
| other (non monotone) | 13.2 (5/38) | 15.8 (6/38) | 14.5 (11/76) |

Looking more closely at subjects with monotone increasing beliefs, a few observations are worth making. First, beliefs are strictly increasing for all $p$ only for a few subjects (3/13 for the A players and 0/13 for the B players). The modal belief at $p = 0$ is $\sigma_A^* = 0.5$ for the B players (5/13), while it is $\sigma_A^{**} = 0$ for the A players (8/13). On the other hand, $\tilde{\sigma}_A = 1$ is the modal belief for both roles when $p = 1$ (6/13 for B and 12/13 for A). Another question one could ask is whether certainty ($p \in \{0, 1\}$) is treated differently. Among the B players, 7/13 subjects form more pessimistic beliefs at $p = 0$ compared to $p = 0.1$; on the other hand, there is no special status given to $p = 1$ relative to $p = 0.9$ (only 3/13 form a different belief at $p = 1$). For the A players, 9/13 (resp. 7/13) form a different belief at $p = 0$ relative to $p = 0.1$ (resp. $p = 1$ relative to $p = 0.9$). However, the beliefs of the A players are generally more smooth than for B; in particular, 7/13 of subjects in role A reported beliefs that are continuously increasing at all values of $p$ except possibly one.

## A.2 Relationship between beliefs and behavior at the individual level

[1] Using the alternative cutoff $\tilde{\sigma}_A = \bar{\sigma} \leq \frac{1}{2}$ and $\tilde{\sigma}_A = \bar{\sigma} > \frac{1}{2}$ would make relatively little difference as only two subjects had constant beliefs at 0.5 (those two subjects were B players).

Figure 2: Individual belief and action profiles




*Notes*: Breakdown of beliefs and action profiles for the 38 subjects in role A (top) and the 38 subjects in role B (bottom). Patterns are presented in sequence for each preference type discussed in Subsection 2.2.3 and Table 1 of the main paper.

## A.3 Robustness analysis

In the paper (Tables A1 and A2), I present an econometric analysis of the effect of $p$ on rates of prosociality and beliefs, first treating $p$ as a continuous variable and then as a categorical variable where $p_L \in \{0, 0.1, 0.2, 0.3\}$, $p_M \in \{0.4, 0.5, 0.6, 0.7\}$, $p_H \in \{0.8, 0.9, 1\}$. Below I present results for two alternative classifications of $p$ into low, medium and high values. Results are qualitatively similar. They tend to be a bit weaker for behavior but similar for beliefs.

Table 2: Rates of prosociality for low, medium and high values of $p$

| | **Panel A: Individual behavior** | | | | **Panel B: Action profiles** | | | |
|---|---|---|---|---|---|---|---|---|
| | A's *In* Rate | | B's *Meet* Rate | | (*In*, *Meet*) | | (*Out*, *Take*) | |
| Sample | Full | $p \neq 0$ | Full | $p \neq 0$ | Full | $p \neq 0$ | Full | $p \neq 0$ |
| Alternative split of $p$ (ALT1) | | | | | | | | |
| $p_L \leq 0.3$ | 0.493 | 0.5 | 0.329 | 0.325 | 0.118 | 0.123 | 0.296 | 0.298 |
| $p_M \in [0.4, 0.6]$ | 0.482 | 0.482 | 0.386 | 0.386 | 0.211 | 0.211 | 0.342 | 0.342 |
| $p_H \geq 0.7$ | 0.5 | 0.5 | 0.461 | 0.461 | 0.257 | 0.257 | 0.296 | 0.296 |
| Predictions* | | | | *t*-Stat values | | | | |
| $\sigma_{i,p_L} \leq \sigma_{i,p_M}$ | 0.14 | 0.22 | 0.96 | 1.07 | 1.57* | 1.53* | 0.73 | 0.71 |
| $\sigma_{i,p_L} \leq \sigma_{i,p_H}$ | 0.00 | 0.00 | 1.56* | 1.62* | 2.05** | 2.06** | 0.00 | 0.00 |
| $\sigma_{i,p_M} \leq \sigma_{i,p_H}$ | 0.36 | 0.36 | 1.68* | 1.68* | 1.12 | 1.12 | 0.96 | 0.96 |
| Alternative split of $p$ (ALT2) | | | | | | | | |
| $p_L \leq 0.2$ | 0.482 | 0.487 | 0.333 | 0.329 | 0.114 | 0.118 | 0.298 | 0.303 |
| $p_M \in [0.3, 0.6]$ | 0.493 | 0.493 | 0.368 | 0.368 | 0.191 | 0.191 | 0.329 | 0.329 |
| $p_H \geq 0.7$ | 0.5 | 0.5 | 0.461 | 0.461 | 0.257 | 0.257 | 0.296 | 0.296 |
| Predictions* | | | | *t*-Stat values | | | | |
| $\sigma_{i,p_L} \leq \sigma_{i,p_M}$ | 0.14 | 0.10 | 0.60 | 0.67 | 1.29 | 1.21 | 0.50 | 0.41 |
| $\sigma_{i,p_L} \leq \sigma_{i,p_H}$ | 0.17 | 0.14 | 1.44* | 1.47* | 1.91** | 1.88** | 0.00 | 0.00 |
| $\sigma_{i,p_M} \leq \sigma_{i,p_H}$ | 0.10 | 0.10 | 1.80** | 1.80** | 1.61* | 1.61* | 0.62 | 0.62 |
| $^*\sigma_i \in \{\sigma_A, \sigma_B\}$ | | | | | | | | |
| Observations | 418 | 380 | 418 | 380 | 418 | 380 | 418 | 380 |

*Notes*: Linear probability models with the dependent variable equal to 1 if A (B) chose *In* (*Meet*) for Panel A, and if the profile (*In*, *Meet*) (resp. (*Out*, *Take*)) is realized for Panel B, regressed on categorical variables for $p_L$, $p_M$ and $p_H$. Full ($p \neq 0$) sample includes (excludes) observations for $p = 0$. Standard errors in square brackets clustered at the subject level for Panel A and at the level of a match for Panel B. Significance assessed with one-sided $t$-tests; * and ** indicate $p$-value $< 0.1$ and $< 0.05$.

Table 3: Beliefs for low, medium and high values of $p$

| | Panel A: Mean belief | | | | | | Panel B: Median belief | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B's belief $\sigma_A^*$ | | A's belief $\sigma_A^{**}$ | | Combined | | B's belief $\sigma_A^*$ | | A's belief $\sigma_A^{**}$ | | Combined | |
| Sample | Full | $p \neq 0$ | Full | $p \neq 0$ | Full | $p \neq 0$ | Full | $p \neq 0$ | Full | $p \neq 0$ | Full | $p \neq 0$ |
| Alternative split of $p$ (ALT1) | | | | | | | | | | | | |
| $p_L \leq 0.3$ | 0.561 | 0.575 | 0.458 | 0.462 | 0.509 | 0.518 | 0.5 | 0.5 | 0.4 | 0.4 | 0.5 | 0.5 |
| $p_M \in [0.4, 0.6]$ | 0.612 | 0.612 | 0.518 | 0.518 | 0.565 | 0.565 | 0.6 | 0.6 | 0.5 | 0.5 | 0.5 | 0.5 |
| $p_H \geq 0.7$ | 0.630 | 0.630 | 0.563 | 0.563 | 0.597 | 0.597 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |
| Predictions* | | | | | | $t$-Stat values | | | | | | |
| $\tilde{\sigma}_{A,p_L} \leq \tilde{\sigma}_{A,p_M}$ | 1.39* | 1.17 | 1.38* | 1.39* | 1.97** | 1.83** | 1.86** | 1.87** | 0.88 | 1.49* | 0.00 | 0.00 |
| $\tilde{\sigma}_{A,p_L} \leq \tilde{\sigma}_{A,p_H}$ | 1.11 | 0.94 | 1.26 | 1.27 | 1.69** | 1.59* | 1.94** | 1.92** | 1.33* | 2.19** | 1.98** | 1.95** |
| $\tilde{\sigma}_{A,p_M} \leq \tilde{\sigma}_{A,p_H}$ | 0.58 | 0.58 | 1.10 | 1.10 | 1.24 | 1.24 | 1.45* | 1.40* | 1.40* | 2.40*** | 3.0*** | 2.91*** |
| Alternative split of $p$ (ALT2) | | | | | | | | | | | | |
| $p_L \leq 0.2$ | 0.548 | 0.563 | 0.452 | 0.455 | 0.5 | 0.509 | 0.5 | 0.5 | 0.4 | 0.4 | 0.5 | 0.5 |
| $p_M \in [0.3, 0.6]$ | 0.609 | 0.609 | 0.507 | 0.507 | 0.558 | 0.558 | 0.6 | 0.6 | 0.5 | 0.5 | 0.5 | 0.5 |
| $p_H \geq 0.7$ | 0.630 | 0.630 | 0.563 | 0.563 | 0.597 | 0.597 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |
| Predictions* | | | | | | $t$-Stat values | | | | | | |
| $\tilde{\sigma}_{A,p_L} \leq \tilde{\sigma}_{A,p_M}$ | 1.55* | 1.33* | 1.40* | 1.44* | 2.10** | 1.98** | 1.76** | 1.70** | 0.79 | 1.53* | 0.00 | 0.00 |
| $\tilde{\sigma}_{A,p_L} \leq \tilde{\sigma}_{A,p_H}$ | 1.20 | 1.04 | 1.28 | 1.29 | 1.76** | 1.67** | 1.83** | 1.79** | 1.24 | 2.11** | 1.88** | 1.82** |
| $\tilde{\sigma}_{A,p_M} \leq \tilde{\sigma}_{A,p_H}$ | 0.62 | 0.62 | 1.14 | 1.14 | 1.30* | 1.30* | 1.39* | 1.35* | 1.33* | 2.18** | 2.82*** | 2.73*** |
| $^*\tilde{\sigma}_A \in \{\sigma_A^*, \sigma_A^{**}\}$ | | | | | | | | | | | | |
| Observations | 418 | 380 | 418 | 380 | 836 | 760 | 418 | 380 | 418 | 380 | 836 | 760 |

*Notes*: Linear regressions where the dependent variable is B's elicited belief $\sigma_A^* \in \{0, 0.1, ..., 1\}$ that A chose $In$, A's elicited belief $\sigma_A^{**} \in \{0, 0.1, ..., 1\}$ about B's belief, or both (Combined), regressed on categorical variables for $p_L$, $p_M$ and $p_H$. Panel A (B) shows OLS (quantile) regressions. Full ($p \neq 0$) sample includes (excludes) observations for $p = 0$. Standard errors in square brackets clustered at the subject level. Significance assessed with one-sided $t$-tests; *, ** and *** indicate $p$-value $< 0.1$, $< 0.05$ and $< 0.01$.

## A.4 Comparison with other findings in the literature

The table below compares the results of this paper to previous findings in the literature. See Figure 2(a) for a discussion of these findings.

Table 4: Comparison with other papers

| Paper | expected payoffs (normalized) | elicitation method | value of $p$ | % *In* of A players | % *Meet* of B players |
|---|---|---|---|---|---|
| **McCabe et al. (2003)** | (5,5) if *Out* | direct response method | $p = 0$ | — | 33.3% |
| | (6.25, 6.25) if (*In*, *Meet*) | | $p = 1$ | 63.0% | 64.7% |
| | (3.75, 7.5) if (*In*, *Take*) | | | | |
| **Cox & Deck (2006)** | (5,5) if *Out* | direct response method | $p = 0$ | — | 35.0% |
| | (7.5, 12.5) if (*In*, *Meet*) | | $p = \frac{3}{4}$ | 33.9% | 55.0% |
| | (0, 20) if (*In*, *Take*) | | $p = 1$ | 50.0% | 63.6% |
| **Charness & Dufwenberg (2006)** | (5,5) if *Out* | strategy method | $p = 1$ | 55.6% | 44.4% |
| | (10, 10) if (*In*, *Meet*) | | | | |
| | (0, 14) if (*In*, *Take*) | | | | |
| **This paper** | (5,5) if *Out* | strategy method | $p = 0$ | 47.4% | 34.2% |
| | (10, 10) if (*In*, *Meet*) | | $p = 0.7$ | 50.0% | 42.1% |
| | (2, 14) if (*In*, *Take*) | | $p = 0.8$ | 52.6% | 44.7% |
| | | | $p = 1$ | 47.4% | 50.0% |

*Notes*: Payoffs normalized so that *Out* payoffs are (5,5) in all games; normalizing factor = 4 in McCabe et al. (2003), = 2 in Cox and Deck (2006) and = 1 in Charness and Dufwenberg (2006). In the latter, A's payoff from (*In*, *Meet*) is 12 with probability $\frac{5}{6}$ and 0 with probability $\frac{1}{6}$, yielding an expected payoff of 10.

## A.5 A's optimal strategy given B's actual play

For each value of $p$, I compute A's optimal strategy given the observed proportion $\sigma_B$ of B players who choose *Meet*, first under the assumption of risk neutrality and then for small amounts of risk aversion. In the following, I assume $u(m) = \frac{m^{1-\alpha}}{1-\alpha}$ where $\alpha \in \{0, 0.2, 0.5\}$.

Table 5: B's actual play by value of $p$

| value of $p$ | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|
| *Meet* rate $\sigma_B$ | 0.342 | 0.316 | 0.316 | 0.395 | 0.342 | 0.421 | 0.421 | 0.447 | 0.474 | 0.5 |

Choosing *In* is optimal for A given $\sigma_B$ if and only if

$$[p+\frac{1}{2}(1-p)][\sigma_B u(10)+(1-\sigma_B)u(2)]+\frac{1}{2}(1-p)\cdot u(5) \geq \frac{1}{2}(1-p)[\sigma_B u(10)+(1-\sigma_B)u(2)]+[p+\frac{1}{2}(1-p)]\cdot u(5)$$

$$\Leftrightarrow \sigma_B \geq \frac{u(5) - u(2)}{u(10) - u(2)}$$

$$\Leftrightarrow \sigma_B \geq \sigma(\alpha) = \frac{5^{1-\alpha} - 2^{1-\alpha}}{10^{1-\alpha} - 2^{1-\alpha}}$$

Table 6: A's optimal strategy given B's actual play

| | Level of risk aversion | | |
|---|---|---|---|
| value of $p$ | $\alpha = 0$ | $\alpha = 0.2$ | $\alpha = 0.5$ |
| 0.1 | *Out* | *Out* | *Out* |
| 0.2 | *Out* | *Out* | *Out* |
| 0.3 | *Out* | *Out* | *Out* |
| 0.4 | *In* | *Out* | *Out* |
| 0.5 | *Out* | *Out* | *Out* |
| 0.6 | *In* | *In* | *Out* |
| 0.7 | *In* | *In* | *Out* |
| 0.8 | *In* | *In* | *Out* |
| 0.9 | *In* | *In* | *In* |
| 1 | *In* | *In* | *In* |
| $\sigma(\alpha)$ | 0.375 | 0.412 | 0.470 |

# B Data from other treatments

## B.1 Description

In this section, I present data from two other treatments excluded from the analysis of the main text because of their more complicated nature, which makes findings harder to interpret. In the baseline treatment analyzed in the main text, B does not receive any information about A's choice at the time of making a decision (*No Information* condition - $NI$). The following two treatments differ from $NI$ in what B knows about A's choice:

*Exogenous Information* ($EI$): B is exogenously informed of A's decision before making a choice.

*Costly Communication* ($COM$): Before B makes a choice, A can inform B of her true decision at a cost of 1 dollar and this is common knowledge.

As in the baseline treatment, B made decisions under the strategy method i.e. for each value of $p$ and each possible choice of A. In $EI$, B made a choice for each of the two cases, "A chose $In$" (case $EI$-$In$) and "A chose *Out*" (case $EI$-*Out*). In $COM$, B made a choice for each of the following three cases: "A paid to inform you that she chose $In$" (case $COM$-$In$), "A paid to inform you that she chose *Out*" (case $COM$-*Out*) and "A didn't pay to inform you" (*No*-$COM$).[2] Therefore, A made 11 choices in each treatment, one for each value of $p$, while B made 11 choices in $NI$, 22 choices in $EI$ and 33 in $COM$.[3] In $COM$, A also made a choice between informing and not informing B of her action for each value of $p$. A could only communicate her true action and the cost of \$1 was incurred only if B's decision affected the outcome (i.e. if $In$ was realized).

As in $NI$, B players were asked to guess the likelihood that A chose $In$ and A was asked to guess B's answer. In $COM$, B was also asked to assess the likelihood that A paid to inform B for each of the two cases (1) A chose $In$; (2) A chose *Out*. Again, A was asked to guess B's answer to these questions. Therefore, subjects answered 11 questions in total in the first two treatments and 33 questions in the last treatment. Subjects were paid according to their guess for the randomly selected value of $p$. In $COM$, one of the three blocks of questions was randomly selected for payment.[4]

[2] While both theory and introspection suggest that the A players who chose *Out* would never choose to inform B of their choice, the case $COM$-*Out* was added to address the legitimate concern that A's choice to inform B may come from experimenter demand effects rather than from A's real understanding of the game.

[3] To keep the environment symmetric between players and across treatments, A and B were asked all 11 questions. However, choices for some questions were inconsequential (i.e. when $p = 0$ for A and when $p = 1$ in case $EI$-*Out* and $COM$-*Out* for B).

[4] More precisely, subjects were paid (with equal chance) either for their answer to the first block of questions or for their answer to the second/third block, depending on A's actual choice between $In$ or *Out*. See instructions in OA-C.3 for more details.

### B.2 Dataset

With all 3 treatments, the dataset comprises 14 sessions, all conducted at the Center for Experimental Social Science (CESS) of New York University. Because the sessions conducted for $EI$ were a bit larger on average than for the other two treatments, I conducted one session less for this treatment to obtain a similar number of subjects per treatment. Sessions were longer for $COM$ than for $NI$ and $EI$; as a result, subjects in $COM$ received a \$7 show-up fee instead of \$5 in the other two treatments. It is not believed that this slight difference in show-up fee affected decisions in the game. Overall, 226 subjects participated in the experiment.

Table 7: Summary Statistics

| Treatment | # of sessions | # of pairs | Total # of obs. |
|---|---|---|---|
| No Information ($NI$) | 5 | 38 | A: 418<br>B: 418 |
| Exogenous Information ($EI$) | 4 | 36 | A: 396<br>B: 792 (= 396 × 2) |
| Costly Commmunication ($COM$) | 5 | 39 | A: 429<br>B: 1,287 (= 429 × 3) |
| Total | 14 | 113 | A: 1,243<br>B: 2,497 |

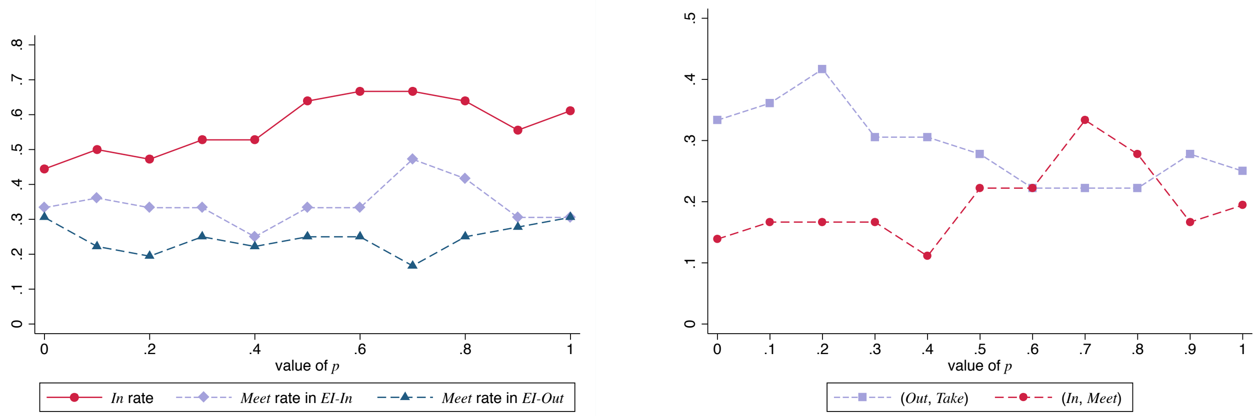
*Notes*: Choices between $In$ or $Out$ ($Meet$ or $Take$) form the unit of observation. Number of observations for B in $EI$ ($COM$) corresponds to choices for the two (three) cases $EI$-$In$ and $EI$-$Out$ ($COM$-$In$, $COM$-$Out$ and $No$-$COM$).

### B.3 Basic findings in *EI*

Figure 3 shows how prosociality is affected by the value of $p$ when B can condition his action on the action chosen by A. Panel (a) shows the $In$ rate and the $Meet$ rate (separately for $EI$-$In$ and $EI$-$Out$), while Panel (b) shows the proportion of realized Trust and No Trust profiles, ($In$, $Meet$) and ($Out$, $Take$). The $In$ rate increases from 44.4% at $p = 0$ to 61.1% at $p = 1$ ($p$-value = 0.08, one-sided $t$-test); the upward trend is however not significant. B's prosociality appears insensitive to $p$ but sensitive to whether A chose $In$ or $Out$: while 34.3% of B players choose the prosocial action when A chose $In$, the rate drops to 24.5% when A chose $Out$ ($p$-value = 0.013, two-sided $t$-test). The No Trust (Trust) profile is less (more) likely to occur when $p \geq 0.5$ compared to when $p < 0.5$, but linear trends are not significant.

Figure 3: Aggregate behavior as a function of $p$

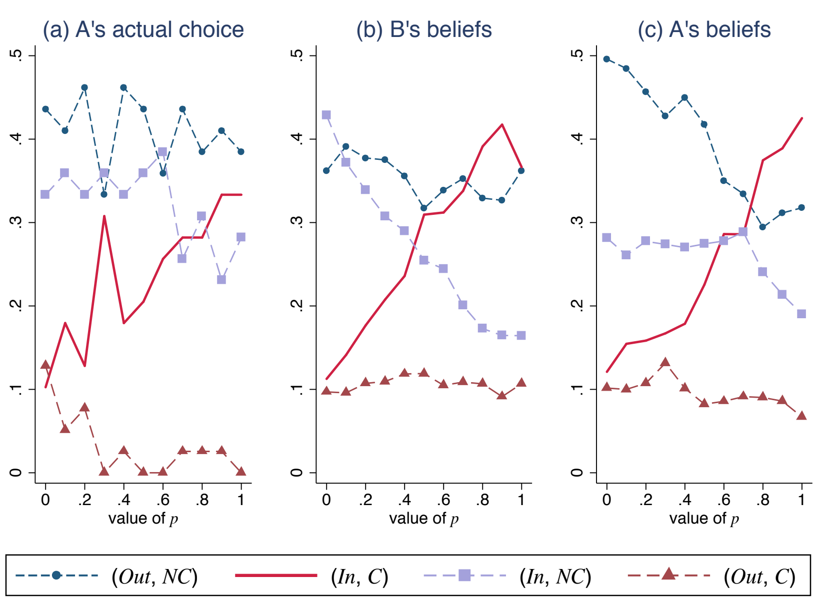
(a) Rate of prosociality by $p$ (b) Proportion of No Trust and Trust profiles by $p$




## B.4 Basic findings in *COM*

In $COM$, the A players made a choice in $\{In, Out\} \times \{C, NC\}$, where $C$ (resp. $NC$) refers to "Communication" ("No Communication"). Pooling observations across all subjects and values of $p$, A chose $(In, C)$ about 24% of the time (101/429); the corresponding choice frequencies for $(In, NC)$, $(Out, NC)$ and $(Out, C)$ were respectively, 32% (138/429), 41% (176/429) and 3% (14/429). Figure 4(a) presents the distribution of A's choices in $COM$ broken down by value of $p$.

Figure 4: Distribution of A's actual choices and beliefs thereof by value of $p$



The fraction of A players who chose $(Out, NC)$ is fairly stable across values of $p$. In contrast, the proportion of A players who communicated $In$ is globally increasing in $p$: while about 10% of the A players chose $(In, C)$ when their choice was inconsequential (i.e. for $p = 0$), more than 33% of the A players did so when their choice was implemented for sure (for $p = 1$), a difference which is highly statistically significant ($p$-value $= 0.013$ on a two-tailed $t$-test). For high values of $p$, the increase in the fraction of $(In, C)$ choices appears to have been partially compensated by a decrease in the fraction of $(In, NC)$ choices, although the overall decrease is small.[5]

Are beliefs about A's decisions consistent with the behavioral patterns observed? For each value of $p$ in $COM$, B was not only asked to form a guess $\sigma_A^*$ of how likely A chose $In$, but also to assess the likelihood that A chose to inform B in case (1) A chose $In$, and (2) A chose $Out$. Denote these subjective likelihoods respectively by $s_1^*$ and $s_2^*$. In turn, A was asked to guess B's answers to these 3 types of questions, denoted by $\sigma_A^{**}$, $s_1^{**}$ and $s_2^{**}$. From these answers, one can compute B's joint belief about A's action and communication choice ($C$ or $NC$), as well as the corresponding second-order belief of A.[6] Figure 4(b) shows B's beliefs about the distribution of choices made by A for each value of $p$, while 4(c) presents the corresponding second-order beliefs of A.

The B players correctly anticipate the monotonic pattern in A's propensity to choose $(In, C)$. Despite slightly overestimating this propensity for high values of $p$, differences between B's beliefs and A's actual choice of $(In, C)$ are not significant for any value of $p$, with an average percentage point deviation of 6.3. The A players are remarkably accurate in guessing the answers of the B players, with guesses that on average deviate from B's beliefs by 3.7 percentage points. The B (resp. A) players also predict a decrease in A's propensity to choose $(In, NC)$ (resp. in B's beliefs), although the fall predicted by B is much sharper than the actual decrease. Somewhat curiously, B overestimates A's tendency to communicate $Out$ and this is almost perfectly predicted by A. Overall, beliefs are however fairly consistent with each other and with actual behavior.

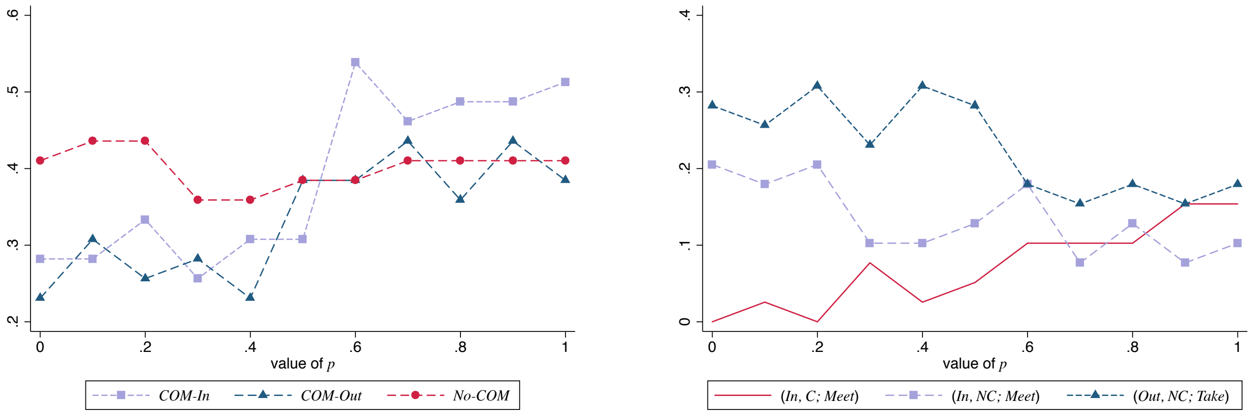
Finally, Figure 5(a) shows how the prosociality of B is affected by A's choice and the value of $p$, while Figure 5(b) looks at the effect of $p$ on outcome profiles. B is more likely to choose $Meet$ when A chose $(In, C)$ and the value of $p$ is high. The $Meet$ rate in $COM$-$In$ indeed increases from 28.2% when $p = 0$ to 51.3% when $p = 1$ ($p$-value $= 0.019$, one-sided $t$-test) and the linear trend is significant ($p$-value $= 0.02$). The B players do not seem to sanction their partner in the $No$-$COM$ case, choosing $Meet$ on average 40.1% of the time across all values of $p$, while the corresponding percentage is 38.7% in $COM$-$In$. On the other hand, B seems to punish A for signaling $Out$ rather than $In$, but the difference is not significant when averaging across all values of $p$. The Trust profile with costly communication is more likely to occur as $p$ increases, starting at 0% for $p = 0$ and reaching 15.4% at $p = 1$; the linear trend is significant ($p$-value $= 0.022$).

[5] The effect of $p$ on the probability to use the communication technology among those who chose $In$ is significant at the 10% level in a linear regression; this finding is robust to excluding observations for $p = 0$.

[6] B's belief that A chose $(Out, NC)$ is computed as $(1-\sigma_A^*)(1-s_2^*)$; the corresponding beliefs for $(In, NC)$, $(In, C)$ and $(Out, C)$ are respectively $\sigma_A^*(1-s_1^*)$, $\sigma_A^* s_1^*$ and $(1-\sigma_A^*)s_2^*$. The beliefs of A are computed in the same manner.

Figure 5: Aggregate behavior as a function of $p$

(a) Rate of prosociality by $p$ (b) Proportion of No Trust and Trust profiles by $p$



# C Instructions

## C.1 Instructions for the baseline treatment ($NI$)

You are about to participate in an experiment on decision-making. You will receive 5 dollars for your participation, irrespective of your decisions. You may also receive additional earnings depending partly on your decisions, partly on the decisions of others, and partly on chance. You will be paid with a cash voucher, privately at the end of the session.

Please turn off cellular phones and similar devices now. All interactions between you and other participants will take place through your computer terminals. Please do not talk or in any way try to communicate with other participants during the session. If you have anything on your table, please place it back in your bag.

During the instruction period, you will be given a description of the main features of the session and will be shown the computer interface. If you have any questions during the period, raise your hand and your question will be answered so everyone can hear.

The experiment has 2 parts; we will start with instructions for part 1. Once this part is over, instructions for part 2 will be distributed to you. Your decisions in part 1 will have no impact on your earnings in part 2.

### Instructions for Part 1

All participants will be randomly assigned a role, either A or B, for the entire session (part 1 and 2). You will interact with one participant in the other role; the participant you are matched with will be selected at random.

Participants will in turn make a choice between two options:

- First, participants in role A will choose between *In* or *Out*.

- Second, participants in role B will choose between *Up* or *Down*.

If A chooses *Out*, the interaction ends. Both A and B receive 5 dollars.

If A chooses *In*, payoffs depend on B's decision:

- If B chooses *Up*, A receives 2 dollars and B receives 14 dollars.

- If B chooses *Down*, both A and B receive 10 dollars.

However, before participants make a decision, **a computer will randomly determine whether A's decision is implemented or not**:

- If A's decision is implemented, then this is the final decision faced by B.

- If A's decision is not implemented, then the final decision faced by B will be determined by a random choice of the computer.

The computer will select *In* and *Out* with equal chance. More precisely, the computer will simulate a coin toss: if heads comes up, *In* will be selected while if tails comes up, *Out* will be selected.

B will be asked to make a choice without knowing whether *In* was the final decision. However, since B's decision can only impact payoffs if *In* was indeed the final decision, B should make a choice accordingly.

The percentage chance $p$ that A's decision gets implemented will be randomly selected among the options **0, 10, 20, 30, 40, 50, 60, 70, 80, 90 or 100%.** For instance:

- If $p = 0$, then B will face the computer's choice for sure.

- If $p = 100$, then B will face A's decision for sure.

- If $p = 40$, then B will face A's decision with a 40% chance and the computer's choice with a 60% chance.

Note that for any value of $p$ between 10 and 90, assuming *In* was the final decision, B will not know whether A chose *In* and A's decision was implemented OR the computer chose *In* and replaced A's decision.

However, note that **B is more likely to face A's decision as the value of $p$ increases**: when $p$ is small, the final decision faced by B is more likely to come from the computer while when $p$ is large, it is more likely to come from A.

In order to determine whether A's decision gets implemented, the computer will randomly draw a number between 1 and 100. For instance, if $p$ is 70%, then:

- A's decision will be implemented if the computer draws any number from 1 to 70 included.

- A's decision will not be implemented if the computer draws any number from 71 to 100 included.

You will not know the value of $p$ while making your decision. Instead, we will ask you to **make a choice for each possible value of $p$ between 0 and 100**. Thus, if you are in role A (resp. role B), you will make a choice between *In* or *Out* (resp. *Up* or *Down*) for each possible percentage chance that your (resp. A's) decision gets implemented.

After the decisions have been made, the computer will randomly select the value of $p$ that will count for payment. All values have equal chance to be selected. For instance, suppose that the randomly selected value of $p$ is 20, meaning A's decision is implemented with a 20% chance. Then A and B will be paid according to their choice for the case corresponding to $p = 20$.

You will not receive any feedback about actions or earnings between part 1 and 2. At the end of the experiment, you will only know how much you earned in total (part 1 and 2).

**To summarize:**

Step 1: A makes a choice between *In* or *Out* for each possible value of $p$, which is the percentage chance that her decision gets implemented.

Step 2: B makes a choice between *Up* and *Down* for each possible value of $p$.

Step 3: Finally, payoffs are determined according to the selected value of $p$:

1. If A's decision is implemented, payoffs are determined according to A's and (possibly) B's choice for the selected value of $p$:

2. If A chooses *Out*, both A and B get 5 dollars, irrespective of B's decision.

   (a) If A chooses *In*, payoffs depend on B's decision: if B chooses *Up*, A gets 2 dollars and B gets 14 dollars; if B chooses *Down*, both A and B get 10 dollars.

3. If A's decision is not implemented, payoffs are determined according to the computer's choice and (possibly) B's choice for the selected value of $p$:

   (a) If the computer selects *Out*, both A and B get 5 dollars, irrespective of B's decision.

   (b) If the computer selects *In*, payoffs depend on B's decision: if B chooses *Up*, A gets 2 dollars and B gets 14 dollars; if B chooses *Down*, both A and B get 10 dollars.

Information about decisions and earnings is summarized in the table below:

| | A gets | B gets |
|---|---|---|
| If *Out* is the final decision (bullet 1(a) or 2(a)) | 5 | 5 |
| If *In* is the final decision (bullet 1(b) or 2(b)) and B chooses *Up* | 2 | 14 |
| If *In* is the final decision (bullet 1(b) or 2(b)) and B chooses *Down* | 10 | 10 |

## Instructions for Part 2

We will now ask you to make guesses about the choices or beliefs of the participant you interacted with during part 1.

If you are in role B:

We will ask you to tell us for each of the possible values of $p$, **how likely you think A chose *In*.** Thus, you will answer 11 questions in total, one for each value of $p$ between 0 and 100.

You will be paid according to your answer to the **question which corresponds to the realized value of $p$**. For instance, if the selected $p$ was 80, you will be paid according to your answer to the question: "How likely do you think A chose *In* if her decision is implemented with a 80%

chance?". You can earn 5 dollars for your answer to this question.

To determine your payment, we use a method under which you maximize your chances of winning 5 dollars by submitting what you truly believe are the chances that A chose $In$. More precisely, your compensation will be determined as follows:

1. You will first tell us how likely you think A chose $In$ by picking a number among the options $\{0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100\}$. For example, if you pick 60, this means that you think there is a 60% chance that A chose $In$.

2. Second, the computer will randomly draw a number between 0 and 100.

3. If the random number is equal or smaller than the number you submitted, then you will receive 5 dollars if A indeed chose $In$. For example, say that the random number is 24 and that you thought A was 60% likely to choose $In$. Because the number you submitted (60) is higher than the random number (24), you will receive 5 dollars if A indeed chose $In$ and 0 if she chose $Out$.

4. If the random number is higher than the number you submitted, then you will receive 5 dollars with the probability determined by the random number. In other words, in that case, the chances that you receive 5 dollars are equal to the random number. For example, say that you thought A was 80% likely to choose $In$ and the random number picked by the computer is 88; because the number you submitted (80) is lower than the random number (88), you will receive 5 dollars with a 88% chance.

   What should you do when answering the question: "How likely do you think A chose $In$"? The best you can do is to choose the number that is closest to how likely you think A chose $In$. Indeed, suppose for example that you believe there is a 60% chance that A chose $In$ but you choose to select 40. Then you will regret your choice if the computer for instance selects 50. Since the random number (50) is higher than the number you submitted (40), you will earn 5 dollars with a 50% chance. On the other hand, if you had declared 60, you would have earned 5 dollars in case A indeed chose $In$, which you think has a 60% chance to occur.

If you are in role A:

The B you were matched with was asked to tell us how likely he thinks you chose $In$ for each of the possible values of $p$, making 11 questions in total. For each question, B could choose a number among the options $\{0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100\}$. For example, if B picked 30 for $p = 40$, this means that B thought you were 30% likely to choose $In$ if your decision is implemented with a 40% chance.

For each of the 11 questions, we ask you to **guess B's answer**. You will be paid 5 dollars if you guess correctly B's answer to the **question which corresponds to the realized value of** $\boldsymbol{p}$. For instance, suppose that the realized value of $p$ is 40 and that B picked 30 for this case. Then you will receive 5 dollars if you choose 30 and nothing for any other number.

## C.2 Part 1 of the instructions for treatment $EI$ (see $NI$ for Part 2)

You are about to participate in an experiment on decision-making. You will receive 5 dollars for your participation, irrespective of your decisions. You may also receive additional earnings depending partly on your decisions, partly on the decisions of others, and partly on chance. You will be paid with a cash voucher, privately at the end of the session.

Please turn off cellular phones and similar devices now. All interactions between you and other participants will take place through your computer terminals. Please do not talk or in any way try to communicate with other participants during the session. If you have anything on your table, please place it back in your bag.

During the instruction period, you will be given a description of the main features of the session and will be shown the computer interface. If you have any questions during the period, raise your hand and your question will be answered so everyone can hear.

The experiment has 2 parts; we will start with instructions for part 1. Once this part is over, instructions for part 2 will be distributed to you. Your decisions in part 1 will have no impact on your earnings in part 2.

### Part 1: General Instructions

All participants will be randomly assigned a role, either A or B, for the entire session (part 1 and 2). You will interact with one participant in the other role; the participant you are matched with will be selected at random.

Participants will make a choice in sequence between two options:

- First, participants in role A will choose between $In$ or $Out$.

- Second, participants in role B will choose between $Up$ or $Down$.

If A chooses $Out$, the interaction ends. Both A and B receive 5 dollars.

If A chooses $In$, payoffs depend on B's decision:

- If B chooses $Up$, A receives 2 dollars and B receives 14 dollars.

- If B chooses $Down$, both A and B receive 10 dollars.

However, before participants make a decision, **a computer will randomly determine whether A's decision is implemented or not**.

- If A's decision is implemented, then this is the final decision faced by B.

- If A's decision is not implemented, then the final decision faced by B will be determined by a random choice of the computer.

  The computer will select *In* and *Out* with equal chance. More precisely, the computer will simulate a coin toss: if heads comes up, *In* will be selected while if tails comes up, *Out* will be selected.

B will be asked to make a choice for each of the following two cases:

- CASE 1: The final decision was *In* and A chose *In*.

  In this case, either A's decision was implemented or the computer drew *In* and replaced A's decision.

- CASE 2: The final decision was *In* and A chose *Out*.

  Note that in this case, the computer must have drawn *In* and replaced A's decision.

If CASE 1 occurs, then payments will be determined by B's choice in CASE 1.
If CASE 2 occurs, then payments will be determined by B's choice in CASE 2.

B will be asked to make a choice without knowing whether *In* was the final decision, or whether A chose *In* (CASE 1) or A chose *Out* (CASE 2). However, since B's decision in either case can only impact payoffs if this case occurs, B should choose accordingly.

The percentage chance $p$ that A's decision gets implemented will be randomly selected among the options **0, 10, 20, 30, 40, 50, 60, 70, 80, 90 or 100%.** For instance:

- If $p = 0$, then B will face the computer's choice for sure.

- If $p = 100$, then B will face A's decision for sure.

- If $p = 40$, then B will face A's decision with a 40% chance and the computer's choice with a 60% chance.

Notice that **B is more likely to face A's decision as the value of $p$ increases**: when $p$ is small, the final decision faced by B is more likely to come from the computer while when $p$ is large, it is more likely to come from A.

In order to determine whether A's decision gets implemented, the computer will randomly draw a number between 1 and 100. For instance, if $p$ is 70%, then:

- A's decision will be implemented if the computer draws any number from 1 to 70 included.

- A's decision will not be implemented if the computer draws any number from 71 to 100 included.

You will not know the value of $p$ while making your decision. Instead, we will ask you to **make a choice for each possible value of $p$ between 0 and 100**. Thus, if you are in role A (resp. role B), you will make a choice between *In* or *Out* (resp. *Up* or *Down*) for each possible percentage chance that your (resp. A's) decision gets implemented.

After the decisions have been made, the computer will randomly select the value of $p$ that will count for payment. All values have equal chance to be selected. For instance, suppose that the randomly selected value of $p$ is 20, meaning A's decision is implemented with a 20% chance. Then A and B will be paid according to their choice for the case corresponding to $p = 20$.

You will not receive any feedback about actions or earnings between part 1 and 2. At the end of the experiment, you will only know how much you earned in total (part 1 and 2).

**To summarize:**

STEP 1: A makes a choice between *In* or *Out* for each possible value of $p$, which is the percentage chance that her decision gets implemented.

STEP 2: B makes a choice between *Up* and *Down* for each possible value of $p$ and for each of the following two cases:

- CASE 1: The final decision was *In* and A chose *In*.

- CASE 2: The final decision was *In* and A chose *Out*.

STEP 3: Finally, payoffs are determined according to the selected value of $p$:

1. If A's decision is implemented, payoffs are determined according to A's and (possibly) B's choice for the selected value of $p$:

   (a) If A chooses *Out*, both A and B get 5 dollars, irrespective of B's decision.

   (b) If A chooses *In*, payoffs depend on B's choice in CASE 1: if B chooses *Up*, A gets 2 dollars and B gets 14 dollars; if B chooses *Down*, both A and B get 10 dollars.

2. If A's decision is not implemented, payoffs are determined according to the computer's choice and (possibly) B's choice for the selected value of $p$:

   (a) If the computer selects *Out*, both A and B get 5 dollars, irrespective of B's decision.

   (b) If the computer selects *In*, payoffs depend on B's decision in CASE 1 (CASE 2) if A chose *In* (chose *Out*): if B chooses *Up*, A gets 2 dollars and B gets 14 dollars; if B chooses *Down*, both A and B get 10 dollars.

Information about decisions and earnings is summarized in the table below:

| | A gets | B gets |
|---|---|---|
| If *Out* is the final decision (BULLET 1(a) or 2(a)) | 5 | 5 |
| If *In* is the final decision (BULLET 1(b) or 2(b)) and B chooses *Up* | 2 | 14 |
| If *In* is the final decision (BULLET 1(b) or 2(b)) and B chooses *Down* | 10 | 10 |

### C.3 Instructions for treatment *COM* (Part 1 and 2)

You are about to participate in an experiment on decision-making. You will receive 7 dollars for your participation, irrespective of your decisions. You may also receive additional earnings depending partly on your decisions, partly on the decisions of others, and partly on chance. You will be paid with a cash voucher, privately at the end of the session.

Please turn off cellular phones and similar devices now. All interactions between you and other participants will take place through your computer terminals. Please do not talk or in any way try to communicate with other participants during the session. If you have anything on your table, please place it back in your bag.

During the instruction period, you will be given a description of the main features of the session and will be shown the computer interface. If you have any questions during the period, raise your hand and your question will be answered so everyone can hear.

The experiment has 2 parts; we will start with instructions for part 1. Once this part is over, instructions for part 2 will be distributed to you. Your decisions in part 1 will have no impact on your earnings in part 2.

#### Part 1: General Instructions

All participants will be randomly assigned a role, either A or B, for the entire session (part 1 and 2). You will interact with one participant in the other role; the participant you are matched with will be selected at random.

Participants will make a choice in turn between two options:

- First, participants in role A will choose between *In* or *Out*.

- Second, participants in role B will choose between *Up* or *Down*.

If A chooses *Out*, the interaction ends. Both A and B receive 5 dollars.

If A chooses *In*, payoffs depend on B's decision:

- If B chooses *Up*, A receives 2 dollars and B receives 14 dollars.

- If B chooses *Down*, both A and B receive 10 dollars.

However, before participants make a decision, **a computer will randomly determine whether A's decision is implemented or not**.

- If A's decision is implemented, then this is the final decision faced by B.

- If A's decision is not implemented, then the final decision faced by B will be determined by a random choice of the computer.

The computer will select *In* and *Out* with equal chance. More precisely, the computer will simulate a coin toss: if heads comes up, *In* will be selected while if tails comes up, *Out* will be selected.

Before B makes a decision, A will be offered the additional option to **inform B of her actual decision at a cost of 1 dollar**, which will be subtracted from A's final payoffs. Importantly, A will only have the option to reveal the choice that she really made. Therefore, there are 3 cases:

- CASE 1: *In* was the final decision, A chose *In* and paid to inform B that she chose *In*.

- CASE 2: *In* was the final decision, A chose *Out* and paid to inform B that she chose *Out*.

- CASE 3: *In* was the final decision and A didn't pay to inform B of her actual decision. In this case, she might have chosen *In* or *Out*.

Notice that in CASE 1 or CASE 3, either A's decision was implemented or the computer drew *In* and replaced A's choice. In CASE 2, the computer must have drawn *In* and replaced A's choice.

**B will be asked to make a choice between *Up* and *Down* for each of the 3 cases**:

- If CASE 1 occurs, then payments will be determined according to B's choice in CASE 1.
- If CASE 2 occurs, then payments will be determined according to B's choice in CASE 2.
- If CASE 3 occurs, then payments will be determined according to B's choice in CASE 3.

B will make a choice without knowing whether *In* was the final decision and without knowing the decisions made by A (corresponding to CASE 1, CASE 2 or CASE 3). However, since B's decision in a given case can only impact payoffs if this case occurred, B should choose accordingly.

The percentage chance $p$ that A's decision gets implemented will be randomly selected among the options **0, 10, 20, 30, 40, 50, 60, 70, 80, 90 or 100%.** For instance:

- If $p = 0$, then B will face the computer's choice for sure.

- If $p = 100$, then B will face A's decision for sure.

- If $p = 40$, then B will face A's decision with a 40% chance and the computer's choice with a 60% chance.

Notice that **B is more likely to face A's decision as the value of $p$ increases**: when $p$ is small, the final decision faced by B is more likely to come from the computer while when $p$ is large, it is more likely to come from A.

In order to determine whether A's decision gets implemented, the computer will randomly draw a number between 1 and 100. For instance, if $p$ is 70%, then:

- A's decision will be implemented if the computer draws any number from 1 to 70 included.
- A's decision will not be implemented if the computer draws any number from 71 to 100 included.

You will not know the value of $p$ while making your decision. Instead, we will ask you to **make a choice for each possible value of $p$ between 0 and 100**. Thus, if you are in role A (resp. role B), you will make a choice between *In* or *Out* (resp. *Up* or *Down*) for each possible percentage chance that your (resp. A's) decision gets implemented. After the decisions have been made, the computer will randomly select the value of $p$ that will count for payment. All values have equal chance to be selected. For instance, suppose that the randomly selected value of $p$ is 20, meaning A's decision is implemented with a 20% chance. Then A and B will be paid according to their choice for the case corresponding to $p = 20$.

You will not receive any feedback about actions or earnings between part 1 and 2. At the end of the experiment, you will only know how much you earned in total (part 1 and 2).

**To summarize:**

STEP 1: A makes a choice between *In* or *Out* for each possible value of $p$, which is the percentage chance that her decision gets implemented.

STEP 2: A chooses whether to pay to inform B of her choice for each possible value of $p$.

STEP 3: B makes a choice between *Up* and *Down* for each value of $p$ and each of the following 3 cases:

- CASE 1: The final decision was *In*, A chose *In* and paid to inform B that she chose *In*.
- CASE 2: The final decision was *In*, A chose *Out* and paid to inform B that she chose *Out*.
- CASE 3: The final decision was *In* and A didn't pay to inform B of her choice.

STEP 4: Finally, payoffs are determined according to the selected value of $p$:

1. If A's decision is implemented, payoffs are determined according to A's and (possibly) B's choice for the selected value of $p$:

   (a) If A chooses *Out*, both A and B get 5 dollars, irrespective of B's decision.

(b) If A chooses $In$, payoffs depend on B's choice in CASE 1 or CASE 3 depending on A's choice: if B chooses $Up$, A gets 2 dollars (- 1 dollar in CASE 1) and B gets 14 dollars; if B chooses $Down$, both A and B get 10 dollars (- 1 dollar for A in CASE 1).

2. If A's decision is not implemented, payoffs are determined according to the computer's choice and (possibly) B's choice for the selected value of $p$:

   (a) If the computer selects $Out$, both A and B get 5 dollars, irrespective of B's decision.

   (b) If the computer selects $In$, payoffs depend on B's decision in CASE 1, CASE 2 or CASE 3 depending on A's choice: if B chooses $Up$, A gets 2 dollars (- 1 dollar in CASE 1 or 2) and B gets 14 dollars; if B chooses $Down$, both A and B get 10 dollars (- 1 dollar for A in CASE 1 or 2).

**A paid to inform B** (CASE 1 OR 2)

| | A gets | B gets |
|---|---|---|
| *Out* is the final decision | 5 | 5 |
| *In* is the final decision, B chooses *Down* | 9 | 10 |
| *In* is the final decision, B chooses *Up* | 1 | 14 |

**A didn't pay to inform B** (CASE 3)

| | A gets | B gets |
|---|---|---|
| *Out* is the final decision | 5 | 5 |
| *In* is the final decision, B chooses *Down* | 10 | 10 |
| *In* is the final decision, B chooses *Up* | 2 | 14 |

## Instructions Part 2

We will now ask you to make guesses about the choices or beliefs of the participant you interacted with during part 1.

IF YOU ARE IN ROLE B:

We will ask you to answer two blocks of questions. One block will be randomly selected for payment (each block with equal chance).

In BLOCK B1, we will ask you to tell us for each of the possible values of $p$, **how likely you think A chose *In*.** Thus, you will answer 11 questions in total, one for each value of $p$ between 0 and 100.

If this block is selected for payment, you will be paid according to your answer to the **question which corresponds to the realized value of $\boldsymbol{p}$**. For instance, if the selected $p$ was 80, you will be paid according to your answer to the question: "How likely do you think A chose *In* if her decision is implemented with a 80% chance?". You can earn 5 dollars for your answer to this question.

To determine your payment, we use a method under which you maximize your chances of winning 5 dollars by submitting what you truly believe are the chances that A chose $In$. More precisely, your compensation will be determined as follows:

1. You will first tell us how likely you think A chose $In$ by picking a number among the options $\{0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100\}$. For example, if you pick 60, this means that you think there is a 60% chance that A chose $In$.
2. Second, the computer will randomly draw a number between 0 and 100.
3. If the random number is equal or smaller than the number you submitted, then you will receive 5 dollars if A indeed chose $In$. For example, say that the random number is 24 and that you thought A was 60% likely to choose $In$. Because the number you submitted (60) is higher than the random number (24), you will receive 5 dollars if A indeed chose $In$ and 0 if she chose $Out$.
4. If the random number is higher than the number you submitted, then you will receive 5 dollars with the probability determined by the random number. In other words, in that case, the chances that you receive 5 dollars are equal to the random number. For example, say that you thought A was 80% likely to choose $In$ and the random number picked by the computer is 88; because the number you submitted (80) is lower than the random number (88), you will receive 5 dollars with a 88% chance.

What should you do when answering the question: "How likely do you think A chose $In$"? The best you can do is to choose the number that is closest to how likely you think A chose $In$. Indeed, suppose for example that you believe there is a 60% chance that A chose $In$ but you choose to select 40. Then you will regret your choice if the computer for instance selects 50. Since the random number (50) is higher than the number you submitted (40), you will earn 5 dollars with a 50% chance. On the other hand, if you had declared 60, you would have earned 5 dollars in case A indeed chose $In$, which you think has a 60% chance to occur.

In BLOCK B2, you will answer two separate questions for each possible value of $p$ (22 questions in total):

QUESTION 1: <u>**Suppose A chose** $In$.</u> We will ask you to tell us **how likely you think A paid to inform you that she chose** $In$.

QUESTION 2: <u>**Suppose A chose** $Out$</u>. We will ask you to tell us **how likely you think A paid to inform you that she chose** $Out$.

If this block is selected for payment, you will be paid according to your answer to the question which corresponds to **A's actual choice for the realized value of $p$**. So if A chose $In$ (resp. $Out$) for the realized value of $p$, you will be paid for your guess in QUESTION 1 (resp. 2). Since you don't know A's choice or the realized value of $p$, you should report what you truly believe is the chance that A paid to inform you for each of the two cases (A chose $In$ and A chose $Out$) and each value of $p$. In order to pay you, we will follow the exact same procedure as for BLOCK B1.

In summary, you will answer 2 blocks of questions, B1 and B2 (33 questions in total). You will be paid according to your answer for the realized value of $p$ in one of the two blocks chosen at random. You will receive either 0 or 5 dollars for the randomly selected question.

IF YOU ARE IN ROLE A:

The B you were matched with was asked 2 blocks of questions for every value of $p$:

B1: How likely do you think A chose $In$?

B2 - QUESTION 1: Suppose that A chose $In$. How likely do you think A paid to inform you that she chose $In$?

B2 - QUESTION 2: Suppose that A chose $Out$. How likely do you think A paid to inform you that she chose $Out$?

B was asked these questions for each possible value of $p$, making 33 answers in total. For each of these questions, B could choose a number among the options $\{0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100\}$. For example, if B picked 30 in B1 when $p$ is 40, this means that B thought you were 30% likely to choose $In$ if there is a 40% chance that your decision gets implemented.

For each of the 33 questions, we ask you to **guess B's answer**. To determine your payment, we will select at random either B1, B2-QUESTION 1 or B2-QUESTION 2 and you will be paid 5 dollars if you guess correctly B's answer to the **question which corresponds to the realized value of $p$**. For instance, suppose that B1 is selected for payment and that the realized value of $p$ is 40. If B picked 30 for that question, then you will receive 5 dollars if you choose 30 and nothing for any other number.

### C.4 Exit questionnaire (all sessions)

A questionnaire was administered at the end of each session in order to gather more information on subjects' decisions and understanding of the experiment. The questionnaire came right after subjects learned about their earnings; therefore, the answers to certain questions (for instance, about general trust) should be interpreted with caution. The italicized terms in parentheses at the end of each question refer to the labels used to designate each variable in the dataset. For some of the open questions (Q6 to Q10), coding variables were constructed in order to categorize answers (labelled as *codeguess* for Q6, *codingfactorsa* for Q7, *codingfactorsb* for Q8, *belief_in_pct* and *p_interact_in* for Q9, *belief_meet_pct* and *p_interact_meet* for Q10).

**Academic information**

What is your major? (*major*)
Choices: Economics, Mathematics or Physics, Social science, Humanities, Other

Which year are you in? (*year*)
Choices: freshman, sophomore, junior, senior, master

What is your GPA? (*gpa*)

**Overall understanding**

(1) How difficult to understand did you find part 1 of the experiment? (*difficulty1*)
Choices: very easy, relatively easy, relatively difficult, very difficult

(2) How difficult to understand did you find part 2 of the experiment? (*difficulty2*)
Choices: very easy, relatively easy, relatively difficult, very difficult

(3) Is there an aspect of the experiment that you found confusing? If so, which one?
(*confusing_points*)

**Motives for strategy choices and beliefs**

(4) How did you make your decisions between the two options IN/OUT or UP/DOWN? Did your decisions depend on the value of p and if so, how? (*motivationAction*)

(5) [ONLY FOR TREATMENT *COM* - SESSIONS 11-14] If you were in role A, did you ever choose to inform B of your choice? If so, were you more likely to inform B when you chose IN or when you chose OUT? Explain how you decided on whether to inform B. If you were in role B, did you play differently based on whether A paid to inform you (CASE 1 or CASE 2) compared to when A didn't pay to inform you (CASE 3)? (*informDecision*)

(6) How did you make your guesses? Which kind of information (if any) did you use in order to form a guess? (*motivationGuess*)

(7) What factors do you think mostly determined the decision of the A's to choose IN or OUT? (*factors_a*)

(8) What factors do you think mostly determined the decision of the B's to choose UP or DOWN? (*factors_b*)

(9) What do you think was the average percentage of A's who chose IN? Did you expect this percentage to vary with p? (*belief_in*)

(10) What do you think was the average percentage of B's who chose DOWN? Did you expect this percentage to vary with p? (*belief_meet*)

**Goal of the experiment**

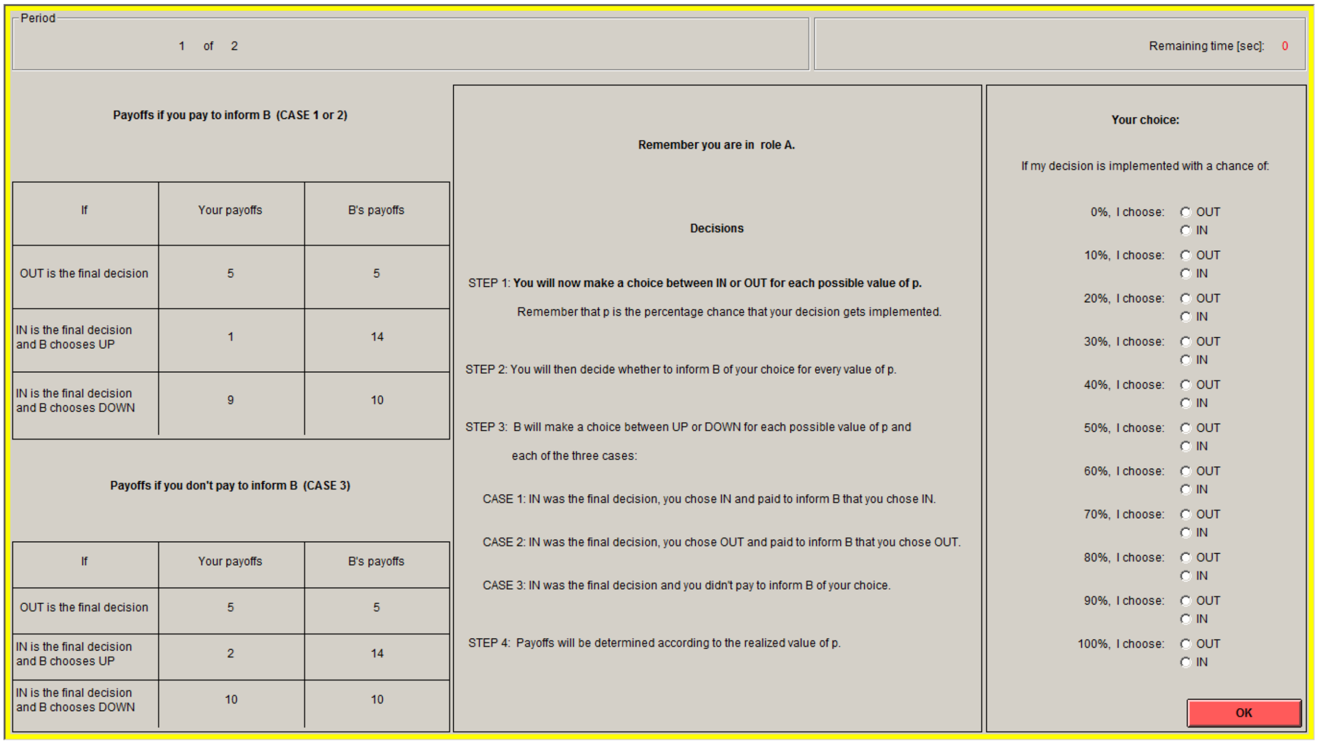
(11) What would you say the main goal of the experiment was? (*goal*)

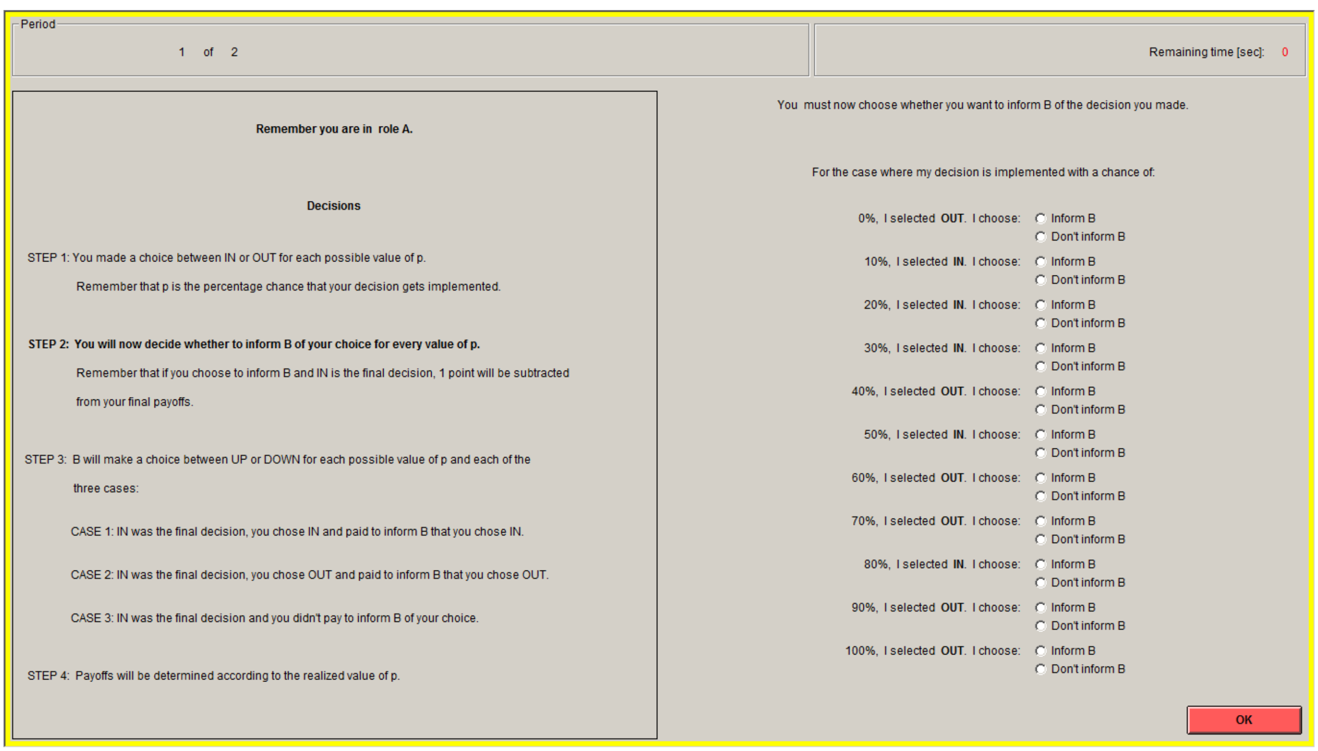
(12) Would you say that this experiment was mostly about: (*about*)
Choices: risk, altruism, trust, reciprocity, intentions

(13) Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people? (*trustWVS*)
Choices: Most people can be trusted, Can't be too careful

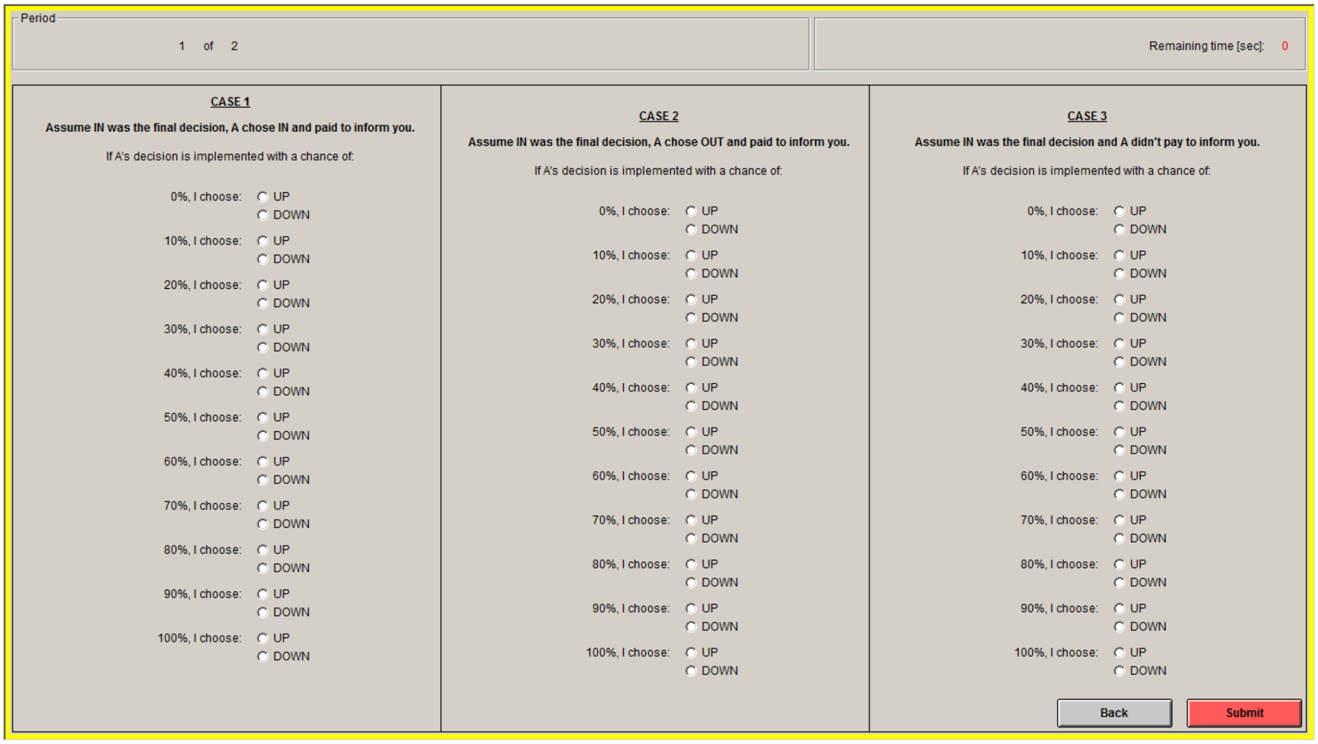
# D Screen shots for Treatment *COM*

## D.1 Action and information decision screens for A

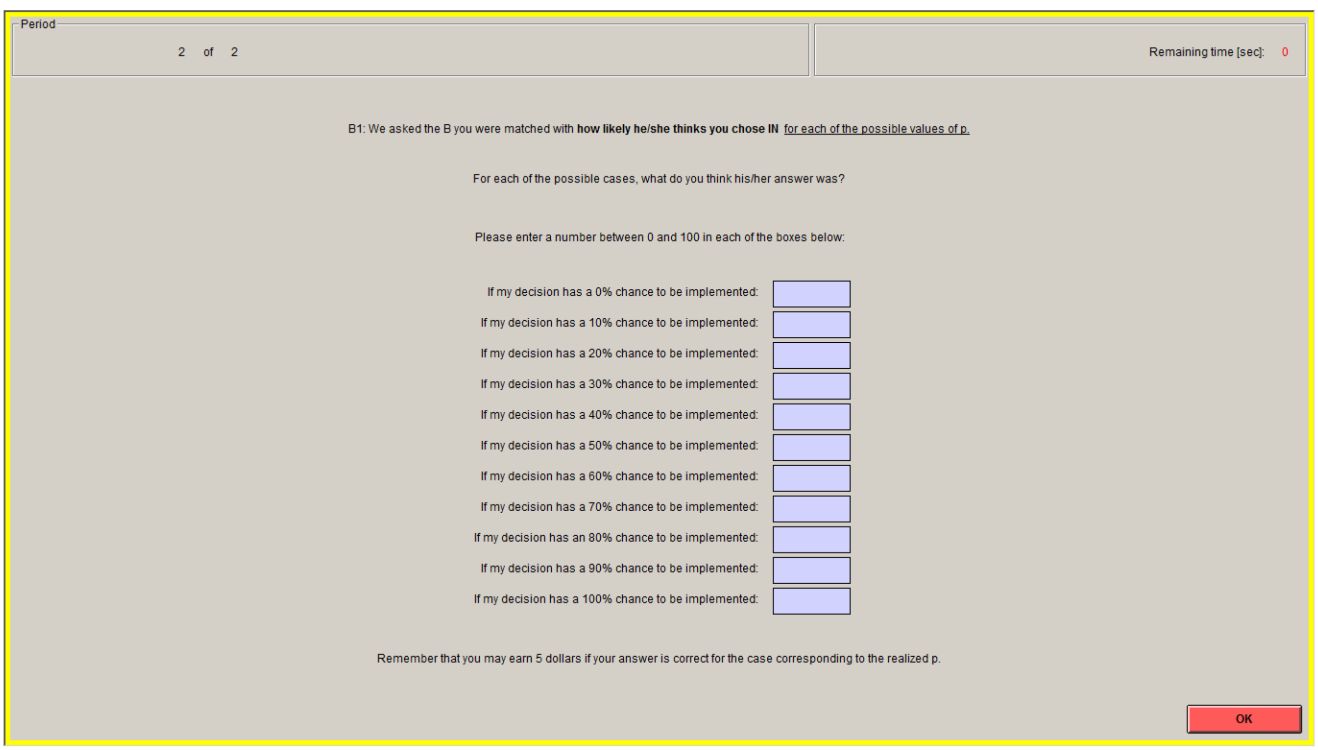


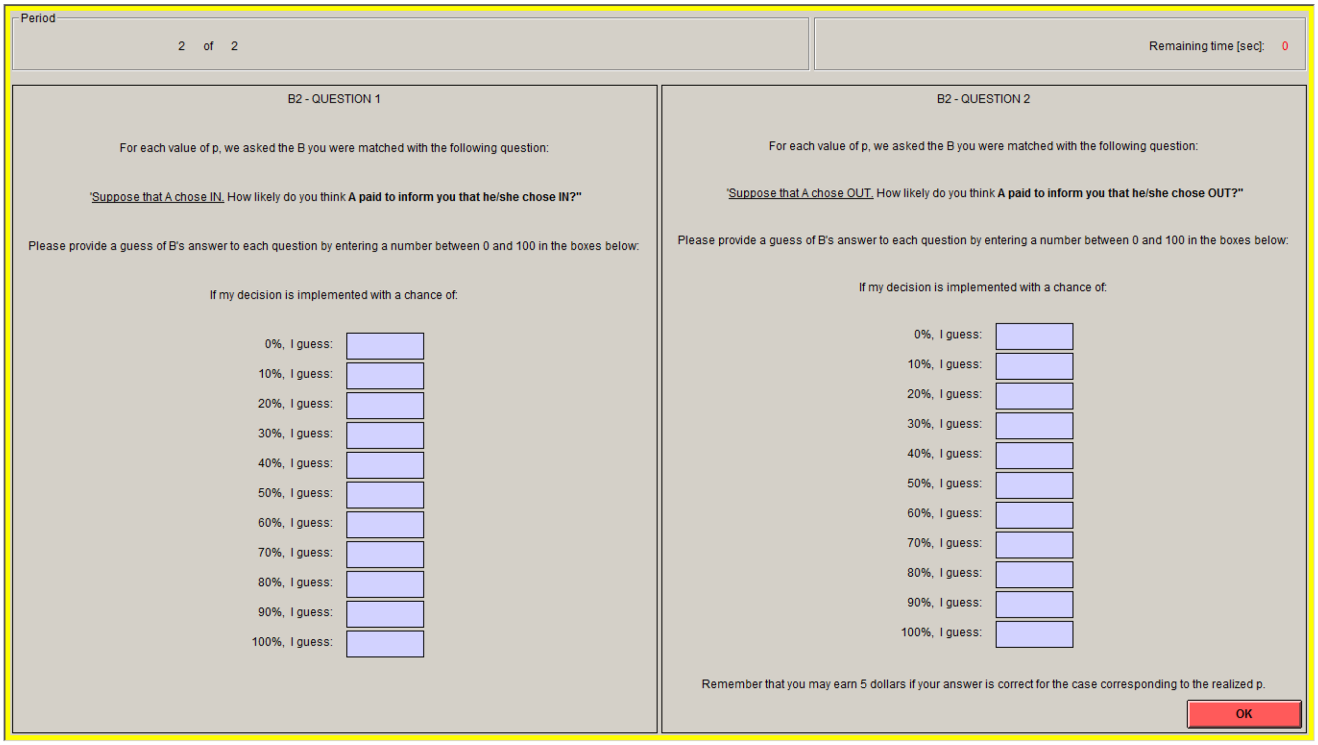



## D.2 Action screen for B




## D.3 Belief screens for A (B is similar)




Period
2 of 2
Remaining time [sec]: 0
B2 - QUESTION 1
For each value of p, we asked the B you were matched with the following question:
'Suppose that A chose IN. How likely do you think A paid to inform you that he/she chose IN?"
Please provide a guess of B's answer to each question by entering a number between 0 and 100 in the boxes below:
If my decision is implemented with a chance of:
0%, I guess:
10%, I guess:
20%, I guess:
30%, I guess:
40%, I guess:
50%, I guess:
60%, I guess:
70%, I guess:
80%, I guess:
90%, I guess:
100%, I guess:
B2 - QUESTION 2
For each value of p, we asked the B you were matched with the following question:
'Suppose that A chose OUT. How likely do you think A paid to inform you that he/she chose OUT?"
Please provide a guess of B's answer to each question by entering a number between 0 and 100 in the boxes below:
If my decision is implemented with a chance of:
0%, I guess:
10%, I guess:
20%, I guess:
30%, I guess:
40%, I guess:
50%, I guess:
60%, I guess:
70%, I guess:
80%, I guess:
90%, I guess:
100%, I guess:
Remember that you may earn 5 dollars if your answer is correct for the case corresponding to the realized p.
OK

# E Exit questionnaire

Below is a list of selected comments made by subjects at the end of the experiment. In all treatments, subjects were asked to explain whether and why their decision depended on the value of $p$. In treatment $COM$, subjects in role A were also asked to explain whether and why they chose to communicate their action and subjects in role B were asked to explain whether their decision was affected by A's communication choice. The entire list of comments is available from the author upon request.

## E.1 Comments of subjects in role A

- "Firstly, the role of A meant that I had the lower hand in this experiment. My decisions depended on the value of p. When p was equal to 50 or higher, I chose OUT in order to increase my chances of earning \$5 over \$2 (assuming that every individual is looking out for her/himself). As p lowered, I gave my partner the benefit of the doubt, hoping that he or she would choose DOWN." (ID 2, Session 3, $NI$)

- "When p is small, I take the risk of choosing IN, because I knew that B would most probably choose DOWN, since he/she has nothing to lose if he/she chooses DOWN, but I still wanted to take a chance and choose IN just in case the person wanted to choose UP. However, when p is big, I could not risk loosing money, so I had to choose OUT." (ID 12, Session 3, $NI$)

- "I thought that if my decision was less likely to be implemented, I would choose IN - I was in Role A and IN was a risky decision for me, so it would be more beneficial for me to just get 5 dollars than risk getting 2 dollars while trying to get 10. If, on the other hand, my decision was more likely to be implemented, I'd choose OUT since that is a relatively safe way to get 5 dollars. My earnings weren't as big as I expected though, so maybe that wasn't the best approach." (ID 8, Session 2, $EI$)

- "I was side A so I had a slight disadvantage compared to side B. I choose a risk averse method with most of my choices resulting in OUT. The higher the p, the more likely I was to choose OUT. At lower values of p, my choice was less likely to be chosen so I went with IN." (ID 16, Session 4, $EI$)

- "I informed my partner of my decision for those cases that I chose IN. I felt this would encourage my partner to show generosity rather than act selfishly by showing them that I had appealed to their good nature instead of making the more cynical decision. However, in cases where I chose OUT, I saw no advantage to informing my partner of the decision, as I was basically making the assumption by choosing OUT that they would act selfishly." (ID 4, Session 2, $COM$)

- "I made my decisions IN/OUT according to the value of p in that the less likely I was able to implement my decisions, I was more inclined to choose OUT, however if there was a substantial amount of chance in my decision being implemented, I automatically chose IN, because I would count on the hope that I could have a higher payoff. I didn't inform B of my choice until the p was high enough for me to think that I had sufficient control in my decisions being implemented, because I found that that it might be a waste of my payoff earning." (ID 6, Session 3, $COM$)

- "I chose to inform B when I chose IN because I wanted to look like I was willing to help them out, I guess? But when I chose OUT I didn't tell them because it would always result in them earning less money. So I think I wanted them to be motivated to press DOWN in cases where they knew I chose IN. Not sure if this is logical or not but it's how I was thinking." (ID 5, Session 4, $COM$)

- "I did not pay to inform B of my choice in any case (unless my memory fails me) because the system did not actually take this into account in real time. If this game were strategy based, where player B knew my decicions before making their own, I might have informed them, but since my choices had no impact on theirs it did not matter to me and I did not want to lose $1 of my potential earnings." (ID 6, Session 4, $COM$)

- "I sometimes chose to inform B when I chose IN to maybe sway him not to choose the payoff best for him in hopes we could both come out with almost equal payoffs." (ID 17, Session 5, $COM$)

### E.2 Comments of subjects in role B

- "The higher the value of p, the more likely i was to put up because a would be reluctant to choose in." (ID 14, Session 1, $NI$)

- "If A's choice is implemented and A chose in, I would appreciate A's decision and choose down. If p is higher than 80, which means A's choice is more likely to be implemented, i choose down." (ID 21, Session 1, $NI$)

- "I was B so I tried to guess what they liklihood I thought A was to choose In or Out, and then in an effort to maximize both earnings (trying not to short-change A) I picked DOWN for all p values but 0, 10, and 20." (ID 13, Session 2, $NI$)

- "The higher the probablilty the more frequently I decided to go with Up because it would befinit me more than choosing Down would. When p was very low, I put down and as p got larger, I chose up instead." (ID 10, Session 3, $NI$)

- "My choices for up/down did depend on the value of p. If the value of p was low, I was more inclined to choose the up because I would receive a higher payoff. If the value of p was high, I chose down because the decision was greatly impacted by A. Thus, A would not want a higher payoff for me, so I chose the decision with equal payoff for the both of us." (ID 9, Session 4, $NI$)

- "My decisions depended on the value of p in that if A chose out and his decision defninitely was going to be implemented, I was more likely to choose down because my decision would not have mattered. The higher the probability that in would be the result, the more certain I was to choose up." (ID 14, Session 1, $EI$)

- "I tried to cover myself, in case ROLE A proved to be more selfish than I anticipated, and chose UP/DOWN accordingly with what I felt ROLE A deserved. So if ROLE A chose to be IN and her decision would be implemented with a chance of 100%, it seemed to me that I should choose DOWN as they were cooperative, and thus in my opinion, more deserving of their share. If I thought they would choose OUT then I would pick UP, in order to sway the profit my way." (ID 19, Session 3, $EI$)

- "My decisions were influenced by p only for when p=100 and p=90 and wanted to reward the corresponding A. All other decisions were made out of self-interest." (ID 8, Session 4, $EI$)

- "I made my decisions between up and down depending primarily on the value of p and cases. In case 1 I put down for half and up for the other half. I figured that the higher the chance of A's choice being implemented the more likely they were to choose in and simultaneously I wanted my decision to be mutually beneficial so I chose down so in that case, if it was chosen, we would both recieve ten dollars. However, for lower p values, where it depended less on A's choice, I did not feel that obligation and chose up to increase my own winnings." (ID 13, Session 4, $EI$)

- "It depended on how sure I was of A's choice. If I knew A was going to choose out, my decision of up/down did not matter. If I knew A was going to choose in, my decision depended on the value of p (how sure I was that the final decision was going to be \"in\") and hence, how likely my decision was going to matter. I chose to put down for some of the higher options because I felt uncomfortable with the fact that I would be earning more money at the expense of someone else, however the temptation of earning that extra money 'for sure' at 100% in was too great." (ID 20, Session 2, $COM$)

- "I made my decisions on the likelihood of getting a higher payout. As B, I chose up or down based on p and the probability of my decision mattering (ie. if A chose in or out, if A chose out and the probability of it being out was high, then my decision did not matter as much but I chose up or down still based on whichever would give me a higher payout if the decision was in).”

- “I played differently based on whether A paid to inform me because if A informed me that they chose out, then we both make the same amount in the end. If A did not pay to inform me, then I assume A chose out or there was high probability of the final decision being out or A chose in and did not want to risk me choosing up ( vs. down where they would not have made as much payout)” (ID 4, Session 5, $COM$)