Can aversion to inequity trump strategic dominance?*

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Abstract

We test experimentally theories of social preferences in strategic situations. We focus on a conflict between strategic dominance and inequity aversion in 2×2 normal-form games, in which both players have a dominant strategy, both earn different payoffs in equilibrium, and most deviations hurt both players. Virtually everybody follows dominance when aligned with inequity aversion, but the selection of the dominant action decreases with the equilibrium-payoff difference between subjects. That inequity concerns may trump strategic dominance represents a strong evidence for other-regarding motives. However, the documented degree of prosocial concerns is considerably lower than in other contexts. This can be mostly attributed to players in the disadvantageous position in equilibrium.

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1 Introduction

Many scholars now agree that people exhibit other-regarding concerns that affect human behavior in a great variety of relevant socio-economic contexts such as market interaction, bargaining, wage-setting, cooperation and collective action among many others (see e.g. Fehr et al. (1993), Fehr and Fischbacher (2002) for examples). Other-regarding preferences are particularly relevant in game-theoretical applications, since the knowledge of the incentive structure is a necessary condition for the equilibrium analysis of behavior in games (Aumann and Brandenburger, 1995).

Prosocial motives have been typically tested in contexts such as bargaining, cooperation, public goods, trust games, etc. (Camerer, 2003). Analyzing such contexts have set ground for many theories of social preferences. However, in these situations, someone typically benefits from non-selfish behavior. The question we raise in this study is whether people exhibit social concerns even in situations, in which everybody is hurt by prosocial behavior.

This paper focuses on a conflict between aversion to inequity and strategic dominance in $2 \times 2$ normal-form games with dominant action for both players that do not present features of social dilemmas inherent in e.g. the Prisoner’s Dilemma. Inequity aversion represents one of the central models of social preferences. It claims that people care not only about their own payoff but also about the payoff distribution in the society and they dislike inequity (Bolton, 1991; Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000). In this study, we apply the Fehr and Schmidt (1999; FS, hereafter) variation for two reasons. First, it allows for easy parametrization and the parameters have a straightforward interpretation. Second, the literature has mostly estimated the FS parameters of social preferences.

As for strategic dominance, it is an extremely simple solution concept, typically the first treated in textbooks and courses of game theory. In fact, strategic dominance in $2 \times 2$ normal-form games is such a natural concept that it is not typically tested experimentally in non-social-dilemma situations. Almost all our participants follow the dominance criterion in our game, in which inequity aversion and strategic dominance are aligned (see below). Therefore, if inequity aversion prevents people from selecting dominant actions in such games, it would represent strong evidence for other-regarding motives.

To this aim, we design three simple two-player $2 \times 2$ games with dominant strategies for both players, in which the dominant action represents the only theoretical prediction according to most reasonable criteria, including Nash, maximin, efficiency, or level-$k$. The three games differ in the payoff difference between the two players in the predicted equilibrium, ranging from (almost) none to a large one (see Figure 1). Moreover, most deviations actually hurt both players and any deviation—be it unilateral or bilateral—hurts both players in one of our games. We then conduct an experiment to test whether people switch from the dominant action as we widen the equilibrium payoff gap.

\[\text{Figure 1}\]

\[\text{Figure 1}\]

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\[1\] Since we focus on simple two-person games, the conclusions of our study extend directly to other models of other-regarding motives such as Bolton and Ockenfels (2000), Charness and Rabin (2002), Falk and Fischbacher (2006) to mention a few.

\[2\] The closest to our analysis we have found is Costa-Gomes et al. (2001) who test several $2 \times 2$ dominance-solvable games. However, only one player has a dominant strategy in their games.
We report two main findings. First, we observe a decreasing association between the payoff difference in equilibrium and the frequency of the dominant action. As mentioned above, virtually nobody selects the dominated action when the difference between the payoffs is very low (∼3% of the lower payoff in the equilibrium) while roughly 30% of the same subjects switch to the dominated action when the payoff difference represents 500% of the lower equilibrium payoff. This provides a strong evidence that prosocial motives play an important role in human decision making, with direct implications for game theory and the role of prosocial motives in equilibrium structure of strategic situations.

These observations notwithstanding, our second result shows that the magnitude of deviations from dominant actions is starkly lower than predicted by the estimated distributions of social concerns in other contexts. The majority of people still selects the dominant action even if it generates very large payoff differences between individuals, compared to other studies. The contrast between the documented low level of social concerns and that reported in the literature is mainly due to the players who are in the disadvantageous situations in the equilibrium. Their behavior is actually never different from those subjects favoured by the equilibrium payoffs, contradicting the assumption of several other-regarding models that claim that people dislike disadvantageous inequality more. However, the favoured individuals still often deviate from the dominant strategy, in line with the evidence that people also dislike favorable inequality (see e.g. Andreoni and Miller, 2002 or Bellemare et al., 2008). This latter result illustrates that incorporating other-regarding concerns into games requires additional empirical work in contexts that differ from those typically employed while testing social preferences, such as social dilemmas, trust- and reciprocity-involving situations and the like.

The remainder of the paper is structured as follows. The next section describes our experimental design. Section 3 contains the experimental hypotheses and the results are presented in Section 4. The last section concludes.

2 Experimental design

A total of 69 (35 female) participants were recruited using the ORSEE recruiting system (Greiner, 2015) in two sessions in May 2016. We ensured that no subject had participated in any similar experiment involving normal-form games in the past. The sessions were conducted in the Laboratory of Experimental Analysis (Bilbao Labean; http://www.bilbaolabean.com) at the University of the Basque Country, Spain, using z-Tree software (Fischbacher, 2007). Subjects were given instructions explaining one example of a 2 × 2 game (different from those used in the experiment; see the instructions), how they could make their choices, the matching procedure, and the payment method. The instructions were read aloud. Subjects were allowed to ask any questions they might have during the whole instruction process. Afterwards, they had to answer several control questions on the computer screen to be able to proceed. An English translation of the instructions can be found in the Appendix.

3In Section 3, we compare our results with the estimates of Bellemare et al. (2008), Cabrales et al. (2010), and Blanco et al. (2011).

4To maximize the number of observations, our matching protocol permitted us to have an uneven number of subjects. See below for details.
After the instruction process and the control questions, the subjects were randomly selected to play as either a row or column player, the role being kept constant during the whole experiment. As both roles were visualized from the row player perspective, they were never informed about their role but they were assured that they play against a real player. In the actual experiment, each subject faced sequentially five 2 × 2 games depicted in Figure 1: (i) three games in which both players have a strictly dominant strategy with large (Game 1), intermediate (Game 2), and low (Game 3) payoff differences in the equilibrium, (ii) one coordination game (Game 4), and (iii) a Prisoner’s Dilemma. Our main objective is to analyze the behavior in Games 1 – 3; the other two games were played last and added to analyze whether failing to select the dominant actions in Games 1 – 3 can be linked to the behavior in either Game 4 (payoff vs. risk dominance) or 5 (cooperation). Subjects made their choices game by game and they have never received any feedback until the end of the experiment. They were never allowed to leave a game without making a decision and get back to it later, and they never knew which games they would face in later stages. Our design minimizes reputation concerns and learning as far as possible and the behavior of each individual in each game can be considered as an independent observation. There was no time constraint and the participants were not obliged to wait for others while making their choices in the five games.

<table>
<thead>
<tr>
<th>Game 1: Large</th>
<th>Game 2: Intermediate</th>
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<tbody>
<tr>
<td>N,E,MM,Lk</td>
<td>N,E,MM,Lk</td>
</tr>
<tr>
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<tr>
<td>1.8, 3.2</td>
<td>4.2, 3.0</td>
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<tr>
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<th>Game 4: Pris. Dilemma</th>
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</tr>
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<td>N,E,MM,Lk</td>
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<tr>
<td>6.4, 6.6</td>
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<tbody>
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<td>P-DN,E</td>
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<td>7.1, 7.1</td>
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<tr>
<td>R-DN,MM</td>
</tr>
</tbody>
</table>

Figure 1: Experimental games with theoretical predictions: N = Nash, E = efficient, MM = maximin, Lk = level-k, P-DN = payoff-dominant Nash, R-DN = risk-dominant Nash.

There were two treatments differing solely in the sequence of the games. Since Games 1 and 2 are the most relevant for our analysis and the behavior in early games may potentially influence behavior in later stages, we made sure that each of these two games was played first in one session. Hence, the order in Treatments 1 and 2, respectively, was Games 1, 2, 3, 4, 5 and 2, 1, 3, 4, 5. Since we find no differences in behavior between the two sequences in Games 1 – 3, we pool the data from both treatments in Section 4.\(^5\)

Once everybody has made all the decisions, participants were randomly paired and one game was chosen randomly for each pair. The behavior of

\(^5\)Using the Wilcoxon rank-sum test, \(p = 0.231, 0.758, \) and \(0.148\) in Games 1 – 3, respectively. The same holds if we study the row and column players separately.
both players in the selected game determined their payoffs. The matching protocol was programmed so that, if an uneven number of subjects showed up, the remaining individual was matched with a randomly chosen subject and the behavior of the latter in the game selected for the former was used to determine the payoff of the remaining subject. The payment details were explained during the instruction process. Before the payment, all subjects were asked to fill a postexperimental questionnaire, aimed at eliciting subjects heterogeneity.

Each session lasted approximately 45 minutes and subjects earned on average 8.5 Euros ($9.5).

3 Hypotheses

In this section, we develop the hypotheses for the behavior of subjects in Games 1–3.

3.1 Selfish preferences

Under the classic assumption, people maximize their payoffs and thus always play the dominant action, independently of their beliefs about the behavior of their opponents. Therefore, our first hypothesis is the following:

Hypothesis 1a. No subject deviates from the dominant strategy in Games 1–3.

Figure 1 shows that this prediction coincides with predictions based on other motives as playing the dominant action maximizes the sum of players’ payoffs (efficiency), corresponds to the maximin strategy, and is prescribed by level-$k$ reasoning for any $k$.

3.2 Social preferences

An alternative hypothesis is based on social preferences. As explained above, we apply the model of inequity aversion proposed by Fehr and Schmidt (1999), under which the utility of an individual is

$$u_i(x_i, x_j) = x_i - \alpha_i \max\{x_j - x_i, 0\} - \beta_i \max\{x_i - x_j, 0\},$$

where $x_i$ and $x_j$ represent the payoffs of players $i$ and $j$, respectively, and $0 \leq \beta_i < 1$ and $\beta_i \leq \alpha_i$ are the parameters measuring $i$’s attitudes toward inequity. If $\alpha_i = \beta_i = 0$, the individual is selfish and should always choose the dominant strategy (as in Hypothesis 1a). The parameter $\alpha_i$ reflects how much an individual dislikes lower payoffs and can be considered a measure of ‘envy.’ In contrast, $\beta_i$ can be interpreted as a measure of ‘guilt’ as it reflects the disutility from favorable situations. It is typically assumed that $\beta_i \leq \alpha_i$; that is, people dislike advantageous payoff distributions less than disadvantageous ones.

Under (1), Game 1–3 can exhibit a very different incentive structure as shown in Figure 2. In particular, in Game 1 the row player would deviate unilaterally from the dominant action if $\alpha_R > 0.0227$. That is, even a really small
degree of envy is sufficient to make the row player deviate from the standard prediction. Similarly, the column player would deviate unilaterally if $\beta_C > 0.683$. This restriction is considerably stronger but not impossible to satisfy. Along the same lines, the row/column player deviates unilaterally if $\beta_R > 1.167$ and $\alpha_C > 0.148$ in Game 2 and none of them should ever deviate in Game 3.

Game 1: Large

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
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<tbody>
<tr>
<td>$2 - 10.2\alpha_R, 12.2 - 10.2\beta_C$</td>
<td>$4.6 - 2\alpha_R, 6.6 - 2\beta_C$</td>
</tr>
<tr>
<td>$1.8 - 1.4\alpha_R, 3.2 - 1.4\beta_C$</td>
<td>$4.2 - 1.2\beta_R, 3 - 1.2\alpha_C$</td>
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Game 2: Intermediate

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<tbody>
<tr>
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<td>$3 - 0.2\beta_R, 2.8 - 0.2\alpha_C$</td>
</tr>
<tr>
<td>$10.2 - 6.2\beta_R, 4 - 6.2\alpha_C$</td>
<td>$4 - 0.8\beta_R, 3.2 - 0.8\alpha_C$</td>
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</table>

Game 3: Low

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>$6.4 - 0.2\alpha_R, 6.6 - 0.2\beta_C$</td>
<td>$6.8 - 0.2\alpha_R, 7 - 0.2\beta_C$</td>
</tr>
<tr>
<td>$5.2 - 1.2\alpha_R, 6.4 - 1.2\beta_C$</td>
<td>$5.6 - 1.2\beta_R, 6.8 - 1.2\alpha_C$</td>
</tr>
</tbody>
</table>

Figure 2: Games 1–3 with inequity aversion. R/C = row/column player.

We contrast these predictions with the estimations of the distribution of $\alpha$ and $\beta$ in the literature. We particularly focus on three studies for that purpose: Bellemare et al. (2008), Cabrales et al. (2010), and Blanco et al. (2011). According to Bellemare et al. (2008), between 99-100% of row and 30-50% of column players should deviate from the dominant action (if they hold equilibrium beliefs about their opponent) in Game 1, 52-98% and 11-30% in Game 2, and no one in Game 3.\textsuperscript{8} Cabrales et al.’s (2010) estimates suggest that 57% of the row and 15% of the column players should deviate from the dominant action in Game 1 and 40% of the row and 4% of the column players in Game 2, whereas no player would choose the dominated action in Game 3 independently of her role.\textsuperscript{9} The corresponding figures for Blanco et al. (2011) are 84% and 25% in Game 1, 79% and 0% in Game 2, and no one in Game 3.\textsuperscript{10} Observe that there are important differences in the estimated parameters across studies. Therefore, we develop several—quantitatively conservative—testable hypotheses:

**Hypothesis 1b.** (i) The fraction of subjects choosing the dominant strategy decreases with the equilibrium-payoff difference between the two players.
(ii) In Games 1 and 2, the selection of the dominant action should be higher for the players favoured by the equilibrium payoffs.
(iii) The fraction of subjects choosing the dominant strategy will be:

\textsuperscript{7}The conditions are $\alpha_R < -1.2$ for the row player. That is, the row player should enjoy disadvantageous positions. There is no $\beta_C$ that could make the column player to deviate.
\textsuperscript{8}We are very grateful to the authors of the paper who provided us with detailed data of their study adjusted to our student pool.
\textsuperscript{9}These numbers are calculated using data that come from the American Economic Review’s website.
\textsuperscript{10}These data were provided by Dirk Engelmann.
(a) at most 43% for the disadvantageous players and between 50-85% for the favoured players in Game 1,
(b) between 2-60% and 70-100%, respectively, in Game 2,
(c) 100% in Game 3.

4 Results

Figure 3 plots the share of individuals playing the dominant strategy in function of the difference between payoffs in the predicted equilibrium by standard game theory: 21% and 26% of row and column players, respectively, deviated from the dominant strategy in Game 1 (the largest payoff differences, represented by the rightmost points), 12% and 14% in Game 2 (intermediate payoff differences), and 0% and 6% in Game 3 (low payoff differences). The vertical lines plot the standard errors of each mean. The figure reveals that: (i) the deviation from the dominant strategy increases with the equilibrium-payoff inequality, (ii) there is virtually no difference between the favoured vs. disadvantageous players, and (iii) very few subjects deviate when the payoff difference is tiny. These observations clearly contradict the assumption of selfishness and support the hypothesis that at least some people exhibit other-regarding concerns.

As for Game 1, the number of individuals selecting the dominant action is significantly different from 100% both on aggregate and separately for those
who do and do not benefit from the equilibrium inequality \((p < 0.01, \text{ Wilcoxon signed-rank test})\), but there exist no difference between the behavior of the two groups \((p = 0.617, \text{ Wilcoxon rank-sum tests})\). The figure differs significantly from Hypothesis 1b in case of individuals, who are worse-off in the equilibrium \((p < 0.0001 \text{ when testing whether } 21\% \text{ is larger or equal than } 52\%)\) but it fits within the predicted interval for those favoured in the equilibrium.

In Game 2, significantly less than 100\% of subjects deviate from the dominant action on aggregate \((p = 0.003, \text{ Wilcoxon signed-rank test})\) as well as disaggregated by who is favoured in equilibrium \((p < 0.046, \text{ Wilcoxon rank-sum test})\), but there is no difference in behavior between those worse- and better-off in equilibrium \((p = 0.758)\). Once again, the share differs from the hypothesized one in case of those who earn lower payoff in the equilibrium \((p < 0.0001)\) but not for the favoured players.

Last, the number of participants choosing the dominant strategy does not differ significantly from 100\%, neither on aggregate nor separately in Game 3 \((p > 0.150, \text{ Wilcoxon signed-rank test})\) and the behavior does not differ between the two groups \((p = 0.160, \text{ Wilcoxon rank-sum test})\). Hence, this shows that participants have no problem understanding payoff dominance and further supports the fact that inequality aversion is the motivation for the failure to choose dominant actions in Games 1 and 2.

As for the differences in behavior across the three games, more people select the dominant action in Game 3 than in both Games 1 and 2 \((p = 0.001 \text{ and } 0.008, \text{ respectively})\). The difference between Games 1 and 2 is not significant at 10\% \((p = 0.108, \text{ Wilcoxon signed-rank test})\).

Apart from the absolute numbers, the theories of social preferences also prescribe certain within-subject consistency of decisions across the three games of interest. We observe that 87\% of subjects are consistent in the following sense: (i) either they never choose the dominated strategy or (ii) if they choose the dominated action for some equilibrium-payoff inequality, then they also do for any larger inequality.\(^{11}\) Hence, a large majority of our subjects are consistent in their decisions. 74.6\% of the consistent participants selected the dominant action in the three games, 20.6\% selected the dominant action for intermediate and low differences (Games 2 and 3) but not in Game 1 with large payoff inequality in equilibrium, and 3 players (4.8\%) chose the dominant action only for small differences (Game 3) but not in Games 1 and 2, where the differences are larger.\(^{12}\) Remember that only a virtually selfish player earning the lower equilibrium payoff in Game 1 would play the dominant action. However, 79.4\% of these players did so, despite such a large disadvantageous inequality, and, as tested above, this difference is not statistically different from those favoured in equilibrium. This figure contrasts starkly with the typical estimates of the number of selfish individuals in the literature and points to lower levels of other-regarding concerns in our data, compared to other studies.

The econometric analysis in Table 1 shows that all the above findings are

\(^{11}\)Six subjects were inconsistent. Two of them chose the dominant actions for large differences but not for low and intermediate ones; the remaining four subjects chose the dominant action for both low and large differences but not for intermediate ones.

\(^{12}\)The consistency of behavior is further supported by the positive correlation between the number of times a player chooses the dominant action in Games 1−3 and the choice of the dominant action in the Prisoner’s Dilemma. The correlation is \(\rho = 0.154 \text{ (} p = 0.206 \text{) for all participants but rises to } \rho = 0.224 \text{ (} p = 0.078 \text{) for the consistent subjects.}
robust to more formal statistical testing even if we control for individual heterogeneity: the likelihood of choosing the dominant strategy depends mostly on the game.

We set the game with the smallest payoff difference in equilibrium as the benchmark and include two dummies, large and intermediate, that are equal to 1 for Games 1 and 2, respectively. The binary variable advantageous indicates whether a player is favoured regarding the payoff in the predicted equilibrium. We also control for whether the player chooses the dominant (non-cooperative) action in the Prisoner’s Dilemma, whether she selects the action corresponding to the risk-dominant equilibrium in the coordination game, gender, cognitive reflection using the Cognitive Reflection Test (Frederick, 2005), and session effects. Robust standard errors clustered at the individual level are reported.

<table>
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<th>(2)</th>
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<tbody>
<tr>
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Table 1: Regression analysis

In line with the previous analysis, the dominant strategy is chosen significantly less frequently in Games 1 and 2 compared to Game 3. The numbers suggest a sizable difference between the large and intermediate payoff difference (27.8% vs. 16.8% less compared to Game 3 in the logit specification (1) in Table 1), but this figures are not significantly different \(p = 0.112\) based again on regression (1)). No other variable has any systematic effect on the probability of choosing the dominant action.

In sum, there is evidence that the deviations from the dominant actions are due to the equilibrium-payoff inequity. We observe less deviations from choosing the dominant action than predicted by the estimated distributions of
FS parameters in the literature. This difference is mostly due to the individuals who would receive lower payoffs in the equilibrium. Their behavior actually does not differ from those ahead in the payoff distribution, in contrast to the standard observation in the literature. Last, most individuals are consistent in their decision across the three games.

5 Discussion

The observed increasing inequality around the globe drew large attention to the macroeconomic effects of inequality, as testified by the worldwide success of the book *Capital in the Twenty-First Century* (Piketty, 2014). In this paper, we report that, apart from the well documented macroeconomic effects, human subjects facing large inequality may take actions that hurt everybody in their reference group. The payoff differences in our study are naturally far from extreme compared to real life. The ratio between the high and low equilibrium payoff in our Game 1 is $12.2/2.2 \approx 5.6$. In the OECD countries, the income ratio between top and bottom deciles is 9.6 (Keeley, 2015); the executive pay relative to the earnings of the average worker was about 20 in 1965, considering the top 350 US firms ranked by sales, and it peaked at 383 in 1999 and stood at 295 in 2012 (Mishel and Davis, 2014). These differences are both relatively and absolutely larger than in our experiment, but they make a non-negligible part of subjects violate the dominance criterion in one of the simplest possible strategic situations and they trigger a sort of “destructive” behavior that hurts both involved sides. In addition, payoff differences do not affect only the relationship and incentives within the firm but possibly also consumers. For instance, Mohan et al. (2015) find that consumers prefer products of firms with lower executive-worker pay ratios. Hence, income inequality can have effects on human behavior, which may explain and/or reinforce the macroeconomic effects of unequal payoff distributions discussed elsewhere.

Our results raise another question: which part of the documented results are driven by preferences and which part by beliefs? People might deviate from dominant actions because i) they have disutility from unequal payoffs, or ii) they believe others have them and will deviate, or both. Our design mitigates the role of beliefs, because a dominant strategy for both players ensures higher payoff independently of the behavior of the opponent by definition. Nevertheless, there might be a more involved relation between preferences and beliefs concerning others’ preferences and so on. We abstract from these issues here and leave them for future research.

References


6 Appendix: Experimental Instructions

INSTRUCTIONS

Welcome and thank you for participating in our experiment! Please, read carefully these instructions. The instructions are identical for all participants with whom you are going to interact during this experiment.

If you have any question, please raise your hand and one of the experimenters will approach you to solve your problem. From now on, you are not allowed to communicate with the other participants of the experiment. If you do not accept these rules, you cannot participate in the experiment. Please, switch off your mobile phone.

The University of the Basque Country has provided the funds to conduct this experiment. You will receive 3 Euros only for your participation. However, throughout the experiment you can earn more money. The exact amount will depend on your decisions and on those made by the other participants in a way that will be explained in a moment. We will pay you the money you earn in cash privately at the end of this experimental session. In this experiment, all payoffs are expressed in Euros. All your decisions will be treated confidentially.

THE EXPERIMENT

The experiment consists of 5 rounds. In each round, you will be paired randomly and anonymously with another participant of this experiment. The individual, with whom you will be paired, changes in every round. That is, during this experiment you will be paired with 5 different individuals. These individuals are not necessarily those seated physically on your right or on your left. You will never know the real identity of any of these individuals and they will never know your identity either.

In each round, you and the individual you will be paired with have to make a decision. The decisions are independent. That is, neither you nor the other participant will know the decision of the other one while making your decision. The two decisions—yours and the one made by the other participant—determine how much money each of you earn in that round.

Each round is independent of the other rounds. That is, the amount of money you earn in any round depends exclusively on the decision made in that round. Once a round is over, neither you nor anybody else can change the decision made in that round. Moreover, during the experiment, nobody (including you) will learn the decisions of the individuals that they were paired with to play. This information will only revealed once all the 5 rounds have been finished.

Each round corresponds to one decision problem, in which you have to choose an action. In what follows, we will show you an illustrative example of such a problem and the way the problems will be presented to you in each round. The following example only serves as an illustration. The situations you will face in the 5 rounds will be different from this example and they will differ across rounds.

Each decision problem will be presented in form of a table similar to the below one (but with different values). You will see the corresponding table each time that you have to make a choice.

Each row of the table represents an action that you may choose: A or B. Your decision consists in selecting one of them. The other participant you will
be paired with also has to choose, independently, between two actions that are represented by the columns of the table: A or B. That is, you choose a row, while the other participant chooses a column. To keep things simple, the experiment is programmed in a way, that all participants—including the person you are paired with—observe the decision problem in the same way as you see it in our example. That is, each participant will see her/his actions to choose as rows of the table. While choosing, neither you will know the decision of the participant you have been paired with nor she/he will know your decision.

Your decision and the one of your partner determine your and her/his pay-offs. In the table, your actions and payoffs appear in red, while the actions and payoffs of the other participant are depicted in blue.

The meaning of the table is the following (in red):

- If you choose action A and the other participant chooses A, you will receive 5.5.
- If you choose action A and the other participant chooses B, you will receive 6.5.
- If you choose action B and the other participant chooses A, you will receive 8.1.
- If you choose action B and the other participant chooses B, you will receive 2.3.

Analogously for participants you have been paired with (in blue):

- If the other participant chooses A and you choose A, she/he will receive 7.0.
- If the other participant chooses A and you choose B, she/he will receive 5.0.
- If the other participant chooses B and you choose A, she/he will receive 5.6.
- If the other participant chooses B and you choose B, she/he will receive 7.1.

The decision problem in each round will be displayed this way. In each round of the experiment, you will see a table with different numbers and you will be paired with a different individual. As in the above example, the amount of money that you earn depends on your decision and on the decision of the other individual.
In each of the 5 rounds, you will see on your screen a table similar to our above example, with the same colors, and 2 white boxes that correspond to the 2 possible actions you can choose. You can choose one of the actions by clicking on the corresponding box. Imagine, for instance, that you choose action A. By clicking on the box corresponding to action A, the box will change its color as illustrated below:

<table>
<thead>
<tr>
<th>The choice of the other participant:</th>
<th>Action A</th>
<th>Action B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your choice:</td>
<td>Action A</td>
<td>5.5 ; 7.0</td>
</tr>
<tr>
<td>Your choice:</td>
<td>Action B</td>
<td>8.1 ; 5.0</td>
</tr>
</tbody>
</table>

The choice is not definitive and you can change it as often as you wish simply by clicking on the other box as long as you do not press the “OK” button that appears on the lower right corner of each screen. Once you push the “OK” button, your choice cannot be modified anymore and you will move to the next round. You can only proceed to the next round once you have chosen an action and pushed the “OK” button.

**PAYOFFS**

Once you have made your decision in the 5 rounds, your final payoff will be determined in the following way. The computer selects randomly for each participant one of the five rounds and each participant receives the money earned in that round, taking into account her/his decision and the decision of the other individual in that round.

The round chosen for the payoff, your decision in that round, the decision of the individual you have been paired with in that round, and the resulting payoff will be shown on your screen once everybody has made all the decisions.

Your final payoff will be the amount determined as described above, plus the 3 Euros that you receive just for coming to the experiment.

At the end of the experiment, we will ask you to fill in a short questionnaire. Once all the participants have finished it, we will call the participants one by one to pay them privately.

**CONTROL QUESTIONS**

Before starting the actual experiment, please, answer the following control questions. The experiment will not begin until everybody answers correctly the 3 questions.

1. Consider the following payoff table. If the other participant chooses B and you choose A, what will be your payoff?
2. If the other participant chooses A and you choose B, what will be the payoff of the other player?

3. True or False? We are going to pay you the sum of the payoffs in the 5 rounds.