

# At the root of the North-South cooperation gap in Italy: Preferences or beliefs?

Maria Bigoni\*  
*University of Bologna*

Stefania Bortolotti†  
*University of Cologne & C-SEB*

Marco Casari‡  
*University of Bologna & IZA*

Diego Gambetta§  
*European University Institute & Nuffield College, University of Oxford*

October 23, 2017

## Abstract

The marked difference in development between the North and the South of Italy represents a classic case of seemingly intractable within-country disparities. Recent research found that a determinant of this socio-economic gap could be a difference in the ability to cooperate. Through a laboratory experiment we investigate whence this difference derives, whether from distinct preferences or beliefs. Our findings indicate that Northerners and Southerners share the same pro-social preferences, and that the cooperation gap lies rather in the more pessimistic beliefs that Southerners have about their cooperativeness. Relative to Northerners, Southerners, furthermore, manifest a stronger aversion to social risk. A policy implication is that an intervention or an event that reduced pessimistic beliefs would directly boost cooperation levels.

**Keywords.** Betrayal aversion, conditional cooperation, experiments, Italy.

**JEL codes:** C72, C93, Z13

---

\*Bigoni: Department of Economics, University of Bologna, Piazza Scaravilli 2, 40126 Bologna, Italy; maria.bigoni@unibo.it, Phone: +39 051 209 8122, Fax: +39 051 0544 522.

†Bortolotti: University of Cologne & C-SEB, Albertus-Magnus-Platz, D-50923 Cologne, Germany; stefania.bortolotti@uni-koeln.de, Phone: +49 221 470 8306.

‡Casari (corresponding author): Department of Economics, University of Bologna, Piazza Scaravilli 2, 40126 Bologna, Italy; marco.casari@unibo.it, Phone: +39 051 209 8662, Fax: +39051 209 8493.

§Gambetta: European University Institute, Badia Fiesolana - Via dei Roccettini 9, I-50014 San Domenico di Fiesole, Italy, diego.gambetta@eui.eu.

# 1 Introduction

The differences in socio-economic performance between the North and the South of Italy have persisted, and even widened, since Italian Unification in 1861. The gap is reflected in many and diverse measures that reveal the worse position of the South, such as a systematically lower per-capita GDP, a higher unemployment rate, a higher child mortality rate (ISTAT, 2014), and a lower rate of waste recycling (ISTAT, 2015). The classic studies by Edward Banfield (1958) and Robert Putnam (1993) that grappled with the North-South gap have propelled to international scholarly attention what in Italy goes under the name of *La Questione Meridionale*, which has become a *paradigmatic puzzle* of why sub-national equilibria can persist despite shared legal institutions, language, and religion. As Italy's major economic burden, the Southern regions are the epitome of seemingly intractable within-country differences.

The socio-economic gap goes hand in hand with a gap in civiness and cooperative behavior De Blasio and Nuzzo (2010), as documented by commonly used measures of social capital, such as electoral turnout, association density, and blood donation (Putnam, 2000; Guiso et al., 2004; Cartocci, 2007; Buonanno et al., 2009; Nannicini et al., 2013). Experimental data suggest that this gap is related to a resilient behavioral difference that holds even if variations in geography, informal institutions, and incentives are experimentally suppressed, and after controlling for socio-demographic characteristics: the ability to cooperate is lower in the South than in the North of Italy, and differences neither in preferences for equality and efficiency, nor in risk attitudes account for it (Bigoni et al., 2016).<sup>1</sup> In this paper we aim to go a step further and identify through the experimental methodology the underlying behavioral mechanisms that could explain these different civic and cooperation outcomes.

We first explore social preferences and, in particular conditional cooperation, that is the willingness to cooperate provided that other people cooperate as well. Conditional cooperators act pro-socially not out of sheer altruism, but of a reciprocal response to others' actions (Fischbacher et al., 2001). For instance, they would be willing to contribute time and effort to promoting

---

<sup>1</sup>This outcome holds taking as measures of cooperation both the size of the contribution in a Public Good Game and the amount sent by trusters in a Trust Game: cooperation declines moving from the North to the South, at both county and individual level. A similar gap has also been found by Battiston and Gamba (2016).

common goods, such as extra-curricular school activities, or to improving the environment, such as sort recyclable garbage, but only if they anticipate that most of their neighbors will do the same. While a large share of the population has been shown to be made of conditional cooperators, the prevalence of this behavioral type greatly varies across and within countries (Kocher et al., 2008; Rustagi and Veronesi, 2016) and it correlates with the ability to establish and sustain large-scale cooperation in the field (Rustagi et al., 2010). Our first conjecture is that the North-South gap is determined by a difference in the prevalence of conditional cooperators across Italy. To test for this conjecture, by means of an experiment we measure preferences for conditional cooperation (Experiment 1).

Even a significant presence of conditional co-operators, however, is not by itself sufficient to guarantee actual cooperation. The choices of conditional cooperators further depend on both their beliefs about other people's behavior and on their propensity to bear the risk of being exploited by free riders. While in Experiment 1 these two factors play no part, in our second experiment we study both individual expectations on others' cooperative behavior and the willingness to bear the risk of being exploited (Experiment 2).

Taking expectations into consideration is crucial in this context. Consider for instance the extreme case in which everyone is a conditional cooperator and is prepared to perfectly match others' contributions: here, optimistic and pessimistic beliefs become self-confirming prophecies. If everyone expects that most of the others will cooperate, they will indeed cooperate. If instead people expect others to free-ride, they will do the same. Either way, expectations would be correct in equilibrium. The role of beliefs has been shown to be important in the repeated interactions not only of perfect conditional co-operators but in that of heterogeneous players (Fischbacher and Gächter, 2010). The North-South gap could persist even in spite of similar pro-social preferences, if expectations are different. Our second conjecture is thus that Southerners' expectations on others' cooperation are more pessimistic than Northerners.

The third element that deserves our attention in this context relates to the attitude toward social risks, that is the aversion to the risk of being cheated by others. There is evidence that people are generally more averse toward social risks than toward risks of nature, that is towards

risks of equally harmful events that are determined by mere chance rather than depending on others' choices (Bohnet and Zeckhauser, 2004). This phenomenon, known as betrayal aversion, seems to vary in intensity across societies (Bohnet et al., 2008). Betrayal aversion can also play a relevant role in the choice to cooperate in a Public Good Game, where contributors may be afraid of being exploited by free riders (Cubitt et al., 2015).<sup>2</sup> Consider, for instance, two conditional cooperators with the same optimistic expectations but different attitudes toward social risk. The one with a higher tolerance for social risk might cooperate in full, while the other one can decide not to contribute at all even if the risk of being exploited by others is low, since the cost associated to such risk would be too high. Our third conjecture is that the North-South gap in cooperation is driven by a difference in the intensity of aversion to betrayal.

The three mechanisms we consider lead to distinct policy implications. If Northerners and Southerners share the same preference for conditional cooperation, but have different expectations about others' cooperation level, a shift in beliefs, generated for instance by migration or by a positive political or institutional shock, could directly improve overall cooperation levels. If instead what matters is a difference in the strength and support of conditional cooperation, a change in behavior would be harder to achieve because it would involve reshaping individual preferences, and would most likely take considerable time, as implied by the high degree of persistence due to the intergenerational transmission of preferences (Bisin and Verdier, 2000; Dohmen et al., 2012). In so far as the attitude towards social risk is a preference trait, the same conclusions would follow also if the betrayal aversion conjecture were found to matter.

For our experimental study we recruited over 400 participants from both the North and the South of Italy. Our recruitment strategy allowed us to have college students that originated from all major regions of the two macro areas (Figure 1). In order to disentangle the various factors that contribute to the ability to achieve and sustain cooperation, we designed two experiments. In Experiment 1, we study preferences for conditional cooperation, when holding expectations constant. In Experiment 2, we study individual expectations on others' cooperative behavior, and betrayal aversion. The design and the results of the two experiments are presented in Section

---

<sup>2</sup>Results in Cubitt et al. (2015) indicate that betrayal aversion is correlated with conditional cooperation only through beliefs, being stronger among pessimistic conditional cooperators.

2 and 3, respectively. Section 4 discusses the main findings of this study and concludes.

## 2 Experiment 1 on Conditional Cooperation

### 2.1 Design

Experiment 1 elicited the contribution in a Public Good Game conditional on others' contribution choices.<sup>3</sup> We followed the design proposed by Fischbacher et al. (2001). Subjects were randomly assigned to groups of  $N = 4$ , and received an endowment of  $w = 20$  tokens, which they could allocate between a group project ( $g_i$ ) – with a marginal per capita return ( $\alpha$ ) of 0.4 – and a private account ( $w - g_i$ ). Earnings were determined as follows:

$$\pi_i = w - g_i + \alpha \sum_{j=1}^N g_j \quad (1)$$

Each subject had to make two types of decisions. The first decision is the *unconditional* choice of how many tokens to contribute to the group project. The second type of decisions are a series of conditional contribution choices. Subjects had to indicate how many tokens they were willing to contribute, given the average contribution to the group project of the other group members. The scenarios for others' contributions ranged from 0 to 20 tokens, in steps of 1 – strategy method. Each subject was paid only for one of his decisions. The relevant decision for payment was the unconditional one for three members of each group. For the fourth group member, selected at random, the relevant decision was the conditional choice corresponding to the realized average contribution of the others. At the end of the session, subjects were informed about their relevant decision, the total contributions to the group project, and their earnings.

Conditional contribution choices provide a generalized measure of social preferences in a Public Good Game. Since we are eliciting answers for each possible contingency of others' contribution levels, the composition of the subject pool should not affect the choice profile. This measure is in fact robust to different beliefs about the cooperation level in the population or betrayal aversion.

---

<sup>3</sup>After the conditional cooperation task, we also elicited time preferences, which will be analyzed in a separate paper. The instructions of Experiment 1 also include the elicitation of time preferences (see Appendix A). Feedback was given at the end of the session to avoid any possible carry over effect.

Figure 1: North and South of Italy



**Notes:** Classification in North, Center, and South macro-regions follows the definitions of the National Institute of Statistics (ISTAT). In our experiments we had participants from all shaded regions, except Valle d'Aosta (North), the smallest Italian region. 231 participants were born in the South and 193 in the North. In the data analysis we excluded data for the 26 participants born in the Central regions and 2 born abroad, and concentrate on the gap between North and South.

## 2.2 Recruitment strategy and experimental procedures

This section describes the recruitment strategy and the procedures adopted for both Experiment 1 and Experiment 2, and finally reports some details that were specific to Experiment 1.

We recruited participants from the University of Bologna subject pool, which attracts students from all Italian regions. The recruitment was aimed at covering the South and the North of Italy, excluding the Center; to this end, we invited only subjects born in a specific set of regions. The vast majority of participants in Experiment 1 and 2 completed primary school in their macro-area of origin (96% for the South, 91% for the North), and had at least one parent born there (100% and 85% respectively), which suggests that they have absorbed the social norms of the area where they come from.

We were able to recruit students scattered in all regions of North and South, which gives a nation-wide dimension to the findings (Figure 1). Such an extensive coverage of the national territory would be difficult with other approaches. Students represent a very homogeneous population in terms of age and education level hence enhancing the control of the experiment. College-educated participants are well suited to handle some complexities embedded in the experimental designs, which instead would be an obstacle when using a representative sample of the population.

Here we focus on students who moved to Bologna to study, which may raise issues of self-selection. Suppose, for instance, that students from the South who moved to Bologna are more cooperative than those who stayed in the South. If that was true, our experiment would overestimate the cooperation level of the Southerners. We cannot rule this out completely. Still, a recent experiment on the college choices of high-school students from the South (Calabria) shows that, at the aggregate level, preferences for conditional cooperation do not differ between those who moved to an University in the Center-North of Italy and those who stayed in the South.<sup>4</sup>

---

<sup>4</sup>In a 2-player public good game played with the strategy method (Fischbacher et al., 2001), no significant difference emerged between movers and stayers in the observed pattern of contributions. Presentation of Andrea Ichino at IZA, November 15, 2016: *Civiness drain: Emigrants' self-selection and social norms in the place of origin*, [http://legacy.iza.org/de/webcontent/events/izaseminar\\_description\\_html?sem\\_id=2964](http://legacy.iza.org/de/webcontent/events/izaseminar_description_html?sem_id=2964)

Our study is not the first to rely on the subject pool of a single institution to draw inferences about behavior across cultures. Barr and Serra (2010) showed that corruption in a lab experiment conducted with undergraduates at Oxford is correlated with the level of corruption in participants' home country. Bornhorst et al. (2010) found a significant correlation between trust and culture among European PhD students who moved to Italy for their studies.

**Procedures.** Each subject could participate in only one of the sessions of either Experiment 1, or Experiment 2. In both experiments, upon arrival, subjects were seated at a visually separated desk and no form of communication was allowed during the session. The instructions were read aloud to ensure common knowledge and then subjects answered to control questions before engaging in the task. At the end of the sessions, we administered a computerized questionnaire where we elicited socio-demographic characteristics. Earnings were expressed in tokens and payments were made in private. Recruitment was done using ORSEE (Greiner, 2015) and the design was implemented through z-Tree software applications (Fischbacher, 2007). The sessions were conducted at the Bologna Laboratory for Experiments in Social Sciences (BLESS) and at the Laboratorio di Economia Sperimentale (LES) in Forlì.

Experiment 1 included 7 sessions with a number of participants ranging from 19 to 24, for a total of 134 subjects.<sup>5</sup> A session lasted on average about 1 hour. The conversion rate was 4 tokens per Euro and the overall average per-capita earnings were 18 Euros including a 4 Euros show-up fee.<sup>6</sup>

## 2.3 Results

**Result 1** *Participants from the South and from the North display a similar preference for conditional cooperation.*

---

<sup>5</sup>We explicitly mention the geographical constraint in the recruitment message for the first sessions, while in the last four sessions we were able to send the invitation exclusively to subjects born in the regions of interest, thanks to an update of the recruitment software.

<sup>6</sup>Average per capita earnings in Experiment 1 include the time-preference task, not discussed here. In the time-preference task earnings were expressed in Euros and always paid via bank transfer.

Figure 2: Conditional cooperation in the Public Good Game

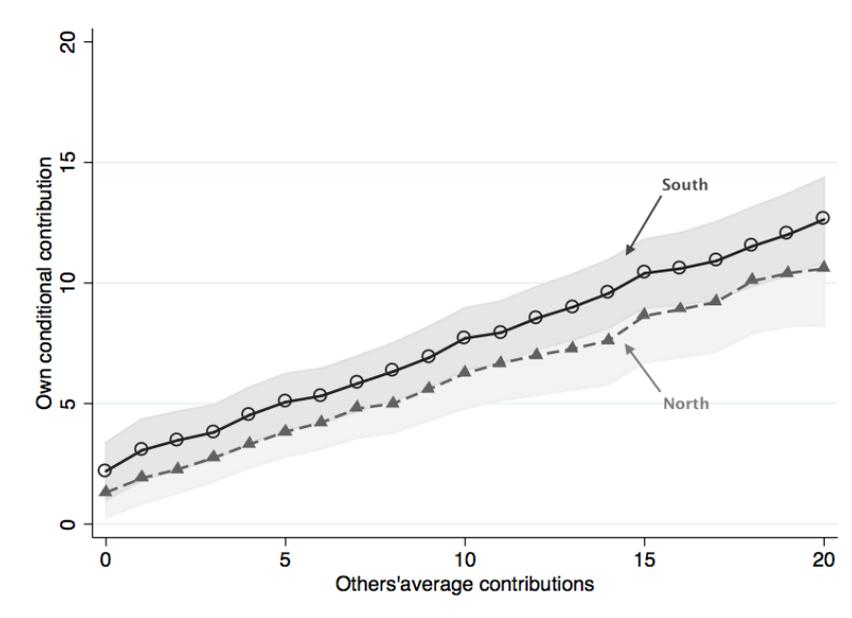


Figure 2 and Table 1 provide support for Result 1. Participants on average varied their contribution depending on the contributions of others. Such link is present both for participants from the North and from the South. These phenomenon is illustrated by the positive slope of the lines in Figure 2 and by the positive correlation at the individual level between own and others' contributions (North:  $\text{avg.corr.}=.69$ ,  $N = 52$ ; South:  $\text{avg.corr.}=.71$ ,  $N = 82$ ). Participants from the North, though, do not differ in a statistically significant manner from those from the South with respect to this correlation ( $p\text{-value}=0.714$ , two-sided Wilcoxon rank-sum test,  $N_N = 52$  and  $N_S = 82$ ).

A regression analysis confirms these findings. Table 1 presents results from OLS regressions explaining the level of contributions conditional on others' choices when pooling participants from the North and the South. In Model 1, we include the variable *Others' average contribution* and a set of controls. *Others' average contributions* is positive and highly significant coefficient, hence showing the presence of conditional cooperation. In Model 2, we include a dummy for those born in the *North* and interact the variable *Others' average contributions* with the *North* and *South* dummies. The difference between the two estimated coefficients of the interacted variables is only marginally statistically significant ( $p\text{-value}=0.058$ ). In Model 3 we replicate the regression of Model 2 on a rooted sample, which is restricted to subjects who have completed

Table 1: Regression on conditional cooperation

<i>Dep. var.: Contribution to PGG for a given contribution of others</i>	Entire sample		Rooted sample
	Model 1	Model 2	Model 3
Others' average contribution	0.495*** (0.011)		
Others' average contribution x North		0.469*** (0.018)	0.469*** (0.021)
Others' average contribution x South		0.512*** (0.014)	0.499*** (0.015)
North		-0.569 (1.088)	-1.493 (1.264)
Controls	Yes	Yes	Yes
Constant	5.603*** (1.093)	5.509*** (1.100)	5.875*** (1.144)
N.obs., N.subjects	2814, 134	2814, 134	2499, 119
R <sup>2</sup>	0.255	0.259	0.262

**Notes:** OLS regression with individual level random-effects. Dependent variable: individual conditional contribution to the public account (21 choices for each subject). Controls include: *Male*, *Experiment run in Forlì*, *Low task comprehension*, *Impulsivity score*, *Logic score*. *Male* takes value 1 for males and 0 for females. *Experiment run in Forlì* takes value 1 for the sessions run in the Forlì campus and 0 for the sessions run in the Bologna campus of the University of Bologna. To account for participants' understanding of instructions, we use the answering time and the number of mistakes they did in the control questions. We classified the task comprehension as low for those subjects who were in the last decile according either to their total answering time, or to their total number of mistakes (this measure was built at the session level). The *Impulsivity score* ranges from 0 to 3 and is the total score in a non-incentivized Cognitive Reflection Test (Frederick, 2005), while the *Logic score* ranges from 0 to 2 and is based on a simplified version of the Raven's progressive matrices test (not incentivized). Symbols \* \* \*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

the primary school in the macro-region of birth, and have at least one parent born in the same macro-region. In this case no significant difference emerges between the behavior of subjects from North and South (p-value=0.247). Result 1 holds also after controlling for gender, task comprehension, cognitive skills and a variety of other confounding factors (see the notes to Table 1)

The aggregate behavior illustrated by Figure 2 and Table 1 is compatible with a variety of individual patterns of conditional cooperation. For this reason, we classify subjects into four types (Table 2). Following Fischbacher et al. (2001), we label a subject as a *conditional co-operator* if he has a highly significant (p-value  $\leq 1\%$ ) and positive Spearman rank correlation

Table 2: Taxonomy of participants in the Public Good Game

<b>Type</b>	South (%)	North (%)	Total (%)
Conditional cooperators	70	62	66
Unconditional:			
Free-riders	9	17	12
Altruists	2	2	2
Others	19	19	19
<b>Total</b>	100	100	100

coefficient or his contribution pattern is monotonically increasing. A *free-rider* is a subject that always contributes 0. An *altruist* is a subject who always contributes more than 15 tokens, unconditionally on others' contributions.

Overall, about two thirds of the subjects are conditional contributors, with similar shares in both macro-regions. About 7% of the subjects matched exactly other's contributions. The percentage of free-riders among the Northerners is almost twice as large as the percentage among the Southerners. Altruists account only for a very small fraction of the population. The distribution of types is not significantly different across macro-regions (Fischer exact test:  $p$ -value=0.466,  $N_N = 52$  and  $N_S = 82$ ).<sup>7</sup>

Quite interestingly, also free-riders can contribute to sustain cooperation as they foresee potential gains in maintaining optimistic expectations among conditional cooperators (Fischbacher and Gächter, 2010). This element could be especially pronounced in field situations where social dilemmas are played sequentially. While free-riders would not contribute when they are last movers, they may fully contribute as first mover in an attempt to entice conditional cooperators to contribute. For instance, some free riders could decide to start sweeping the sidewalk to send a signal to conditional cooperators and hence induce them to follow through.

To sum up, the evidence from Experiment 1 shows that the average subject is conditionally cooperative and the strength of this preference is similar among Northerners and Southerners. In a society of conditional cooperators the actual cooperation level in a public good game

<sup>7</sup>In the unconditional decision, subjects contributed on average about half of their endowment (10.49). Contributions were slightly higher among Southerners than Northerners (10.74 vs. 10.08), but the difference was not statistically significant (two-sided Wilcoxon rank-sum test,  $p=0.579$ ,  $N_N = 52$  and  $N_S = 82$ ). OLS regressions provide similar results. Contrary to Bigoni et al. (2016), here participants were interacting with others from all parts of Italy. The geographical composition of the group could indeed affect beliefs about others' contributions and therefore unconditional cooperation.

depends from the strength of cooperative preferences as well as from people’s beliefs about others’ contribution behavior. In line with previous evidence, we report that the average subject exhibits imperfect conditional cooperation, which means that an extra unit of contribution by all others would induce the average subject to increase her contribution by less than one unit (Fischbacher et al., 2001). Actual contributions, though, also directly depend on people’s beliefs about others’ contributions (Fischbacher and Gächter, 2010), and optimistic beliefs can compensate for the imperfect responsiveness from conditionally cooperative preferences. In general, the observed level of cooperation in a society can vary considerably depending on the combined effect of conditionally cooperative preferences and expectations about others’ behavior. The Italian regional gap in cooperation could well originate from different levels of expectations about others’ contribution. We explore this mechanism in Experiment 2. In addition, Experiment 2 also studies tolerance for social risk, which could – independently from or jointly with expectations – shape the ability of a society to achieve cooperative outcomes.

### 3 Experiment 2 on Beliefs and Betrayal Aversion

#### 3.1 Design

In Experiment 2 we elicited betrayal aversion (Part 1) and then beliefs about the ability to cooperate in the North and South of Italy (Part 2). For the sake of exposition, we reverse the order in which we present the tasks.

**Beliefs.** We asked subjects to estimate the cooperation levels realized in a previous experiment run in the North and South of Italy. The task was a Public Good Game run in separate sessions in the city of Cuneo and Crotone with a representative sample of the Italian population (Figure 1). Before eliciting beliefs, we read the instructions of the original experiment (Bigoni et al., 2016) where it was publicly announced that all participants were born and resident in the province where the experiment was conducted.<sup>8</sup> In the original experiment, subjects interacted for 8 rounds in groups of  $N = 4$  strangers (random matching).<sup>9</sup>

---

<sup>8</sup>We read the Part 2 instructions from the PG session of Bigoni et al. (2016), and asked subjects to answer the same control questions.

<sup>9</sup>Payoffs were as in Expression (1) with  $w = 20$ ,  $\alpha = 0.5$ , and  $g_i = 0, 6, 14$ , or  $20$ .

Each participant had to provide two estimates of the average contribution across 8 rounds, one for Cuneo, the other for Crotone.<sup>10</sup> An estimate had to be an integer number between 0 and 20 tokens. We randomly selected two subjects from the original experiment, one from Crotone, the other from Cuneo. These two random draws were repeated for every session of Experiment 2 to limit information leakage across sessions. Everyone was paid according to one of the two estimates, selected at random, which was then compared to the actual contribution of a single subject taken from the original experiment. Belief elicitation was incentivized by means of a quadratic scoring rule (see Appendix A). A subjects could earn up to 26 tokens for an accurate estimate ( $+/- 1$  token). Deviations larger than 5 tokens yielded zero tokens.

**Betrayal aversion.** This part comprised two between-subjects treatments – *Trust* and *Risky Dictator* – based on the experimental set-up proposed by Bohnet et al. (2008).<sup>11</sup> Subjects interacted in pairs with a first mover (blue) and a second mover (red). Pair matching and roles were randomly determined.<sup>12</sup> Betrayal aversion is measured as the difference in the average choice of the first movers between the *Trust* and the *Risky Dictator* treatment.

In the *Trust* treatment – meant to capture preferences toward social risk – blue faces alternatives A and B (Figure 3). Under alternative A both subjects earn 10 tokens and red takes no decision. Under alternative B, earnings in the pair depend on the choice of red, who can choose between options 1 or 2. Option 1 delivers 15 tokens to both subjects while with option 2 blue earns 8 tokens and red earns 22.

The implementation of the game is such that blue (first mover) does not directly choose between the alternatives A and B, but states under which circumstances he prefers A over B. More precisely, he states a number between 0 and 100 that indicates the minimum percentage of red (second movers) choosing option 1 that he requires in order to prefer the “risky” alternative

---

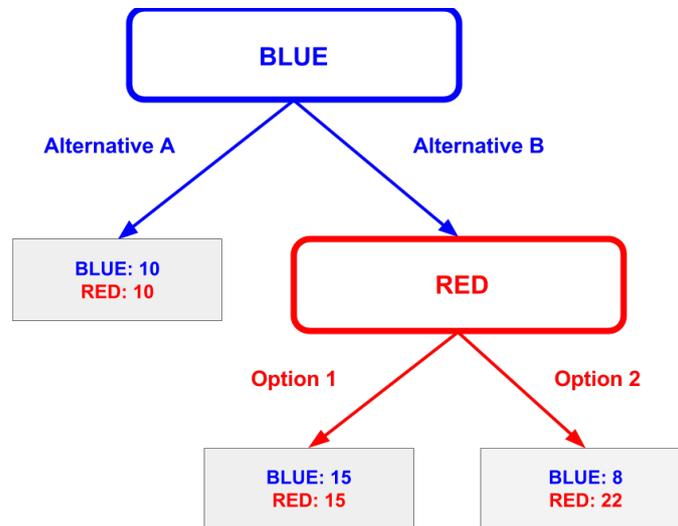
<sup>10</sup>The list of cities was not disclosed in advance, to avoid any demand effect. The order of the cities was randomized within each session. For each estimate, subjects could see on their screen a map of Italy showing the city location.

<sup>11</sup>We departed from Bohnet et al. (2008) as we used a different payoff structure, rewrote the instructions, and did not run the treatment where subjects played a lottery against nature (i.e. the Decision Problem).

<sup>12</sup>Red and blue subjects were in the same room and read the same instructions.

B over the “safe” alternative A. This threshold number is called the minimum acceptable probability (MAP, henceforth). Red always makes a choice, without knowing blue’s choice in advance. To determine the outcome of the game for a specific pair of subjects, and their payoffs, at the end of each session one needs to compare the MAP chosen by the blue player in the pair with the realized percentage of second movers choosing option 1 in the whole session ( $p$ , henceforth). Alternative A was implemented in the pair if the session’s  $p$  was smaller than the MAP, and alternative B otherwise.<sup>13</sup>

Figure 3: Trust treatment



The *Risky Dictator* treatment is meant to capture preferences toward the risk of nature. It is alike the *Trust* treatment, with one difference: reds (second movers) are passive players because their actions are determined by a random draw. The probability of option 1 or 2 being selected was unbeknown to the subjects, and it was determined by the share of second movers’ choices observed in one previous session of the *Trust* treatment. Feedback for the Trust and Risky Dictator tasks were given at the end of the session to avoid any possible carry over effect (see Section 2.2 for detailed procedures).

A risk-neutral payoff-maximizer would chose a MAP of about 29%. To see this, one should equalize the certain payoff of 10 from Alternative A to the expected payoff from alternative

<sup>13</sup>At the end of the experiments, everyone observed the outcome in his pair. In addition, first movers observed the RP in the session.

B,  $15p + 8(1 - p)$ , where  $p$  denotes the probability that option 1 is selected. The MAP is the probability  $p$  that solves this equation. A person with no aversion to betrayal would state the same MAP in the *Trust* and *Risky Dictator* treatments. A person that is averse to betrayal would state a higher MAP in the *Trust* than in the *Risky Dictator* treatment.

**Procedures.** Experiment 2 involved 290 subjects (141 from the North and 149 from the South), divided in 15 sessions; session participants ranged from 10 to 31. Earnings were expressed in tokens. The conversion rate was 2 tokens per Euro and the overall average per-capita earnings were 14 Euros, including a 4 Euros show-up fee. For more details about the experimental procedures see Section 2.2.

## 3.2 Results

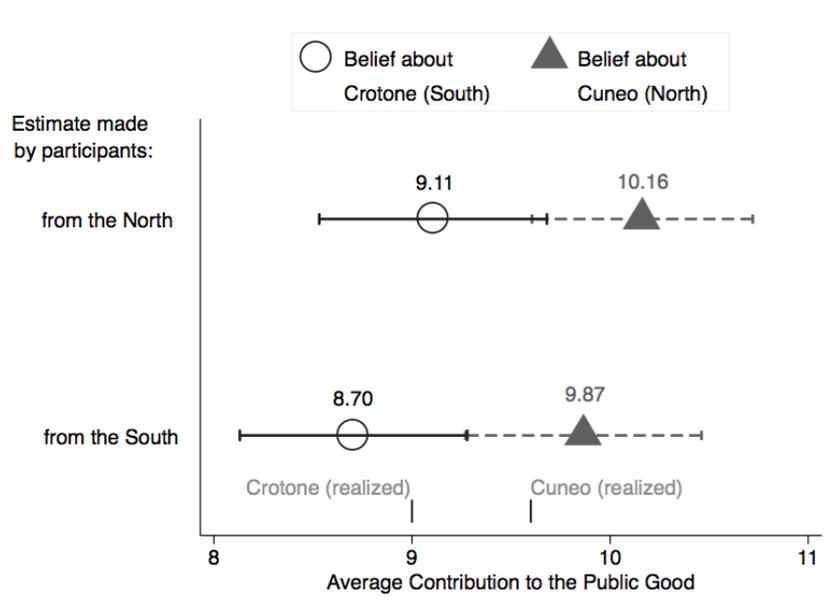
**Result 2** *Participants expect higher cooperation in the North than in the South.*

Support for Result 2 comes from Figure 4 and Table 3. There is a widespread belief that people in Cuneo (North) contribute in a Public Good Game more than people in Crotona (South) and this difference is statistically significant (two-sided Wilcoxon signed-rank test:  $p < 0.001$ ,  $N = 290$ ). More precisely, the average estimate is 10.01 tokens for Cuneo, and 8.90 tokens for Crotona. This belief is shared among participants from both the North and the South (two-sided Wilcoxon signed-rank test:  $p = 0.003$ ,  $N = 141$ ;  $p < 0.001$ ,  $N = 149$ , respectively).

This result is confirmed by regressions in Table 3. Subjects on average believe that contributions are 1.1 tokens higher in Cuneo than in Crotona (Model 1, coefficient for *Cuneo*). In Model 2, we include a dummy for people who were born in the *North*, and interact the variable *Cuneo* with *North* and *South* dummies. The difference between the two estimated coefficients of the interacted variables is not statistically significant ( $p$ -value=0.836). This result holds even if we restrict the sample to subjects rooted in their macro-area (Model 3,  $p$ -value=0.758).

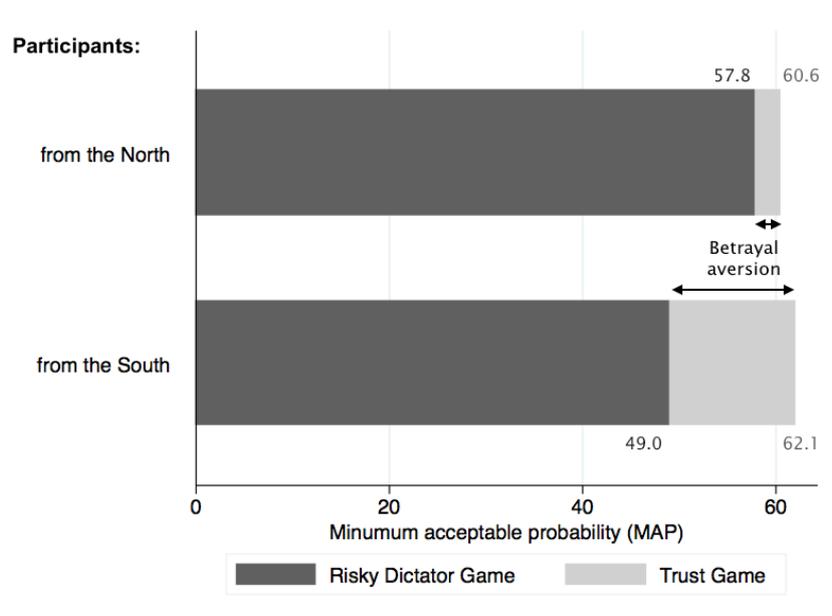
**Result 3** *Participants from the South display a significant aversion to betrayal.*

Figure 4: Beliefs about cooperation



**Notes:** the vertical dashed lines report the average contribution levels observed in Bigoni et al. (2016). The whiskers denote 90% confidence intervals.

Figure 5: Betrayal aversion



**Notes:** 72 observations from the North, and 74 observations from the South. One observation per subject.

Table 3: Regression on beliefs about cooperation

<i>Dep.var.: Belief about</i>	Entire sample		Rooted sample
<i>in a PGG in Cuneo or Crotona</i>	Model 1	Model 2	Model 3
Cuneo	1.110*** (0.251)		
North		0.090 (0.514)	0.000 (0.560)
Cuneo x North		1.057*** (0.361)	1.106*** (0.400)
Cuneo x South		1.161*** (0.351)	1.271*** (0.354)
Controls	Yes	Yes	Yes
Constant	8.193*** (0.578)	8.161*** (0.598)	7.967*** (0.625)
N.obs., N.subjects	580, 290	580, 290	514, 257
R <sup>2</sup>	0.059	0.059	0.076

**Notes:** OLS regression with individual-level random effects. Every subject makes two estimates. See notes to Table 1 for a description of *Controls*. Default location is Crotona (South). Symbols \* \* \*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

Table 4: Regression on betrayal aversion

<i>Dep. var.: MAP in Trust</i>	Entire sample		Rooted sample
<i>and Risky Dictator treatments</i>	Model 1	Model 2	Model 3
Trust treatment	10.374** (4.091)		
North		4.862 (6.156)	4.914 (6.627)
Trust treatment x North		6.905 (6.029)	10.581 (7.033)
Trust treatment x South		13.285** (5.567)	13.157** (5.586)
Controls	Yes	Yes	Yes
Constant	39.001*** (6.229)	37.859*** (6.407)	37.691*** (6.667)
N.obs.	146	146	128
R <sup>2</sup>	0.081	0.086	0.110

**Notes:** OLS regression. One observation per subject. See notes to Table 1 for a description of *Controls*. Default decision refers to the Risky Dictator treatment. Symbols \* \* \*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

Support for Result 3 comes from Figure 5 and Table 4. Following Bohnet et al. (2008) we say that there is betrayal aversion if the minimum acceptable probability stated in the Trust treatment is higher than in the Risky Dictator treatment. We measure betrayal aversion at the aggregate level, and not at the individual level, because of the between-subject design.

The degree of betrayal aversion across Italian macro-regions is illustrated in Figure 5 by the white portion of the bars. Subjects from the South of Italy display a substantial degree of betrayal aversion (13.1 percentage points) which is statistically significant (two-sided Wilcoxon rank-sum test,  $p=0.027$ ,  $N_T = 38$  and  $N_{RD} = 36$ ). The degree of betrayal aversion among subjects from the North is much smaller (2.8 percentage points) and is not statistically significant (two-sided Wilcoxon rank-sum test,  $p=0.552$ ,  $N_T = 40$  and  $N_{RD} = 32$ ).

These results are confirmed by the OLS regressions presented in Table 4. Model 1 shows that overall participants display betrayal aversion. Models 2 and 3 reveal that betrayal aversion is significant only for subjects from the South ( $Trust\ treatment \times South$ ). According to an F-test, however, the degree of betrayal aversion does not significantly differ among Southerners and Northerners ( $p$ -value=0.436 for Model 2,  $p$ -value=0.773 for Model 3).

## 4 Discussion and Conclusions

Stark regional disparities in income are common in many countries (Ezcurra and Rodríguez-Pose, 2013) and policies aimed at reducing within-country differences have commanded much attention in Europe and elsewhere. Our results suggest that cohesion policies might be less successful than expected if people's preferences and beliefs are not taken into account and policies only focus on equalizing opportunities and welfare conditions across areas. (Brosig-Koch et al., 2011; Rustagi and Veronesi, 2016 are exceptions). However, in so far as regional differences in preferences and beliefs are found to explain regional differences in cooperation, they may be precious in identifying which policies are more likely to succeed. To this end, we have taken Italy as a case-study and have measured beliefs and key economic preferences by using the rigorous methodology of experimental economics (Bigoni et al., 2016).

Previous results suggest that the difference in the ability to cooperate between the North and the South of Italy that can be observed experimentally is not reflected in individual preferences for equity. Here we go further and investigate other possible causes of such cooperation gap.

Our study confirms that the problem of cooperation in the South relative to the North does not lie in differences in pro-social preferences. We find that conditional cooperation is not responsible for the gap: in both macro-regions, the same proportion of subjects, two-thirds, behave as conditional cooperators, increasing their contribution in the Public Good Game in response to the other members of their group increasing theirs. In theory self-selection could be an issue, but the evidence we have on college choice of the Italian students allays this concern.<sup>14</sup>

The cause of the difference in cooperative ability lies elsewhere. First, Northerners and Southerners differ in their aversion to social risk, which is present among the latter, but negligible among the former. The pattern of statistical significance based on the behavior in a Trust Game, however, is inconclusive: betrayal aversion is significantly different from zero among Southerners and but not among Northerners, yet the two values do not significantly differ from each other. The low number of subjects (ca. 70) may have something to do with this. It is nonetheless tempting to speculate on this result as it seems a promising avenue of further study. A more intense aversion to betrayal could be due to engrained conventional values that hold people who are cheated in lower esteem than people who cheat – “fool me once shame on me.” Or it could be a response to the expected cost of being cheated, the fear that one could have to bear the cost of redress and reputation re-building privately rather than rely on public or social justice.

Our more robust result puts the responsibility for cooperation disparities squarely on more pessimistic expectations about how much others are likely to contribute in the Public Good Games: Southerners have more cautious beliefs about other Southerners’ contribution, than Northerners have about other Northerners. Interestingly, these lower expectations are shared

---

<sup>14</sup>Presentation of Andrea Ichino at IZA, November 15, 2016: Civicness drain: Emigrants’ self-selection and social norms in the place of origin.

by Northerners when asked about Southerners.

Our findings suggest that the distance between the North and South of Italy pertains to a dimension of social interaction. The observed regional difference in behavior is not rooted in individual pro-social preferences, as suggested by Banfield. What really matters are the beliefs about others' cooperative behavior and the preferences toward social risk. The coherent picture offered by our findings throws up further questions on the historical origins of both the different cooperative beliefs and the different weight attributed to social risk across Italy, but these are left for future research.

**Acknowledgments.** The authors thank participants at the NIBS workshop in Nottingham, ESA European meeting in Heidelberg, C-SEB workshop in Cologne, Social Capital and Regional Divides Workshop in Cagliari, ESA European meeting in Bergen, 11<sup>th</sup> Nordic Conference on Behavioral and Experimental Economics in Oslo, and seminar participants at University of Bologna, University of Trento, LUISS Guido Carli (Rome), and University Federico II (Naples) for helpful comments and suggestions on previous versions of this paper. M. Casari gratefully acknowledges support from an ERC Starting Grant (No. 241196). The usual disclaimer applies.

## References

- Banfield, E. C. and L. Fasano (1958). *The Moral Basis of a Backward Society*. The Free Press.
- Barr, A. and D. Serra (2010). Corruption and culture: An experimental analysis. *Journal of Public Economics* 94, 862–869.
- Battiston, P. and S. Gamba (2016). When the two ends meet: An experiment on cooperation across the Italian North-South divide. LEM Papers Series 2016/41, Laboratory of Economics and Management (LEM), Sant’Anna School of Advanced Studies, Pisa, Italy.
- Bigoni, M., S. Bortolotti, M. Casari, D. Gambetta, and F. Pancotto (2016). Amoral familism, social capital, or trust? The behavioural foundations of the Italian North-South Divide. *The Economic Journal* 126(594), 1318–1341.
- Bisin, A. and T. Verdier (2000). Beyond the Melting Pot: Cultural Transmission, Marriage, and the Evolution of Ethnic and Religious Traits. *Quarterly Journal of Economics* 115(3), 955–988.
- Bohnet, I., F. Greig, B. Herrmann, and R. Zeckhauser (2008). Betrayal Aversion: Evidence from Brazil, China, Oman, Switzerland, Turkey, and the United States. *American Economic Review* 98(1), 294–310.
- Bohnet, I. and R. Zeckhauser (2004). Trust, risk and betrayal. *Journal of Economic Behavior & Organization* 55(4), 467–484.
- Bornhorst, F., A. Ichino, O. Kirchkamp, K. H. Schlag, and E. Winter (2010). Similarities and differences when building trust: The role of cultures. *Experimental Economics* 13(3), 260–283.
- Brosig-Koch, J., C. Helbach, A. Ockenfels, and J. Weimann (2011). Still different after all these years: Solidarity behavior in East and West Germany. *Journal of Public Economics* 95(11-12), 1373–1376.
- Buonanno, P., D. Montolio, and P. Vanin (2009). Does social capital reduce crime? *Journal of Law and Economics* 52(1), pp. 145–170.
- Cartocci, R. (2007). *Mappe del tesoro: atlante del capitale sociale in Italia*. Il mulino.

- Cubitt, R. P., S. Gächter, and S. Quercia (2015). Conditional Cooperation and Betrayal Aversion. CESifo Working Paper Series 5444, CESifo Group Munich.
- De Blasio, G. and G. Nuzzo (2010). Historical Traditions of Civicness and Local Economic Development. *Journal of Regional Science* 50(4), 833–857.
- Dohmen, T., A. Falk, D. Huffman, and U. Sunde (2012). The Intergenerational Transmission of Risk and Trust Attitudes. *Review of Economic Studies* 79(2), 645–677.
- Ezcurra, R. and A. Rodríguez-Pose (2013). Does economic globalization affect regional inequality? A cross-country analysis. *World Development* 52, 92–103.
- Fischbacher, U. (2007). z-Tree: Zurich toolbox for ready-made economic experiments. *Experimental Economics* 10(2), 171–178.
- Fischbacher, U. and S. Gächter (2010). Social preferences, beliefs, and the dynamics of free riding in public goods experiments. *American Economic Review* 100(1), 541–56.
- Fischbacher, U., S. Gächter, and E. Fehr (2001). Are people conditionally cooperative? Evidence from a public goods experiment. *Economics Letters* 71(3), 397–404.
- Frederick, S. (2005). Cognitive reflection and decision making. *The Journal of Economic Perspectives* 19(4), 25–42.
- Greiner, B. (2015). Subject pool recruitment procedures: Organizing experiments with orsee. *Journal of the Economic Science Association* 1(1), 114–125.
- Guiso, L., P. Sapienza, and L. Zingales (2004, June). The role of social capital in financial development. *American Economic Review* 94(3), 526–556.
- ISTAT (2014). La mortalità dei bambini ieri e oggi in italia. Technical report.
- ISTAT (2015). Italia in cifre: edizione 2015. Technical report.
- Kocher, M. G., T. Cherry, S. Kroll, R. J. Netzer, and M. Sutter (2008). Conditional cooperation on three continents. *Economics Letters* 101(3), 175–178.
- Nannicini, T., A. Stella, G. Tabellini, and U. Troiano (2013, May). Social capital and political accountability. *American Economic Journal: Economic Policy* 5(2), 222–50.

Putnam, R. (2000). *Bowling Alone: The Collapse and Revival of American Community*. A Touchstone book. Simon & Schuster.

Putnam, R., R. Leonardi, and R. Nanetti (1993). *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton University Press.

Rustagi, D., S. Engel, and M. Kosfeld (2010). Conditional cooperation and costly monitoring explain success in forest commons management. *Science* 330(6006), 961–965.

Rustagi, D. and M. Veronesi (2016). Social identity, attitudes towards cooperation, and social preferences: Evidence from Switzerland. Working Papers 01/2016, University of Verona, Department of Economics.

# Appendix A [not for publication]

## Instructions for Experiment 1

Welcome. The goal of this study is to understand how people take decisions. Starting from now and till the end of the study, no form of communication with the other participants is allowed. Please switch off your mobile phones. You have earned € 4 for showing-up on time. During the study, you will be able to earn additional money, depending on your choices and the choices of the other participants.

### Part 1: Instructions

**Tokens and payments.** All the earnings for this first part will be expressed in tokens. Tokens will be converted at the end of the study at the rate of € 1=3 tokens. Your earnings for this part will be paid to you in cash and anonymously at the end of the study; other participants will not be informed about your earnings.

**Group formation.** In this part, you will be assigned to a group of four people. Groups will be formed randomly by the computer. Nobody will be informed about the identity of the other people in the group.

**Decisions to make.** You have to decide how to use 20 tokens. You can put the 20 tokens in your personal account or invest them – all or part of them – in a common project. Every token not invested in the common project will be automatically put in your personal account.

**Your earnings from the personal account.** For every token you put in the personal account, you earn exactly one token. For instance, if you put all 20 tokens in your personal account – i.e., you invest 0 in the common project – you get exactly 20 tokens. Instead, if you put 6 tokens in your personal account, you get 6 tokens from the account. There could be additional earnings coming from the common project.

**Your earnings from the common project.** In contrast with the personal account, everything you invest in the common project generate some earnings for all the group members. The earnings from the common project will be divided equally among all group members. Of course, you will also benefit from the tokens invested in the common project by you and by the other members of the group. More precisely, you earnings from the project are computed as follows:

*Your earnings from the common project = Sum of the investments in the common project  $\times$  0.4*

Let consider some example:

- If the sum of your investments and the investments of the other group members is equal to 60, everyone in the group – you included – earns 24 tokens from the common project.  
That is,  $60 \times 0.4 = 24$
- If the sum of your investments and the investments of the other group members is equal to 10, everyone in the group – you included – earns 4 tokens from the common project.  
That is,  $10 \times 0.4 = 4$

**Your total earnings.** Your total earnings will be equal to the sum of the earnings obtained from your personal account and from the common project.

*Your total earnings = Earnings from the private account + Earnings from the common project*  
*Your total earnings = (20 - Investment in the common project) + (Sum of the investments in the common project  $\times$  0.4)*

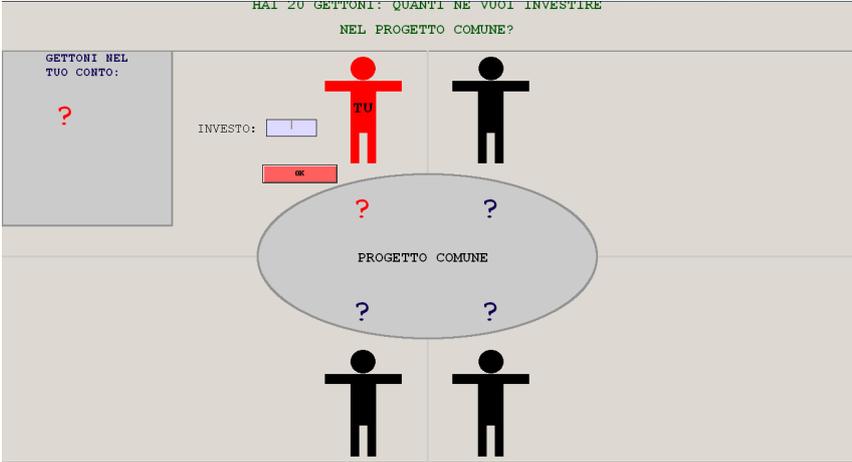
Before proceeding, we ask you to answer a few questions. The answers to these questions won't influence your earnings. If you have any question or doubt, please rise you hand and one of us will come to your desk to answer.

⇒ ——— new page ——— ⇐

**How to proceed.** In this part, you will have 20 tokens and you will have to decide how many tokens to put in your private account and how many to invest in the common project. Each

participant, will have to make two decisions – decision A and B.

Figure A-1: Decision A



- **Decision A.** You have to decide how many tokens, out of 20, you want to invest in the common project. A screen like the one in Figure A-1 will be displayed: you have to enter an integer between 0 and 20 in the gray field. That number corresponds to the money you intend to invest in the common project. A confirmation box will appear as soon as you make your decision and tap OK. Please, try to enter a number and press OK. You should be able to see the confirmation box and the amount you invested in the common project (central part of the screen). You should also be able to see how much you put in your personal account (upper-left part of the screen).
- **Decision B.** After Decision A, you will see a screen like the one in Figure A-2. In each cell of the table there is a possible (rounded) average investment by the other three members of your group. The cell in the upper-left corner represents the case in which none of the other group members have invested in the common project. The cell in the bottom-right corner represents the case in which all of the other group members have invested 20 tokens in the common project. For every cell, you have to enter an integer between 0 and 20. That number corresponds to the money you intend to invest in the common project if the average investment by the other group members is the one indicated in that cell. In Decision B, you can vary your investment level in the common project based on the average investment by the other group members. Please notice that you have to make 21 decisions,

one for each cell. You have to say how much you want to invest in the common projects if the others have invested on average 0, 1, 2, 3 etc. Once you have made all 21 decisions, you have to tap OK (bottom part of the screen) to confirm.

Figure A-2: Decisione B

**Earnings.** A random draw will determine if your payment will depend on Decision A or B. You won't know which decision will be relevant when deciding. It is hence in your best interest to pay attention to both decisions. At the end of today's session, one member of each group will be randomly selected. Decision B will be implemented for the selected participant, while Decision A will be implemented for the others. Let consider a few example together to better understand how your payments will be computed.

**Example 1.** Consider the following scenario. Please bear in mind that it is just an example to better understand how you will be payed.

- **You have** been selected and your Decision B will be implemented. It follows that Decision A will be implemented for the other 3 members of your group;
- The investments by the other 3 group members in Decision A are: 0, 2, and 4 tokens;
- The average investment of the non-selected group members is equal to 2 tokens:  $(0 + 2 + 4)/3 = 2$ ;
- In Decision B you stated that you want to invest 1 token if the others invested 2 on average;
- Therefore, the total investment in the common project is:  $0 + 2 + 4 + 1 = 7$  tokens;

- Your earnings from the common project are:  $7 \times 0.4 = 2.8$  tokens;
- Your total earnings are: 19 tokens from your personal account (you invested 1, so you have 19 left) plus 2.8 tokens from the common project, for a total of 21.8 tokens;
- Consider instead the following: in Decision B, you have decided to invest 19 tokens in the common project. The total investment in the common project is:  $0 + 2 + 4 + 19 = 25$  tokens
- In this case, your earnings from the common project are  $25 \times 0.4 = 10$  tokens;
- Your total earnings are: 1 token from your personal account (you have invested 19, so you are left with 1) plus 10 tokens from the common project, for a total of 11 tokens.

**Example 2.** Consider the following scenario. Please bear in mind that it is just an example to better understand how you will be payed.

- **You have not** been selected and your Decision A will be implemented. It follows that for one of the other 3 group members Decision B will be implemented;
- In Decision A, you have decided to invest 16 tokens and the other 2 non-selected members of your group have invested 18 and 20;
- The average investment of the non-selected group members is equal to 18 tokens:  $(16 + 18 + 20)/3 = 18$ ;
- The selected participant stated that he/she wants to invest 1 token if the others invested 18 on average;
- Therefore, the total investment in the common project is:  $16 + 18 + 20 + 1 = 55$  tokens;
- Your earnings from the common project are:  $55 \times 0.4 = 22$  tokens;
- Your total earnings are: 4 tokens from your personal account (you invested 16, so you have 4 left) plus 22 tokens from the common project, for a total of 26 tokens;
- Consider instead the following: in Decision B, the selected person have decided to invest 19 tokens in the common project. The total investment in the common project is:  $16 + 18 + 20 + 19 = 73$  tokens;

- In this case, your earnings from the common project are  $73 \times 0.4 = 29.2$  tokens;
- Your total earnings are: 4 token from your personal account (you have invested 16, so you are left with 4) plus 29.2 tokens from the common project, for a total of 33.2 tokens.

Is there any question?

⇒ ——— *new set of instructions* ——— ⇐

## Part 2: Instructions

**The decision.** You will face 10 situations; in each situation, you have to decide between an amount of money today and a larger amount in 4 weeks. You can see the 10 situations on the screen and in Figure A-3. Each situation requires to decide between two options:

- **Option A:** a bank transfer of 100 Euro to be executed **today**;
- **Option B:** a bank transfer of 100 Euros or more to be executed in **4 weeks** from now.

Figure A-3: Choice between A and B

RIGA	Opzione A OGGI	Scegli A o B		Opzione B IN 4 SETTIMANE	Tasso di interesse annuale
1	100 Euro	A <input type="checkbox"/>	<input type="checkbox"/> B	100 Euro	0 %
2	100 Euro	A <input type="checkbox"/>	<input type="checkbox"/> B	102 Euro	26 %
3	100 Euro	A <input type="checkbox"/>	<input type="checkbox"/> B	105 Euro	65 %
4	100 Euro	A <input type="checkbox"/>	<input type="checkbox"/> B	108 Euro	104 %
5	100 Euro	A <input type="checkbox"/>	<input type="checkbox"/> B	111 Euro	143 %
6	100 Euro	A <input type="checkbox"/>	<input type="checkbox"/> B	114 Euro	183 %
7	100 Euro	A <input type="checkbox"/>	<input type="checkbox"/> B	117 Euro	222 %
8	100 Euro	A <input type="checkbox"/>	<input type="checkbox"/> B	120 Euro	261 %
9	100 Euro	A <input type="checkbox"/>	<input type="checkbox"/> B	123 Euro	300 %
10	100 Euro	A <input type="checkbox"/>	<input type="checkbox"/> B	126 Euro	339 %

**Payment.** If you chose Option A, the bank transfer will be executed **today**, before midnight. If you chose Option B, the money will be wired in **4 weeks** from today, before the midnight

of the due day. From the moment the transfer is wired, it usually takes about two day before you can dispose of the money on your bank account. The lag is the same for both options. Therefore, the money won't be available on your account the very same day the transfer is made.

Every situation corresponds to a row in the decision table. For each row, you must indicate if you prefer Option A or B. For instance, in the first row you must say if you prefer 100 Euros today (Option A) or 100 Euros in 4 weeks (Option B). In the second row, you must say if you prefer 100 Euros today (Option A) or 102 Euros in 4 weeks (Option B). In the last row, you must say if you prefer 100 Euros today (Option A) or 126 Euros in 4 weeks (Option B). Next to each row, you can see the interest rate –computed on a yearly base– for that situation.

**Your earnings.** Once everyone is finished with the task, the computer will randomly select one person in this room and the number of the selected desk will appear on the screen. Only the selected person will be paid for this part, the other participants will get nothing for this part. The amount of the transfer will depend on a second random draw. The computer will randomly draw one of the 10 situations (row 1 to 10 in the table). The selected participant will hence receive a bank transfer for the amount he/she had chosen in the selected row. Consider the following example. Row number 4 is randomly selected:

- If the selected person has chosen Option A, he/she will receive a 100 Euros transfer today;
- If the selected person has chosen Option B, he/she will receive a 108 Euros transfer in 4 weeks.

The earnings for this part are added to the ones from the first part.

Is there any question? Please rise your hand if you have any question and one of us will come to your desk to answer.

## Instructions for Experiment 2

Welcome. This study is financed by the European Commission and the University of Bologna. The goal of the study is to understand how people take decisions. During the study, you will be able to earn money, depending on your choices and the choices of the other participants. Your earnings will be expressed in tokens and converted at the rate of 1 Euro = 2 tokens at the end of the study. To the amount you will earn during the study, you have to add 4 Euros for showing-up on time. You will be paid at the end of this session in private and in cash; others participants will not be informed about your earnings.

From now and till the end of the study, no form of communication with the other participants is allowed. Please switch off your mobile phones.

The study comprises two parts. I am about to read the instructions for the first part, please follow them carefully.

### Part 1: Instructions

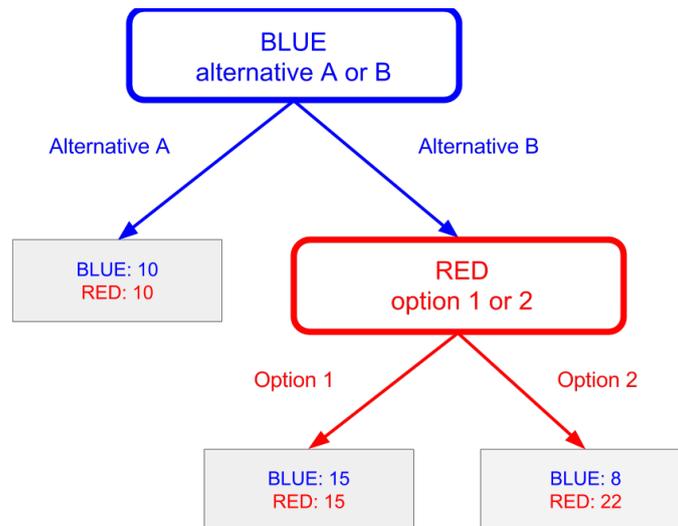
Participants in this room will be randomly assigned to one of two roles. Half of the people in this room will be BLUE players and the other half will be RED players. Pairs will be formed randomly and will comprise one BLUE and one RED player. You won't be given any information about the identity of the other person in your pair.

BLUE and RED have to make different decisions; see Figure below.

**If your role is BLUE.** You have two alternatives: A and B.

- Alternative A (on the left) grants 10 for sure.
- Alternative B (on the right) grants either 8 or 15, depending of RED' choice.

Figure A-1: Earnings table



**If your role is RED.** You must choose between two options: 1 and 2 (see Figure A-1). If alternative A is implemented, then your choice is not relevant and you earn 10. If alternative B is implemented, your choice will have consequences for your earnings and the ones of BLUE.

- Option 1 yields 15 to both you and BLUE;
- Option 2 yields 22 to you and 8 to BLUE.

**Your task if your role is RED.** You have to choose between option 1 and 2. At the time of your choice, you don't know which alternative – A or B – will be implemented.

Please, look at the screen. You will have to complete the following statement:

*If alternative B is implemented, I choose option \_\_\_\_\_.*

You have to tap on your preferred option to make your decision.

**Your task if your role is BLUE.** You have to choose under which conditions you prefer alternative B over alternative A.

Alternative A yields you 10 for sure. In case you select alternative B, you earnings depend on the choice of RED. If you are paired with a RED choosing option 1, you earn 15. If you are

paired with a RED choosing option 2, you earn 8. Therefore, the lower the number of REDs choosing option 1, the more likely that you will earn 8 instead of 15.

If none of the REDs choose 1 (0%), you know that you will earn 8 tokens for sure if you choose alternative B. If all REDs choose 1 (100%), you know that you will earn 15 tokens for sure if you choose alternative B. If a RED every 5 chooses 1 (20%), you could be paired with a RED that chose 1 or 2. In this case, you have a 20% probability of being paired with a RED who chose 1 and a 80% probability to be paired with a RED who chose 2.

Please look at the screen. You will have to complete the following sentence:

*I prefer **alternative B** if at least \_\_\_\_\_ percent of the REDs choose option 1 (please enter a number between 0 and 100).*

Please move the triangle to answer. Make some trials: drag the triangle with the mouse or with your fingers and observe how your answer changes. For your convenience, you can also use the + and – buttons at the sides of the bar.

Once you have selected the desired number, please press confirm.

**Important remarks.** BLUE does not know the actual fraction of RED players choosing 1 and has no means to influence this fraction. This fraction will depend on the number of REDs that choose 1. BLUE just indicate under which circumstances he/she prefers alternative B: that is, how large the fraction of REDs choosing option 1 has to be in order for him/her to prefer alternative B.

**Earnings** After all REDs and BLUEs have made their decision, the actual percentage of RED choosing option 1 is computed. This information will only be visible on BLUEs' screen. In each pair, the actual percentage will be juxtaposed to the minimum one required by BLUE.

- If the **actual percentage** is **smaller** than the minimum percentage required by BLUE, alternative A is implemented. Both BLUE and RED earns 10 tokens each.

- If the **actual percentage** is **larger** than the minimum percentage required by BLUE, alternative B is implemented. The earnings also depend on the choice made by RED as shown in Figure A-1.

**Examples.** Consider the following situation. BLUE prefers alternative B if at least 50% of REDs choose option 1. Which alternative is implemented if it turns out that 20% of RED has chosen option 1? Alternative A is implemented as the actual percentage (20%) is smaller than 50%. In this case BLUE has a sure earnings of 10.

Which alternative is implemented if it turns out that 83% of REDs have chosen option 1? Alternative B is implemented as the actual percentage (83%) is smaller than 50%. In this case BLUE earns 15 with probability 83% and 8 with probability 17%

Is there any question? Please rise your hand if there is a question and we will come to your desk to answer it. Before proceeding, please answer a quiz to make sure everyone has correctly understood the instructions.

⇒ ——— *new set of instructions* ——— ⇐

## Part 2: Instructions

In this part, you are asked to provide an estimate about decisions made by other people who took part in a series of previous studies. These studies were conducted in different cities with participants with different age, gender and employment status.

I am about to read the instructions we used in these previous studies. It is important that you carefully follow these instructions and fully understand them.

---

*Beginning of the original instructions*

People in this room are randomly divided in groups of four; nobody can know the identity of the other members of the group.

The screen displays your group: you are the person in red.

What is your task? Each member of the group is endowed with 20 tokens that have to be divided between a common project and his wallet. You can see four red buttons on the screen. You can decide to:

- put 0 tokens in the common project and keep 20 tokens in your wallet;
- put 6 tokens in the common project and keep 14 tokens in your wallet;
- put 14 tokens in the common project and keep 6 tokens in your wallet;
- put 20 tokens in the common project and keep 0 tokens in your wallet.

As an example with no consequences for your earnings, please press the button PUT 0 AND KEEP 20.

A box to CONFIRM or CHANGE your choice has appeared on the screen; please, press CONFIRM.

After everyone has confirmed his choice, you can see:

- the tokens kept in the wallet by each member of the group;
- the tokens put in the common project by each member of the group;
- the total number of tokens the group has put in the common project.

How are your earnings computed?

- you earn the tokens you kept in your wallet;
- the total number of tokens in the project is doubled and divided equally among the four members of the group.

Look at the top-left part of the screen; as you can see, in the present example you earn the 20 tokens you kept in your wallet. In addition, you earn 20 tokens from the common project. Why?

Because:

- you put 0 tokens in the common project, while the other people put 20, 14, and 6 tokens, for a total of 40;
- the 40 tokens are doubled for a total of 80;

- the 80 tokens are equally shared; therefore, you earn 20 from the common project; that is, 80 divided by 4.

Earnings for the other members of the group are computed alike. Please, remember that this is just an example.

Earnings from the common project are the same for each member of the group: is it just a coincidence? No it is not; even though the amount of tokens put in the project by each member is different, the total amount is always shared equally.

Can you know how much has been put in the common project by each member of the group? Yes, you can know the amount. Consider the tokens kept in the wallet, as reported next to each person:

- if the person kept 20 tokens in his wallet, he put 0 tokens in the common project;
- if the person kept 14 tokens in his wallet, he put 6 tokens in the common project;
- if the person kept 6 tokens in his wallet, he put 14 tokens in the common project;
- if the person kept 0 tokens in his wallet, he put 20 tokens in the common project.

In this part there are 8 rounds with the same rules. In the upper-left part of the screen you can see the number of the current round. At the beginning of every round, new groups of four people are formed at random.

To sum up, in every round:

- you are endowed with 20 tokens;
- you have to decide how to allocate the tokens between your wallet and the common project;
- the tokens put in the common project by the group are doubled and then divided equally among the four members of the group;
- your earnings are equal to the sum of what is in your wallet and the tokens from the common project.

Earnings are summed from round to round. *[Is everything clear?]*

Before starting, please answer a few questions.

*End of original instructions*

---

Before describing your task and how your earnings are computed, please answer the same quiz we administered to the participants who took part in the previous experiments.

**Your task.** At the beginning of this part of the study, the computer will randomly draw two participants from the previous study – the one we just read the instructions.

For every selected person, you will be asked to estimate how many tokens this person has contributed to the common project. We ask for the average over the 8 rounds.

Your answer has to be an integer number between 0 and 20.

**Key question: How many token the selected person has contributed (on average) to the common project?**

We run sessions in different cities. We used these instructions and paid participants based on their choices. In each city, we recruited about 80-90 participants, both male and females, between 18 and 90 years old. We recruited participants with different employment status: workers, unemployed, housewives, and retired. The composition of the participants to these previous studies is similar to the one of the Italian population with respect to gender, age and employment status. That means, for instance, that about half of the participants were females, as they represent about half of the Italian population.

You will have to provide your estimate of the tokens contributed to the common project by the selected person, without knowing his/her gender, age, and employment status. For the selected person, you will only get to know the province where the study was conducted: this information will be displayed on the upper part of the screen. Please keep in mind that the participants were born and resident in the province where the study was run.

Once you will have submitted the first estimate, we will move to the estimate for the second person. Once more, you will be asked to estimate how many tokens this person has contributed to the common project – we ask for the average over the 8 cycles. You will only get to know the

city where the study including the selected person was run.

Table A-1: Tabella dei guadagni

Distance from the actual average	Your earnings (in tokens)
0 o 1 token	26
2 tokens	22
3 tokens	17
4 tokens	10
5 tokens	1
6 tokens or more	0

**Your earnings.** Your earnings can vary between 0 and 26 tokens depending on the accuracy of your estimate. The closer you get to the actual average number of tokens put in the common pool by the selected person, the higher your earnings. Please see Table A-1. You earn 26 tokens if your estimate is identical to the actual contribution or if it departs from the actual number by at most 1 token (from above or below). If, for instance, your estimate departs from the actual contribution by 4 tokens, you earn 10. If your estimate departs by 6 or more tokens you earn nothing. You will be paid only for one of the two estimates; the computer will randomly determine if you will be be paid for the first or the second estimate. You will know which of the two estimates will be paid only after having made both decisions; it is hence in your interest to pay attention to both decisions. The earnings from this part will be added to the ones from the previous part.

Please rise you hand if you have any question and I will come to your desk to answer.