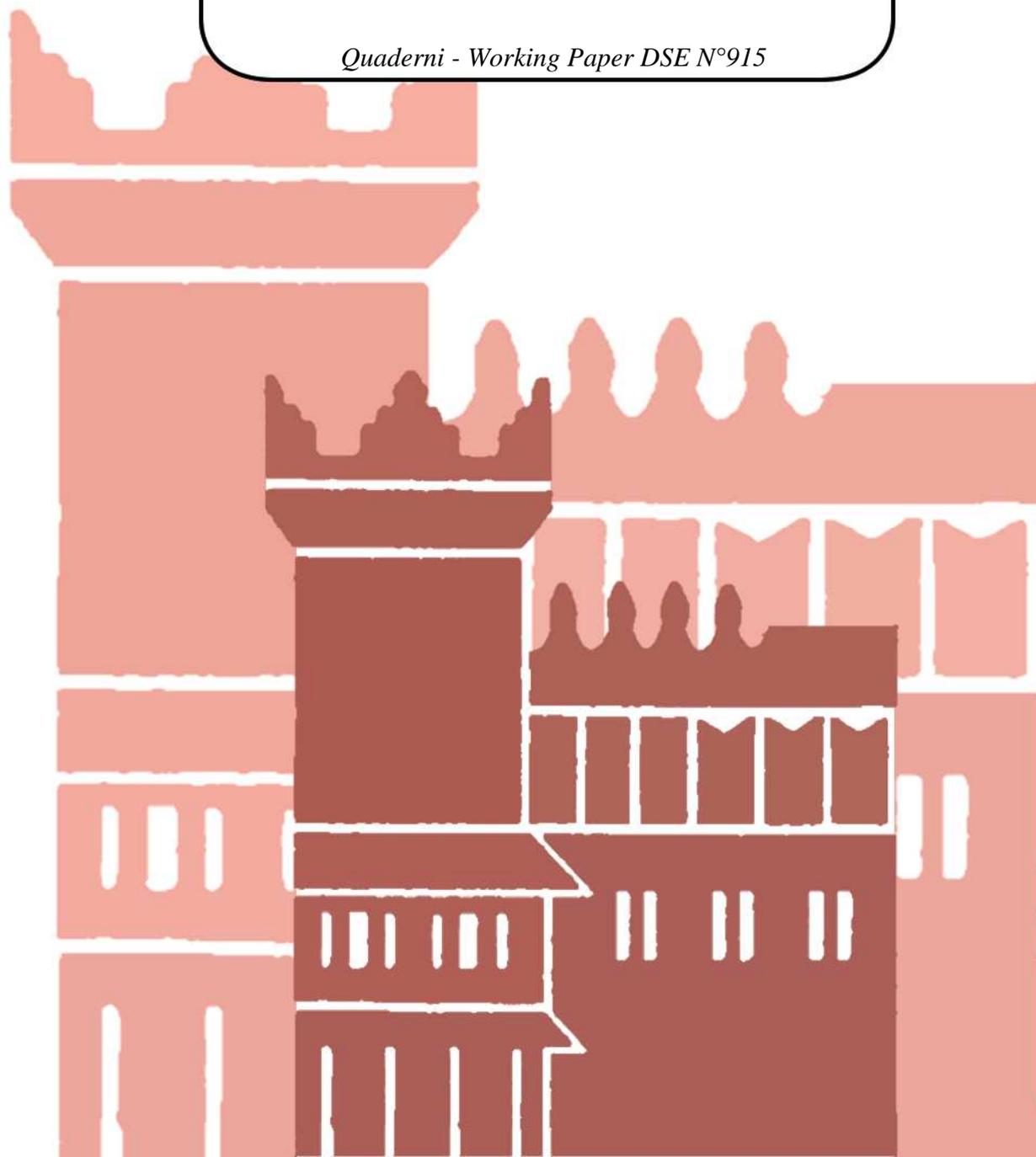Alma Mater Studiorum - Università di Bologna
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Temporary Workers Are Not Free-Riders: An Experimental Investigation

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Abstract

We conduct an artefactual field experiment to study whether the individual preferences and propensity to cooperate of temporary workers differ from permanent contract workers. We find that temporary and permanent contract workers have different other-regarding preferences, but display similar contribution patterns in an anonymous Public Good Game. Students, instead, are more selfish and contribute less than temporary and permanent workers.

Keywords: Temporary Worker, Decomposed Prisoner Dilemma, Dictator Game, Public Good Game, Field Experiment.

JEL codes: C72, C93, D23, H41, J54

I.   Introduction

A temporary worker is an employee hired for a pre-determined time limit. In the last 25 years there has been a rapid diffusion of temporary employment in many industrialized countries, in particular

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in countries providing high levels of employment protection (Sala *et al*., 2012). From a firm's perspective, temporary employment reflects the need for a flexible labor demand. Allowing for a higher turnover rate, flexible employment makes it easier for a firm to replace less productive people with more productive ones, and may as well favor the inflow of innovative ideas. On the other hand, a high turnover may hinder social cohesion and trust, and increase the probability of opportunistic behavior. Moreover, temporary employment may determine economic, psychological and social costs as temporary workers are often found to be less satisfied with their jobs; they also receive less training from the firms and are usually paid less than permanent workers (Booth *et al*., 2002).

The recent diffusion of temporary employment has stimulated research aimed at assessing the economic and social impact of temporary work arrangements concerning, e.g., the existence of a gap in the working conditions of permanent and temporary workers, particularly in terms of working rights and training received by the firm, and the effect of wage differentials between temporary and permanent contracts (OECD, 2002), the role of temporary work as a stepping-stone towards regular employment (Ichino *et al*., 2008), the relationship between temporary work and job satisfaction (Booth *et al*., 2002), the effect of temporary status on the worker's well-being, mental and physical health (Cuyper *et al*., 2008, Martinez *et al*., 2010, Rousseau, 1995).

In this paper we investigate whether temporary and permanent workers differ in terms of propensity to cooperate and in terms of other-regarding preferences. Since these are crucial factors in affecting a worker's productivity and performance on the job (Carpenter and Seki, 2005), our results can provide useful information for an employer who is contemplating which contractual arrangement best fits her needs.

To carry out this investigation, we ran an *artefactual field experiment* (see Harrison and List, 2004) with three different subject pools: one made of Temporary workers, one made of Permanent workers and one of university Students. The subjects participated in a Dictator Game, a Decomposed Prisoner Dilemma and a Public Good Game. These tasks allowed us investigating the intensity of other-regarding preferences, as well as the individual propensity to cooperate, across the three different sample pools, in a controlled lab environment where we could measure the frequency and extent of opportunistic and cooperative behavior. The comparison between Temporary workers and Permanent workers is particularly interesting, as the latter pool was composed by members of a co-operative of workers. Co-ops are "autonomous associations of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and

democratically-controlled enterprise",[5] and they have specific institutional features that distinguish them from other firms in terms of purposes, control structures and allocation of profits. As the word co-op suggests, the importance of cooperation is one of the distinctive features of a co-op, together with the importance given to the values of self-help, self-responsibility, democracy, equality, equity and solidarity. For all these reasons, our a-priori expectation was that co-op workers would be particularly prone to cooperation, with significant and sizeable differences with respect to non-co-op workers, in particular temporary workers who are not members of a co-op.

Our results show that the cooperation rates of Students are similar to those reported in the literature with similar subject pools (e.g. Burlando and Guala, 2005; Croson, 1996; Andreoni, 1988). Temporary workers, instead, are significantly more cooperative and less opportunistic. In addition, they are also more other-regarding than Students and their behavior and preferences are very much similar to those of co-op Permanent workers. This is a rather surprising result because a priori we expected to obtain very different behavioral patterns when comparing Temporary workers with co-op Permanent workers. Temporary workers did not know each other, and they shared very little common experiences, either in terms of education, training on the job or specialization. Moreover, the probability of meeting again in subsequent occasions is small, which makes reputation a rather weak argument for inducing cooperation in a repeated interaction perspective. On the contrary, Permanent workers knew each other and interact together on a daily basis in the same workplace. In addition, they work for the same co-operative, and are constantly exposed to the values of the institution they work for.

The comparison among Temporary and Permanent (co-op) workers is a useful starting point to understand what factors drive the propensity to cooperate of workers in general, and whether the possible differences in preferences and behavior may be driven by the specific type of contractual arrangement. To the best of our knowledge this is the first paper which applies the experimental methodology to a sample of Temporary workers. Our experiment provides new evidence, as measured in a controlled lab environment, on the workers' preferences and propensity to cooperate, and can be a useful complement to more traditional sources of information, such as those based on surveys and questionnaires (e.g. Borzaga and Depedri, 2005; Novkovic *et al.*, 2012). We also obtain information on the preferences and propensity to cooperate of co-op workers, on which previous

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[5] Co-ops around the world adhere to the same seven principles: Voluntary and open membership, Democratic member control, Member economic participation, Autonomy and independence, Education, Training, and Information, Co-operation among co-operatives, Concern for community (http://ica.coop/en/what-co-op/co-operative-identity-values-principles).

experimental investigation is surprisingly scarce. A noteworthy exception is Burks *et al*. (2009), who provide field experimental evidence that employees at firms that pay for performance are significantly less cooperative than those who are members of cooperatives. Finally, by comparing the behavior of workers with a sample of university Students, we contribute to the experimental literature studying the external validity of experiments employing Students as subjects (for a review, see Frechette, 2009).

The paper is structured as follows. In next section we describe the three sample pools employed in the experiment. In section 3 we present the experimental design, and in section 4 we report the results. Section 5 contains a discussion of the results and Section 6 concludes.

II. The subjects pools: Temporary workers, Permanent workers, and Students

The subjects taking part to the experiment were recruited from three different populations: Temporary employees, Permanent employees and undergraduate Students of the University of Bologna.

Temporary workers. The pool of Temporary workers that participated to the experiment was supplied by Obiettivo Lavoro (OL), a large recruitment agency that operates mainly in Italy, with branches operating also in Bolivia, Brazil, Ecuador, Poland, Romania, Paraguay and Peru. OL operates in sectors such as health care and social assistance, cleaning and logistics, construction, large scale retail, hotel, catering, and tourism, with yearly total revenue of 308 million euros (operating revenue, 2012). It manages more than 1,400,000 profiles of workers to be hired to firms or institutions demanding labor force. Originally established as a co-operative company in 1997, OL was converted into a public limited company in 2003. It has adopted an Ethics Code and in 2007 it obtained the SA8000 certification for its Corporate Responsibility practices.[6] The 72 subjects which OL supplied for the experiment where Temporary workers who had never participated in an economic experiment like ours, nor had ever had relations with OL before 2003.

Permanent workers. The pool of cooperative members that took part to the experiment was supplied by Formula Servizi (FS), a workers co-operative company founded in 1975, which operates in five

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[6] SA8000 is a global social accountability standard for decent working conditions. The standard is based on the principles of international human rights and conventions of the International Labour Organisation (ILO), which encourage management to implement sustainable systemic changes in business operations. SA8000 aims to improve the work conditions in organizations; the standard governs child or forced labor, health and safety, freedom of association and right to collective bargaining, discrimination, disciplinary practices, work hours, compensation, and management system.

Italian regions (mainly in Emilia Romagna, where 75% of its revenue is raised). It supplies several services, mainly in sectors such as cleaning, catering, maintenance and logistics, with yearly total revenue of 55 million euros (operating revenue, 2012) raised both with private firms (30%) and the public sector (70%). FS has obtained the SA8000 certification for its Corporate Responsibility practices in 2003, and has adopted an Ethical Code in 2012. The total number of workers in 2012 is 1892, with a prevalence of women (83%) and an average age of 47 years. Among these workers, 892 are members of the cooperative ("soci"), 890 are employees, while 110 are outsourced workers. For our experiment we recruited 84 subjects only among cooperative members, therefore choosing to focus on the most "permanent" set of workers, and we excluded both employees and outsourced staff.

Students. As a benchmark, we recruited 96 students from the Forlì Campus of the University of Bologna, using the subject pools maintained through ORSEE. Although being quite different from the other two samples of workers for their educational background and age, student subjects are meant to check the conformity of our experimental results with similar existing studies which are run mainly with student subjects.

III. Experimental design

The experiment is composed of two stages: a classification stage and a main stage. In the classification stage subjects are required to perform three tasks which are widely employed in the experimental literature to study other-regarding preferences. The subjects first play a one-shot Dictator Game, then they play a Public Good Game to assess their conditional willingness to contribute to a public good (Strategy Method) and finally they play a Decomposed Prisoner Dilemma. In the main stage the subjects play a repeated anonymous linear Public Good Game (12 repetitions). The experiment was incentivized and fully computerized, and anonymity was guaranteed both during the game and the payment procedures.[7]

In the one-shot Dictator Game each subject is randomly matched with another individual, and has to decide how to divide an endowment of 30 experimental tokens between herself and her matched subject. After each subject has made her decision, a random mechanism establishes whether her proposal or the proposal of the counterpart is implemented. Subjects who give less than 10 tokens

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[7] The experiment was programmed and conducted with the software z-Tree (Fischbacher, 2007). The computer screens and code can be provided from the authors upon request.

are classified as self-centered, while those who give 10 or more are classified as beneficent (for a similar classification, see Brosig, 2002).

In the second task, subjects are classified based on their behavior in a linear one-shot Public Good Game using the Strategy Method Technique (Fischbacher *et al.* 2001; Fischbacher and Gächter, 2010). Subjects are randomly allocated to groups of four individuals. An endowment of 200 tokens is to be allocated by each subject between a 'private' and a 'public' account. The individual payoff is determined according to the following function:

$$\pi_i = 200 - g_i + 0.5 \sum_{j=1}^{4} g_j,$$

where g_i is player *i*'s contribution to the public account and g_j the contribution by the other members of the group. Since the contributions of the group to the public account are doubled and equally divided among the group participants, the marginal individual benefit from a contribution to the public good is 0.5. Subjects are first asked to make an unconditional contribution to the public good, and then to indicate their willingness to contribute to the public account, conditional on different possible contributions of the other group members. The possible average contributions range from 0 to 200, and are listed as multiple of 10 tokens. After the choices are made, one subject per each group is randomly selected and paid accordingly to her conditional contribution to the unconditional contributions of the other three members. The remaining players are paid accordingly to their unconditional contributions.

In the third classification task, we employ a Decomposed Prisoner's Dilemma Game, a classificatory task used both in the economic and psychological literature (e.g. Burlando and Guala, 2005; Brosig, 2002; Kuhlman and Marshello, 1975; Pruitt, 1967). The Decomposed Game is designed to study the distributional preferences of the subjects who are asked to choose between two possible allocations of money. For example, a subject must choose whether she prefers an allocation where she receives 130 tokens and the other participant receives 75 tokens, or an allocation where she receives 145 tokens and the other participants loses 39 tokens. Subjects are randomly and anonymously matched in couples and asked to make 24 choices between pairs of

allocations. The individual earnings are equal to the sum of the payoffs of the 24 choices made by the subject and by her co-participant, who remains the same throughout the 24 choices.[8]

No feedback about the co-participant's choices is provided to the subjects during the classification stage: the subjects only receive information about their earnings at the end of the experiment. In addition, the order of the classification tasks is the same for all the subjects, and, therefore, cannot explain across-sample differences.

After the classification stage, the subjects enter the main stage of the experiment and play a repeated linear 4-player Public Good Game (12 rounds). At the beginning of the first round, subjects are randomly matched in groups of four which remain the same over all rounds. The payoff function is identical to the one used in the Strategy Method, except for the individual endowment (20 tokens instead of 200 tokens). At the end of each round, each subject receives feedback about her contribution to the group account, the single contributions of the other members (whose identities are hidden),[9] and her total earnings. Comprehension and familiarity with the experimental setup is obtained requiring the subjects to enter three forced inputs.[10] After the first 12 rounds, the subjects engage in additional experimental tasks which we do not consider in this paper.[11] After all tasks are completed, subjects are informed about their earnings and are required to complete a demographic questionnaire (reported in the Appendix).

The experiment was conducted at the LES (Laboratorio di Economia Sperimentale, Forlì campus of the University of Bologna, Italy) and at the BLESS (Bologna Laboratory for Experiments in Social Science, Bologna campus of the University of Bologna, Italy) in the period July 2009 - January 2011.[12] We ran a total of 18 sessions, with either 12 or 24 subjects per session. Each session was composed by homogeneous subject pools, for a total of 72 Temporary workers, 84 Permanent workers and 96 Students, none of which had previously participated in a similar experiment. No subject could participate in more than one session. The participants were randomly assigned to computer terminals, which were separated by partitions in order to avoid facial or verbal communication between subjects. Before proceeding with each task, subjects filled in a control

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[8] See Burlando and Guala (2005) and Brosig (2002) for more details.

[9] The order in which the contributions of the other members were displayed was randomized in each round.

[10] As shown in Bigoni and Dragone (2012), in a Public Good Game, on-screen instructions requiring forced inputs improve on subjects' comprehension and familiarity with the experimental task. They also contribute to reduce both decision and waiting times without affecting the overall pattern of contributions.

[11] The additional tasks consist of 24 additional rounds of the Public Good Game with some design changes with respect to the initial 12 rounds, and a Stug Hunt Game with framed instructions. Since the subjects where not informed about the future tasks, no distortion in their choices was artificially introduced by the experimenters.

[12] In the Appendix we report details about dates and places of each session.

questionnaire designed to check their understanding of the instructions. Clarifications were individually given to subjects who answered incorrectly. The experiment used a fictional currency, with one token being equal to one euro cent. Subjects received a show-up fee of € 2, independently of their earnings in the experiment. On average, subjects earned € 20.93 (approximately 28 US dollars). To secure anonymity in the lab, assistants paid the participants privately at their desks. Each session lasted on average no more than 2 hours, including instructions and check questions to verify the understanding of the rules by participants. The experimental instructions were as neutral as possible, and made available both on screen and on paper at the beginning of each experimental task. To ensure common knowledge, instructions were also read out aloud by the experimenter.

IV. Results

In this section we report the results of the classification tasks (Dictator Game, Strategy Method and Decomposed Prisoner Dilemma) and of the repeated linear Public Good Game.

A. Dictator Game

Following Brosig (2002), we classify the subjects as beneficent when they donate one third or more of their endowment to the other player, and we classify them as self-centered otherwise. The results are reported in Table 1.

Table 1: Beneficent and Self-centered subjects in the Dictator Game

	Temporary	Permanent	Students	Total
N. subjects	72	84	96	252
Average contribution	121	135	70	106
Self-centered	25% (n=18)	14.3% (n=12)	55.2% (n=53)	32.9% (n=83)
Beneficent	75% (n=54)	85.7% (n=72)	44.8% (n=43)	67.1% (n=169)

We can reject the hypothesis that being beneficent is independent of whether a subject is a Temporary worker, a Permanent worker or a Student (Chi-squared test, $p = 0.000$).[13] The proportion of beneficent subjects among Temporary and Permanent workers is significantly larger than among Students (Chi-squared test, $p = 0.000$). Although beneficent subjects are more common among the

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[13] Throughout the paper, bivariate tests are two-tailed.

Permanent workers than among the Temporary workers, the difference is not significant at 5% level (Chi-squared test, $p = 0.091$).[14] This allows stating the following:

Result 1: *In the Dictator Game Temporary and Permanent workers are more beneficent than Students.*

Table 2 reports the results from the regression analysis. Regression 1 is a Tobit regression where the dependent variable is the amount offered in the Dictator Game; regression 2 is a Probit regression on the likelihood of being a beneficent subject. In both regressions the explanatory variables include age and dummies identifying the experimental sample (using Temporary workers as baseline category), gender (Male = 1 for male subjects), marital status (Married = 1 for married subjects), religious affiliation (NoReligion = 1 for atheist or agnostic subjects), and educational background (Degree = 1 for subjects with a university degree).[15]

Table 2: Regression analysis (Dictator Game)

	Regression 1			Regression 2		
	B	Std.Err.	p > z	β	Std.Err.	p > z
Student	-53.557***	12.35	0	-0.590***	0.22	0.008
Permanent	3.082	15.77	0.845	0.12	0.29	0.684
Male	4.264	11.3	0.706	-0.064	0.18	0.725
Married	5.092	12.75	0.69	0.09	0.28	0.748
NoReligion	-21.08	12.99	0.106	-0.191	0.22	0.38
Degree	10.108	11.08	0.363	0.136	0.19	0.478
Age	0.945	0.64	0.144	0.028**	0.01	0.035
Constant	86.641***	22.18	0	-0.197	0.42	0.64
Obs	252			252		
Pseudo R2	0.021[a]			0.141		
Prob > F	0.000			0.000		

Notes: Regression 1: Tobit regression with robust standard errors, the dependent variable is the offer in the Dictator Game; Regression 2: Probit regression with robust standard errors on the likelihood of being a beneficent. [a] This is the McFadden's pseudo R-squared. * p<0.1, ** p<0.05, *** p<0.01

We detect a significant effect of age in Regression 2. In particular, older subjects are more likely to be beneficent than younger. Once we control for individual characteristics, the regression analysis is consistent with Result 1.

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[14] Similar results hold when considering the distribution of offers (see the Appendix).
[15] Throughout the paper, in the regression analysis we control for socio-demographic characteristics (see the Appendix). We also ran regressions without including the individual characteristics of the subjects among the explanatory variables. The results qualitatively replicate those reported in the paper and are available upon request.

B. Strategy Method

Using the Strategy Method, subjects are classified in six categories depending on their conditional contributions in the Public Good Game. Similar to Fischbacher *et al.* (2001) and Fischbacher and Gächter (2010), we classify as *Conditional Cooperators* those subjects that display a significant monotonically increasing pattern (Spearman rank correlation $\rho > 0$, $p < 0.01$); as *Free Riders* those who always contribute zero, and as *Triangle* contributors those who display a significant monotonically increasing pattern up to a maximum (Spearman $\rho > 0$, $p < 0.01$) and a significant monotonically decreasing pattern after that maximum (Spearman $\rho < 0$, $p < 0.01$). We also add two categories. Subjects who contribute a positive amount irrespective of the others contributions are classified as *Unconditional Cooperators*, whereas subjects who display a significantly monotonically decreasing pattern (Spearman $\rho < 0$, $p < 0.01$) are classified as *Compensators*, as they seem to counterbalance low contributions by the others. All remaining subjects are pooled in a residual category called *Others*. In Figure 1 we report the average contribution of each type of subject per round.

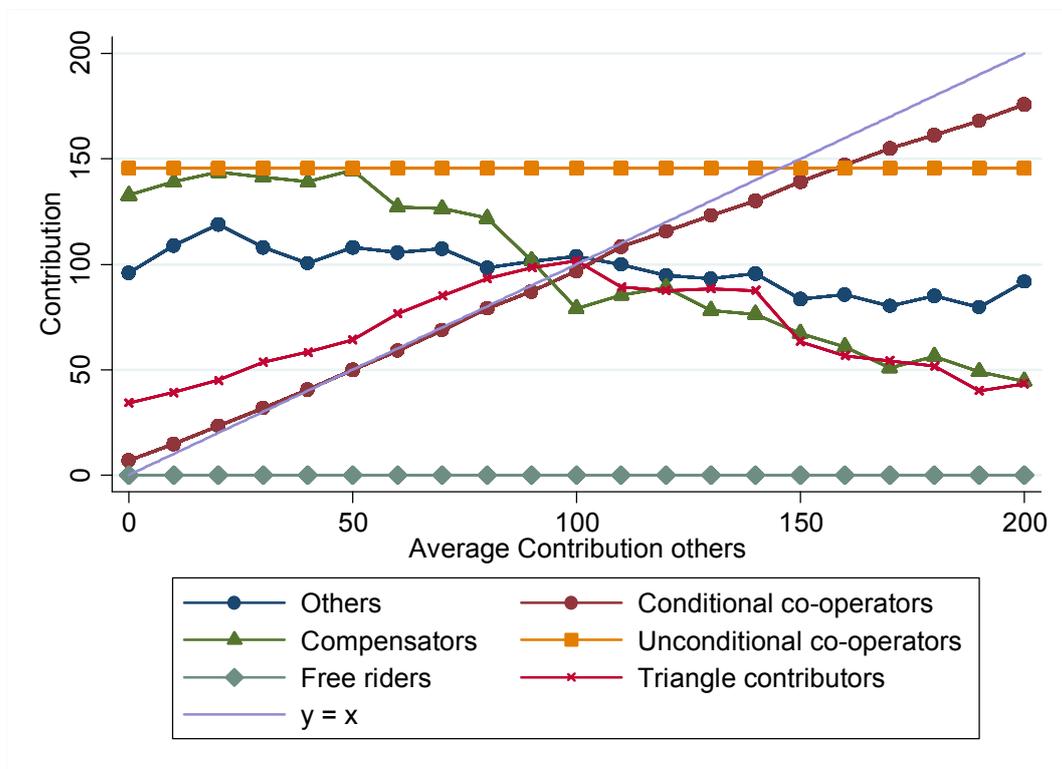**Figure 1**: Average contribution (Strategy method)

Table 3 shows the frequencies of the different types of subjects in the three samples and in the whole data set.

Table 3: Classification of types in the three samples (Strategy method)

Type	Temporary	Permanent	Student	Total
Conditional cooperator	70.8% (n=51)	64.3% (n=54)	78.1% (n=75)	71.4% (n=180)
Unconditional cooperator	9.7% (n=7)	7.1% (n=6)	1.0% (n=1)	5.6% (n=14)
Free rider	1.4% (n=1)	3.6% (n=3)	5.2% (n=5)	3.6% (n=9)
Triangular	1.4% (n=1)	3.6% (n=3)	2.1% (n=2)	2.4% (n=6)
Compensator	5.6% (n=4)	5.9% (n=5)	2.1% (n=2)	4.4% (n=11)
Others	11.1% (n=8)	15.5% (n=13)	11.5% (n=11)	12.7% (n=32)
Total	100% (n=72)	100% (n=84)	100% (n=96)	100% (n=252)

A priori we expected Permanent workers to display a larger share of cooperators (either conditional or unconditional) with respect to Temporary workers. Interestingly, this is not the case as the shares of Temporary and Permanent workers in both categories are not statistically different ($p > 0.1$).

Result 2: *The shares of conditional and unconditional cooperators do not differ among Temporary and Permanent workers.*

We find that the share of conditional cooperators is the largest in all the three samples, which suggests a general tendency to reciprocate and to conform to the choices of the other group members. When considering Students, however, some differences deserve to be mentioned. The share of conditional cooperators among Students is significantly higher than among Permanent workers (Fisher's exact test, $p = 0.029$). Moreover the share of unconditional cooperators is the lowest among Students ($p = 0.040$ when comparing with the Permanent workers, and $p = 0.012$ with the Temporary workers).[16]

We also elicited the subjects' beliefs about the average contributions by the other group members (see Table A1 in the appendix). Beliefs do not significantly differ across samples. Interestingly, the average contributions of both Permanent and Temporary workers are statistically higher than their beliefs about the contribution of the others (Wilcoxon $p = 0.000$ and 0.001, respectively), whereas contributions and beliefs of Students do not statistically differ (Wilcoxon $p = 0.609$), which is

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[16] We also ran some probit regressions (available upon request) where the dependent variable is a dichotomous variable which takes value 1 when the subject falls in that particular category and 0 otherwise and where we control for the socio-demographic characteristics of the subjects. The results of these regressions confirm that Temporary and Permanent workers are more likely to be unconditional co-operators compared to Students, although this information must be taken with care as for certain categories the sample size is very small.

consistent with the evidence that Permanent and Temporary workers are more likely to be unconditional cooperators compared to Students.[17]

C. Decomposed Prisoner Dilemma

The Decomposed Prisoner Dilemma allows classifying subjects in five categories (*Aggressive, Competitive, Individualistic, Reciprocating and Cooperative*) depending on their choices across 24 pairs of allocations. To classify subjects, we consider the total amount of tokens *x* each person allocated to herself in the 24 choices, and the total amount of tokens *y* she allocated to her partner. The classification depends on a measure, called the *motivational vector* that is calculated as the inverse tangent of the ratio y/x (see Griesinger and Livingston, 1973; Liebrand, 1984). Geometrically, this measure represents the slope of the line passing for the origin and the point (*x, y*). Subjects are classified as *Aggressive* if the motivational vector has a slope between -112.5 and -67.5 degrees, *Competitive* if it is between -67.5 and -22.5, *Individualistic* if between -22.5 and 22.5, *Reciprocating* if between 22.5 and 67.5, and *Cooperative* if between 67.5 and 112.5. Finally, subjects are classified as *Others* if the length of their vector is less than 75 (see Brosig, 2002; Burlando and Guala, 2005).[18]

The results of this classification are reported in Table 4. Comparing the proportion of each type of subject across the three samples, the share of Competitive, Cooperative, Reciprocating and Individualistic subjects statistically differ across the three samples (Fisher's exact test, $p = 0.039$, 0.038, 0.071, and 0.000, respectively).

Table 4: Distribution of types in the three samples

Type	Temporary	Permanent	Student	Total
Aggressive	0% (n=0)	1.2% (n=1)	2.0% (n=2)	1.2% (n=3)
Competitive	4.2% (n=3)	10.7% (n=9)	2.0% (n=2)	5.6% (n=14)
Cooperative	2.8% (n=2)	5.9% (n=5)	0% (n=0)	2.8% (n=7)
Individualistic	41.7% (n=30)	22.6% (n=19)	55.2% (n=53)	40.5% (n=102)
Reciprocating	44.4% (n=32)	54.8% (n=46)	37.5% (n=36)	45.2% (n=114)
Others	6.9% (n=5)	4.8% (n=4)	3.1% (n=3)	4.8% (n=12)
Total	100% (n=72)	100% (n=84)	100% (n=96)	100% (n=252)

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[17] A Tobit regression where the dependent variable is the unconditional contribution and the set of regressors includes the individual beliefs shows that individual contributions are positively related to the individual beliefs about the contribution of others. The results of the Tobit regression are reported in the Appendix (Table A2).

[18] The list of choices and the graphical representation of the motivational vector are reported in the Appendix

Two categories collect more than 75% of the subjects in each sample: Individualistic and Reciprocating. Considering these two categories, the shares are unbalanced, as there are more Reciprocating subjects among Permanent workers and more Individualistic subjects among Students. Comparing Permanent workers and Students, the difference in the share of Individualistic subjects is statistically significant (Fisher's exact test, $p = 0.000$), while comparing Permanent and Temporary workers the share of Individualistic subjects is lower among the former category, although the difference is only mildly significant (Fisher's exact test, $p = 0.088$).[19]

Is the information on distributional and motivational characteristics consistent among the different classification tasks employed in the experiment? Overall there is a good degree of consistency although correlations are not perfect. For example, being classified as 'Beneficent' in the Dictator Game is positively correlated to being classified as 'Reciprocating' (Spearman $\rho = 0.268$),[20] and negatively related to being classified as 'Individualistic' ($\rho = -0.282$) or as a 'Free rider' ($\rho=-0.318$) in the Decomposed Game. Being classified as a Beneficent in the Dictator Game is also negatively correlated to being a 'Free rider' ($\rho = -0.138$) in the Strategy Method. Considering each group separately, we observe additional differences. In the Permanent workers sample, being classified as 'Reciprocating' in the Decomposed Game is negatively related to being classified as 'Free rider' ($\rho = -0.239$) in the Strategy Method. Interestingly, being classified as an 'Individualistic' in the Decomposed Game is also positively related to being classified as 'Free rider' ($\rho = 0.265$) in the Strategy Method. In the Temporary workers sample, instead, correlations between the different classifications are not significant at 5% level.

D. Linear Public Good Game

The classification tasks reveal that the shares of Unconditional cooperators, Conditional cooperators and Free riders differ among the three samples. In a repeated strategic game this allows making some predictions on the behavior of the subjects, since feedback on the others participants choices and own earnings should induce adaptation to the behavior of other players and, possibly, learning. In particular, since there is a higher share of Unconditional cooperators among the Permanent and Temporary workers, as well as a lower share of Free riders, we would expect higher initial levels of contributions in the samples of workers than in the sample of students. Furthermore, we would

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[19] As we did for the strategy method, we also ran some regressions, one for each category, where we controlled for the socio-demographic characteristics of the subjects. The results of these regressions are consistent with those reported in the paper.

[20] We report the correlations that are statistically significant at 5% level. The interpretation of some of these correlations should be taken with caution since, for certain categories, we do not have enough observations.

expect Conditional co-operators to provide high levels of contribution in the subsequent rounds. In contrast, since in the Student sample there is a higher share of Free riders, we would expect lower initial contributions, which in turn should induce Conditional co-operators to lower their contributions over time.

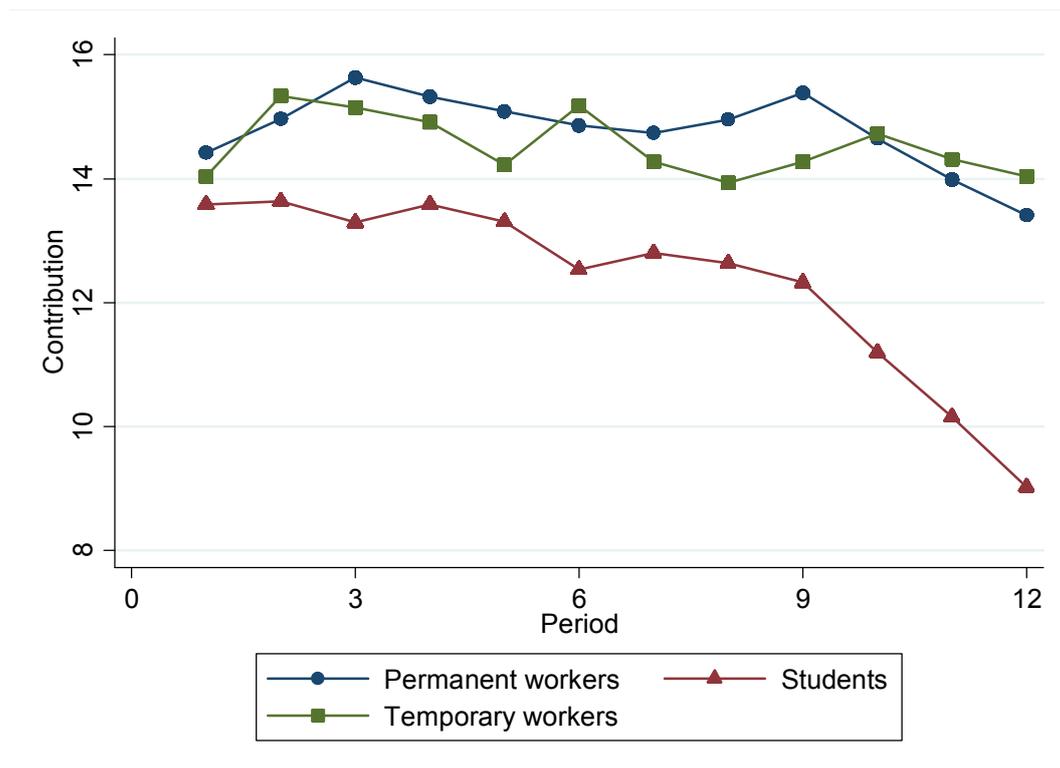**Figure 2**: Evolution of average contributions over time

Figure 2 shows the average contribution in the first 12 rounds of the Linear Public Good Game. Initial contributions do not differ significantly, although we can observe some differences as the game unravels. In the Students sample, average contributions per round and total average contributions are below those by Permanent and Temporary workers. Comparing the contributions across the three samples for each round,[21] we reject the hypothesis that the three samples come from the same population only for the last two rounds (Kruskal Wallis test, p = 0.084 and 0.026 respectively). Students contributed significantly less in the last rounds of the Public Good Game compared to Permanent (round 10, 11, 12)[22] and Temporary workers (round 11, 12)[23], but we do not detect any significant difference in the average contribution of Permanent and Temporary workers (Mann-Whitney test, p > 0.1). The Students' contributions significantly decrease over time

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[21] We use the average of each Public Good Game group's contribution as the unit of observation.
[22] Mann-Whitney test p = 0.090, 0.053 and 0.024 respectively.
[23] Mann-Whitney test p = 0.069 and 0.020 respectively.

(Spearman ρ = -0.192, *p* = 0.001), which is a recurrent finding in the literature (see, e.g. Andreoni, 1988; Croson, 1996). Interestingly, there is no significant downward trend for Temporary and Permanent workers (Spearman ρ = -0.016 and -0.060, *p* = 0.820 and 0.343), with an average contribution that remains quite constant throughout the 12 rounds of the Public Good Game.

Result 3: *Temporary and Permanent workers contribute on average more than 70% of their endowment and their contributions remain stable over time. Students, instead, contribute less than workers and their contributions decrease over time.*

To study how contributions depend on the history of the game, we employ a Poisson-logit maximum-likelihood hurdle model to separate the decision of contributing in two steps (see, e.g., Nikiforakis, 2008). First, with a logit model we study whether the subjects decide to contribute or not, then with a zero-truncated Poisson model we study the decision about the amount of the contribution, conditional on contributing a positive amount. Table 5 displays the results of this estimation. In a first model (Hurdle model 1), the independent variables are the sample dummies (the baseline category is "Temporary"), a time variable, the positive and negative deviations of *i*'s contribution from the average group contribution in period $t - 1$, the individual *i*'s contributions made in $t - 1$ and $t - 2$, and, as in previous regressions, the socio-demographic characteristics of the subjects. In a second model (Hurdle model 2), we also include the classification dummies obtained from the classification tasks. In particular, we consider being Individualistic, Competitive or Reciprocating in the Decomposed Game, Beneficent in the Dictator Game, and being Conditional, Unconditional or a Free rider in the Strategy Method.

The results of the estimation appear to be consistent with our expectations based on the shares of Free riders, Unconditional and Conditional co-operators detected in the classification task (in particular, in the Strategy Method). From the first model we observe that Students are less likely to contribute a positive amount compared to Temporary and Permanent workers. This result may be explained by the larger proportion of Free riders and the smaller proportion of Unconditional contributors among Students. Indeed, once we include the classification dummies in the regressions (Hurdle model 2), the point estimate for the variable *Students* decreases and becomes only weakly significant, whereas the variable *Free rider* is negative and strongly significant, suggesting that subjects who are classified as Free Riders in the Strategy Method are less likely to contribute to the public good.[24] In both the first and second model, we also find that the probability of not

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[24] There is also some weakly significant evidence that Reciprocating and Individualistic subjects are less likely to contribute, whereas Beneficent subjects are more likely to contribute.

contributing to the public good significantly increases across periods, and it increases if the subject's contribution in the previous period had not matched the average contribution of her group. There is also evidence that subjects are more likely to contribute a positive amount the higher their contribution in the previous rounds (this effect is small, but highly significant).[25] When considering the decision of how much to contribute (conditional on contributing a positive amount), in both models we observe that current contributions are positively correlated to past contributions, and they increase if the subject's contribution in the previous period was smaller than the average contribution of the group. Furthermore, subjects who contributed above the average in the previous period adjust their decision and reduce their contribution in the current round, and that older and more educated subjects contribute more than younger subjects. Finally, in the first model we also have some weakly significant evidence that, conditional on contributing a positive amount, Permanent workers contribute less than Temporary workers.

Table 5: Poisson-logit maximum-likelihood hurdle model

	HURDLE MODEL 1					
	Decision to contribute			Decision of how much to contribute		
	dy/dx	Std. Err.	p>z	dy/dx	Std. Err.	p>z
Contribution t-1	0.007***	0.001	0.000	0.738***	0.045	0.000
Contribution t-2	0.003***	0.001	0.002	0.247***	0.027	0.000
Positive deviation (t-1)	-0.015***	0.002	0.000	-0.305***	0.046	0.000
Negative deviation (t-1)	-0.010***	0.002	0.000	0.521***	0.113	0.000
Period	-0.009***	0.002	0.000	-0.030	0.024	0.211
Male	-0.015	0.014	0.283	0.131	0.209	0.531
Married	0.039*	0.020	0.051	-0.030	0.241	0.899
NoReligion	-0.029*	0.017	0.093	-0.086	0.256	0.738
Degree	0.021	0.014	0.119	-0.640***	0.240	0.008
Age	0.001	0.001	0.235	0.029**	0.013	0.024
Permanent	-0.035	0.024	0.157	-0.459*	0.266	0.085
Student	-0.044**	0.018	0.017	-0.085	0.264	0.749
Obs	1512			1336		

	HURDLE MODEL 2					
	Decision to contribute			Decision of how much to contribute		
	dy/dx	Std. Err.	p>z	dy/dx	Std. Err.	p>z
Contribution t-1	0.007***	0.001	0.000	0.732***	0.045	0.000
Contribution t-2	0.002**	0.001	0.013	0.245***	0.027	0.000
Positive deviation (t-1)	-0.015***	0.002	0.000	-0.306***	0.046	0.000
Negative deviation (t-1)	-0.009***	0.002	0.000	0.513***	0.113	0.000
Period	-0.009***	0.002	0.000	-0.031	0.024	0.202
Male	-0.017	0.012	0.174	0.107	0.214	0.618
Married	0.030	0.020	0.124	-0.051	0.244	0.835
NoReligion	-0.016	0.016	0.292	-0.121	0.258	0.639

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[25] In the first model, we also find that married subjects are more likely to contribute to the public good, and that atheist or agnostic subjects are less likely to contribute, although these estimates are only weakly significant.

Degree	0.008	0.013	0.532	-0.592**	0.242	0.015
Age	0.001	0.001	0.453	0.028**	0.014	0.048
Permanent	-0.035	0.022	0.115	-0.369	0.286	0.197
Student	-0.035*	0.018	0.056	-0.086	0.281	0.758
Beneficent	0.027*	0.014	0.063	0.023	0.256	0.929
Reciprocating	-0.124*	0.067	0.062	0.699	0.472	0.138
Individualistic	-0.132*	0.072	0.065	0.578	0.485	0.233
Competitive	-0.087	0.097	0.367	-0.165	0.686	0.810
Conditional	-0.005	0.016	0.772	0.062	0.259	0.812
Free rider	-0.135**	0.050	0.007	-0.866	1.147	0.450
Unconditional	-0.025	0.027	0.351	0.394	0.491	0.422
Obs	2520			2292		

Notes: the decision to contribute is estimated with a logit model with clustered standard errors at individual level. The decision of how much to contribute is estimated with a zero-truncated Poisson model with clustered standard errors at individual level. In the table, we report the average marginal effects of the independent variables (see Bartus, 2005). * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

V.   Discussion

Before running the experiment we expected to find a significantly lower propensity to cooperate in the group of Temporary workers with respect to the group of Permanent (co-op) workers, as the former are less likely to know each other and they have received no specific training on the values of cooperation and mutualism. The experimental results show, instead, that Temporary and Permanent workers contribute substantially and in a very similar way to the public good over the 12 rounds of the game. This result holds even if there are some differences in preferences, and even if Temporary workers tend to be slightly more individualistic than Permanent workers.

A possible explanation for the results in the Public Good Game relies on the large proportion of Unconditional contributors in both the Temporary and Permanent workers samples (and, analogously, to the low proportion of free riders). This may have helped a sustained high level of cooperation for Conditional contributors, thereby maintaining high average contribution rates. In contrast, the higher share of Free riders among Students might have induced Conditional cooperators to lower their contributions over time in response to the low contributions of free riders. This interpretation is consistent with the results shown in Table 5, which allow joining and comparing the information on the distributional preferences of the subjects obtained in the Classification stage of the experiment with the Strategic behavior observed in the repeated Public Good Game.

A second possible explanation is that workers, irrespective of whether they are employed under a temporary or permanent contract, are less selfish than Students. This explanation would suggest that socialization processes due to working experiences and age (or both) could be major factors. If workers have learnt that cooperating provides long-run benefits, they may have brought in the lab

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this experience and use it when contributing in the Public Good Game. Students, instead, are more used to individual rather than team work and have less experience with repeated interactions and the related reputational concerns.

Note that the above result cannot be due to demand effects, as we ensured anonymity and, if anything, we should expect this effect to operate in the same direction in all sessions. Also, the results cannot be due to reputational concerns within the lab, as we guaranteed anonymity in the whole experiment. Subjects only knew that the pools were homogeneous. This might have induced an in-group bias. For example, Temporary workers may have chosen their contributions based on mutual insurance considerations. Accordingly, they might have contributed to the public good knowing that the other group members were also Temporary workers, and this may have stimulated high contributions. However, this effect should be stronger among the Permanent workers, as they work for the same cooperative and meet each other daily, but we detect no significant difference with respect to Temporary workers. This is a particularly important result, as it shows that Temporary and Permanent arrangements do not affect the propensity to cooperate to a public good when workers are part of a homogeneous group. As far as we know, this is the first experimental evidence showing this result. A different, but related, question which we leave for future investigation is whether heterogeneous groups composed by both Temporary and Permanent workers display the same levels and trends of contributions.

Our a priori expectation of a higher contribution rate in Permanent workers was based on the fact that they knew each other, that they work in the same place, and that the common employer is a co-op which actively emphasizes the values of mutualism and cooperation. It is however possible that other factors may have driven the behavior of Permanent workers toward an unexpected direction. Knowing each other is not a guarantee *per se* of a high social capital and willingness to cooperate, as human relationships can improve, but as well deteriorate over time. Analogously, being constantly exposed to the values of mutualism does not ensure these values are internalized by workers, since these values may possibly be rejected. If this were the case, we should observe low contribution rates. The result that the observed contribution rates of Permanent workers are significantly higher than those of Students and that they remain quite high over time (about 60% of the initial endowment), however, does not support this hypothesis.

The high degree of cooperative and other-regarding behavior observed among Temporary workers may be also explained by what social and labor psychologists refer as *impression management*, that is the systematic attempt by temporary workers to behave in a way that pleases the employee (Leary

and Kowalski 1990). Such an attitude might have been brought by the Temporary workers into the lab, and push them to cooperate. Although this possibility cannot be excluded *a priori*, we made very clear that the participation to our experiment was a one-shot experience, and that in no way we would have communicated the results of their individual choices to Obiettivo Lavoro.

Another possible explanation is that, contrary to our priors, co-op workers are not the only workers that had been exposed to the values of cooperation and mutualism. After all, the recruiting agency which supplied the Temporary workers was originally established as a co-op and, although it converted into a public limited company in 2003, it adheres to the Social Responsibility practices, it has an Ethical code and its guiding principles are (according to its Charter of Values) attentiveness, collaboration, improvement, equity, transparency, and integrity. We cannot exclude that these factors have had an influence on the preferences and behavior of the Temporary workers that took part in our experiment, but we do not think it has played a major role because there is very little interaction between the Temporary workers and the staff of the recruiting agency, which is a simple intermediary between employers and workers. If anything, there may have been an interaction with the temporary employers, some of which also have Ethical codes and adhere to the Social Responsibility practices, while some others do not. More in general, it is possible that the common social environment in which both Temporary and Permanent workers live has played a major role on working people. The social environment can overwhelm the role of investments in the values of cooperation by the co-operative, or the possible differences induced by Permanent and Temporary work arrangements. This can be the case, as the places where the experiments were conducted (located within the Emilia-Romagna region) are characterized by high levels of social capital and generalized trust (Bigoni *et al.*, 2013). This may have shaped in a similar way the behavior of both Temporary and Permanent workers, as well as that of the Students raised in Emilia-Romagna. However, this conjecture is not consistent with the finding that Students display significantly lower contribution rates. Hence, if the reason for the scant difference in the contribution rates of Temporary and Permanent workers relies on the existence of a high social capital at the regional level, one should also explain why this seem to affect more workers than students. This requires additional data aimed at understanding whether our results also hold in regions where social capital is low.

VI.   Conclusions

The rapid diffusion of temporary employment in many industrialized countries, in particular in countries providing high levels of employment protection, has raised questions concerning the economic and psychological effects of this form of contracts. Several studies have indicated the existence of a gap in the working conditions of Permanent and Temporary workers, particularly in terms of wages and working rights, and on the psychological consequences of being employed on a temporary basis. To the best of our knowledge, no paper has so far investigated whether there exist differences in the individual preferences and in the propensity to cooperate and free-ride of Temporary workers with respect to Permanent ones. In this paper we address this question from an experimental perspective. This allows providing an incentive compatible source of information on the individual characteristics and behavior of workers under different contractual arrangements. Although an overall assessment on the desirability of temporary and permanent contracts must necessarily include the impact of relevant dimensions of individual well-being, such as the economic and psychological impact of temporary arrangements, information on individual behavior in a strategic environment with free-riding opportunities can be very useful for an employer who is considering which contractual arrangement best suits her needs.

We consider three types of subjects: Temporary workers, Permanent workers and Students. Before running the experiment we expected the group of Temporary workers to cooperate less and to exploit the opportunity of free-riding more than Permanent workers. This expectation was based on the fact that Temporary workers did not know each other and had never met before. In contrast, the Permanent workers physically work in the same offices and they meet on a daily basis. In addition, they were recruited among workers of a Co-op where the values of cooperation and mutualism are actively transmitted and enforced.

We find some differences in the distributional preferences of the two groups of workers, but a very similar behavior in a Public Good Game. Workers, irrespective of the type of their contractual arrangement, begin with high levels of contribution to the public good, and contributions remain high over time. Instead, in the sample of Students that we used as a control, contributions begin at high levels, but then decline considerably over time. While the latter result is very much in line with the previous experimental evidence on the Public Good game, the high and steady level of contributions by workers is a less common finding. A possible explanation for this result is that the different contractual arrangements, and the consequent economic and psychological effects, play a minor role with respect to other factors. For example, socialization and learning on the job may have induced both Temporary and Permanent workers to behave similarly and avoid free-riding opportunities. Also, in-group and mutual insurance considerations may have driven Temporary

workers to contribute to the public good. In either case, the result that Temporary workers cooperate more than the control group of Students, and as much as Permanent co-op workers, is a new and unexpected outcome which paves the way to investigating whether this result will translate into productivity at work, outside the lab. This venue of research is left for further investigation.

Appendix

A.1 Subjects' socio-demographic characteristics

Characteristics	Permanent	Student	Temporary
Gender	(n=84)	(n=96)	(n=72)
Female	58 (69.05%)	52 (54.17%)	43 (59.72%)
Male	26 (30.95%)	44 (45.83%)	29 (40.28%)
Age	(n=84)	(n=96)	(n=72)
Mean	41.64	23.94	31.67
St. dev.	9.19	4.57	9.39
Marital Status	(n=84)	(n=96)	(n=72)
Married	44 (52.38%)	1 (1.04%)	13 (18.06%)
Unmarried	40 (47.62%)	95 (98.96%)	59 (81.94%)
Nationality	(n=84)	(n=96)	(n=72)
non-Italian[a]	7 (8.33%)	5 (5.21%)	8 (11.11%)
Italian	77 (91.67%)	91 (94.79%)	64 (88.89%)
Religion	(n=84)	(n=96)	(n=72)
Agnostic/Atheist	9 (10.71%)	28 (29.17%)	15 (20.83%)
Christian	71 (84.52%)	64 (66.67%)	42 (58.33%)
Other[b]	4 (4.76%)	4 (4.17%)	15 (20.83%)
Education	(n=84)	(n=96)	(n=72)
Lower Secondary School or less	56 (66.67%)	95 (98.96%)	52 (72.22%)
Upper Secondary School or more	27 (32.14%)	0 (0%)	14 (19.44%)
Other	1 (1.19%)	1 (1.04%)	6 (8.33%)
Years of work	(n=36)[c]		(n=72)
Mean	19.42		10.22
St. dev.	10.59		9.01
Years of work in coop	(n=36)[c]		
Mean	10.01		
Std. Dev.	6.88		
Years of work as Temporary			(n=72)
<1			41 (56.94%)
>1			31 (43.06%)
Working days as Temporary worker (last 12 months)			(n=72)
Mean			46.04
Std. Dev.			87.55
Working days as Temporary worker (total)			(n=72)
Mean			92.22
Std. Dev.			189.96
Months worked in coop			(n=71)[d]
Mean			14.2
Std. Dev.			83.97
Student status			(n=72)
Only worker			58 (80.56%)
Lower Secondary School or less			1 (1.39%)
Upper Secondary School or more			11 (15.28%)
Other			2 (2.78%)

Notes: [a] 7 were Albanian, 1 Brazilian, 2 Moldavian, 1 Polish, 5 Romanian, 2 Senegalese, 1 Serb, and 1 Hungarian. [b] 2 were Buddhist, 1 Indu, 6 Muslim, and 14 did not specify. [c] This information was collected only for a subset of Permanent workers. [d] One subject did not specify how many months she worked in a coop.

If we compare the proportion of males and females across the three samples, we do not detect any statistically significant difference (Chi-squared test, $p = 0.122$). In pairwise comparisons, the only statistically significant different occurs between Permanent workers and Students. In particular, the proportion of females is significantly lager in the Permanent workers sample compared to the Students sample ($p = 0.041$). There is no statistically significant difference in the proportion of females between Temporary and Permanent workers, and Temporary workers and Students ($p = 0.224$ and 0.472 respectively). The three samples statistically significantly differ with respect to age (Kruskal Wallis test, $p = 0.000$). In particular, Permanent workers are significantly older than Students and Temporary workers respectively (Mann-Whitney $p = 0.000$), and Temporary workers are significantly older than Students ($p = 0.000$). If we look at the marital status of the subjects, the three samples statistically significantly differ both in aggregate (Chi-squared test, $p = 0.000$) and in pairwise comparisons ($p = 0.000$). In particular, the proportion of Permanent workers who are married is significantly larger than Students and Temporary workers. Similarly, the proportion of married subjects in the Temporary workers sample is significantly larger than in the Students sample. Almost the totality of the participants is Italian (92%). Only few subjects are not from Italy. Those who are not Italian are Albanian, Brazilian, Moldavian, Polish, Romanian, Senegalese, Serb, or Hungarian. If we compare the proportion of non-Italian across the three samples, we do not detect any statistically significant difference (Chi-squared test, $p = 0.370$). A similar result is obtained in pairwise comparisons ($p > 0.1$). If we look at the religious affiliation, subjects statistically significantly differ in their religious beliefs across samples (Chi-squared test, $p = 0.000$). This evidence is also supported in pairwise comparisons (Chi-squared test, $p < 0.01$). More specifically, the fraction of Christians is larger among Permanent workers than Temporary workers and Students. Students are generally more agnostic/atheist. The proportion of participants who are neither Christian nor agnostic/atheist is larger among Temporary workers compared to Students and Permanent workers. In general, Permanent workers are more religious than Students ($p = 0.002$) and Temporary workers ($p = 0.081$). In contrast, Temporary workers are not statistically significantly more religious than Students ($p = 0.221$). If we compare the level of education, the three samples statistically significantly differ (Chi-squared test, $p = 0.000$). In particular, a higher proportion of Students possess a higher degree compared to Permanent and Temporary workers (Chi-squared test, $p = 0.000$). No statistically significant difference occurs between Temporary and Permanent workers on the level of education (Chi-squared test, $p = 0.124$). If we compare the years of work between Permanent and Temporary workers, Permanent workers have more years than Temporary workers (Mann-Whitney $p = 0.000$).

A.2   Details of the sessions

Session	Sample pool	N. Participants	Date	Location
1	Students	12	29/07/2009	Forli'
2	Students	12	29/07/2009	Forli'
3	Permanent workers	12	03/09/2009	Forli'
4	Permanent workers	12	03/09/2009	Forli'
5	Permanent workers	12	04/09/2009	Forli'
6	Students	24	14/04/2010	Forli'
7	Permanent workers	12	14/04/2010	Forli'
8	Permanent workers	12	16/04/2010	Forli'
9	Students	24	16/04/2010	Forli'
10	Permanent workers	12	16/04/2010	Forli'
11	Permanent workers	12	21/04/2010	Forli'
12	Students	12	24/02/2011	Forli'
13	Students	12	24/02/2011	Forli'
14	Temporary workers	12	24/02/2011	Bologna
15	Temporary workers	12	25/02/2011	Forli'
16	Temporary workers	12	25/02/2011	Forli'
17	Temporary workers	12	04/03/2011	Forli'
18	Temporary workers	12	25/03/2011	Bologna
19	Temporary workers	12	21/06/2011	Bologna

A.3   Distribution of offers in the Dictator Game

Figure A1 shows the distribution of the offers per sample. Comparing the distributions of the offers between Permanent workers and Students, we reject the null hypothesis that they are the same (Epps-Singleton test, $p = 0.000$). A similar result holds when comparing Temporary workers and Students (Epp-Singleton test, $p = 0.000$). When we compare the sample distributions of the offers between Temporary and Permanent workers, we only mildly reject the hypothesis that they have been drawn from the same population (Epps-Singleton $p = 0.077$).

Figure A1: Dictator Game: Distribution of offers
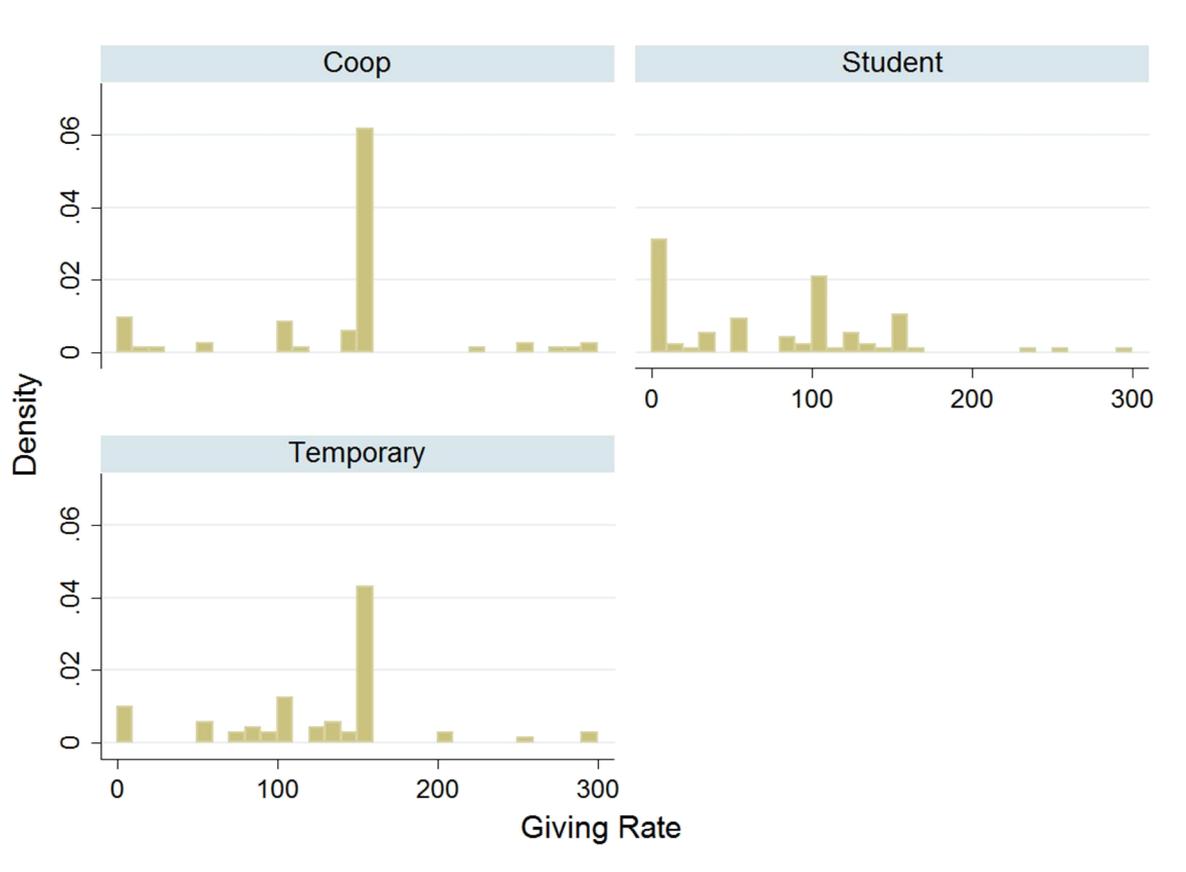
A.4 Unconditional contributions and beliefs in the Strategy Method

If we look at the unconditional contributions in the Strategy Method (Table A1), they mildly statistically differ across samples (Kruskal Wallis test, $p = 0.061$). In particular, if we conduct pairwise comparisons, Students contributed on average less than Permanent and Temporary workers. However, the difference is statistically significant only when comparing Students with Permanent workers (Mann-Whitney test, $p = 0.021$). The beliefs do not significantly differ across samples, or in pairwise comparisons. Interestingly, the average contributions of both Permanent and Temporary workers are statistically higher than their beliefs about the contribution of the others (Wilcoxon $p = 0.000$ and 0.001 respectively), whereas contributions and beliefs of Students do not statistically differ (Wilcoxon $p = 0.609$). This result support the evidence that Permanent and Temporary workers are more likely to be unconditional co-operators compared to Students, i.e. they contribute no matter what is the contribution of the others.

Table A1: Unconditional contributions and beliefs

Sample	Contribution		Belief	
Permanent (n = 84)	118.99	57.54	102.34	54.05
Student (n = 96)	97.88	60.18	105.71	47.10
Temporary (n = 72)	112.13	53.75	101.19	46.27
Total (n = 252)	108.99	58.02	103.30	49.14

Table A2: Tobit regression (unconditional choice)

	Regression 1		
	B	Se	p
Belief	0.991***	0.07	0
Student	-20.937**	8.77	0.018
Permanent	6.864	9.69	0.479
Male	-4.767	6.98	0.495
Married	-12.099	9.54	0.206
NoReligion	-9.649	8.36	0.25
Degree	8.562	7.63	0.263
Age	0.574	0.43	0.188
Constant	2.708	16.68	0.871
Obs	252		
Ll	-1113.4		
Prob > F	0		

Notes: * p<0.1, ** p<0.05, *** p<0.01

We also ran a Tobit regression where the dependent variable is the unconditional contribution. Independent variables include dummy variables for the experimental sample (using the Temporary workers as baseline category), age, gender (Male = 1 for male subjects), relationship status (Married = 1 for married subjects), religious affiliation (NoReligion = 1 for atheist or agnostic subjects), educational background (Degree = 1 for subjects with a university degree), and beliefs. Table A2 displays the results of the regression. When covariates are controlled for, we observe that Students contribute significantly less than Temporary workers, whereas the unconditional contributions of Permanent workers do no statistically differ from those of Temporary workers. In addition, there is strong evidence that the contribution is positively related to the beliefs about the contribution of the others. This result does not surprise since about 70 % of the subjects were classified as conditional co-operators.

A.5 Decomposed Prisoner's Dilemma

Table A3: Choice of allocations

Question	Option A		Option B	
	Self	Other	Self	Other
1	150	0	145	39
2	144	-39	130	-75
3	130	-45	106	-106
4	106	-106	75	-130
5	75	-130	39	-145
6	39	-145	0	-150
7	0	-150	-39	-145
8	-39	-145	-75	-130
9	-75	-130	-106	-106
10	-106	-106	-130	-75
11	-130	-75	-145	-39
12	-145	-39	-150	0
13	-150	0	-145	39
14	-145	39	-130	75
15	-130	75	-106	106
16	-106	106	-75	130
17	-75	130	-39	145
18	-39	145	0	50
19	0	150	39	145
20	39	145	75	130
21	75	130	106	106
22	106	106	130	75
23	130	75	145	39
24	145	39	150	0

Figure A2: The 'value orientation circle'
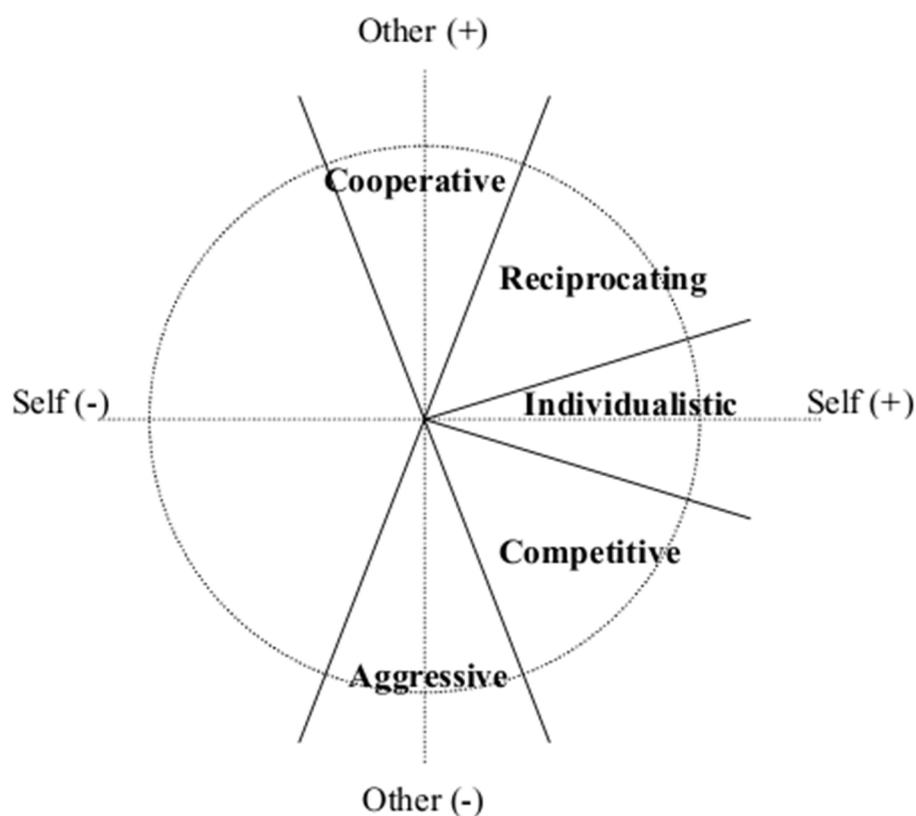
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Instructions (translation from Italian; bold, italics and other formatting options are as in the original version of the instructions)

INSTRUCTIONS

Introduction

Welcome to the Laboratory of Experimental Economics of the University of Bologna.

ou will participate in a study on the individual behavior of about one hour and a half. If you read these instructions carefully, you can, depending on your decisions, earn some money. For your convenience, instructions are provided both on screen and on paper.

Your earnings will be calculated in *florins* and will be converted into Euros at the end of today's session. Every florin equals 1 euro cent. Payment will be made in cash at the end of this session and it will be done in such a way that no other participant will know how much you have earned.

he experiment is divided into various stages. At each stage you will be asked to make some decisions or to answer a few simple questions.

From now on it is forbidden to talk to the other participants, or communicate in any other way. If you want to ask a question, raise your hand.

STAGE ONE

Situation

In this stage each of you is randomly matched with another participant. The identity of the participant with whom you are matched remains anonymous. You will never know with whom you are matched.

For each pair of participants, the computer assigns 300 florins, which are randomly given to only one of the two members of the couple. The other participant gets nothing.

Those who receive the 300 florins can decide whether to keep them all or give part of the florins to the other participant they are matched with. Those who have not received the 300 florins, instead, can only receive florins from their partner.

You cannot currently know whether you are one of those who will receive the 300 florins, because those who will receive 300 florins will be randomly selected at the end of stage seven.

What you should do in stage one

At this stage we ask you to indicate how you would divide 300 florins between you and the other person, in case you are randomly selected to receive the 300 florins. If, at the end of stage seven, you actually receive the 300 florins, then your choice will be implemented. If, instead, your partner

will be selected, her/his choice will be implemented, and you will receive the amount of florins indicated by her/him.

Push the button "Continue" and make your choice.

STAGE TWO

Situation

In this stage, each of you is randomly matched with three other participants to form a group of four persons. The identity of the other participants is anonymous and you will not know with whom you are matched.

Each person receives 200 florins and must decide how many florins to put in her/his own personal account and how many to invest in a project. The overall payoff is given by the personal account plus the earnings resulting from the project.

Earnings from the personal account: For each florin you put in your personal account you will earn exactly one florin.

For example, if you put 200 florins in your personal account (and therefore you do not invest in the project), you will earn exactly 200 florins. If you put 60 florins in your personal account, you will earn 60 florins.

Earnings from the project: The earnings resulting from the project depend on your choices and the choices of the other members of the group. For each member of the group, the earnings from the project will be determined as follows:

1) All florins given by the group members are summed up.

2) The sum is doubled.

3) The doubled sum is divided into <u>four equal parts</u> and assigned to each group member.

Now let's see two examples to better understand how the earnings from the project are calculated:

Example 1: If the sum of all contributions to the project is 300 florins, each group member will receive individually:

(300 florins multiplied by 2 and then divided by 4) = 150 florins from the project.

Example 2: If the four members of the group invest 25 florins each, and then the sum of their investment is 100 florins, each group member will receive

(100 florins multiplied by 2 and then divided by 4) = 50 florins from the project.

Practice in stage two

Please answer the following questions. The purpose is to practice with the computation of the earnings you will get. The answers you give to these questions **will not** affect your final earnings. (If you like, you can use the electronic calculator that you can activate by pressing the small button at the bottom of the screen).

Each member of the group has 200 florins at his disposal. Suppose that none of the four members of the group (including you) contributes to the project.

- How much will your total earnings be (income + personal project)?

- What will the individual earnings of the others members of the group be?

2. Each member of the group has 200 florins at his disposal. Suppose you put $200 florins in the project and each of the other members of the group puts 200 florins.

- How much will your total earnings be (income + personal project)?

Start of Stage Two

Now the choice situation we have just described begins. You will be given 200 florins and you will decide how much you want to put in your personal account and how much in the project. The mechanism for calculating earnings is the one just described.

What you should do in stage two

In this stage you will make two kinds of choices: we will call the first "single choice" and the second "choice in the table." Your earning in this stage depends both on what you have chosen in the "single choice", and on what you have chosen in the "choice in the table"

Single Choice

With the single choice you have to decide how many of the 200 florins you want to put in the project.

You also have to indicate how much you think that others are investing in the project. If your guess is at 3 florins or closer from the actual average, you earn 3 extra florins.

On your screen you will see this:

Scelta singola

Tu sei il Partecipante B

Hai a disposizione 200 fiorini.

Devi decidere quanti fiorini investire nel progetto.

Inserisci un numero tra 0 e 200 e premi il bottone.

Scelgo di investire [ ]

Quanto pensi che investiranno in media gli altri componenti del gruppo? [ ]

OK

After pressing the "OK" button, you will go to the "choice in the table."

Choice in the table: The screen for the "choice in the table" will look like this:

Scelta nella tabella

Per ogni contribuzione media degli altri membri del gruppo indica quanto vuoi contribuire al progetto.

Inserisci tutti gli importi e premi il bottone.

Scelta Media effettuata dagli altri	La tua scelta (scegli un numero tra 0 e 200)	Scelta Media effettuata dagli altri	La tua scelta (scegli un numero tra 0 e 200)
0		110	
10		120	
20		130	
30		140	
40		150	
50		160	
60		170	
70		180	
80		190	
90		200	
100			

OK

For example, in the third cell of the first column you are asked to indicate how much you would like to contribute to the project if the average contribution of each of other members of your group is 20 florins. Or, in the third cell of the second column you are asked to indicate how much you would like to contribute if each of the other group members contributes (on average) 130 florins.

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Results of stage two

After all participants to the experiment have given their answers, the computer will randomly select a person in each group.

The computer will take the choices made by the other 3 people in the "single choice" and it will compute the average of their contributions. Then it will consider what is the contribution choice indicated by the fourth person in the "choice in the table" in correspondence of the average contribution of the other three members.

By combining this information, the computer:

- Will compute the total contribution of the group by adding the three individual contributions (single choice) and the contribution given by the selected person (choice in the table);

- Will determine the earnings from the project, by doubling the total amount of the contributions to the project;

- Will give a quarter of the doubled sum to each member of the group.

Since you do not know who will be selected by the computer to determine the choice in the table, when you have to fill in the single-choice and the choice in the table, you have to think carefully about both types of choice because both can prove to be decisive in the determination of your earnings.

The computer draw and the result of these computations will be communicated at the end of stage seven. Press the "Continue" button to begin.

<div align="center">

STAGE THREE

</div>

Situation

At this stage you have to choose between two options, Option A and Option B. The two options are related to sums of money that you and another participant will earn. For example, you may be asked to choose between two options, A and B, where option A is a gain of 145 florins for you and a loss of 39 florins for another participant, while Option B means a gain of 130 florins for you and a gain of 75 for the other participant. The other participant will have to choose from the same options. An example of the choice between A and B is the following:

There is a total of 24 pairs of choices, and you will be matched with the same participant (selected at random by the computer at the beginning of stage three) for all 24 pairs of choice. The identity of the other participant will remain anonymous, and no one will know who has been matched with.

Your payoff depends on your choices and on those of the other participant, and it is given by the sum of the choices made by you and the other participant.

Going on with the previous example, if you choose option A (a gain of 145 florins for you, a loss of 39 loss for your partner), and the other chooses option B (a gain of 130 florins for her/himself and a gain of 75 florins for you), you will earn 145 + 75 = 220 florins, while the other participant will earn -39 +130 = 91 florins. If, instead, also the other chooses option A, you will earn 145 + 75 = 220 florins, while the other participant will earn -39 +130 = 91 florins.

What you should do in stage three

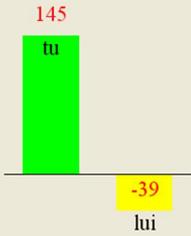In this stage we ask you to make 24 choices between options A and B. The options will be different each time.

Results

The overall outcome of your choices will be known only at the end of stage seven. In any case, you will be paid privately and you will not know the identity of the other participant, nor she/he will know yours.

Before starting with stage three, we ask you to answer some questions. The purpose is to practice with the computations of the earnings you will get. The answers you give to these questions **will not** affect your final earnings.

In the situation described below:

If both choose option B

- how much do you earn?

- how much does the other participant earn?

If you choose option B, while the other participant chooses A

- how much do you earn?

- how much does the other participant earn?

STAGE FOUR

Situation

You will make choices similar to those of stage two, the one in which you received a sum of money and had to choose how much to invest in a common project and how much to put in your personal account.

As before, the sum of money invested in the project is doubled and then divided among four anonymous participants, and your earnings will be the sum of these florins and of those that you put in your personal account.

The participants in your group will be randomly selected by the computer from all the participants to this experiment and they will remain the same throughout this stage.

Unlike before, every time you and the other three participants choose how much to invest in the project, the individual contributions will be immediately communicated to all participants in the group. To protect anonymity, the participants are indicated with letters A, B, C or D that the computer randomly assigns at each round. This means, for example, that letter A can indicate different people in the course of the phase.

Along with your choice of contributing in the project, we will ask you what you think the others are contributing to the project, on average. If your prediction is at 3 or less florins from the actual average, you will earn three extra florins.

What you should do in stage four

This stage consists of 12 rounds. In each round you are given 20 florins and you are asked to choose how much to invest in the project (12 choices), and to indicate what you think is the average contribution of the other participants (12 forecasts).

Results

After you have made your choice and your forecast, you will be informed about the others' contributions and how much you have earned. Payment will take place privately at the end of stage seven.

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