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INDIVIDUALS' VOTING CHOICE AND COOPERATION IN REPEATED SOCIAL DILEMMA GAMES[§]

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ABSTRACT

In this paper we explore the relationship between the individual's preference for cooperation and the establishment of cooperative norms. Our aim is to provide an experimental test of the evolutionary hypothesis (see Carpenter, 2004, Fehr and Gachter 2002; Gintis 2000; Boyd, Bowles, Gintis and Richerson 2003; Bowles and Gintis 2004), according to which individuals are prepared to punish defectors in experimental social dilemma games because they want to enforce a social ("altruistic") norm which may conduce to increasing their future payoffs, as in the case of sanctions against free riding behaviour. According to this line of research , the high levels of cooperation we observe in our societies can, therefore, be strictly related to the establishment of social norms which are able to enforce and maintain cooperation in the long run. We study the results of two experiments in which the individuals decided both whether to participate in a common project and the institutional rule according to which the profits of the project had to be shared among each of the participants in the group. They could choose between 1) a regime where gains were shared equally, regardless of individuals' contributions and without sanctions and rewards (System A); 2) a regime where individuals were paid according to their marginal contribution, but the profits of the investments were lower than in the other contexts (System B); finally 3) a regime in which gains were shared equally (as in System A), but individuals were allowed to punish (and\or reward) free riding (cooperative) behaviours as in Sefton, Shupp and Walker (2007). Before the experiments took place, our subjects were required to fill a questionnaire composed of four sections, where their attitude to cooperate and their opinions on civic values and free riding behaviours were thoroughly explored. We then monitored the behaviour of potential free riders and cooperators in the game and their institutional choices. Our results partly contradict the evolutionary hypothesis in as much as System A and B received the largest shares of votes in almost all rounds and they were voted by free riders and cooperators alike. Thus, most individuals do not like sanctions (incentives) against defectors and free riders (cooperators), and their institutional preferences do not seem to be related to their willingness to cooperate. The inspection of individual data, however, reveals some interesting points. In fact, we can assert that System C was mostly chosen by cooperative individuals in response to observed free riding behaviour. Furthermore, when a cooperative individual chose C, she would tend to punish free riders and reward cooperators. Our conclusion is that, as far as the institutional choices are concerned, beside the profit motivations underlined in the evolutionary hypothesis, the ethical and cultural unobserved individual preferences play an important role. There is a number of individuals (limited in our experiments, ranging between 15 and 30 per cent of the entire population) who see cooperation as the "right" thing to do, and therefore are prepared to implement institutional rules that may favour this collective outcome. Most people in our experiments did not share these same values.

Keywords: *public good games, experiments, voting choices*

J.E.L. Classification: C90, C91.

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INDIVIDUALS' VOTING CHOICE AND COOPERATION IN REPEATED SOCIAL DILEMMA GAMES

"It must not be forgotten that although a high standard of morality gives but a slight or no advantage to each individual man and his children over the other men of the same tribe, yet that an increase in the number of well-endowed men and advancement in the standard of morality will certainly give an immense advantage to one tribe over another. A tribe including many members who from possessing in a high degree of patriotism, fidelity, obedience, courage and sympathy, were always ready to aid one another, and to sacrifice themselves for the common good, would be victorious over most other tribes; and this would be natural selection." (Darwin, 1871, p. 166)[1]

Introduction

It is a well established result that in the presence of sanctions and opportunities to punish free riding behaviours, individuals are more willing to cooperate in experimental public good games (Fehr and Gachter, 2000, 2002).

The individuals' motivations lying behind these results are however still puzzling. Specifically, while the possibilities of punishing increase overall efficiency, the reasons why individuals should accept to reduce their own utilities in order to reach a Pareto improving collective outcome still remain not fully explained.

In Fehr and Gachter 2002, an evolutionary explanation is put forward. As they state: "punishment may well benefit the future group members of a punished subject, if that subject responds to the punishment by raising investments in the following periods. In this sense, punishment is altruistic. In the presence of altruistic punishers, even purely selfish subjects have a reason to cooperate in the punishment treatment" (p. 137).

On similar lines of research, Carpenter 2004; Gintis 2000; Boyd, Bowles, Gintis and Richerson 2003; Bowles and Gintis 2004 explore the nature of altruistic punishment and its evolution in small and large groups of individuals.

Thus, the basic idea underlying these research works is that individuals are prepared to punish defectors – even at a personal cost and in the absence of motives of reputation building - because they want to enforce a social ("altruistic") norm which may conduce to increasing their future payoffs, as in the case of cooperative norms. The high levels of cooperation we observe in our societies are, therefore, strictly related to the establishment of social norms which are able to enforce and maintain cooperation in the long run[2].

This interpretation has a strong explanatory power, since punishment is actually observed in experiments and it is highly effective even in those cases in which individuals are aware that they will never interact with same groups' subjects ever again.

[1] We took the quotation from Rowthorn *et al.*, 2009 (p. 4) and not directly from Darwin's original text.

[2] It is known that, in repeated public good experiments, high levels of cooperation are observed only in the short run, and, in the absence of sanctions, they deteriorate very quickly (see Ledyard 1995; Camerer 2003).

One very important criticism to these conclusions can be found in Bothelo, Harrison, Pinto e Rutström (2005) and it is related to the possibility of carrying out institutional comparisons adopting the current experimental settings. The argument can be summarised as follows. Individuals' behaviour observed under an exogenously determined institution can depend on a large number of factors which cannot be disentangled in a simple manner. In order to draw conclusions on the evolutionary nature of social norms and their effect on cooperation, we need to study the problem in a condition in which the agents' choices under each institution are directly comparable, and, furthermore, the agents' motivations are fully investigated. According to the authors, one way to explore the relationship between the cooperative behaviour and the establishment of cooperative norms would be to analyse different contexts in which the individual expected income under one institution (e.g., the no-punishment setting) is greater than or it is equal to its alternative institution (e.g., the punishment setting), and would include "the outside option of not participating at all" (p.1, *ibidem*).

In order to explore some of the points reported above, a number of papers studying the endogenous norms' formation process have been realised.

The idea is that first subjects choose whether or not to implement the "punishment" regime, and only after the voting decision has been taken and the institutional rule has been implemented , the actual public good game takes place. During one (or more) stage of the game, therefore, the individual takes two (or three, in the case of the punishment regime) decisions, one regarding the specific institution, the other regarding her participation to the common fund and , finally, in some cases the decision to punish co-players.

There are many interesting points on which such line of research can shed more light.

On one side, in fact, allowing subjects to choose the institution under which they want to interact answers the critique raised in Bothelo *et al.* on the comparability of the two settings and provide a support to the Fehr and Gachter results.

On another side, the research on voting in public games add new information on the nature and the effects of the voting strategies[3].

Dal Bó, Foster, Putterman 2007 design an experiment in which subjects play several rounds of a PD game. Participants are randomly divided into groups of 4 subjects. After 10 rounds, players are asked to vote on a choice which allow them to switch to a different stage game in which a penalty for defectors is considered, transforming the initial PD game into a game with two stage equilibria (mutual defection and mutual coordination). There are two possible outcomes of the voting stage, for each group. In the first case, (i) the subjects' voting decisions is implemented by the computer

[3] See for a survey, Palfrey 2005.

or, on the contrary, (ii) the computer exogenously decides the institutional rule which will govern the group's interaction in the subsequent 10 experimental periods. The main conclusion is that when the policy (or the punishment norm) is endogenously (democratically) chosen, the level of cooperation is higher than in the opposite scenario in which the decision is exogenously taken by the computer. Therefore, the endogenous choice of the "norm" not only confirms Fehr and Gachter results, but also reinforces the overall effect that the same "norm" has on behaviour, adding a new component - what Dal Bó *et al.*, define as the effect of democracy on the policy[4].

Similar results are found in Bothelo *et al.* and in Sutter, Haigner and Kocher 2006. The two papers are however constructed according to different lines. Haigner *et al.* compare the endogenous choices of a punishment and reward norm in public good games in relation to settings where the same norms are imposed exogenously by the experimenters. Bothelo *et al.* reproduce Fehr and Gachter's designs on the two stage public good game, introducing the possibility of choosing among alternative institutional rules. Again, both research papers confirm the importance of norms and the relevance of the endogenous choice process. Haigner *et al.* , finally, confirm the higher effectiveness of the punishment regimes relative to the reward regime.

Using different designs, Gürerk, Irlenbusch and Rochenbach (2005) propose an experimental setting in which individuals vote on the norms in each stage, and then are allocated to groups with partners who voted for the same norm (punishment\no punishment; reward\no reward). Their experimental design is the more direct test of the "evolutionary" hypothesis on the punishment norm, since individuals vote in each period and the authors are able to study the dynamics of the different institutions. Their most important result is that a large share of the population "move" from the "no-punishment" regime to the "punishment" regime within the experimental sessions, confirming both the effect of sanctions and democracy on cooperation but also the possible existence of an evolutionary motive at work.

Most of the research in this area is still under investigation and therefore no result can be considered robust; there are however several aspects of the current literature which we find unsatisfactory and motivated our research.

First of all, even if individuals are able to choose between alternative norms, the voting stage is often predetermined by the experimenters and, the decision – once taken – cannot be changed.

In our opinion, if the aim of the research is to study the effect of endogenously created norms, then it is more convincing – as in Gürerk *et al.* – to study the dynamics of norms formation in a context in which individuals can change their choices and are fully aware of the possibility.

[4] In Ertan, Page and Putternam, 2005, an endogenous mechanism of norms' formation is explored in a context of repeated public good games. The aim of the paper is however to test whether subjects were prepared to sanction low or high contributors in their groups.

Norms, once implemented, are going to influence behaviour of all subjects, whether they voted for them or not. On another side, norms, once implemented, tend to create "conformity" in behaviour (Bicchieri, 2006; Faillo, Sacconi, Ottone, 2008) and therefore the increase in cooperation we observe in these experiments might be related to a general conformity to the "institutional setting" rather to a specific preference for sanctioning free riding. In our opinion, allowing subjects to revise their decisions lowers the effects of the norm – conformity component.

A possible argument in favour of our hypothesis is related to the puzzling result found in Bothelo *et al.* , who, though finding higher levels of cooperation in the punishment setting, allowed the subjects in these experiments to decide whether to enter a society in which punishment norms were effective, in the final stage of the game. No subject chose to join such a society: thus, even though individuals are more cooperative if sanctions are institutionally effective, we may not be allowed to conclude that there exist a specific willingness to enforce the same norms.

For this reason, we compare the results of two different experimental designs (E1, E2) on a finitely repeated public good game in which individuals could choose the institutional rule according to which the profits of the common fund were divided among all players in the group; in the first one (E1), individuals voted in each stage (the selection of the institution was carried out using a simple majority rule), whilst in the second one (E2), there were only two voting stages (again, the institutions were selected using a simple majority rule). In both cases, however, individuals were fully informed on the distribution of the votes on the alternative possibilities.

A second point on which our research is centred relates to the individuals' preference for cooperation. It is a well-known result (Fischbaker and Gachter, 2006) that preferences for cooperation are highly heterogeneous: adopting the classification of Fischabaker and Gachter, 2006, in fact, one may identify three possible types of individual preferences for cooperation in public good games (free riders, conditional cooperators and unconditional cooperators). If the scope of our analysis is to verify the individuals' willingness to establish social norms, so to increase the collective future benefits, it is important, in our opinion, to explore the heterogeneous nature of the subjects' preferences and to assess its importance in relationship to the subsequent selection of the norms[5]. At the moment, there are several ways to elicit individual preferences (see Burlando and Guala, 2005 for extensive research in the specific field of public good games). We adopted a simple procedure, in as much as our subjects were required to fill a questionnaire composed of four sections, where their attitude to cooperate and their opinions on civic values and free riding behaviours were thoroughly explored. In fact, before the experiments took place, we delivered a questionnaire to subjects who were then recruited for the sessions in the University of

[5] Many authors have often found that a conspicuous share of the "punishments" in public good games "goes in the wrong direction": in fact it comes from free riders who wish to lower the cooperators' level of income.

Siena and Salerno. As it will explained in the following sections, we then "monitored" the behaviour of the different types within the E1 and E2 experiments, so to identify the possible correspondence between the selection of the norms and the individual's preference for cooperation.

The third and final aspect on which our experiments differ from the previous contributions relates to the choice of the institutional rules. Most of the papers reported above test the alternative choices of two regimes (punishment\no punishment; or reward\no reward). According to our opinion, adopting similar experimental models, the questions raised in Bothelo *et al.*, may not find a satisfactory answer. In fact, in order to study whether a given institutional context (i.e, the punishment\reward setting) is preferred not by the revengeful free riders but by the cooperative individuals who wish to increase current and future levels of cooperation, all subjects alike should also be given the opportunity to respond to uncooperative behaviours by selecting regimes where they can avoid such behaviours without directly or indirectly bearing the costs of heavy sanctions. For this reasons, we devise three possible alternatives for subjects in our experiments. They could choose between 1) a regime where gains were shared equally, regardless of individuals contributions and without sanctions and rewards (system A); 2) a regime where individuals were paid according to their marginal contribution, but the profits of the investments were lower than in the other contexts (system B); finally 3) a regime in which gains were shared equally (as in System A), but individuals were allowed to punish (or reward) free riding (cooperative) behaviours as in Sefton, Shupp and Walker (2007)[6].

Though not conclusive, we find many interesting results. First of all, considering both E1 and E2, in all sessions average contributions never converge to the perfect free riding equilibrium, and in 5 sessions out of 7, average contributions increase overtime (see Figures 2 and 3).

Second, both in E1 and E2, the systems which received the largest shares of votes in the majority of the rounds were A and B and they were voted by all types of players, suggesting that sanctions and incentives for cooperation are not very popular even among people who would actually contribute more than average to common projects. Nevertheless, the inspection of the individual data reveals some surprising aspects of the subjects' behaviour which may favour the evolutionary thesis.

In fact a high correspondence between the questionnaires profiles and the individual play can be identified both in E1 and E2[7]. If we then monitor the institutional choices of potential free riders and cooperators, we can assert that the system C is mostly chosen by cooperative individuals, and

[6] In Section 2 we will explain and compare the three regimes.

[7] In Section 1 a clear definition of the classification criteria *per* type will be given; the presentation of the experimental evidence will then show that individuals (both in E1 and E2) who may be classified as potential free riders (or cooperators) are the ones whose contributions tended to be lower (higher) than average throughout the experiment.

when a cooperative individual chooses C, she will tend to punish free riders and to reward cooperators. Considering E1, if we study the individuals' switching probabilities across systems, we can also see that cooperative individuals have a high switching probability between A and C[8]; such probability tends to be higher than between system A and B. Finally, if we want to assert in which condition system C does emerge as an endogenous choice of a highly heterogeneous population, we may then suggest that – in order for that to happen – a high share of unconditional cooperators is required as a starting condition.

What are our conclusions? Would subjects' choose sanctions and rewards if given the opportunity, and, more importantly, would their choice correspond to a willingness to establish cooperation as a social norm in response to observed free riding behaviour? The answer is doubtful. In our opinion, beside the profit motivations, the ethical and cultural unobserved individual preferences play an important role. There are a number of individuals (limited in our experiments, ranging between 15 and 30 per cent of the entire population) who see cooperation as the "right" thing to do, and therefore are prepared to implement institutional rules that may favour this collective outcome. Most people (in our experiments) do not share these same values.

The paper is organized as follows. In Section 1, we will describe the questionnaire and the classification criteria. In Section 2 we will present the experimental model and state our working hypotheses. Section 3 is devoted to the presentation of the results of E1 and E2 respectively, and to the comparison of the two settings. In Section 4 some concluding remarks are presented, along with some suggestions for further research in this area.

1. Questionnaires' answers and individuals' social preferences.

In order to elicit individuals' preferences for cooperation, we asked our subjects to fill a questionnaire before the experiment took place. We adopted a special procedure in order to control for sample selection. In fact, students were recruited directly during their classes two weeks before the experiment took place, and we asked all the people participating to those classes to fill the questionnaire, which would be collected at the end of the lesson. On the questionnaire sheet, there was an identification number, and if they decided to participate in the experiment, they had to send an email to the lab organiser reporting that number. Over 300 questionnaires were delivered, while only 124 students[9], whose questionnaires' answers are available, participated in the experiments[10].

[8] System A was voted by the majority of all types of players in the first round in all sessions of both experimental designs.

[9] For organisational problems, we are unable to use the questionnaires answers of the students participating in the Sessions 1 and 2 of the E1 design. We use the data of Sessions 1 and 2 only for analysing the dynamics and convergence of contributions and rules, but not for the whole empirical analysis of the individuals' choice.

There are now a large number of studies which make use of questionnaires in order to classify individual attitudes towards cooperation in social dilemma experiments (see Burlando and Guala, 2005, for a comparative study on the efficiency of the alternative methodologies). For the scope of our analysis, which is centred on the institutional choices in a heterogeneous population, we believed that a comprehensive questionnaire which could provide information on the individuals' propensity to cooperate and at the same time provide some insights on their civic values was the correct way to proceed.

As emerges from Table 1.1, our questionnaire was composed of four sections (social participation; civic cooperation; perceived others' behaviour; opinions on free riding behaviour).

Central to our methodology to classify potential free riders and cooperators are the questions contained in Section 4. These questions are drawn from a section of the 2004 Bank of Italy questionnaire (SHIW) eliciting opinions about tax evasion, although, in order to make the interview more interesting for undergraduate students and to focus on the more general issue of cooperative behaviours, we shifted the focus from the theme of tax evasion to the specific case concerning the payment for public services and the access to subsidies and grants for students (education, public transport, clubs, but also cheating on applications for university grants, etc.).[11]

It is important to notice that empirical studies which make use of the Bank of Italy questionnaire's dataset have proved that the individual's opinions on tax evasion are highly indicative of her actual cooperative behaviour (Cannari and D'Alessio, 2007; Fiorio and Zanardi, 2006; Nese, 2008). In addition to that, the Bank of Italy survey has been analysed to highlight the specific importance of behavioural components which may affect tax evasion in Italy, and it can provides an indirect test of the robustness of our classification methodology [12].

In turn, the recent literature on social capital (specifically on tax compliance as a specific expression of social capital), and the differences in social capital among European countries, have shown that a wide range of personal and contextual factors (religious sentiments, civic values, perceived others' behaviour, etc.) may affect cooperative behaviour as well (Andreoni et al. , 1998; Sandmo, 2005; Slemrod, 1998; Torgler, 2007).

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[10] We analysed all the 300 questionnaires in order to understand whether only the more cooperative students participated to our experiment. However, we did not report (statistically) significant evidence of selection.

[11] Two things should be specified. First, we adopted questions on tax evasion because they directly allow to evaluate the individuals' propensity to contribute (or free ride) in projects which affect their social group's well being. Secondly, as it appears from the Table, we adapted the wording and the focus of Section 4 to our sample of young people with no independent income. In order to do that, we excluded all questions of interest for employees who actually pay taxes out of their income for public services.

[12] Specifically, Cannari and D'Alessio (2007) show that individual propensities to evade taxes (measured through the principal components analysis applied to all the questions included in the Bank of Italy questionnaire) are highly correlated with real individual probabilities to evade taxes. Similar results are in Nese (2008).

For this reason, taking into account previous empirical literature, we also used questions drawn from the 1999-2004 European Value Survey on individual civic values and social cooperation to highlight the presence of similar patterns in our sample (see Sections 1, 2, 3 in Table 1.1). Finally, we elicited information on socio-demographic characteristics: sex, age, parental income and education, score in high school diploma.

In order to classify the students' social preferences, we proceeded to analyse the questionnaire's answers in three subsequent steps. Firstly, using the data from the two experiments (124 observations) we derive a synthetic indicator of individual propensities to cooperate through the principal components analysis applied to all the questions included in the fourth section of the questionnaire.

Secondly, by selecting the individuals' answers to three specific questions contained in Section 4, we identify three possible categories of players in E1, E2: free riders, conditional cooperators and unconditional cooperators.

Finally, we estimate a multinomial logit model to evaluate the specific role that social participation and civic values have in determining free riders and cooperative individuals' social preferences profiles.

Starting with the first point, Table 1.2 shows the results of the principal component analysis[13].

The first principal component seems to describe the students' average position concerning cheating on paying for public services - or, more specifically, the individuals' propensity to cooperate- since it has positive loadings on sentences condemning cheating (because it is immoral or unfair).

At the same time, the first principal component has negative loadings on statements justifying free riding. If people are less willing to free-ride, they are likely to disagree with the first items and to agree with the second ones.

However, we go beyond the analysis of individual propensity to cooperate: we also want to infer the presence of different types of agents.

- INSERT TABLE 1.1 ABOUT HERE -

[13] As it is known, the Principal component analysis (PCA) is a statistical procedure useful when data on a number of variables are available and there is some redundancy in those variables (redundancy means that at least some of the variables are correlated with each other, basically because they are measuring the same underlying construct). The PCA leads to the reduction of the observed variables into a smaller number of artificial variables (principal components) that account for most of the variance in the observed data. The first principal component accounts for as much of the variability in the data as possible.

Among the Bank of Italy questions, we selected those that, in our opinion, were more adequate to depict different agents' profile (according to the classification in reciprocators, free riders, cooperators); in particular, we concentrated on the following statements:

1) Seeking not to pay or to pay less for the University fees and facilities is one of the worst offences a person can commit because it damages the entire students' community.
2) One pays more willingly if one knows everybody else is paying.
3) Some try to avoid paying, because there is little risk in not paying.

- INSERT TABLE 1.2 ABOUT HERE -

Each individual has been classified as:
-"unconditional cooperator" if sentence 1) reported the highest score among the three selected sentences;
- "conditional cooperator" if question 2) reported the highest score among the three selected sentences;
- "free rider" if the highest if question 3) reported the highest score among the three selected sentences;
- "other" if the three questions reported the same score.

There are several reasons why we adopted such classification. As can be noticed the Bank of Italy questions try to capture many possible motives and justifications for cooperative or free riding behaviour; furthermore some questions are similar in spirit and they can equally contribute to depict the same type of individuals' preference profile. However, we believed that considering a statistical measure (i.e., the mean or the median) representing sets of alternatively similar questions could be deceptive, since different types of agents would probably agree with some of statements presented (for example, sentence 6 is quite general[14]). Furthermore, the PCA analysis provided a check of the correlation among the different sentences, and the overall coherence of the individuals' profiles. For these reasons, we preferred to select only the questions which seemed more suitable to distinguish among the different types and adhered to some well established theoretical and experimental findings.

More specifically, in our opinion, the first statement is particularly proper to indicate individual willingness to contribute in projects affecting the social group's well being since it not only

[14] It reported a high score in most questionnaires.

indicates the individual's attitudes to comply with civic duties but it also signals her awareness on the fact that free riding behaviour constitutes an obstacle to the achievement of collective goals.

On the contrary, the second statement is likely to meet fairness sentiments: people are more motivated to pay when the others pay (Andreoni, 1988; Bordignon, 1993). Finally, we argue that people giving the highest score to the third statement exhibit more cynicism in that they take into account risks involved in cheating (more than moral aspects or fairness considerations); moreover, as argumented in Sandmo and Allingham (1972) and in Sandmo (2005), people willing to cheat are more likely to undervalue risks of detection. Inspection of Table 1.2 provides a first test of our selection criteria. In fact it can be noted that the first principal component has positive loadings on the first two sentences while it has a negative loading on the third one.

Finally, in order to provide a further check of the robustness of our classification method and to identify an overall social profile of potential free riders and cooperators, in Table 1.3 we also estimate a multinomial logit: the dependent variable is the individual probability of being conditionally cooperator, unconditional cooperator, free rider; the set of explanatory variables includes main socio-economic characteristics (sex, score in high school diploma, parental education, social relations) and the opinions on civic cooperation expressed in the other sections of the questionnaire.

- INSERT TABLE 1.3 HERE -

The results are remarkably coherent with the finding of the existing literature on tax evasion and cooperative behaviour in Italy. In fact, the estimates indicate that unconditional cooperators exhibit a higher predisposition to civic cooperation (or, more specifically, they are less inclined to justify "uncivil behaviour") and are more likely to be involved in social relations[15]; finally, parental education is likely to be lower among free riders thus confirming a significant correlation between education and predisposition to cooperate.

Adopting the classification method described above, our sample, composed by 124 students, was divided into the four sub-groups in the following way. In the third session of E1, 29% of individuals were defined as "others", 14% were defined as unconditional cooperators, 21% were defined as free riders, 36% as conditional cooperators. In the fourth session (E1), 25% of the individuals were classified as "others", 19% were defined as unconditional cooperators, 31% as

[15] However, when we estimated the model including all the questions in section 1, we reported a statistically significant coefficient (with a negative sign) on questions 1.3 and 1.4: this means that unconditional cooperators are more likely to be engaged in clubs and voluntary associations and to spend time with people at church.

free riders, 25% as conditional cooperators. In the fifth session (E2), individual types can be classified as follows: 25% as "others", 35% as unconditional cooperators, 35% as conditional cooperators, 5% as free riders.

Also the two sessions of E2 exhibit a different preference-type composition. More specifically, the second session is characterised by a majority of conditional cooperators (46%), 15% of individuals were classified as unconditional cooperators, 12% as free riders and 27% as others. The first session exhibits a higher percentage of unconditional cooperators (28%) and a lower percentage of conditional cooperators (22%) while 22% were classified as free riders.

2. Theoretical Models and Experimental Designs.

As the basic model in our experimental sessions, we adopted a repeated linear public good game (Voluntary Contribution Mechanism, VCM), which lasted 10 periods (the duration of the game was common knowledge).

In each period, the subject would choose whether to invest a fraction of her initial endowment (6 experimental tokens, and the exchange rate was equal to 0.5 Euro for each token) between a common project which guaranteed an individual marginal return equal to 0.5 for each token sent by all co-players and a private account. Each subject participated in a group composed by four anonymous partners, and they were informed on the contributions and gains of each individual of their group, in each period of the game. We adopted a random matching procedure, but subjects could access (at no cost) a table which reported the contributions and the profits of all members of all groups. We run two experiments (E1 and E2), which basically differed for the timing according to which the institutional rules governing the division of the gains of the common fund were established.

In the experimental design E1, subjects voted in each period of the game, starting with the first one. The participants were divided into groups of four anonymous co-partners and they would be informed on the individual contributions of the members of their group, as well as they could also access a table in which the contributions of all groups were reported.

The timing of the decisions in E1 was described in the Instructions sheet where it was well specified that each individual would first contribute to the project and then vote for the institutional rule governing the distribution of the profits in each period of the game.

As an example of the voting procedure in E1 and E2, Figure 1 reports the screen subjects would see when they were required to cast their vote.

- INSERT FIGURE 1 ABOUT HERE -

In the experimental design E2, subjects played two periods with a basic treatment which allowed them to share equally the profits of the fund, regardless of the individuals' contribution. At the beginning of period three, subjects were asked to choose among three alternative ways to share the profits of the common project and they were also informed that the institutional rule which received the highest number of votes would be applied in the following four periods. Again, in the Instructions, such distributional rules were labelled "System A", "System B", "System C".

Therefore, in E2 there were only two voting stages, at the beginning of period three and seven and the results of this selection procedure would be given through a table in which the votes for each system were reported.

The basic difference between E1 and E2 consisted in the timing of the institutional choices. In E2, players knew that the chosen system would be effective for four periods, whilst they were entitled to revise their decisions in the subsequent voting stage. As it will be explained in a following section, the aim of this specific design is to analyse some issues relating to the voting strategies *per se*, such as the existence of "moral" and "material" motivations explaining the specific selection of the norms, and the evaluation of the "norm conformity" component in the analysis of the participants' decision process, once the norm had been established. In E1, players voted in each stage, and in this case our objective was to observe the endogenous formation of norms, monitoring the behaviour of free riders and cooperative individuals.

In total, 168 subjects participated in our experiments (108 subjects in E1, 60 subjects in E2). The experiments were run in the Universities of Siena and Salerno in 2008, and the students were undergraduates enrolled in the faculties of Economics, Law, Literature and Classical Studies and Political Science.

Table 2.1 reports the organisational details of our experimental work.

We adopted a random matching procedure and a complete information framework so that the choice of the norms would reflect the subject's preference for cooperation, minimising the probability of spiteful behaviours (i.e., free riders using sanctions against cooperators).

An important point of our experimental work relates to the design of the "institutions" (System A, B and C).

As pointed out earlier, in most of the experimental analyses on the endogenous formation of institutional norms, the authors allowed the subjects to choose between two institutional settings, one in which the gains of common fund were shared equally, with no sanctions (rewards), and

another in which sanctions were effective. These settings correspond to our Systems A and C and we will compare them first.

System A

If System A was chosen by the majority of the population, then the components of each group would play a repeated public good game, sharing the gains in equal parts, regardless of the individual contributions.

Under this institutional regime, the expected individual gains at time t were equal to :

$$\pi_t^i = D - c_t^i + \left(\frac{2G_t}{4} \right) \qquad (\mathbf{1})$$

Where D was equal to per period initial endowment, c_t^i corresponded to subject's i contribution to the common project at time t and G_t corresponded to the sum of the contributions of all the members of the group.[16]

System C

Beginning with the paper by Fehr and Gachter (2000), a widespread literature on punishment in public good games has been produced and several "punishment technologies" have been explored in the experimental literature.[17]

In this paper, we selected one of the experimental designs developed in Sefton, Shupp and Walker (2007).

Their design consisted in a finitely repeated VCM model (the game lasted 20 periods). However, each stage, from the tenth to twentieth and final period, was divided into two parts. In the first part, subjects participated in the VCM basic game; in the second part, they were endowed with an additional number of tokens with which they could reward and\or sanction co-players.[18]

It is important to stress some asymmetric effects of the "punishment" and the "reward" institutional settings. As noted in Sefton *et al.*, it is a quite common result that sanctions have a greater effect on future levels of cooperation than rewards, though the level of static and dynamic

[16] System A was exogenously imposed in the practice round in the second experimental design; however, subjects were informed on the total profits accrued in the two periods only at the end of the practice rounds.
[17] See Casari and Luini, 2005, for references.
[18] Specifically, in Sefton *et al*., the authors compared the effects of three different regimes: 1) "punishment"; 2) "reward"; 3) "punishment" plus "reward". Our System C was based on their third treatment. The number of extra tokens in Sefton *et al.* as in our experiments was equal to 6.

efficiency is not always higher. In other words, the threat and the imposition of sanctions increase the individual willingness to cooperate, but considering the individual and social cost of the sanctions, the overall level of efficiency is often lower than in the "reward" setting.[19]

The interesting result in the institutional comparisons carried out in Sefton *et al.* is that the treatment where both sanctions and incentives were allowed: "suggests a synergistic relationship between the two, insofar as this treatment generates the highest contributions and earnings" (p. 3).

In our opinion - even though the authors do not provide a "behavioural" explanation of this result - one might infer that the co-presence of sanctions and incentives (that is, both of negative and positive reciprocation) can be perceived by the individuals as a fairer and more efficient way to support cooperative behaviours and consequently this perception increases the subjects' willingness to cooperate.

For this reason, not only did we select this institutional setting for our analysis, but also we allowed a stronger effect of both sanctions and rewards in our experiment.

In fact, in the Instructions, it was specified that for each token the individual would use for sanctioning (rewarding) one of the co-player, the loss (gain) in this individual's income would be equal to two tokens.[20]

System B

One important motivation of our research was that in most of the existing research works on cooperation and institutional choices, the comparisons between "institutions" relate to two different settings, one in which sanction or rewards are allowed, and another in which they are prohibited.

We believe that this way to proceed may not be very effective to analyse the relationship between cooperation and norms. Would, in fact, anyone respond to uncooperative behaviours by imposing costly sanctions on defectors or rather by claiming a lower rate of return of the investment but a regime where each individual contribution is paid in proportion with the subject's effort? The question is relevant and bears directly on the study of alternative institutions.

Clarke (1998) conducted a number of experiments comparing individuals' preferences on alternative distributional rules. He found that people regard "proportionality" rules as fair rules

[19] Sefton *et al.*'s results seem to confirm the asymmetric effects of sanctions and incentives; furthermore, they notice that players tend initially to use a higher number of rewards with respect to the number of sanctions, but the difference disappear in later rounds. Finally, the level of cooperation in the "reward" setting decreases overtime as in the baseline design (where no sanction or incentive were allowed).

[20] Doubling the effect of sanctions and incentives has a negative impact on the level of the groups' overall efficiency. However, we are interested in studying the relationship between the individual's preference for cooperation and her choice of the regime, and therefore we assume that the greater is the perceived individual impact of the sanctions (incentives), the greater might be the incentive to select that regime if the individual wants to increase current and future levels of cooperation.

and they were widely chosen. Therefore, one might assume that a "proportional" regime may be preferred by all types of individuals for two possible reasons, that is, for its fairness and because sanctions may be used strategically and therefore may be imposed unfairly on cooperative individuals.

Since the aim of our work is provide an experimental test to the evolutionary hypothesis, we designed a third institutional setting (System B), in which individuals could turn to a "proportional" regime, but the return from the investment were lower than in System A.

In fact, if System B was chosen by the majority of the subjects, then the individual per period expected income would be equal to:

$$\pi_t^i = D - c_t^i + \left(\frac{1.96G}{4}\right)\alpha \qquad (2)$$

where, D was equal to per period initial endowment, c_t^i corresponded to subject's i contribution to the common project at time t and G_t corresponded to the sum of the contributions of all the members of the group and $\alpha = \frac{c_t^i}{C_t}$; C_t is equal to the total of the group contribution.

Turning now to our experimental hypotheses, two alternative scenarios may envisaged on the basis of the evolutionary hypothesis: one which cooperative individuals respond to free riding behaviours by implementing social rules which will enhance current and future cooperation, whilst guaranteeing the highest levels of contributions and earnings (Claim 1), the opposite scenario in which self interest prevails and the response to uncooperative behaviour favours lower returns and proportional rules (Claim 2). Accordingly:

Claim 1: If the evolutionary hypothesis is confirmed, we will observe that cooperative individuals respond to free riding behaviours by preferring System C to System B. The higher is the share of the population whose contribution is lower than the average of the groups, the greater is the number of votes for System C coming from the cooperative individuals:

Claim 2: If the evolutionary hypothesis is not confirmed, then we will observe that cooperators respond to free riding by preferring System B to System C. The higher is the share of the population whose contribution is lower than the average of the groups, the greater is the number of votes for System B coming from the cooperative individuals.

3. Individuals' voting choices and cooperation: the analysis of the results in E1 and E2.

In this section we report the results of the E1 and E2 experiments. The section is divided into different parts, in which all data evidence is investigated. In Section 3.1 we report descriptive statistics of contributions and votes; the following sub-sections are devoted to the econometric analysis of individuals' behaviour. Finally, Section 3.4 reports with the study of punishments and rewards both in E1 and E2, whilst Section 3.5 compares the results in E1 and E2.

3.1 Contributions and votes in E1 and E2.

Table 3.1.1 and Figure 2 show interesting patterns emerging in the E1 experiment: in particular, the evidence drawn from session 1 and session 5 indicates a higher propensity to vote for distributional rules B and C, while, in session 3 and in session 4, System A receives the highest percentage of votes during the whole game; in session 2 there is a systematic rotation among the three systems.

However, it is interesting to notice that in the last rounds (in particular, in the 8th or in the 9th round), System C receives the highest percentage of votes in most sessions. [21]

An interesting pattern also emerges observing both voting decisions and contributions: in particular, in the first and in the fifth session (where B and C are the most voted systems) individual contributions increase during the game; on the contrary, in the third and in the fourth session, individual contributions decline during the 10 periods (however, in the last round of session 4 – when system C receives the highest percentage of votes – individual contributions slightly increase).

- **INSERT TABLE 3.1.1 ABOUT HERE –**

- **INSERT FIGURE 2 ABOUT HERE -**

Finally, also in session 2 – characterized by a systematic switching among the three Systems- individuals contribute more when they vote for system B and C, less when they vote for System A.

Thus, the main result, shared by the evidence reported for each session in E1, is that individual contributions decline during the game only when System A is the prevailing system.

[21] In the 4thsession system A and system C receive the same percentage of votes during the 9th round; system A is chosen by the computer.

Table 3.1.2 and Figure 3 show the results obtained from E2.

- **INSERT TABLE 3.1.2 ABOUT HERE –**

- **INSERT FIGURE 3 ABOUT HERE -**

In both sessions, System A prevails in the first voting stage and individual contributions decline during the first four rounds (in the second session they are slightly higher).

In the second voting stage Systems B and C receive the same number of votes in the first session, so that system C for the last four rounds is chosen by the computer. On the contrary, System B receives the highest percentage of votes in the second session.

From the seventh to the last round, individual contributions in the two sessions are noticeably different: in the second session, the introduction of System B increases individual investments; in the first session, in which System C was effective, after a slight increase (by about 16%) just after the second voting stage, contributions substantially do not vary (only in the final round they slightly decrease).[22]

Analysing the evidence, we are therefore able to state the following result:

Result 1: In E1, overall System A and B received the highest share of votes, and in E2, System A was selected in the first voting stage in both sessions. The proportion of votes for System C, however, increases overtime in E1 and C gains the majority of votes in most session in the latest rounds; the same System is selected in the first session in E2. With the only exception of the first session in E2, contributions tend to increase when C and B are the prevailing Systems; on the contrary, they tend to decline if A is voted (See session 3 E1).

3.2 Heterogeneous agents and behavioural patterns.

This section investigates type-preference composition of the different groups of students engaged in our experiments. Let us first consider the data drawn from the first experiment (E1). As stated earlier, of the three sessions for which questionnaires are available, in the third session, 29% of individuals were defined as “others”, 14% were defined as unconditional cooperators, 21%

[22] It should be noticed that many students participating in the first session of E2 were enrolled in the Literature and Classical Study first year courses: they had never participated in economic experiments before, and they found some difficulties in understanding the Instructions. We suspect that these factors have some bearing in explaining the low levels of contributions in the second part of the experiment.

were defined as free riders, 36% as conditional cooperators. In the fourth session, 25% of the individuals were classified as "others", 19% were defined as unconditional cooperators, 31% as free riders, 25% as conditional cooperators. In the fifth session individual types can be classified as follows: 25% as "others", 35% as unconditional cooperators, 35% as conditional cooperators, 5% as free riders.

It can be noted that the percentages of free riders in Sessions 3 and 4 are much higher than in Session 5. These data seem to be coherent with the results of the game observed in the two sessions in that Sessions 3 and 4 were mainly characterized by a prevalence of system A and by low contributions.

Table 3.2.1 indicates that all individuals (conditionally cooperators, unconditionally cooperators and free riders) are more likely to vote for system A in the first round (68.75%). On the contrary, in the final stages of the game, individual voting decisions reflect more properly individual profiles: unconditional cooperators are more likely to vote C in the last three rounds of the game[23]; conditional cooperators exhibit similar patterns even if, in the ninth and in the tenth round, the percentages voting for C (respectively, 42.85% and 38.09%) are lower than those reported for the unconditional cooperators[24] (respectively, 57.14% and 50.00%). Finally, free riders are more likely to vote for A throughout the game (the percentage of free riders voting A is 75% in the first round, 66.67% in the last round).

Moreover, when we consider contributing behaviour, we also report different patterns among the three types of agents: more specifically, the mean contribution among unconditional cooperators is 3.79 tokens, it is about 2.78 tokens when we consider both conditional cooperators and individuals classified as "others", while free riders contribute less than the other two types (1.97 tokens on the average).

- INSERT TABLE 3.2.1 ABOUT HERE -

In Table 3.2.2, we consider the experimental evidence drawn from the second experiment (E2). System A and system C are again the most voted systems, respectively, by free riders and unconditional cooperators, both in the first and in the second voting stage (moreover the

[23] In order to highlight significant patterns in the probabilities of voting A, B, C, we also estimated a multinomial logit model. The main results (statistically significant at the conventional levels) can be summarised as follows: cooperators are more likely to choose system C in the last rounds of the game. However, conditional cooperators are more likely to switch to B in the last round.

[24] In preliminary estimation, we also noticed that conditional cooperators switching from C to B (or to A) in the last two rounds exhibit a civic participation score (derived from Question 2 in our questionnaire) lower that that reported for conditional cooperators voting C until the last round.

percentage of unconditional cooperators voting C increases from 46.15%, in the first voting stage, to 61.54%, in the second voting stage).

Individual contributions are again coherent with the profiles emerging from the questionnaire analysis: unconditional cooperators contribute more than average (4.12 tokens), free riders less (2.40 tokens); conditional cooperators and others report similar mean contributions (respectively, 3.25 and 3.54 tokens).

Again, the two sessions exhibit a different preference-type composition. More specifically, the second session is characterised by a majority of conditional cooperators (46%), 15% of individuals were classified as unconditional cooperators, 12% as free riders and 27% as others.

- **INSERT TABLE 3.2.2 –**

The first session exhibits a higher percentage of unconditional cooperators (28%)- and this could explain the result of the second voting stage- but a lower percentage of conditional cooperators (22% compared to 46% in the second session) so that the percentage of free riders is slightly higher than in the second session (22%).

Result 2: Analysing voting behaviours of different types of agents, one can assert that in both experiments, all types of players begin playing A and then they switch to different System towards the end of the sessions. Overall, cooperative individuals switch to B and C, with the proportion of votes for the C system increasing overtime as far as the unconditional cooperators are concerned. Free riders in both experiments tend to vote System A throughout the experiment.

As far as contributions are concerned, it should be noticed that – in all sessions - unconditional cooperators give the highest contributions to the fund, while free riders' level of contributions are always less than the average of all groups.

3.3 Contribution patterns and individuals' preferences in E1 and E2

In this section, we investigate with econometric models the evidence from the E1 and E2 experiments in order to highlight (statistically) significant patterns about individual behaviour.

Beginning with E1, in each period of the game, the probability that subject *i* cooperates can be written as:

Ci=(*Others'contribution, ES(t), vi, μi*)

where:

- *Others'contribution*: expected average contribution of the other group members;

-*ES(t)*: subject's expectations on the system (A, B, or C) prevailing in period t ;

- νi : subject's voting decision (system A, B or C) in period t;

- μi: personal characteristics (unobserved) that may be correlated with both the subject's propensity to cooperate (Ci) and his/her voting decision (νi).

Given that

vi=f(μi)

we can also write:

Ci=(*Others' contribution, ES(t),* μi)

We also assume adaptive expectations, in as much as the expected system in period t is the system most voted in period t-1, so that we can write:

ES(t)=S(t-1)

We estimated five models which are reported in Table 3.3.1. These models differ according to the set of explanatory variables or the observations included in the estimation.

- INSERT TABLE 3.3.1 ABOUT HERE -

We observe that, in all the specifications of the model, other's contribution in the period t-1 significantly influences individual contributions in period t; the coefficients reported in the first column on variables "Votes B" and "Votes C" indicate a positive correlation with the dependent variable: in particular, individuals give higher contributions when they vote "B" or "C".

In the specification of the model reported in the second column, we analyse the impact of the expected systems (variables "S(t-1)B" and "S(t-1)C") on individual contributions (dependent variable).

It is important to notice that the variables "S(t-1)B" and "S(t-1)C" could be endogenous variables: when certain institutional rules are voted, they are likely to reflect individual "types". As a consequence, if we observed, for example, a positive impact of the variable "S(t-1)C" on individual contributions, the result could be due to the circumstance that more cooperative individuals simultaneously give higher contributes and choose C. This issue – related to the analysis of the effect of specific institutions or policies more generally – is still under investigation

in studies considering the role of punishments and rewards in games[25]. In order to control for individual types, we include individual votes in the previous round (more specifically, the variables "Voted B" and "Voted C") in the set of explanatory variables. The evidence reported in the second and in the third column[26] again indicates that when systems B and C are expected to prevail, contributions are higher.

However, controlling for individual votes in the previous round does not completely solve the issue of endogeneity because of the likely correlation among individual choices (arising from the interactions among the players during the game)[27]. To solve the problem we follow two routes.

Firstly, in the fourth and fifth column of Table 3.3.1 we control for individual heterogeneity using both individual propensities to cooperate (derived from the first principal component discussed in section 1) and the dummies for different individual types (conditional cooperators, unconditional cooperators, free riders). Secondly, in Table 3.3.2 we consider individual contributions only in the second round (in this case, the variables "Voted B" and "Voted C" can be considered as exogenous because they refer to the first round of the game). The last set of estimates essentially confirm our previous results: more specifically, when systems B or C are expected to prevail, contributions are higher.

Moreover, the results in the last two columns of Table 3.3.1 and Table 3.3.2 indicate that individual more inclined to cooperate (and in particular, the unconditional cooperators) contribute more, but they end up by adopting selfish behaviour in the last round.

- INSERT TABLE 3.3.2

In the second experiment (E2), after two practice rounds, individuals voted in the third and in the seventh round. In each round of the game, however, they decided contribution levels.

The estimates in Table 3.3.3 indicate that in both sessions unconditional cooperators, as well as individuals who voted A or C in the first voting stage, contributed more during the first four rounds of the game. When we consider the last four rounds we report different estimates for the second and the first session, characterized by different systems.

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[25] This problem has been underlined by Dal Bo' et al. (2007): "*Since people usually choose their policies, institutions or purchases, it is necessary to account for selection into treatment to measure the "true" treatment effect*" (p. 4)". In their experiment, subjects play 10 rounds of the prisoner's dilemma game; then, subjects vote on whether to introduce a fine on unilateral defection; in part 2 of the experiment, subjects play 10 rounds as in part 1, but the payoffs are modified according to the rules chosen in the voting stage. The authors control for selection taking into account individual votes in the "policy selection" stage.

[26] The estimates reported in the third column have been obtained excluding from the sample players in the second session: because of the systematic switching among the three systems in that session, we do not assume that the system expected to prevail in period t is the system prevailed in period t-1.

[27] See also Dal Bo' et al. (2007), p.13, Note 16.

Let us consider the estimates concerning the second session: it is interesting to note that individuals who voted C (or B) in the seventh round contribute more; at the same time, cooperators and free riders do not exhibit different contributing behaviour.[28] A different result is obtained considering the first session where unconditional cooperators contribute more even in the last four rounds.

- **INSERT TABLE 3.3.3 ABOUT HERE –**

- **INSERT TABLE 3.3.4 ABOUT HERE –**

In conclusion, the study of the individual choices confirms that different types behave quite differently both as far as contributions (and votes) are concerned. Free riders invest very little in the common project (and persistently vote A). Conditional and unconditional cooperators have similar patterns of behaviour as far as voting choices are concerned, (they start with A and switch to B and C), but in the final stages of the game they behave differently, since the majority of unconditional cooperators vote C in rounds 9 and 10 (respectively, 57% and 50%), whilst some conditional cooperators switch to A (or to B). Unconditional cooperators provide also the highest contributions to the fund in all rounds compared to the average of all groups (with the only exception of the last round in 6 sessions out of 7).

3.4 Punishments and Rewards in E1 and E2

We now look at the amount and the direction of the sanctions and incentives in all rounds and sessions in which System C received the majority of the votes.

Tables 3.4.1 and 3.4.2 show that individuals who voted C and individuals classified both as conditional and unconditional cooperators are more willing to use sanctions and rewards. The results are however somewhat different. Beginning with E1, one can notice that in the three sessions in which the classification per type has been carried out, there is no substantial difference in the behaviour of reciprocators and unconditional cooperators, whilst cooperative individuals and free riders exhibit different behaviour.[29]

- INSERT TABLE 3.4.1 AND 3.4.2 ABOUT HERE -

[28] In the first session in which C was selected, all individuals tried to invest a number of tokens which would be close to the previous period average, so to avoid sanctions. In the second session, once B was selected, all individuals invested all their tokens in the fund.

[29] However, unconditional use more rewards than conditional cooperators.

Table 3.4.2 illustrates what happened in E2. Again, cooperators use sanctions and rewards more than free riders: here however there is a marked difference in behaviour in as much as unconditional cooperators use punishments and rewards more than the two remaining types of agents.

Finally, two things should be noticed as far as the use of sanctions and rewards are concerned.

First, as in Sefton *et al.*, the number of punishments exceed the number of rewards and it increases overtime. In particular, the number of punishments increases in the final round while the number of rewards decreases.

Secondly, in both experiments, all types of players use sanctions (rewards) against low (high) contributors in the majority of the cases: in E1, only the 14% of sanctions and rewards are in the "wrong direction" (e.g., high contributors getting the sanctions), and the majority of them were carried out by conditional cooperators; in E2 we have no cases of spiteful behaviour. [30]

3.5 Comparing E1 and E2: a general insight on voting strategies

The experimental evidence gathered from the E1 and E2's designs show similar results both as far as voting and contributing behaviour are concerned for all types of individuals. In fact, the two designs have similar structures and they differ only for the number of voting decisions (10 in E1 and 2 in E2). However, this difference allows us to explore some issues related to individuals' voting behaviour which have been tackled in the theoretical and experimental fields of political economy but they are still unanswered in the specific literature on the endogenous norms' formation process in social dilemma games.

First, the individual's motivations behind her voting choice may follow two different conflicting routes, the first one concerning her moral evaluation of the specific institutional rules, the second one concerning the expected profit which she can gain if a specific rule is established. When there is a conflict between ethical and profit motivations, the "low cost" hypothesis (Brennan and Lomansky, 1993) states that an individual will tend to follow her ethical preferences if she conjectures her vote will have a small effect on the final outcome, on the contrary, her profit motivations will prevail if she expects her vote to be highly effective in deciding the final outcome. Tyran, 2004 provides an experimental test of the low cost hypothesis and his results seem to suggest that not only ethical motivations are strongly determinant of individual choices,

[30] In E1, 10% of the "incoherent" punishers (or rewarders) are conditional cooperators, 2% are free riders, 2% are unconditional cooperators. We have not analysed the overall level of efficiency in the rounds in which C was selected.

but also, the more effective is the individual choice in deciding the outcome, the more subjects are influenced by their moral evaluations of the alternative options. In E2, participants had little information on the effectiveness of their choice in the second voting turnout; it is possible therefore to expect that moral sentiments would prevail on the individuals' profit calculations. In E1, subjects were aware of the number of votes for each System period after period; in this case it is possible to expect that profit motivations play an important role in the voting decision process.

Comparing E1 and E2 we are able to assess how important are the two conflicting motivations in our heterogeneous population. In E2, the majority of cooperators switched to different Systems in the second voting stage in both sessions, opting for C and B; by the same token, only one free rider changed her initial decision to vote for A.

If we consider Session 3 and 4 in E1, where System A received a high proportion of votes during the entire game and if we monitor the voting behaviour of each type of agent, we can assert that the majority of votes for C and B came from cooperative individuals throughout the sessions, despite the fact that all participants could observe a stable and large share of votes for the A alternative. Contributions declined overtime in both sessions; however, there was a high correspondence between the players' profile and their voting behaviour in response to observed free riding - with the number of votes for C and B from cooperative individuals increasing in the last three periods.[31]

Therefore, we may conclude that there are strong ethical motivations behind voting strategies in both experimental designs. Furthermore, even though in E1 different motives could have played an important role, the majority of players still followed "morals" rather "money" (Tyran, 2004).[32]

The second aspect which can be explored comparing E1 and E2 consists on the existence of "norm conformity" as an important component of individuals' behaviour in a given context. In E1, rules could change in each period and this specific component is expected to play a very little role. In E2, after both voting stages, subjects played the repeated public good games in a specific context. If we compare the behaviour of the different types of agents in E2, we can conclude that all types change their behaviour in dependence to the established institutional System; at the same

[31] With the exception of period 10. It is worth noticing that we only monitor the behaviour of each type of agent in these sessions, but we are not able to interpret the behaviour of the large categories of "others".

[32] If we look at the change in behaviour of conditional cooperators in period 9 in all 3 sessions of E1, we may suggest that, as in Tyran 2004, a "bandwagon effect" may be at work, with most cooperative individuals converging on the choice of C in period 9.

time, a similar pattern of behaviour may be envisaged in E1, in particular, if we look at the increase (decrease) in average contributions in all stages in which B and C (A) were expected.[33]

In conclusion, comparing E1 and E2 we can conclude that ethical more than profit motivations play an important role when subjects vote; once, however, the institutional rule is established, all types tend to conform to that rule and profit motivations become prevalent.

Conclusions

In this paper we analyse the relationship between individuals' social preferences and the selection of alternative institutional rules, two of which provide a response to uncooperative behaviour in a public good game. Our main finding is that most cooperative individuals progressively switch to System C in the latest stages of the game. Among cooperative individuals, those who show a specific preference for cooperating behind reciprocating principles and have strong civic values, overall, turn to C directly after observing free riding. Reciprocators have similar institutional preferences, but they tend to switch to B later in the game. We conclude that in order to observe "altruistic punishment" we should therefore carefully analyse what "type" of cooperative individuals we are taking into account, and what are their ethical values on the issues of social participation and civic cooperation.

Whilst there are a number of lines along which our research need to be developed, one point is probably worth noticing in this concluding section. The adoption of a complex questionnaire in which not only the subjects' attitude to cooperate but also their general and ethical views on cooperation are taken into account posits the accent on the specific composition of our experimental samples. The experiments were carried out in two Italian Universities (Siena and Salerno), the first one located in a part of Italy which is regarded to have a high level of social capital; the second one located in the South of Italy traditionally known as an area with very low levels of social capital (Putnam, 1993). Despite our effort to use two distinct samples, for organisational problems, we only account for 10 per cent of Central Italian students in our questionnaire analysis, thus having the majority of students coming from the South. If this specific feature may be misleading on the actual effect that social capital have on our results, it cannot

[33] A "norm conformity component" may be traced also in the behaviour of subjects of Session 1 in E2, though contributions remain substantially constant in the two parts of the experiment, after rules A and C were selected. Besides possible cognitive motives at work (subjects were at their very first experience with economic experiments and they all read Literature and Classical Studies), we have two alternative explanations for the observed behaviour. First, we conjecture that participants tried to be in line with average contributions in order to avoid punishments. Second, we conjecture that the equal number of votes for C and B (C was chosen by the computer) may have lowered the effect of the "endogeneity premium" that Dal Bó et al., 2007 describe in their experiments.

change the essence of the relationship between the selection of the institutional rules and the overall social preferences' profiles.

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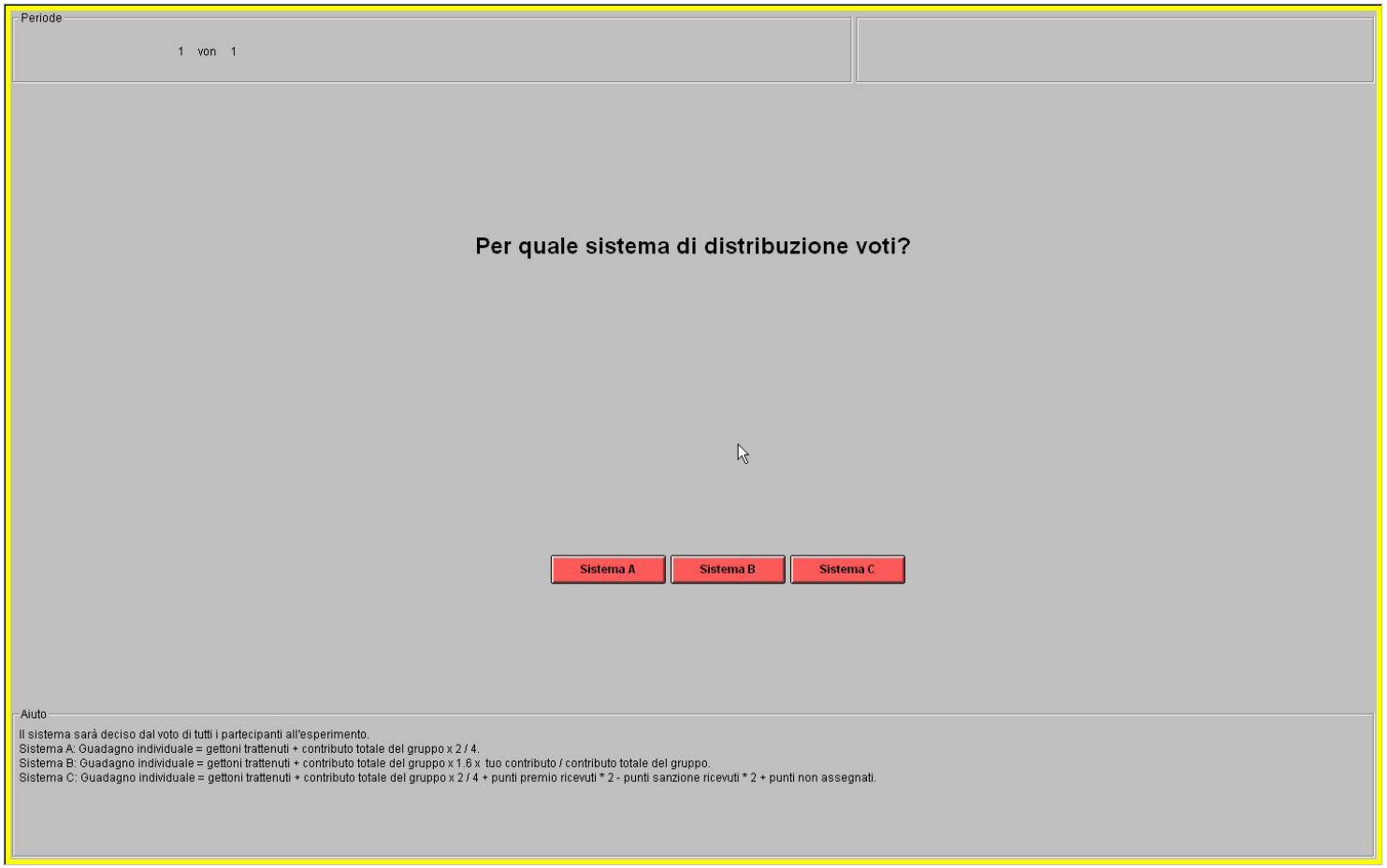

Figure 1: Voting choice in the experiment

Figure 2: Contribution patterns in all sessions in E1

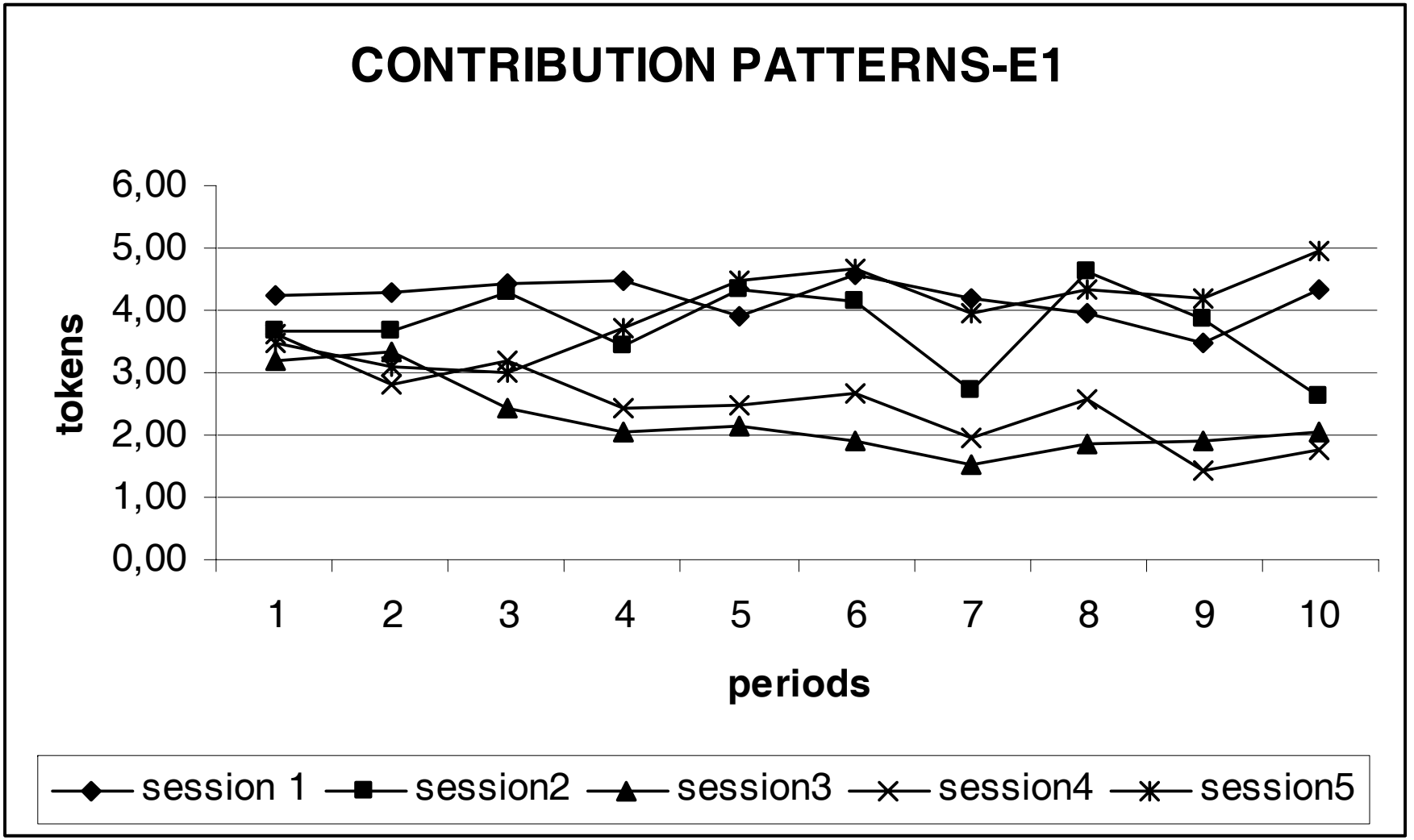

Figure 3: contribution patterns in all sessions in E2

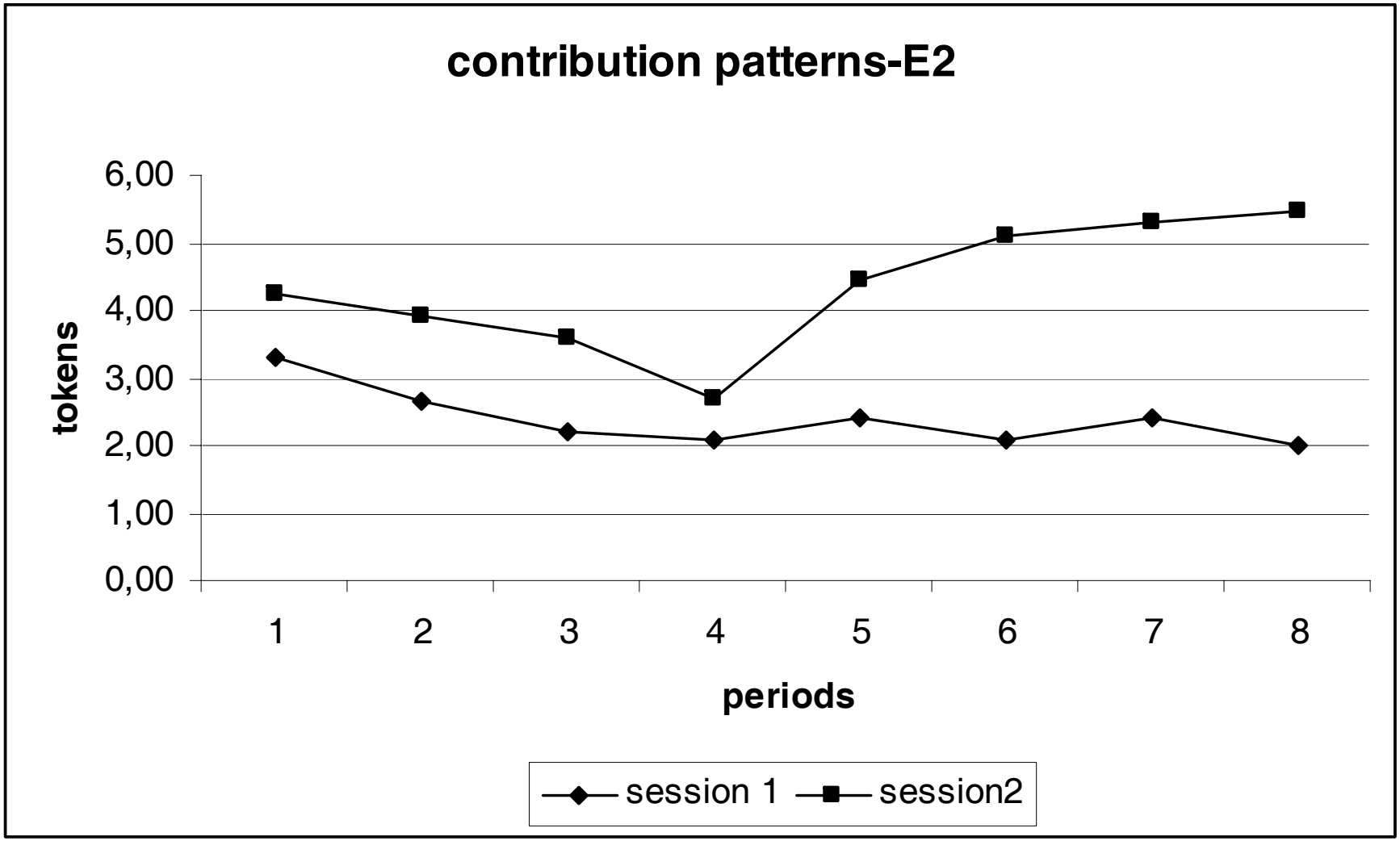

Table 1.1: The Questionnaire: Questions concerning Social Participation (Section1), civic cooperation (Sections 2, 3), cheating in payment for University services (Section 4).

Section1

Please indicate how often you do certain things (1=every week, 2=once or twice a month, 3=few times a year, 4=not at all).

1.1) Spend time with friends.
1.2) Spend time with colleagues from work or University outside the workplace (or outside the University).
1.3) Spend time with people at your church, mosque or synagogue.
1.4) Spend time with people in clubs and voluntary associations.

Section 2

Please indicate (on a scale 1-10) for each of the following statements whether you think it can always justified, never be justified, or something in between (1=can never be justified…10=can always be justified):

2.1) Claiming state benefits which you are not entitled to.
2.2) Cheating on taxi f you have the chance.
2.3) Having casual sex.
2.4) Lying in your own interest.
2.5) Someone accepting a bribe in the course of their duties.
2.6) Throwing away bitter in a public space.
2.7) Paying cash for services to avoid taxes.
2.8) Avoiding a fare on public transport.
2.9) Speeding over the limit in built-up areas.
2.10) Driving under the influence of alcohol.

Section 3

In your opinion, how many people are doing the following? (1= almost all, 2=many, 3=some, 4=almost none)

3.1) Claiming state benefits which you are not entitled to.
3.2) Cheating on taxi f you have the chance.
3.3) Having casual sex.
3.4) Lying in your own interest.
3.5) Someone accepting a bribe in the course of their duties.
3.6) Throwing away bitter in a public space.
3.7) Paying cash for services to avoid taxes.
3.8) Avoiding a fare on public transport.
3.9) Speeding over the limit in built-up areas.
3.10) Driving under the influence of alcohol.

Section 4

Let us now specifically consider young people who try to avoid paying for the University fees and the Campus facilities (canteen, sports clubs, transport services and so forth), or they claim grants and benefits for which they are not eligible. Indicate on a scale 1-5, (1=low; 5=high) how much you agree with the following sentences:

1) Seeking not to pay or to pay less for the University fees and facilities is one of the worst offences a person can commit because it damages the entire students' community.
2) One tries not to pay for fees and services because one knows that money is inefficiently spent.
3) Even though one believes fees and prices are unfair, one has to pay first and complain afterwards.
4) Some are forced to try to avoid paying because life is very expensive nowadays.
5) It's fair to pay for these services according the person's own income, so it is possible to support poor people.
6) One pays more willingly if one knows that services are efficient.
7) If everybody pays, then we all pays less.
8) One pays more willingly if one knows everybody else is paying.
9) Some try to avoid paying because fees and prices are too high.
10) Some try to avoid paying, because there is little risk in not paying.

Table 1.2-First principal component loadings*

Statements in the questionnaire – Section 4	Component loadings
1) Seeking not to pay or to pay less for the University fees and facilities is one of the worst offences a person can commit because it damages the entire students' community.	0.517
2) One tries not to pay for fees and services because one knows that money is inefficiently spent.	0.235
3) Even though one believes fees and prices are unfair, one has to pay first and complain afterwards.	0.429
4) Some are forced to try to avoid paying because life is very expensive nowadays.	-0.04
5) It's fair to pay for these services according the person's own income, so it is possible to support poor people.	0.401
6) One pays more willingly if one knows that services are efficient.	0.256
7) If everybody pays, then we all pays less.	0.327
8) One pays more willingly if one knows everybody else is paying.	0.319
9) Some try to avoid paying because fees and prices are too high.	-0.109
10) Some try to avoid paying, because there is little risk in not paying.	-0.215

Notes: *The first principal component explains the 22% of the variance in our data.; component loadings are equivalent to bivariate correlations between the observed variables and the first principal component.

Table 1.3 - Multinomial logit (E1, E2). -Dependent variable: probability of being conditional cooperator, unconditional cooperator, free rider.

Probability of being unconditional cooperator/Probability of being conditional cooperator		**Marginal effects of each variable on the probability of being unconditional cooperator**
Variables	**Coefficients (std. err.)**	
Sex	-0.049 (0.635)	-0.058(0.119)
High school score	0.022 (0.019)	0.002(0.004)
Parents'schooling	-0.452 (0.539)	-0.012(0.097)
Social part. index	-0.982(0.587)*	-0.158(0.107)°
Civic coop. index	-0.592(0.366)°	-0.117(0.069)*
Social context	0.642 (0.737)	0.113(0.137)
Probability of being free rider/Probability of being conditional cooperator		**Marginal effects of each variable on the probability of being free rider**
Variables	**Coefficients (std err.)**	
Sex	0.648(0.658)	0.127(0.114)
High school score	0.034(0.023)°	0.005(0.004)
Parents'schooling	-1.090(0.570)*	-0.175(0.095)*
Social part. Index	-0.569(0.593)	-0.036(0.102)
Civic coop. index	-0.053(0.333)	0.033(0.059)
Social context	0.243(0.759)	-0.005(0.133)
Log-likelihood	-76.015	
Restricted Log.-Lik	-83.355	
Obs.	78	

Notes: in the first panel, the coefficients estimated with a positive sign (or with a negative sign) indicate that the probability of being unconditional cooperator is higher (or lower) than the probability of being conditional cooperator. In like manner, the coefficients reported in the second panel indicate the probability of being free rider rather than conditional cooperator. We excluded from the sample individuals classified as "others". **Legenda**: sex=1 if male, 0 if female; parents schooling= (mother's schooling level + father' schooling level)/2; social participation index: mean score reported on questions 1.1-1.4 (first section of the questionnaire); civic cooperation index: mean score reported on questions 2.1-2.10 (second section of the questionnaire); social context: mean score reported on questions 3.1-3.10 (third section of the questionnaire).°Statistically significant at the 20% level; *statistically significant at the 10% level.

Table 2.1: The Experiments

EXPERIMENT	N. SUBJECTS	PERIODS	N. VOTING DECISIONS	INFORMATION
SESSION 1 (E1)	**24**	**10**	**10**	**COMPLETE**
SESSION 2 (E1)	**20**	**10**	**10**	**COMPLETE**
SESSION 3 (E1)	**28**	**10**	**10**	**COMPLETE**
SESSION 4 (E1)	**16**	**10**	**10**	**COMPLETE**
SESSION 5 (E1)	**20**	**10**	**10**	**COMPLETE**
SESSION 6 (E2)	**32**	**10**	**2**	**COMPLETE**
SESSION 7 (E2)	**28**	**10**	**2**	**COMPLETE**

Table 3.1.1-Voting decisions-E1

SESSION I - N. of subjects: 24

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8	Round 9	Round 10
Prevailing system	C	C	B	B	B	B	B	B	C	B
Votes for A (%)	29.17	29.17	12.5	16.67	16.67	16.67	25.00	20.83	16.67	8.33
Votes for B (%)	33.33	33.33	50.00	50.00	58.33	62.50	41.67	54.17	27.50	62.50
Votes for C (%)	37.5	37.5	37.5	33.33	20.83	20.83	33.33	25.00	45.83	29.17
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

SESSION II - N. of subjects: 20

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8	Round 9	Round 10
Prevailing system	A	B	C	A	B	C	A	B	C	A
Votes for A(%)	45.00	20.00	25.00	50.00	15.00	15.00	85.00	0.00	20.00	75.00
Votes for B (%)	35.00	45.00	30.00	40.00	70.00	20.00	5.00	85.00	25.00	15.00
Votes for C(%)	20.00	35.00	45.00	10.00	15.00	65.00	10.00	15.00	55.00	10.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

SESSION III - N. of subjects: 28

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8	Round 9	Round 10
Prevailing system	A	A	A	A	A	A	A	C	C	A
Votes for A (%)	71.43	53.50	53.50	50.00	57.14	64.28	57.14	42.85	46.43	50.00
Votes for B (%)	14.28	21.43	10.71	7.14	3.57	3.57	3.57	7.14	7.14	7.14
Votes for C (%)	14.28	25.00	35.71	42.8	39.28	32.14	39.28	50.00	46.43	42.86
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

SESSION IV - N. of subjects: 16

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8	Round 9	Round 10
Prevailing system	A	A	A	A	A	A	A	A	A	C
Votes for A (%)	81.25	50.00	43.75	56.25	50.00	43.75	81.25	56.25	43.75	37.50
Votes for B (%)	12.50	25.00	25.00	25.00	6.25	18.75	0.00	12.50	12.50	12.50
Votes for C (%)	6.25	25.00	31.25	18.75	43.75	37.50	18.75	31.25	43.75	50.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.0

SESSION V - N. of subjects: 20

	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8	Round 9	Round 10
Prevailing system	A	A	B	B	B	B	B	C	B	B
Votes for A (%)	55.00	55.00	45.00	30.00	35.00	25.00	30.00	15.00	25.00	25.00
Votes for B (%)	45.00	30.00	50.00	60.00	40.00	55.00	35.00	40.00	50.00	50.00
Votes for C (%)	0.00	15.00	5.00	10.00	25.00	20.00	35.00	45.00	25.00	25.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.0

Table 3.1.2-Voting decisions-E2

SESSION I	**First voting stage**	**Second voting stage**
N. of subjects: 32		
Votes for sistem A (%)	43.75	25.00
Votes for sistem B (%)	28.12	37.50
Votes for sistem C (%)	28.12	37.50
Total	100.00	100.00
SESSION II	**First voting stage**	**Second voting stage**
N. of subjects: 28		
Prevailing system	A	B
Votes for sistem A (%)	46.43	32.14
Votes for sistem B (%)	28.57	39.28
Votes for sistem C (%)	25.00	28.57
Total	100.00	100.00

Table 3.2.1-Voting decisions in E1 and heterogeneous preferences (%)

	1st round-Sessions 3, 4, 5			
	Votes for A	**Votes for B**	**Votes for C**	**Total**
Others	70.58	23.52	5.88	100.00
Cond. Coop.	66.67	19.04	14.28	100.00
Uncond. Coop.	64.28	35.71	0	100.00
Free riders	75.00	16.67	8.33	100.00
Total	68.75	23.43	7.81	100.00
	8th round- Sessions 3, 4, 5			
	Votes for A	**Votes for B**	**Votes for C**	**Total**
Others	47.06	11.76	41.18	100.00
Cond. Coop.	19.05	28.57	52.38	100.00
Uncond. Coop.	14.28	28.57	57.14	100.00
Free riders	83.33	0	16.67	100.00
Total	37.50	18.75	43.75	100.00
	9th round- Sessions 3, 4, 5			
	Votes for A	**Votes for B**	**Votes for C**	**Total**
Others	47.06	23.52	29.41	100.00
Cond. Coop.	38.09	19.05	42.85	100.00
Uncond. Coop.	7.14	35.71	57.14	100.00
Free riders	66.67	8.33	25.00	100.00
Total	39.06	21.87	39.06	100.00
	10th round- Sessions 3, 4, 5			
	Votes for A	**Votes for B**	**Votes for C**	**Total**
Others	47.06	11.76	41.18	100.00
Cond. Coop.	28.57	33.33	38.09	100.00
Uncond. Coop.	21.43	28.57	50.00	100.00
Free riders	66.67	8.33	25.00	100.00
Total	39.06	21.87	39.06	100.00

Table 3.2.2-Voting decisions in E2 and heterogeneous preferences (%)

1st voting stage –Sessions 1,2				
	Votes for A	**Votes for B**	**Votes for C**	**Total**
Others	38.89	27.78	33.33	100.00
Cond. Coop.	52.63	31.58	15.79	100.00
Uncond. Coop.	30.77	23.08	46.15	100.00
Free riders	60.00	30.00	10.00	100.00
Total	45.00	28.33	26.67	100.00
2nd voting stage –Sessions 1,2				
	Votes for A	**Votes for B**	**Votes for C**	**Total**
Others	27.78	38.89	33.33	100.00
Cond. Coop.	31.58	42.10	26.31	100.00
Uncond. Coop.	7.69	30.77	61.54	100.00
Free riders	50.00	40.00	10.00	100.00
Total	28.33	38.33	33.33	100.00

Table 3.3.1- Contribution patterns- all sessions in E1- Tobit panel model

Variable	**Coeff. (std .err.) I Periods 2-10**	**Coeff. (std .err.) II Periods 2-10**	**Coeff.(std.err.)^ III Periods 2-10**	**Coeff. (std .err.) IV Periods 2-10**	**Coeff. (std .err.) V Periods 2-10**
Others' contribution	0.252***(0.053)	0.229 ***(0.061)	0.258***(0.067)	0.433(0.085)	0.425(0.088)***
Votes B	1.721*** (0.152)				
Votes C	0.620***(0.134)				
S(t-1)B		0.615*** (0.138)	1.153***(0.033)	2.110(0.456)***	1.825(0.454)***
S(t-1) C		0.245°(0.176)	0.887***(0.104)	1.116(0.574)**	0.970(0.607)*
Voted B		-0.168 (0.159)	-0.043 (0.174)		
Voted C		-0.310**(0.158)	-0.119 (0.169)		
Uncond. coop.					2.750(0.796)***
Cond. coop.					1.392(0.772)*
Others					1.106(0.908)
Propensity to cooperate				0.382(0.189)**	
Log-likelihood	-1607.324	-1.669.087	-1330.186	-1006.351	-1002.792
Rest. Log-lik.				-1095.671	-1083.417
Obs.	972	972	792	576	576

Notes: columns I, II, III report tobit fixed effects estimates; columns IV and V report random effects estimates only for sessions 3,4,5. Period dummies are not reported. Thresholds values for the dep. var.: 0, 6. **Legenda**: ^second session excluded; ° statistically significant at 20% level. * statistically significance at 10% level; ** statistically significance at 5% level; ***statistically significant at 1%. Votes B: dummy =1 if the individual votes B in the period t; Voted B: dummy =1 if the individual voted B in the period t-1; Votes C: dummy =1 if the individual votes C in the period t; Voted C: dummy =1 if the individual voted C in the period t-1; S(t-1)B: dummy =1 if system B prevailed in the period t-1; S(t-1)C: dummy =1 if system C prevailed in the period t-1;Others'contribution: others' contribution in the period t-1.

Table 3.3.2 - Contribution patterns according to individual profiles- Sessions 3, 4, 5 in E1

Variable	Coeff. (std .err.) OLS estimates I	Coeff. (std .err.) OLS estimates II	Coeff. (std .err.) OLS estimates III
	2nd period	1rst period	10^{th} period
Others' contribution	0.214(0.205)		-0.173(0.194)***
S(t-1)B	0.106(0.06)*		3.486(0.344)***
S(t-1)C	0.328(0.078)***		0.342(0.048)***
Voted B	0.970(0.264)***		
Voted C	0.062(0.512)		
Cond. Coop.		-0.633(0.334)*	0.766(0.857)
Uncond. Coop.		1.167(0.259)***	0.838(0.864)
Others		0.055(0.315)	0.376(0.940)
constant	1.450(0.533)***	3.333(0.130)***	1.557(0.285)***
Adj R-squared	0.13	0.12	0.32
Obs.	108	64	64

Notes: the estimates in the two last columns are based on the last three sections. std err. clustered on sessions. Tobit estimates were very similar. **Legenda**: S(t-1)B: dummy =1 if system B prevailed in the period t-1; S(t-1)C: dummy =1 if system C prevailed in the period t-1; others contribution: others' contribution in the period t-1.° statistically significant at 20% level. * statistically significance at 10% level; ***statistically significant at 1.

Table 3.3.3- Contribution patterns according to individual profiles- Sessions 1, 2 in E2

Variable	Random effects tobit model Coeff. (std .err.)		Random effects tobit model Coeff. (std .err.)		Random effects tobit model Coeff. (std .err.)	
	3^{rd} -6^{th} round- first and second session		7^{th}-10^{th} round-first session		7^{th}-10^{th} round-second session	
	I	II	III	IV	V	VI
Others' contribution	1.21(0.05)**	0.12(0.05)***	0.04(0.08)	0.04(0.08)	0.05(0.08)	0.03(0.10)
Voted B	-2.29(0.80)**		-1.53(1.06)		4.87(1.86)**	
Voted C	1.07(0.86)°		1.39(1.25)		3.36(1.87)*	
Cond. Coop.		1.39(1.11)°		0.17(1.38)		-1.05(1.36)
Uncond. Coop.		3.52(1.17)***		3.70(1.51)**		0.12(0.33)
Others		1.88(1.28)°		1.27(1.83)		0.52(1.91)
Log-lik.	-314.36	-314.80	-202.703	-200.27	-102.332	-104.230
R. Log.-lik.	-338.74	-340.84	-229.53	-222.25	-120.265	-128.400
Obs.	177	177	124	124	112	112

Notes: tresholds values for the dep. var.: 0, 6. Constant and period dummies not reported. **Legenda**: S(t-1)B: dummy =1 if system B prevailed in the period t-1; S(t-1)C: dummy =1 if system C prevailed in the period t-1; others contribution: others' contribution in the period t-1.° statistically significant at 20% level. * statistically significance at 10% level; ** statistically significance at 5% level; ***statistically significant at 1.

Table 3.3.4 - Contribution patterns according to individual profiles- Sessions 1, 2 in E2

Variable	Coeff. (std .err.^) OLS estimates		Coeff. (std .err.^^) OLS estimates		Coeff. (std .err.^^) OLS estimates	
	3rd round		last th round-first session		last th round-second session	
	I	II	III	IV	V	VI
Voted B	-1.567(0.72)***		-0.636(0.983)		1.444(0.623)**	
Voted C	0.649(0.973)		0.583(0.966)		1.194(0.671)*	
Cond. Coop.		0.984(1.176)		0.143(1.117)		-0.418(0.995)
Uncond. Coop.		1.633(0.34)***		1.839(1.082)*		0.333(1.178)
Others		1.356(0.739)*		0.714(1.053)		-0.222(1.028)
constant	4.038(1.956)**	2.700(0.226)**	2.00(0.748)	1.286(0.790)	4.555(0.460)**	6.582(2.065)**
R-squared	0.18	0.07	0.06	0.12	0.19	0.03
Obs.	59	59	31	31	28	28

Notes: ^std. err. clustered on sessions;^^robust std. errors.Tobit estimates were very similar. **Legenda** *statistically significant at 5 percent level; **statistically significant at 10 percent level;***statistically significant at 1 percent level.

Table 3.4.1: Punishment and Rewards (in E1)

- PUNISHMENTS AND REWARDS ACCORDING TO INDIVIDUAL VOTING DECISIONS								
Individuals voting A		**Individuals voting B**		**Individuals voting C**		TOT	
punishments	rewards	punishments	rewards	punishments	rewards	punishments	rewards
34	20	30	10	56	38	120	68
- PUNISHMENTS AND REWARDS ACCORDING TO INDIVIDUAL PROFILES (only the last three sessions)							
Conditional cooperators		**Unconditional Cooperators**		**Free riders**		TOT *	
punishments	rewards	punishments	rewards	punishments	rewards	punishments	rewards
18	10	10	6	9	4	53	30

* includes individuals classified ad "others"

Table 3.4.2: Punishments and Rewards (first session in E2)

- PUNISHMENTS AND REWARDS ACCORDING TO INDIVIDUAL VOTING DECISIONS								
	Individuals voting A		**Individuals voting B**		**Individuals voting C**		TOT	
	punishments	rewards	punishments	rewards	punishments	rewards	punishments	rewards
	10	4	16	10	25	14	51	28
- PUNISHMENTS AND REWARDS ACCORDING TO INDIVIDUAL PROFILES								
round	**Conditional cooperators**		**Unconditional Cooperators**		**Free riders**		TOT *	
	punishments	rewards	punishments	rewards	punishments	rewards	punishments	rewards
7th	3	3	3	4	0	1	11	12
8th	2	1	4	3	1	1	13	7
9th	3	0	3	3	1	0	12	5
10th	4	0	4	2	1	0	15	4
	12	4	14	12	3	2	51	28

* includes individuals classified ad "others"

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