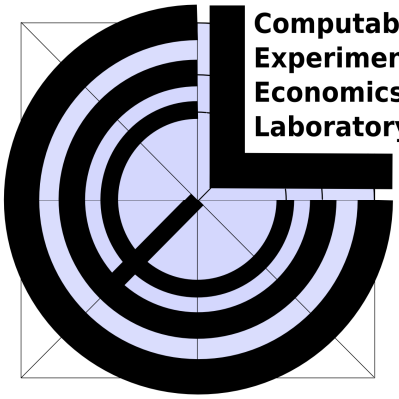

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Does Participating in a Collective Decision Affect the Levels of Contributions Provided? An Experimental Investigation

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ABSTRACT

From a purely theoretical perspective, there is no reason to expect that different levels of contributions in public goods games are associated with the same sanctioning/rewarding rule. The efficiency of a norm should be independent of its enactment procedure. On the contrary, multidisciplinary and empirical considerations suggest that individuals may behave differently, according to the level of their direct involvement. The question whether participation in norm enactment results in more contributory gap than when the same norm is received, has not been addressed in public good literature so far. Our three experiments show a behavioural regularity: participating in a normative enactment generates different contributory effects, with respect to the case when the sanctioning norm is merely received.

KEY WORDS: participation, public good games, free riding

INTRODUCTION

Free riding is one of the main implications deriving the theoretical models of public good provision with voluntary contribution mechanisms. Conversely, a common experimental result is that the level of personal contribution is often positive but inefficient, and many explanatory reasons are still being discussed for this weak free riding. The positive contributions may be interpreted by following two possible explanations. The first one concerns how to explain the gap between the theoretic prediction of no contribution and the empirical results (e.g., Kim & Walker, 1984; Fisher, Isaac, Schatzberg & Walker, 1995; Chu & Li, 1999; Cornes & Schweinberger, 1996; Sandler, Sterbenz & Posnett, 1987). The second line explains the positive contribution in terms of behavioural effects, as fairness (Fehr &

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Schmidt, 1999), altruism and co-operation (e.g., Andreoni, 1995; Sefton & Steinberg, 1996; Gachter, Fehr & Kment, 1996; Fehr & Schmidt, 1999; Fischbacher, Gachter & Fehr, 2001), reciprocity (Sudgen, 1984; Sethi and Somanathan, 2001, 2003), social preferences (Fischbacher & Gachter, 2006), conditional cooperation (Fischbacher, Gachter & Fehr, 2001), different beliefs and expectations (Offerman, Sonnemans, Schram, 2001), specific Value Orientation (Offerman, Sonnemans & Schram, 1996) or as a combination of the aforementioned elements (Janssen & Ahn, 2006).

Beside the explanations of the positive contributions, literature deems two complementary instruments to improve the levels of contribution: one is to reinforce the observed co-operation by using systems of incentives, and the other is to repress the remaining opportunism by adopting sanctioning systems.

Scholars recognize two different typologies of incentives, the first is obtained by modifying factors in the experimental design[2] that affect positively the co-operation (e.g., Weimann, 1994; Orr, 2001), whereas the second type concerns more directly the aspects linked with monetary returns, like the payoff structure and rewards (Sefton & Steinberg, 1996).

To explain the sanctioning/rewarding systems and their effects is necessary to refer to the particular theoretical benchmarks, both standard and behavioural models. The standard microeconomic model predicts that no rational agent will punish the others whenever it costs him in monetary terms. Assuming representative agents (i.e. with perfect rationality and self-centred preference) the punishment will never be efficient if the marginal profit of free riding will be greater than the marginal cost of avoiding the punishment (see for example Fehr & Gachter, 2000.a; Sefton, Shupp & Walker, 2007). When the standard classical model is not the principal benchmark, how punishments affect individual choices is not uniquely defined. For example, punishment may act via inequity aversion (Fehr & Schmidt, 1999; Ahn, Ostrom, & Walker, 2003; Dannenberg, Riechmann, Sturm & Vogt, 2007), through negative reciprocity considerations (Sefton, Shupp & Walker, 2007; Ones & Putterman, 2007), or through conditional cooperation (Fischbacher, Gachter, & Fehr, 2001; Kurzban & Houser, 2001). All these latest approaches underline the importance of introducing models with heterogeneity of agents (e.g., Carpenter, 2002).

The heterogeneity assumption increases the level of adaptability to the real context, but simultaneously increases also the complexity of the problem to design a perfect and efficient

[2] The most important modifications regard the environment variables, such as the group size, the possibility of communication, mutual monitoring upon the contributions, relevant information exchange, symmetry of initial endowments and the perception that the personal contribution is critically effective on the aggregate level of provision, as well as the anonymity and unanimity conditions.

audit/sanctioning system. A possible compromise may be to search for alternative instruments that may indirectly lead to a personal conformity, without excluding the heterogeneity hypothesis. To this purpose, a more recent tendency in public good games is to deem norms, social norms and norms enforcement to play an important role in contributory dynamics. This is possible whenever economics analysis is enriched with a socio-psychological perspective. At least three common considerations about conformity and social norms arise between socio-psychological approach and economics. First both of them deem fairness, altruism and reciprocity to be important social norms. Secondly both disciplines commonly define the norm enforcement to be the set of possible devices by which norms are held in place. Finally both of them consider social norms as tools which yield coordination in social contexts (e.g., Opp, 2002; Ostrom, 1990).

Scholars have being recently studied the role of norm enforcements, in order to better understand why, and to what extent, people adopt, accept or comply with a norm. The causal relationship between norms and behaviour is very complex, because it involves simultaneously different components, such as beliefs, expectations, individual characteristics (for example, individual preferences for conformity), and environmental settings (such as group size, possibility of communication, complexity of the information available, and so on).

In case of public good games, there are at least two complementary perspectives to investigate the contributory implications of the norms. The first one is individual-centred, that is to say it concerns how norms affect individual contributions in terms of expectations (e.g., Bicchieri, 2006) communication, (e.g., Carpenter, 2004; Young, 2006) norm enforcement and conformity (i.e. individual preferences, as in Camerer & Fehr, 2002; Perez, 2008). The second perspective is institutional-centred, that is to say it concerns the comparison of how different normative enactments affect individual/aggregated levels of contributions, in terms of institutional decisions (i.e. decentralized or centralized systems, as for instance in Falkinger, 2004) and collective decisional mechanisms, making comparisons between endogenously-exogenously imposed institutional systems (e.g., Okada, 1993, 1997; Kosfeld & Rield, 2004; Kosfeld, Okada & Rield, 2006). Moreover, other studies about compliance in public good games consist in comparing different types of sanctioning norms (Decker, Stiehler & Strobel 2003), different way by which they are applied to the games (Tyran and Feld, 2006) and different kinds of obligations (Galbiati and Vertova, 2008).

Despite the presence of a large number of experimental studies about free riding and sanctioning/rewarding systems, to the best of our knowledge, there is no investigation on the question whether participation in norm enactment results in different contributory behaviour

than when the same norm is received. As a matter of the fact, from a purely theoretical perspective, there is no reason to expect that different levels of contribution are associated to the same sanctioning/rewarding rule. The efficiency of a norm should be independent of its enactment procedure, taking other conditions as fixed. Nevertheless, multidisciplinary and empirical considerations suggest that individuals may behave differently according to their direct involvement. For instance, Law scholars deem the importance of the Subsidiarity principle and the active role of citizens in the administration of the public assets (e.g., Bohman, 1999; Miller, 1992).

In the present study, our experimental question aims at testing whether participating in a constituent process affects contributions in public goods environments. Our experimental investigation will therefore answer the following question:

Does participating in a collective decision affect the levels of contributions provided, ceteris paribus?

The remaining parts of the paper provide the description of our experimental design and the results observed in its three replications (named Pilot Experiment, A Experiment and B Experiment respectively). Our results suggest the existence of a participation effect, here intended as behavioural consequence of an active involvement in a decision making process with public goods frame.

GAME DESCRIPTION AND HYPOTHESIS

Our experimental design summarizes previous contributions to classical public good games, but it is also strictly linked to the sanctioning dimension, in particular to the consideration of different ways to insert rules in the game. The principal novelty is represented by the sanctioning mechanism in itself, because it is endogenously determined by experimental agents. This not only allows one to study the effect of a sanctioning system, but also to observe what kind of sanctioning rule is collectively decided. Moreover, agents who participate in the creation process are directly involved in a public good game. This implies a double public good perspective: a first-order public good (resulting from the public good game), and a second-order public good game (resulting from the collective decision regard the sanctioning system).

In order to single out the role of Participation, two groups are compared. The first group (First Group, Gr1) participates in the decisional process, whereas the second one (Second Group, Gr2) does not. They both play two games: the Basic Game (BG) and the Basic Game with Rule (BG+R).

The Rule is the same for both groups, with only one main difference: the rule is created by the experimental group by a decisional process, called "Rule-Phase". In this sense, the First Group plays BG+R in which the rule has been self- created, and the Second Group plays BG+R with the same rule which, however, has been imposed.

Each possible final rule, determined in the Rule-Phase, may be intended as a "legal paradigm" in a Law perspective. As commonly accepted, different rules may have different effects, in terms of obligations, sanctions, rewards and so on. This is clearly linked to studies that focus on the role of different legal paradigms in disciplining the same problem (as in Decker, Stiehler, & Strobel, 2003). Our perspective, however, is very different: in fact, we are investigating whether the same norm has different effects on the same problem discipline, only according to the way by which the norm is determined. There is no theoretical support to such consideration. The same norm should have the same regulation effects, independently of its enactment or emanation. Our approach is hence more similar to the institutional mechanism comparisons, where different regulation systems may have different implications. Our experimental perspective may, with some precaution, mimic situations in which decentralized decisions are compared with centralized ones. For example, the experimental design may represent a test for the principle of Subsidiarity[3].

This experiment has been run under a pilot version, and under two other replications. We will define these three experiments as the class of "Standard Versions", used to differentiate these experiments from the "Software Version" in Bortolami (2008). The main difference between the Standard Versions and the Software Version is in the communication modality adopted during the "Rule-Phase". In the standard versions, experimental agents interact by face-to-face communication, whereas in the software version, they interact using a chat-line.

[3]The principle of Subsidiarity is one of the central principles in the European Union, and it is defined in Article 5 of the Treaty establishing the European Community. The principle of Subsidiarity is stated also in Article 4 (entitled "Scope of local self-government") of the European Charter of Local Self-Government-Council of Europe Convention (1985), and it specifies: "Public responsibilities shall generally be exercised, in preference, by those authorities who are closest to the citizen. Allocation of the responsibility to another authority should weigh up the extent and nature of the task and requirements of efficiency and economy".
For instance, the principle of Subsidiarity has two characterizations in the Italian Constitution: there is a vertical Subsidiarity (art. 117) and a horizontal Subsidiarity (art. 118). The vertical dimension recognizes a bottom-up perspective, in which the State may delegate some competence to local institutions (decentralization). The horizontal Subsidiarity concerns more directly the active role of citizens in collective activities, that is: "The State, regions, metropolitan cities, provinces and municipalities shall promote the autonomous initiatives of citizens, both as individuals and as members of associations, relating to activities of general interest, on the basis of the principle of Subsidiarity" (art. 118).

METHOD

Participants

The global game is proposed to two groups, the experimental one and the control one. Each consists of 14 members, chosen randomly (by voluntary subscription to the game) among students at the University of Trento (Italy).

Before the game starts, each member is given a personal identity number (ID), in order to maintain the anonymity condition during the entire game. Before making the first choice, all the instructions[4] are read aloud by the experimenter and any doubts are clarified.

Procedure

The sequence of the game is the following (see details in the next sections):

1. Both groups play five rounds of the "Basic Game". The BG belongs to the family of linear public good games with voluntary contribution mechanism, without infra-group communication.

   At the beginning of each round, people have to decide their personal choice of investment and key it in. After this, the computer collects all the choices and communicates the total amount of the public good provided.

2. The experimental group proceeds with the "Rule-Phase", in which the sanctioning/rewarding rule is determined.

   The final rule is the output of five different phases in succession. Each phase is presented separately, and people do not know the specific content of each phase in detail, but they commonly know the total number of the phases and what each phase will regulate. At the beginning of the "Rule-Phase" they are informed that they have to decide about:

   1. When the control will take place;
   2. How many people will be controlled;
   3. The type of punishment;
   4. The possibility to reward;
   5. The type of reward.

   Each phase consists in a discussion stage about a set of alternatives, followed by a voting referendum (with majority criterion). After reading the list of available alternatives, people discuss about the effect of the single options, and then they vote anonymously for their preferred one. The option that obtains the majority is called the "finalist". The final rule is hence the result collection of the five finalist options, each resulting from one of the five distinct phases.

[4] See the Appendix for details

3. Finally, the experimental group and the control group play the five rounds of the BG again, but now knowing that the rule (BG+R) is in force. Since the norm is created by the first group, we will define the rule as *endogenously enacted* or *self determined* in the BG+R of the first group (constituent group), while the same norm will be defined as *exogenously enacted* or *imposed* when it will be applied in the BG+R of the second group (recipient group).

The actual final payoff is determined according to the individual personal performances. It is common knowledge (i.e. it is clearly stated in the instructions) that the payment will be provided at the end of the whole game (i.e. after the BG+R), by random extraction of one round for each game. This method is adopted in order to exclude any uncontrolled interference among games, and to allow the games to be considered as multiple one-shot games when they are separately analysed.

The "Basic Game" (BG)

The Basic Game is a classical linear Public Good Game with Voluntary Contribution Mechanism (linear PGG with VCM), repeated for five rounds. The aim of the Basic Game structure is to create a strong scenario in which free riding behaviour is expected to take place. The specific parameters used are justified both in light of strong theoretical predictions, and of behavioural extensions resulting from the most recent public good games literature.

The payoff structure of the BG is of a classical formulation, as the following:

$$\pi_i(q_i) = \alpha(E - q_i) + \beta \sum_{j=1}^{n} q_j \qquad [1]$$

Where the individual amount spent on the public good is q_i, and the total amount of public good provided, Q, which coincides with the sum of all individual contributions to the public fund, that is $Q = \sum_{j=1}^{n} q_j$. Moreover, the residual part $(E - q_i)$ of the initial endowment is directly invested in the private fund.

The parameters α and β define the return from the private investment and the return of the public investment, respectively. The theoretical condition which predicts null contributions is obtained by the relationship between the ratio of the investment rates, i.e. by considering the marginal per capita return (MPCR) and the group size, n. Recalling that $MPCR = \frac{\beta}{\alpha}$, that condition becomes (see, for example, Sefton and Steinberg, 1996):

$$MPCR < 1 < n \cdot MPCR \qquad [2]$$

In our experiment the payoff function is:

$$\pi_i = 10 - q_i + 0.08 \sum_{j=1}^{14} q_j \qquad [3]$$

Where $E = 10$ Euro; $\alpha = 1$; $\beta = 0.08$.

Independently of the choice of the other members, the dominant Nash equilibrium with $q = 0$ Euro is theoretically predicted. Nevertheless, the experimental results of positive contributions coming from experimental literature have suggested that completely strong free riding (i.e. $q = 0$) should not be expected, but rather that, given this combination of elements, it is more proper to expect levels of weak free riding (i.e. $0 \leq q_i \leq 4$).

The Rule-Phase

The Rule-Phase consists in the determination of a control rule by the experimental group by means of a specific and new procedure. The aim of this phase is to choose a control norm in an endogenous way, i.e. experimental agents are directly involved in deciding the type of norm they will self- enact.

We consider free riding behaviour as the individual contributions to the public fund belonging to the range $0 \leq q_i \leq 4$. This close interval is chosen according to the observed empirical results in literature, which show investments in the public good of 40%-60% of initial endowments, but here we restrict the range also according to our payoff function implications predicted in the Basic Game.

The norm is generated by combining elements of a set of alternatives already formulated in the experimental design. Therefore, it is more proper to state that the group chooses, rather than completely generating, a control norm. Presenting a set of already-made alternatives is only aimed at allowing choices to be feasible, i.e. the final combination of the elements can effectively be played. In simpler words, the decision to present a list of possible elements does not aim at reducing the number of feasible rules, but it is structured so as to maintain the experimental design under control.

The final norm is the sum of five different elements determined in succession, each established separately in a single different phase (so that there are five phases in all)[5]. Experimental agents decide what option they prefer, among a set of alternatives (options) for each phase. The choice is collectively determined with a specific procedure consisting of a discussion stage and of a voting stage.

[5] The total number of rule combinations is simply determined. Any norm is the result of 5 components. The first and second components have 5 options, the third one has 3 options and the last one has 5 options. This means 5x5x3x5=375 combinations.

Experimental agents decide:

1. When the control takes place (1st. phase; 1st. component);
2. The number of subjects to be investigated (2nd. phase; 2nd. component);
3. The possibility to give rewards to people who contribute more than 4 Euro (3rd. phase; 3rd. component);
4. The type of reward (4th. phase; 4th. component);
5. The type of sanction (5th. phase; 5th. component).

The discussion stage allows agents to exchange opinions about the efficacy of each option, to make comments about the role of the component, and so on, but they are not allowed to communicate strategic future decisions (i.e. they cannot state anything about their future contribution in the Basic Game with Rule). Within this frame, communication may be considered as cheap talk and causes no binding agreement, above all because future contributions and voting decisions will still be anonymous (and, hence, they might be completely different from those established in the discussion stage).

After the time allocated for the discussion (ex ante determined in the experimental design) is over, people proceed with the voting phase. They have to anonymously choose their preferred option. The option that obtains the majority of preferences is defined as the winner, and people proceed to the next phase. In our Rule-Phase, voting is essentially included as an instrument of collective decision, i.e. as a social instrument to aggregate individual preferences into a collective one. The majority rule is inserted on the basis of a trade-off between the effective achievement of the goal (that is, to obtain a social decision), and the robustness of such choice. We are perfectly aware that the unanimity rule will better represent individual choices but, considering our group size and the complex step by step procedure, the majority rule will be the best balance between the benefits of the unanimity rule, and its highest procedural costs (these considerations parallel those classically supported by Buchanan & Tullock[6], 1962).

In our design, the voting procedure is also adopted in order to take into account some individual signalling considerations raised in recent experimental studies (see, for example, Tyran & Feld, 2006), or as a form of prior commitment, stronger than the simple discussion phase. Anyway, these implications will be taken into account in our discussion of the experimental results, rather than being a structured environmental decision. This is so

[6] See Mittone and Bortolami (2007) for a discussion about Buchanan and Tullock's model as possible interpretation of the present experimental design.

because our main focus will be on the comparison between the two groups (experimental and control ones), rather than on an in-group analysis.

Each component of the rule presents several options, some of which (i.e. those concerning the sanctioning structure) are associated with different costs of implementation. The cost of implementation is inserted to mimic real contexts, in which several regulatory systems are provided by individual payments. In our frame, the regulatory system is the mechanism of punishment and rewarding. The mechanism is supplied by collective provision, i.e. it is financed by individual and coactive withdrawals.

The costs are generally separated into collective and private costs. Collective costs are associated with the mere application of the norm, and they concern only the first two components (i.e. the moment in which the control will take place, and the number of persons audited). These costs are non rival and non excludible, and their calculation affects the level of total public good collectively provided. Private costs concern the individual consequence of the norm application, i.e. they are associated with individual sanctions and individual rewards. The calculation of these costs affects uniquely the individual payoffs, and so they are private goods (i.e. rival and excludible).

The costs are structured by considering a common trade-off: the more audits take place (both in terms of controlled people and of number of rounds audited), the higher will be the costs sustained. This is so because a higher number of controls has the advantage of strongly deterring free riding behaviour, but it has the disadvantage of having higher costs. This cost implementation seeks to parallel real contexts in which there are no economies of scale in the control technologies, so that frequent controls on large samples are logistically more expensive.

The choice of specific costs, i.e. the concrete amount associated to each option, has two main justifications. The first one is that explained above, i.e. to maintain the parallel between higher costs and higher potential efficacy in containing free riding incentives. The second motivation regards the feasibility of the combination of options. As stated above, we do not restrict the type of possible norm enforced, in the sense that we allow the possibility to differentiate the severity of the punishments from the power of the norm on the whole, but we have to keep the environment controlled. In this perspective, the specific cost percentages are experimentally chosen among a restricted range of alternatives. Within the same phase, they are proportional to each other, in order to realize the above-mentioned parallel between costs and potential efficiency. From one phase to the other, the composition of costs must keep the feasibility of the game.

In an individual perspective, the aforementioned trade-off between high costs and high efficiency parallels a social-individual dilemma. In fact, higher costs are associated with greater power in achieving the group goal (i.e. to enact a strong rule), but they have to be individually paid. In other words, by analyzing the final rule we can observe the extent to which people are prone to sacrificing personal payoffs in order to achieve the goal of repressing opportunism and, consequently, to obtaining the social maximum payoff. This perspective seems to be similar to Yamagishi's model of Sanctioning System (1986), built on structural goal and mutual cooperation.

In order to achieve feasibility, we have calculated three extreme cases in which the final rule may be placed, which are: highest efficiency, medium efficiency and lowest efficiency. All other feasible combinations belong to intermediate characterizations of the closed set delimited by the extreme positions. In other words, there will no other highest or lowest composition. However, it is important to state that all possible combinations never change the dominance of Nash equilibrium, that is, the severity of the norm will never be such to make the contribution be the dominant strategy. Adopting Tyran's and Feld terminology (2006), all of our rules are defined as "mild" laws and never "severe" ones.

When the rule is finally established, the general payoff function in the BG+R becomes:

a) In case the player is audited (with probability $p = \frac{r}{5}\frac{n}{14}$) his payoff becomes:

$$\pi_i = 10 - q_i + 0.08\sum_{j=1}^{14} q_j - \frac{1}{14}C(Q) + R(Q) \qquad \text{if } 5 \le q_i \le 10 \qquad [4]$$

$$\pi_i = 10 - q_i + 0.08\sum_{j=1}^{14} q_j - \frac{1}{14}C(Q) - P(Q, q_i) \qquad \text{if } 0 \le q_i \le 4 \qquad [5]$$

b) In case the single player is not audited (with probability $p = 1 - \frac{r}{5}\frac{p}{14}$) his payoff becomes:

$$\pi_i = 10 - q_i + 0.08\sum_{j=1}^{14} q_j - \frac{1}{14}C(Q) \qquad [6]$$

Where:
r is the number of round controlled; *n* is the number of subjects controlled; *C* is the sum of all collective costs associated with the specific rule; *R* is the Reward; *P* is the Punishment.
This general payoff function changes according to the options chosen by the subjects in the rule phase. Table 1 specifies what are the values associated with every option and the associated costs (see the Instructions in Appendix for details).

Phase	Options and Associated Costs (c)				
	A	B	C	D	E
1	r = 1 (fixed at the beginning), c = 0.05Q	r=1 (random), c = 0.03Q	r = 2, c= 0.06 Q	r = 3, c= 0.09Q	r = 5, c=0. Q
2	n= 1, c= 0.001Q	n= 2, c= 0.002Q	n= 3, c= 0.003Q	n= 4, c= 0.004Q	n= 5, c= 0.005Q
3	Yes	No			
4	R= 0.02Q (windfall)	R= 0.02Q (endogenous)			
5	P=0.02 Q	$P=0.1\pi_i$	P= α Q α =0.05Q, If q_i =0 α =0.04Q, If q_i =1 α =0.03Q, If q_i =2 α =0.02Q, If q_i =3 α =0.01Q, If q_i =4	P= β π_i β=0.10, If q_i =0 β=0.08, If q_i =1 β=0.06, If q_i =2 β=0.04, If q_i =3 β=0.02, If q_i =4	$P=\pi_i$

Table 1*. The parameters associated with the Rule's options.*

For the sake of exposition suppose the subjects determine a rule combination with {1C; 2A; 3A; 4A and 5E}. The associated values will be (r=2; n=1; R=0.02Q; P= π_i). The specific payoff function would become:

a) In case the player is audited (with probability $p = \frac{2}{5}\frac{1}{14}$) his payoff becomes:

$$\pi_i = 10 - q_i + 0.08\sum_{j=1}^{14} q_j - \frac{1}{14}0.0601Q + 0.02Q \qquad \text{if } 5 \le q_i \le 10 \qquad [4a]$$

$$\pi_i = 10 - q_i + 0.08\sum_{j=1}^{14} q_j - \frac{1}{14}0.0601Q - \pi_i \qquad \text{if } 0 \le q_i \le 4 \qquad [5a]$$

b) In case the single player is not audited (with probability $p = 1 - \frac{2}{5}\frac{1}{14}$) his payoff becomes:

$$\pi_i = 10 - q_i + 0.08\sum_{j=1}^{14} q_j - \frac{1}{14}0.0601Q \qquad [6a]$$

RESULTS

In order to test the Participation extent, we compare the results obtained in the BG+R by the two groups (between-groups analysis) through different indexes of efficiency:

- The total level of public good provided;
- The individual average contributions;
- The group allocations distinguished into different contributory classes[7];

[7] Specifically, we differentiate strong free riding contributions (i.e. $q = 0$); week free riders contributions (i.e. $1 \le q \le 4$); half endowment contributors (i.e. $q = 5$) and cooperative contributors (i.e. $6 \le q \le 10$).

- The number of free riders

The groups are compared in a Group History perspective (i.e. considering the BG+R results in the complete game) and in a round-wise comparison. In particular, special attention is paid to the first round comparison in the BG+R, since we may suspect that in such round a "pure participating effect" will be take place. With the elimination of potential History game effects, we concentrate therefore on the pure enactment effect.

We measure the relative normative efficacy trough a within-group comparison before-after the normative enactment. To this purpose, we compare the variation of the public good provided, balanced on the maximum amount achievable at the end of the game history[8]. In individual perspective, we confront the individual average level of contributions without-with norm.

We provide the BG's between-groups comparison only to assure that both groups start to play the BG+R under the same conditions. In other words, we verify that there are not significant differences in the baseline stage.

Pilot Experiment

The Comparison of the Basic Games

The week free riding behaviour is the main prediction in the BG, since we structured our environment to refer to previous experimental evidence in the literature. To this purpose, we expect the average contributions will belong to the range 0-40% of both initial endowments (in an individual perspective), and aggregate level of public good provided (in a collective dimension).

The first five rounds in Figure 1 show the total level of public good yielded (Q) in both groups (henceforth Gr1P will be the constituent group, and Gr2P will be the recipient group in the Pilot Experiment).

Comparing the aggregate levels of contribution between-groups, both in the round-wise and in the general game perspective, Gr1P and Gr2P display similar contributory behaviours. In particular, over the entire history of the game, Gr1P achieves 32% of the maximum level of public good available and Gr2P obtains 29%. No round-wise between-groups comparison underlines any significant difference between aggregate levels of public good provided (see Table 2). In the game history perspective, the total public good provided is not significantly different between-groups (M-W test, $p = 0.465$).

[8]Provided that there are 14 members, 5 rounds and the full contribution is 10 euro for each members, the maximum level obtainable is equal to 700 euro. This ratio will be used as measure to compare the participation effect between-groups. Moreover, following the example in Tyran and Feld (2006) the ratio will be used as measure of norm efficiency between-experiments.

Between-groups (Mann-Whitney Test)	R1-R1	R2-R2	R3-R3	R4-R4	R5-R5
Gr1P-Gr2P	*p= 0.598*	*p= 0.148*	*p= 0.565*	*p= 0.747*	*p= 0.550*

Table 2. *Between-groups analysis. Round-wise comparisons (level of Q) in BG.P*

The BG individual average contributions are not significantly different between-groups (M-W test, $p = 0.597$). Specifically, individual contributory averages ($\overline{q}$) belong to the week free riding range ($\overline{q}_{Gr1P} = 3.2$ Euro and $\overline{q}_{Gr2P} = 2.9$ Euro).

The voted rule (P-Rule)

The final rule is the combination of the options {1B; 2D; 3A; 4A; 4E} with associated values (r=1; n=5; R= 0.02Q; P=π_i). It means that the final rule establishes to control only one round, randomly extracted by the experimenter at the end of the BG+R. The number of audited people is 5/14 subjects. If the extracted player is a contributor, she/will receive an extra payment coinciding with 2% of the collective fund. To the contrary, if the selected player is a weak free rider, she/he will lose the entire payoff. The total cost of this rule enactment is 3.5% of the total public good provided.

This rule is considered a medium-severe norm among the available set of normative formulation. Notwithstanding, this norm is the most severe in terms of punishment, since it causes people to lose their entire payoff. The effect of the reward may be neutral, since it depends on the level of public good provided. Finally, the costs associated to this rule composition make the Q columns to shift at maximum of one column to the left in the payoff table.

Given these observations, the final payoff is differentiated among eventual contributors and eventual free riders:

a) In case the player is audited (with probability $p = \frac{1}{5}\frac{5}{14}$) his payoff becomes:

$$\pi_i = 10 - q_i + 0.08\sum_{j=1}^{14} q_j - \frac{1}{14}0.035Q + 0.02Q \qquad \text{if } 5 \le q_i \le 10 \qquad [7]$$

$$\pi_i = 0 \qquad \text{if } 0 \le q_i \le 4 \qquad [8]$$

b) In case the single player is not audited (with probability $p = 1 - \frac{1}{5}\frac{5}{14}$) his payoff becomes:

$$\pi_i = 10 - q_i + 0.08\sum_{j=1}^{14} q_j - \frac{1}{14}0.035Q, \qquad [9]$$

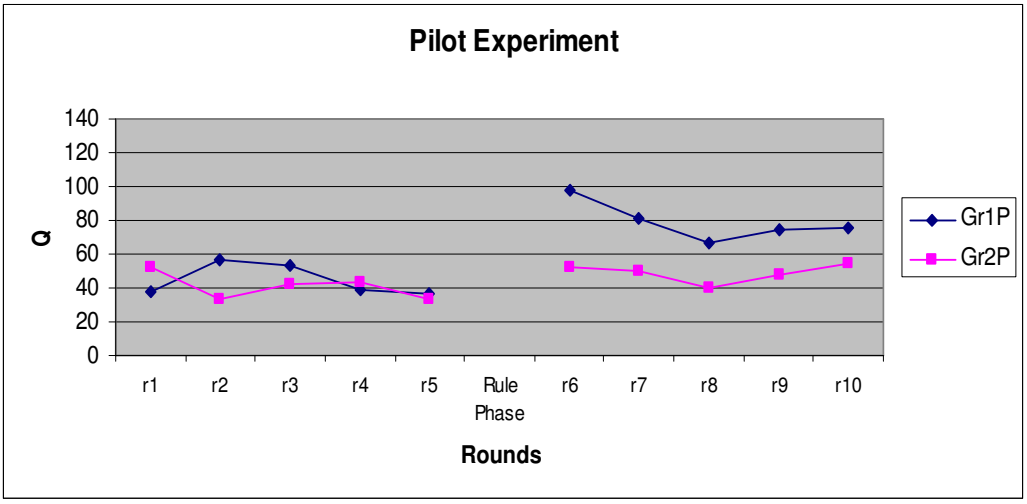

Fig. 1 *The level of total public good provided (Q) in the Pilot Experiment*

The results of the BG+R in the Pilot Experiment

After Gr1P has defined the normative formulation, both groups replay the same version of the BG. Players are perfectly aware that the rule is effectively in force in BG+R with retroactive effects. In other words, they commonly know that the control will be realized at the end of BG+R.

The rule is exogenously enforced in the BG+R game, since we execute for sure its sanctioning implications at the end of the game. Inasmuch as the only difference between-groups is in the presence of direct participation to the collective decision, possible between-groups diversity will be traced back to the positive extent of participation.

A. The total level of public good provided and individual contributory averages

The second five rounds in Figure 1 illustrate the total level of public good provided after the insertion of the norm. In a between-groups game history perspective, Gr1P always displays greater total amounts invested in the collective fund. At the end of BG+R, Gr1P achieves 57% of maximum public good obtainable, whereas Gr2P provides 35%. This aggregate provision is significantly different between groups (Mann Whitney test, $p = 0.009$).

Table 3 provides the round-wise between- groups comparison about collective levels supplied. We observe that the first three rounds are significantly different between-groups, but the fourth and the last ones reduce the contributory gap. Nevertheless, it is important to note that the first round is highly significant and it presents the maximum contributory difference. This result has a relevant role, since we suppose that in the first round the pure participation effect is isolated, that is, contributory behaviors are less influenced by further game dynamics.

Between-groups (Mann-Whitney Test)	R1-R1	R2-R2	R3-R3	R4-R4	R5-R5
Gr1P-Gr2P	*p= 0.008*	*p= 0.034*	*p= 0.043*	*p= 0.107*	*p= 0.056*

Table 3. *Between-groups analysis. Round-wise comparisons (level of Q) in BG+R.P*

The aforementioned observations are summarized in our first result:

Result 1.P *After the rule enactment, the constituent group contributes, on average, significantly more than the recipient group. In the round-wise between-groups comparison, the first round presents the larger contributory gap.*

The individual contributory averages with the norm enactment are respectively $\overline{q}_{Gr1P} = 5.7$ Euro and $\overline{q}_{Gr2P} = 3.5$ Euro. Mann-Whitney tests confirms that members in Gr1P contribute significantly more than those in Gr2B (M-W test, $p = 0.001$).

Compared with the BG case, the introduction of the norm has positive effects on the individual contributions for both groups. The Gr1P individual average contribution is nearly double in the BG+R; the level observed in the BG+R is 1,07 times greater than the one obtained in the BG. Such increment is highly significant (Wilcoxon test, $p = 0.003$). Gr2P individual average contribution slightly improves, but the difference is not statistically different (Wilcoxon test, $p = 0.396$).

B. Contributory allocations and number of free riders

Figure 2 shows how individual contributions are distributed throughout the total history of the game. A first clear observation regards the common modal value between the groups, that is $q = 5$ (52,8% of cases in Gr1P and 66% of cases in Gr2P). Nevertheless, Gr1P contributions are mainly distributed to the right of the modal value, that is, in the class of cooperative contribution (37% of the cases against the 3% in the Gr2P). To the contrary, Gr2P contributions are allocated on the left of the modal value, that is, in the class of free riding contribution (31% of the case in Gr2P and 10% of cases in Gr1P). Mann Whitney test verifies that both the free riding and the cooperative classes are significantly different between-groups ($p = 0.02$ in both cases).

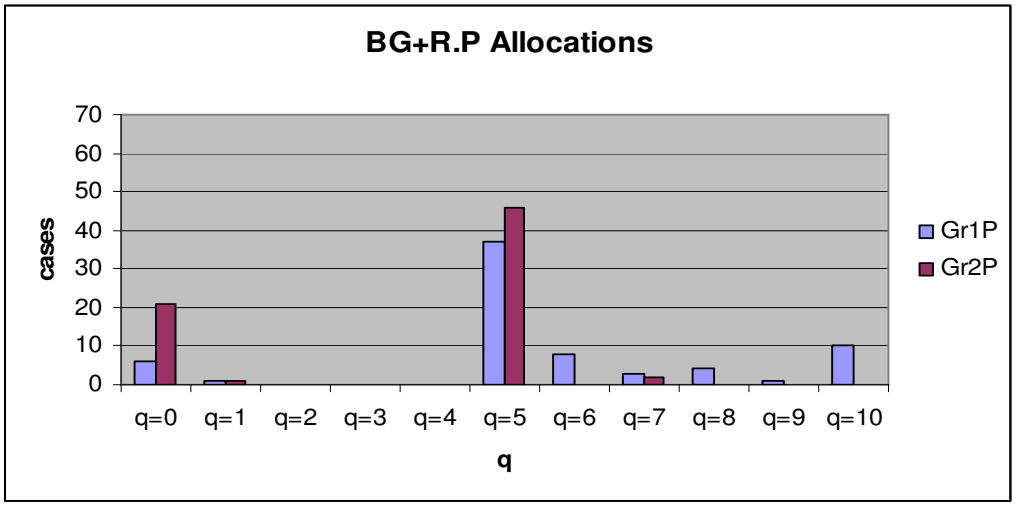

Fig. 2. *Frequencies for type of allocation (q) in the BG+R.P*

Result 2.P *Regardless of the way by which the norm is enacted, the modal value is q=5 for both groups. Nevertheless, with endogenous enactment the numbers of cooperative allocations is significantly greater than in the case of norm imposition. Furthermore, the number of free riding allocations is significantly smaller in the case of self-creation than in the case of norm imposition.*

Experiment A

This experiment is the first replication of the Pilot version. The principal aim of Experiment A is to verify whether the behavioural gap previously emerged is still observed, even in case of enacting a different final rule. As stated in the presentation of the experimental design, our environment does not allow to anticipate what the final norm will be. The high number of possible combinations do not exclude that the constituent group should determine a very mild or inefficient norm. We anticipate that experiment A is one of such possible instance.

The Comparison of the Basic Games

The BG results of this experiment confirm that our environment supports once more the display of weak free riding behaviour. The first five rounds in Figure 3 shows the level of public good provided (Q) throughout the entire game history. It immediately emerges that both groups start with a very similar level of contribution, coinciding with 40% of the maximum public good achievable, ending with the 23% of the such maximum.

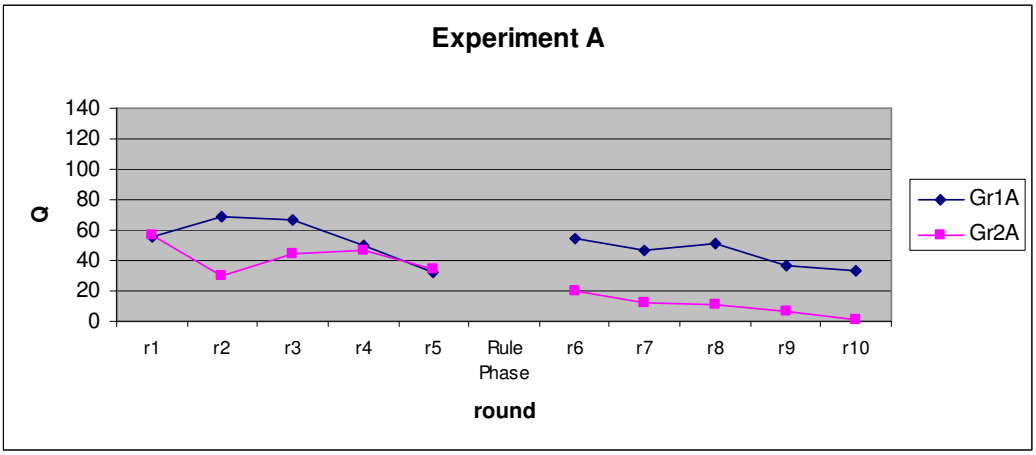

Fig. 3. *The level of total public good provided (Q) in the Experiment A*

In the between-group comparisons, the total level of public good provided throughout the entire game history is not significantly different (M-W test, $p = 0.174$). Table 4 highlights that only the second round is statistically different between groups. Moreover, individual average contributions are not statistically different between-groups (M-W test, $p = 0.169$).

Between-groups (Mann-Whitney Test)	**R1-R1**	**R2-R2**	**R3-R3**	**R4-R4**	**R5-R5**
Gr1A-Gr2A	*p= 0.693*	*p= 0.031*	*p= 0.314*	*p= 0.676*	*p= 0.592*

Table 4. *Between-groups analysis. Round-wise comparisons (level of Q) in BG.A*

The voted rule (A-Rule)

The rule in Experiment A is the combination of options {1A; 2D; 3A; 4A; 5D} with associated values (r=1; n=5; R= 0.02Q; P=$\beta\pi_i$). The final rule hence establishes the random selection of one round, in which five members are audited. In the case the selected member is a contributor, she/he will receive a reward equal to the 2% of the collective fund. Who is detected to be a free rider will pay a proportional sanction, calculated as percentage of his own payoff. The total cost of this rule enactment is 3.5% of the total public good provided. This implies that the Q columns in the payoff table may shift at maximum of one column to the left.

This norm is classifiable as a very weakly efficient norm, provided the relative low probability to be detected and the low applicable punishment.

The final payoff is hence differentiated among eventual contributors and eventual free riders.

a) In the case the player is audited (with probability $p = \frac{1}{5}\frac{5}{14}$) the payoff becomes:

$$\pi_i = 10 - q_i + 0.08\sum_{j=1}^{14} q_j - \frac{1}{14}0.035Q + 0.02Q \qquad \text{if} \qquad 5 \le q_i \le 10 \qquad [10]$$

$$\pi_i = 10 - q_i + 0.08\sum_{j=1}^{14} q_j - \frac{1}{14}0.035Q - \beta\pi_i(q_i) \qquad \text{if} \qquad 0 \le q_i \le 4 \qquad [11]$$

With

$\beta = 0.10$ *if* $q_i = 0$
$\beta = 0.08$ *if* $q_i = 1$
$\beta = 0.06$ *if* $q_i = 2$
$\beta = 0.04$ *if* $q_i = 3$
$\beta = 0.02$ *if* $q_i = 4$

b) In case the single player is not audited (with probability $p = 1 - \frac{1}{5}\frac{5}{14}$) his payoff becomes:

$$\pi_i = 10 - q_i + 0.08\sum_{j=1}^{14} q_j - \frac{1}{14}0.035Q, \qquad [12]$$

The results of the Basic Game with Rule

A. The total level of public good provided and individual contributory averages

After the insertion of this weak norm, both groups decrease their initial contribution when compared to the BG. In particular, Gr1A passes from the 39% of maximum level achievable in the game history of BG to the 32% in this game with rule. Gr2A decreases its investment in the public good from 30% of the maximum achievable in BG to only 7% in BG+R. Consequently, also the individual group average decreases, becoming $\bar{q}_{Gr1A} = 3$ Euro and $\bar{q}_{Gr2A} = 0.7$ Euro.

The second five rounds in Figure 3 show the total level of public good provided. Gr1A starts with 39% of maximum Q, which is the same level of public good provided in the first BG's round. Gr1A concludes yielding 23% of collective contributions in the last round. On the other hand, Gr2A displays a continuous reduction of public good provided, beginning with 14% of maximum achievable and ending with quasi null contributions (the last round only one Euro is invested in Q). More importantly, Gr1A allocations always dominate Gr2A contributions to the public good. Table 5 confirms the any round-wise comparison is significantly different between-groups.

Between-groups (Mann-Whitney Test)	**R1-R1**	**R2-R2**	**R3-R3**	**R4-R4**	**R5-R5**
Gr1A-Gr2A	*p=0.008*	*p=0.012*	*p=0.004*	*p=0.010*	*p=0.008*

Table 5. *Between-groups analysis. Round-wise comparisons (level of Q) in BG+R.A*

Mann-Whitney test confirms that between-groups difference is significant, both in the general game history ($p = 0.009$) than in an individual average perspective ($p = 0.002$).

Looking at the within-group consideration without and with the norm, the two groups present an interesting difference. Gr1A, in fact, does not significantly reduce the individual average contributions to the public good (Wilcoxon test, $p = 0.529$) comparing BG and BG+R. On the contrary, Gr2A significantly decreases the individual average investment from BG to BG+R ($p = 0.004$).

These results are summarized as follows:

Result 1.A *The weak norm enactment does not improve the level of public good provided in both groups, and it tends to decrease the aggregate contributions. Anyhow, the effect of the norm is different between-groups. The constituent group does not significantly decrease the individual average contributions, whereas Gr2A does significantly reduce them.*

Despite of the inefficient level of public good provided, the constituent group contributes significantly more than the recipient group, both in aggregate and in individual level.

B. Contributory allocations and number of free riders

Figure 4 shows the contributory frequencies throughout the entire BG+R history. The first relevant observation is the different modal value between-groups. Gr1A presents the half endowment as the most frequent allocation (about 42% of cases), whereas Gr2A's modal value is the full free riding contribution (about 71% of cases). Furthermore, only Gr1A exhibits full contributions (7% of cases).

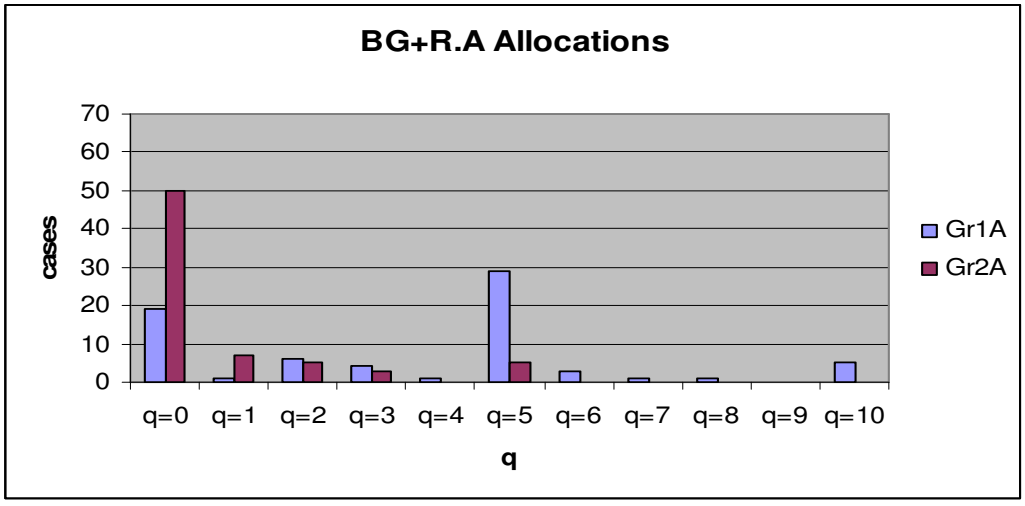

Fig. 4. *Frequencies for type of allocation (q) in BG+R.A*

A clear disparity between-groups emerges comparing both the class of free riding contributions and the class of cooperative contributions. In particular, the former class reaches 44% of cases in the Gr1A and 93% of cases in Gr2A, whereas the latter achieves only 14% in Gr1A but is completely absent in Gr2A. Nevertheless, Mann Whitney test confirms that between-groups difference is significant only for strong free riding class ($p = 0.016$) and for the class of half contributory class ($p = 0.008$), whereas the remaining two classes does not present any significant difference.

In a within-group perspective, the weak norm enactment has different effects on the contributory frequencies when compared with the allocations in BG. Although the norm is completely inefficient to increase the level of public good, Gr1A maintains the similar cooperative contributions achieved in BG. To the contrary, Gr2 completely nullifies any cooperative contribution, by doubling the number of weak free riders.

Result 2A *Endogenous enactment drives contributions to the minimum allocation which avoids punishment, without removing the incentive to free ride. To the contrary, the exogenous enactment not only is inefficient to eliminate free riding, but it leads to nullify any positive cooperative contribution to the public fund.*

Result 3A *The number of total free riders remains a frequent contributory allocation, independently of the different norm enactment. Nevertheless, the number of free riders is significantly smaller in case of endogenous enactment than in case of rule imposition.*

Experiment B

The Comparison of the Basic Games

The first five rounds in Figure 5 show the aggregate level of public good Q. Both groups start and end the game with similar amounts of public good, about 40% of the maximum achievable. Nevertheless, since Gr1B and Gr2B follow different round evolution, the average level of total public good provided is slightly different between groups. Specifically, the former group reaches 32% of the maximum Q achievable, whereas Gr2B provides 39%. Consequently, the final individual average contributions are respectively $\bar{q}_{Gr1B} = 3.2$ Euro and $\bar{q}_{Gr2B} = 3.9$ Euro. These observations confirm our BG to support weak free riding behaviours.

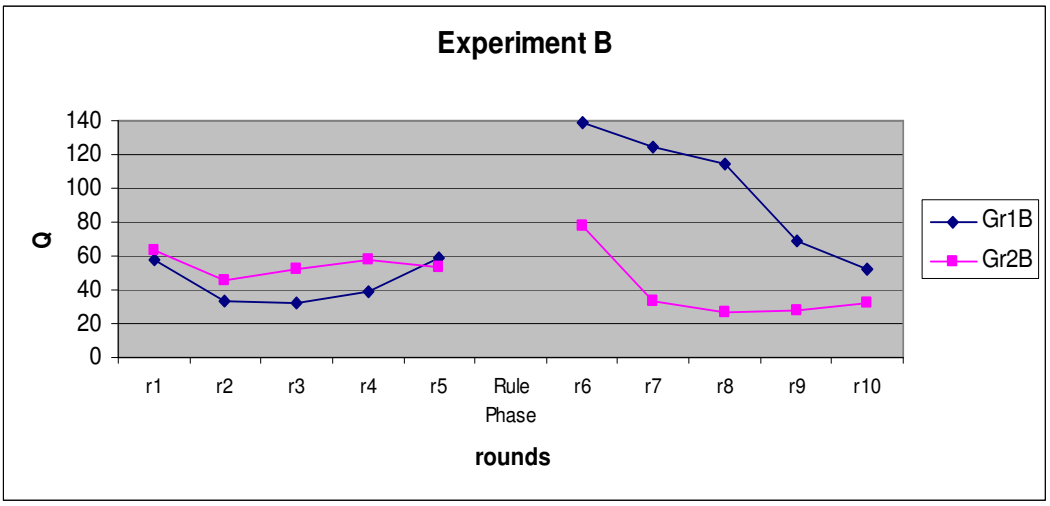

Fig. 5. *The level of total public good provided (Q) in the Experiment B*

Mann Whitney test reveals that the contributory gaps indicated by Figure 9 are not statistically different (see Table 6). Moreover, not even the individual contributory averages are significantly different between Gr1B and Gr2B (M-W test, $p = 0.408$).

Between-groups (Mann-Whitney Test)	**R1-R1**	**R2-R2**	**R3-R3**	**R4-R4**	**R5-R5**
Gr1B-Gr2B	*p= 0.817*	*p= 0.439*	*p= 0.229*	*p= 0.152*	*p= 0.1*

Table 6. *Between-groups analysis. Round-wise comparisons (level of Q) in BG.B*

The total number of strong free riders in Gr1B is greater than in Gr2B (40% and 23% respectively), but the relation is reversed about the number of full contributors (21% in Gr1B and 31% in Gr2B). Nevertheless, this difference within the strong free riding class is balanced by the presence of more week free riders in Gr2B.

The voted rule (B-Rule)

The final rule in Experiment B is the combination of options {1A;2D;3A;4A;5D} with associated values (r=1; n= 5; R=0.02Q; P=π_i). The final rule establishes that at the end of the third round 5 persons are controlled. In case the audited player is a contributor with more than 4 euro, she/he will receive a reward equal to 2% of the public fund provided. To the contrary, if the audited member is a free rider, the punishment coincides with the loss of her/his entire payoff. The enactment cost is 5.5% of the total public good provided.

It is important to underline that from the discussion of the first phase emerged the awareness that the controlled round might not coincide with the third one. Consequently, the

payment might be not calculated on the third round but, as usual, the effective payoff will be determined by the random extraction of one round at the end of the game. Players assert to be completely aware about such determinant implication.

This type of voted rule may be classified as medium-severe law, since it states the possibility to lose the entire payoff in case of control. This high severity is associated to a relative high probability to be detected. The total cost of the norm enactment makes the Q columns in the payoff shift at most by one column to the left.

Given these observations, the final payoff may be differentiated among eventual contributors and eventual free riders:

a) In case the player is audited (with probability $p = \frac{1}{5}\frac{5}{14}$) his payoff becomes:

$$\pi_i = 10 - q_i + 0.08\sum_{j=1}^{14} q_j - \frac{1}{14}0.055Q + 0.02Q \qquad \text{if} \quad 5 \le q_i \le 10 \qquad [13]$$

$$\pi_i = 0 \qquad \text{if} \quad 0 \le q_i \le 4 \qquad [14]$$

b) In case the single player is not audited (with probability $p = 1 - \frac{1}{5}\frac{5}{14}$) his payoff becomes:

$$\pi_i = 10 - q_i + 0.08\sum_{j=1}^{14} q_j - \frac{1}{14}0.055Q\,, \qquad [15]$$

The results of the Basic Game with Rule

We test whether the participation gap is present in this experiment, paying particular attention to the (possible) behavioural consequences of having established a round for the control.

A. The total level of public good provided and individual contributory averages

The second five rounds of Figure 5 show the total level of public good provided (Q) at the presence of the B-rule. Two immediate observations arise. First of all, there is a great gap between groups since Gr1B always contributes more. Nevertheless, this difference tends to be reduced after the third round. In second instance, Gr2B decreases its contribution after the second round, making the level of total public good to be inferior than the case of BG.

Surprisingly, the initial level of public good provided in the constituent group nearly reaches the maximum obtainable, that is, people provide 99% of the total public good. To the contrary, Gr2B starts with 56% of the maximum achievable.

The strong decay is amplified in the first group, in which the last round presents 37% of the maximum public good obtainable. Nevertheless, the maximum variation is observed from the third to the fourth round (here there is a shrinkage of 39%). This important

changing in contributions implies that the game history level achieves 71% of the maximum total public good available.

The decay of Gr2B starts after the first round, with a decrement of 58% on the total public good. After that round, next contributions are stabilized without changing up to the end of the game, reaching 28% of final game history level. When compared to BG levels, Gr2B responds to norm enactment by further reducing about 25% of collective investments.

Table 7 shows the round-wise between-groups comparisons, highlighting the strong difference between constituent and recipient groups, at least up to the third round. Only the last round is not significantly different. Nevertheless, the total level of public good provided is significantly different between constituent and recipient groups (p= 0.028).

Between-groups (Mann-Whitney Test)	**R1-R1**	**R2-R2**	**R3-R3**	**R4-R4**	**R5-R5**
Gr1B-Gr2B	*p= 0.009*	*p= 0.000*	*p= 0.000*	*p= 0.022*	*p= 0.344*

Table 7. *Between-groups analysis. Round-wise comparisons (level of Q) in BG+R.B*

Despite the final decay in Gr1B, the individual contributory averages are extremely different between groups (M-W $p = 0.000$ 0); they achieve respectively $\bar{q}_{Gr1B} = 7.1$ Euro and $\bar{q}_{Gr2B} = 2.8$ Euro.

We may observe the effect of the norm enactment by comparing BG and BG+R contributions. The presence of the norm has significantly affected the aggregated level of public good provided in Gr1B only in the first three rounds (Wilcoxon test, $p = 0.001$, $p = 0.002$ and $p = 0.001$ respectively). To the contrary, the within group analysis made for Gr2B confirms that the exogenous enactment does not affect the level of public good provided, both in a game history perspective and in round-wise comparisons (Wilcoxon test, $p = 0.575$ for the first round; $p = 0.309$ for the second one; $p = 0.325$ for the third one; $p = 0.194$ for the fourth one and $p = 0.306$ for the last one).

Result 1.B *Endogenous enactment implies always a greater level of public good provided with respect to the case of rule imposition. Nevertheless, this difference diminishes after the third round. This is the round suggested by the constituent group to be the one in which the control had to take place.*

Result 2.B *Despite the decay observed in the constituent group, individual contributory averages are significantly greater in case of endogenous enactment than in the exogenous one.*

B. Contributory allocations and number of free riders

Figure 6 presents the contributory frequencies throughout the entire game history. Here, three picks are observed: the strong free riding contribution, the half endowment contribution and the full contribution. Other allocations seem to play no relevant role in both groups.

The modal values are deeply different between-groups; Gr1B yields 60% of full contribution cases (against 16% in Gr2B), while Gr2B attains 47% of strong free riding allocations (against 14% in Gr1B). Both groups present the second modal value in the half endowment allocation (23% of cases in Gr1B and 17% in Gr2B).

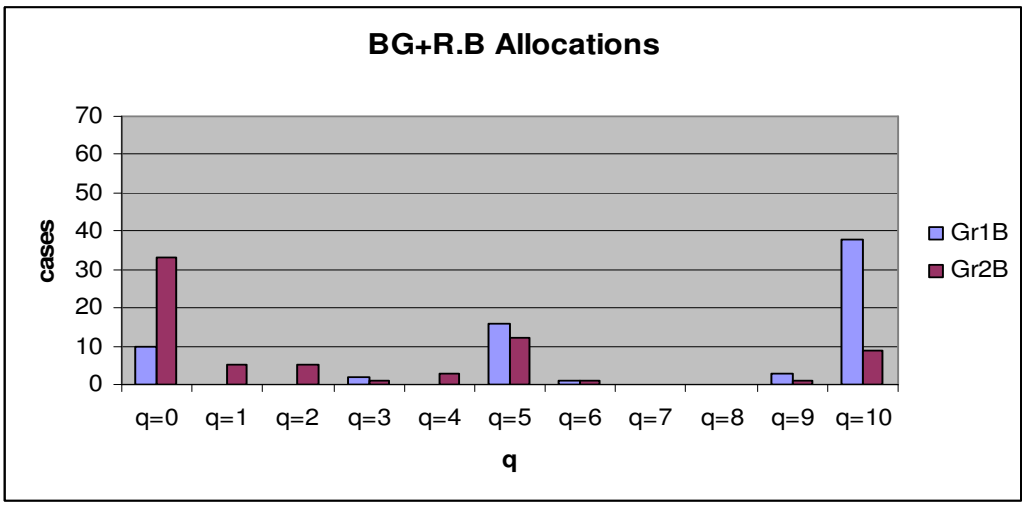

Fig. 6. *Frequencies for type of allocation (q) in BG+R.B*

In the first round comparison, Gr1B displays the quasi unanimity of allocations on the full contributions (13/14 members invested the entire endowment and only a person invests 9 euro). To the contrary, Gr2B divides its allocations among the full contributors (50% of cases) and pure strong free riders (28% of cases). Moreover, Gr2B's class of strong free riding allocations are three times greater than those in Gr1B. On the contrary, the number of total full contributions in Gr2B is nearly one fourth of those in Gr1B. The unique similarity is in the class of half contributions (23% in Gr1B and 17% in Gr2B).

Mann Whitney test confirms the statistical difference among the aforementioned contributory classes. Specifically, $p = 0.020$ for the strong free riding class; $p = 0.013$ in

weak free riding class and $p = 0.028$ in the cooperative class. The only non-significantly different class is the half endowment one ($p = 0.456$).

Result 3B *The endogenous enactment drives firstly allocations to the cooperative class, then to the half endowment contributions and, finally, to the strong free riding class. This order is reversed in case of imposition.*

The endogenous implementation has a strong deterrence effect at least in the first three rounds. To the contrary, the imposition is not able to reduce the free riding display, especially the strong free riding allocations.

Several comparisons between the three experiments

The three experiments presented in this section clearly give a positive answer to our original question, that is, participating in the determination of the norm implies different contribution levels when compared to the imposition of the same norm, taking as fixed other conditions. Our results also suggest a possible direction of such difference, that is, endogenous creation provides greater level of contribution than does exogenous introduction.

Although the constituent groups display greater levels of contribution in BG+R, not always does the mere presence of the sanctioning rule efficiently increase the levels of contributions. As found in experiment A, the introduction of a weak norm does not improve personal contributions when compared to the investments of the BG. Instead, medium-severe norms have amplified the direction of positive contributions in the constituent groups. Nonetheless, these norms have not a clear direction on recipient groups' contributions. In fact -although not in a significant way- they have caused both an increase (in the pilot experiment) and a decrease (in experiment B).

With caution, several between-experiment comparisons may be made. The three experiments are based on three different voted norms. As anticipated in the experimental design, the aim of this study is not to test different degrees of effectiveness associated with different norms. Nevertheless, it is simple to point out that the actual efficacy of the norm is related to the content of its formulation, in terms of both punishments and audits, at least in the constituent groups. This seems to confirm previous experimental results in the literature, in which different types of norm have generated different level of contributions (see, for example, Decker, Stiehler & Strobel, 2003).

The three norms show some similarities in their components. Whenever a pairwise-rule comparison highlights only one different element, we may point out some considerations about the effect of the single isolated component. For example, the rule created in the pilot

experiment is similar to the one generated in experiment A, except for the type of sanctions. Provided that the two recipient groups (i.e. Gr2P and Gr2A) are not significantly different in BG[9], we may make a first remark about the role of the different types of punishment. From this perspective, it seems that the threat of complete payoff loss has stronger effect[10] than the proportional sanction, if all the other normative components are equal.

Moreover, P-rule is similar to B-rule, except for the presence of the indication of the round under control. Since this announcement does not have effect on Gr2B behaviour, the comparison between Gr2P and Gr2B suggests that round indication does not improve contributions but, in fact, it seems to reduce them[11].

Interestingly, in the constituent groups there could be a positive correlation between the strength of the norm and its social support, based on the electoral group that has supported it. The norms voted in the pilot experiment and in experiment B are supported by a quasi unanimity of preferences for 3/5 components, whereas in experiment A only the weaker component (concerning the possibility to reward) obtains the quasi totality of preferences. In the same direction, we observe the final rules of groups Gr1P and Gr1B to have greater impact on the contributory levels. This is quite important, since the experimental design has not explicitly required the need for unanimity to determine the final rule. Nevertheless, in these two experiments the constituent groups spontaneously reach unanimous consensus about the majority of the voted components. Our results suggest that wider social rule-acceptance provides greater level of confidence about future conformity. However, the reinforcement of individual expectation about others' contribution should increase the incentive to free ride. This does not seem to be the case for these two constituent groups. On the contrary, it appears that voting the rule and participating in its creation, promotes the effective acceptance of the rule itself (i.e. the compliance with the contributory norm). Nevertheless, in the light of the results of experiment A, contributory levels improve only when the norm has received a wide collective support and its formulation is severe enough.

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[9] Non parametric tests verify that Gr2P and Gr2A are not statistically different throughout the entire history of BG. Mann Whitney test shows the absence of any difference, in terms of the total level of public good provided (p= 0.563) and the individual average contribution (p= 0.877). The round-wise comparisons yield p= 0.457 (R1); p= 0.681 (R2); p= 0.777 (R3); p= 0.791 (R4) and p= 0.411 (R5).

[10] Mann Whitney test run for Gr2P and Gr2A in BG+R shows significant difference in terms of total level of public good provided (p= 0.009) and individual average contributions (p= 0.000). The round-wise comparisons reveal a unique weak significance in the third round (p= 0.061). The other comparisons yield p= 0.038 (R1); p= 0.014 (R2); p= 0.004 (R4); p= 0.000 (R5).

[11] The individual average contributions are not significant different in the BG of Gr2P and Gr2B (p= 0.260), despite of the total public good (p= 0.022). Nevertheless, no round is significantly different in round-wise comparisons. Specifically, p= 0.520 (R1); p= 0.437 (R2); p= 0.421 (R3); p= 0.462 (R4); p= 0.223 (R5). In BG+R, there are no significantly differences, both in the average contributions (p= 0.334) and in the aggregate level of public good (p=0.117). No round-wise comparison reveals any significant difference, given p= 0.260 (R1); p= 0.270 (R2); p= 0.334 (R3); p= 0.147 (R4) and p= 0.107).

The above considerations parallel several experimental results in the literature, in which different voting rules (i.e. when comparing simple majority, absolute majority and unanimity rules) are explicitly asserted to affect the norm effectiveness (see, for example, Fischer & Nicklisch, 2007). The focus of our study, however, is to verify whether participating in a norm creation procedure has some effects on its actual enforcement.

DISCUSSION

The three previous experiments represent an extremely reduced portion of possible cases that can be generated, given the high number of potential combinations of norms. We are perfectly aware that many other replications are necessary in order to be more confident about several general observations. Nevertheless, and within the same conditions, we would like to make some remarks about the insights we have gained from these studies.

Remark 1 *Participating in a normative process has different consequences with respect to merely receiving the norm (i.e. without participating in the process of its creation).*

Remark 2 *Being member of a constituent group has positive implications on individual contributions, with respect to being the simple recipient of the norm.*

Remark 3 *The effect of participation is positive, independently of the specific formulation of the norm. In any observed case, and in all normative formulations, the endogenous implementation provides significantly higher level of collective public good provided, as well as lower numbers of free riders and greater individual average contributions than in the case of exogenous implementation.*

Further studies are required to provide support as to *why* participation determines such results. The present study is not designed to test different explanations, since it has been structured only to verify *whether* participating has effect or not. Several possible justifications may be taken into account but, since we do not provide any statistical support for any of them, they may all be considered to be equally probable. First of all, the normative enactment is differentiated because of the different procedures, that is, in the first case the norm is generated by a phase of discussion and vote whereas, in the second case, it is directly applied to the other group. Note that the norm is exogenously enforced on both groups. In other words, once the norm is created, both groups know that it will be concretely applied at the end of the game. Moreover, both groups are perfectly aware that the norm implications will really be applied (i.e. the established punishments and rewards will be enforced by the

experimenter). Given the same final norm, the different normative enactments should not differentiate *before* the potential degree of between-group conformity. In other words, individuals are completely free to choose what they want to contribute in BG+R, independently of having participated in the process or not.

In both groups people perfectly realize that the rule will be effective but, in the light of the experimental results, their different affiliated groups seem to have played a role. We wonder why these between-group differences have occurred in relation to the different norm enactments.

If, as we have assumed, the differences are due to the participation procedure, several different causal elements may be taken into account. The next points provide some examples of possible environmental variations in order to properly isolate- whenever possible- the role of these single elements[12].

At least three different classes of elements may concur to originate the gap between self-determination and imposition: the procedure itself, individual expectations, socio-psychological dynamics associated with participation.

A. The procedure itself

A first question concerns the procedure itself, based on *discussion* and *voting* by a *step-by-step* process. Nevertheless, the discussion stage is not what discriminates the two groups. The socio-psychological literature asserts the importance of communication as a device to build up social identity. Provided that both groups have discussed for the same period of time, this seems not to be the most important element for discriminating between the two groups.

More interestingly, the voting procedure may have more strongly affected the final outcome. The classical institutional approach deems voting to be a social instrument for converting individual preferences into collective decision (see, for example, Ledyard & Palfrey, 2002). Moreover, voting may generate conformity expectations, and may allow people to signal future contributory intentions. From the latter perspective, voting is, therefore, an instrument for informal commitment, which may induce conditional cooperators to positively react to their expectations about others' contribution (as in Tyran & Feld, 2006).

We have assumed the presence of heterogeneous subgroups of agents for both groups, without going into detail about any specific form of preferences. Following the example of Tyran and Feld (2006), the presence of conditional cooperators could be one explanation for

[12] Several socio psychological components may remain undetected or difficult to be singled out.

positive contribution, but it may not be exclusive, for instance, if we assume the co-presence of other types of players, such as reciprocators, self-oriented agents, altruists, and so on. Necessary modifications of our environment should be taken into account in order to ratify whether the presence of one class of preferences is dominant or not, both within- and between-group dynamics. These modifications lead to the consideration of the approaches which elicit individual and social preferences (see, for example, Fischbacher & Gachter, 2006).

The socio-psychological literature asserts that norms have to be activated in people's mind to perform any of their manifold functions (such as behavioural clue, informative anchoring), or to coordinate behaviour (see for instance Aronson, Wilson, & Akert, 2005). Norm activation may be obtained both by deliberate and unintended processes. To this aim, voting for a rule may be one possible method to activate, for instance, cooperative behaviour (as in Tyran & Feld, 2006).

The step-by-step procedure is chiefly inserted in order to allow people to focus on components one at time, with the aim of decomposing the presumed complexity of understanding a norm in its whole. Nevertheless, following the classical Buchanan and Tullock approach (1962), the decomposition may have generated higher decisional costs in the constituent groups, at least in units of time (the Rule Phase may potentially require up to 30 minutes in total). From this perspective, in fact, different levels of contributions may be traced back to these higher decisional costs. This would mean that much inner-group dynamics was due, for example, to people trying to compensate decisional costs with greater positive contributions. This seems to be a very weak justification for providing support to the different behaviour observed in the BG+R of the constituent groups.

B. Expectations

Both socio-psychology and economics acknowledge the existence of a relationship between conformity and individual expectations about others' compliance. These approaches may be suitably adopted to provide possible explanations for the different results obtained in the case of self-determination and in the case of imposition. Nevertheless, as reported in the introduction, economics scholars necessarily differentiate their consideration according to the theoretical models they take as benchmark.

At least two different explanations may be provided to support the differences observed in the three experiments. The first one assumes that different contributions may be explained in terms of different expectations generated within groups. If positive contributions are positively correlated with expectations, this will be the case in which the constituent groups display higher expectations of normative compliance, than those formed in the recipient

groups (First Hypothesis). The second explanation assumes that the different way in which the norm is enacted provides the same expectations; therefore, the difference between groups should be explained in terms of individual replies to these expectations. If this perspective is correct, greater contributions in the constituent groups seem to be related to positive reply (i.e. positive reciprocations, or activations of conditional cooperators), whereas recipient groups' answers should be more strategically oriented, that is, people reply to positive expectations by free riding more intensely (Second Hypothesis).

The present design is not able to discern whether one of the aforementioned perspectives is the proper one or whether, instead, a combination of both is the answer. In this regard, Bicchieri's approach (1997, 2006) may give a good hint to properly modify the present experimental environment in order to test which type of expectation may be quoted to justify these experimental results. In particular, it could be interesting to distinguish whether the two groups have or not the same direction in terms of empirical and normative expectations. Provided the existence of a correlation between expectations and effective contributions[13], the distinction of the direction of the expectations may lead to verifying the two aforementioned hypotheses. The support for the First Hypothesis is provided by testing whether the constituent groups have both greater empirical and normative expectations, when compared to the recipient groups. On the contrary, the support for the Second Hypothesis is provided by testing whether the constituent groups diverge as regards the relationship between contributions and normative, and/or the empirical expectations. The main problem associated with these hypotheses regards the search for a proper method to correctly elicit expectations. To this end, scholars acknowledge the robustness of the "strategy method" à la Selten (Fischbacher & Gachter, 2006, Feld & Tyran, 2006).

Another way to justify our results according to individual expectations is to adopt some arguments in Bicchieri (2000) and Young (2006). Both authors deem the creation of the norm to be potentially perceived as a focal point for future coordination. Nevertheless, following Peres (2006), the existence of the norm itself may activate the focal point. From this perspective, our group constituents or receivers equally activate a focal point, caused by the presence of the norm. However, it remains to be explained why the same focal point provided different between-group results.

C. Social-psychological dynamics associated with participation

In addition to the previous possible justifications, we believe that important supports have to be sought in a multidisciplinary approach. To this end, the socio-psychological contributions

[13] Here, we do not specify the causal relation between expectation and behaviour (neither in favour of the False Consensus nor in favour of the Triangle Hypothesis).

may deepen the between-group considerations in terms of different within-group dynamics. Multiple explanations may be quoted to justify the positive role of participation, for instance, in terms of compliance, group goal, personal involvement, closeness effect, and inner coherence.

Suppose that the observed level of compliance associated with the *same* norm is different between the constituent groups and the recipient groups. This would mean that groups that have generated the norm respond with a higher degree of compliance. This may be explained by following Aronson et al. (2005), who explicitly define the set elements which affect individual compliance to a group norm. For instance, the "collective agreement" of constituent groups is achieved through the voting procedures, implying that *those* norms are supported by wide consensus of the group. Moreover, the voting procedure may represent a form of prior commitment (see item A in this section). Therefore, contributions in BG+R may be interpreted as a sign of compliance, in response to a sort of inner coherence for previously expressed commitments. In contrast, the cases of imposition seem to imply a lower degree of compliance. The psychological discipline acknowledges that people sometimes prefer not to abide by a particular rule. This is the case, for example, when people perceive the norm as a limitation of personal behaviour. Following this reasoning, the recipient groups may have perceived the norm as an effective imposition and, consequently, as a limit to their individual behaviour.

The Rule-Phase frame may parallel Yamagishi's Structural Goal-Expectation (1986). Adapting this perspective to our study, the creation of the norm should represent both the group goal and the instrumental cooperation. Whenever the norm enactment is thought of as a group goal, other socio-psychological studies may be quoted. For example, Neuberg and Fiske (1987) recognize the so called "outcome dependency" as an element that may reinforce individual conformity to the established group goal. In addition, Locke and Lathman (2002) state that the more specific and well defined goals are, the more likely they are to be attained[14].

In-group interactions are not only related to the presence of group goals, but are also related to the "social influence" perspective. We are aware that our experimental spot relations are not the correct settings for social influence and social identity in a purely socio-psychological perspective. Nevertheless, we may notice some (limited) interesting analogies. For instance, having participated in a group decision with direct involvement should have

[14] This consideration deems our norm procedure (decomposition of five components) to be a "well defined goal".

induced agents to activate a sort of individual responsibility in achieving the group goal[15]. This kind of individual responsibility may be reinforced by considering the use of the face-to-face communication, although agents play the BG+R under complete anonymity.

The interpretation of positive effects as due to participation seems to parallel Young's model (1988), who asserts that internal rewards may be linked to the satisfaction deriving the mere act of personal participation. Of course, this statement more directly refers to the definition of 'fair perception' in that model, which our study does not explicitly assume.

The positive effects of participation in a self-enacting decision may be also explained using the closeness effect. In our frame, being close means being directly involved in the decisional process. As a consequence, this personal involvement may activate a sort of inner coherence, or a sense of individual responsibility.

The latter considerations are very important, since (under obvious limitations) they may find several analogies with the Subsidiarity principle. Several Law scholars acknowledge the importance of the Subsidiarity principle as a foundation of the statement "Autonomy is Responsibility and vice versa" (see, for example, Cassese, 2002; Arena, 2006[16]). In this regard, the standard-version results may give a (marginal) support to the validity of that principle, in particular for the horizontal definition. Our constituent groups could represent decisional (decentralized) committees, where individuals actively participate in normative enactments which discipline group interests. This sort of personal closeness may enforce the individual responsibility toward the collective dimension and, indirectly, it may improve individual compliance.

SUMMARY AND CONCLUSIONS

The aim of this experimental design is to test whether direct involvement in a decisional problem, which is a second order public good in itself, may affect individual contributions. The question whether participation in norm enactment provides a contributory difference with respect to when the norm is received has not been addressed in public good literature so far.

We assumed the presence of heterogeneous players, without specifying any specific type of preference. We tested for the absence of significant differences between groups in BG. Since both groups displayed the same level of free riding, on average, we conjectured that

[15] The group achievement is calculated on the basis of the effective efficiency of the norm in BG+R, which means the effective public good provided as a percentage of the maximum achievable.

[16] These works are in Italian. Similar arguments in English are in Arena and Chiti (2002) "Public Administration, Competitiveness and Sustainable Development", Istituto Italiano di Scienze Amministrative, Florence University Press.

we had heterogeneous groups which did not affect the main prediction of our BG. In other words, independently of any within-group specification, the prediction of weak free riding is realized in our baseline game. Moreover, we stated that both groups have equally experienced the free riding problem at the end of the BG.

The Pilot experiment and its two replications show a sort of behavioural regularity: participating in a normative procedure, which is self-enforcing, provides a greater level of contributions and a smaller number of free riders, than receiving the same norm, taking other conditions as fixed. This difference is significant whenever we compare the constituent groups to receiver groups, in the whole game history. From a round-wise comparison, we obtain that the first rounds of the BG+R are always significantly different between groups. In the first round, the constituent groups always contribute more, and the number of free riders is always smaller than that of the recipients, independently of the specific norm enacted.

We obtained three different final rules, which differ partly in their components. We observed that, according to previous experiments in the literature, the norm formulation influenced the level of total public good provided. We noticed that our weakest norm decreased the level of public good provided, when compared to the BG. Nevertheless, the gap is also realized in this condition.

We proposed some possible explanations to justify why participation may affect the level of public good provision. We distinguished three possible perspectives in order to interpret our gap: the specific enactment procedure, individual expectations, and the socio-psychological contributions. The specific procedure involves three main elements: a step-by-step procedure, the discussion stage, and the voting stage. Each of these may have potentially affected individual behaviour via expectations, or through within-group dynamics. Nevertheless, since the sanctioning system is a second-order public good, the expectations of greater contributions (i.e. the expectation of group conformity) should lead to a greater level of free riding. This prediction should be the same for both groups, independently of the norm enactment. This does not seem to be our case, at least in the constituent groups. Probably, our gap may be explained once non-theoretical standard approaches are involved. In this regard, we mentioned the role of the voting procedure and discussion phase to form potential group dynamics, aimed at achieving the group goal of normative compliance. In this sense, our results may support a decentralized model of norm enactment (for instance, the Subsidiarity principle), or endogenous norm enforcement (like, for instance, Yamagishi's and Falkinger's models).

Bicchieri's definition of expectations seems to be a possible avenue to a deeper understanding of our results. The separation of expectations into empirical and normative

ones may represent our gap in terms of different group expectations, or different group reaction to those expectations. Nevertheless, the present standard version designs are not able to test Bicchieri's perspective.

We are aware that these experiments represent only a preliminary test of the existence of the participation gap. However, we consider this limitation as a good starting point for future experimental development.

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APPENDIX

Instructions

(This is a translation of the original Italian version)
[In brackets the variations for the second group]

Welcome and thank you for your participation

With this game you can earn an amount of money, which depends both on your decisions and on what other players will decide.

Please read carefully the following instructions. If you have any questions, please raise your hand and an experimenter will clarify your doubts.

Throughout the whole game, you are not allowed to communicate. The violation of this rule leads to the exclusion from the experiment and from all payments.

To ensure your anonymity, you will play using your ID. Nobody will be able to trace your personal identity from your decisions. Please, key in your ID whenever required.

This game consists of three separate parts, which will be presented in sequence.

1. **Basic Game**. This is the baseline game of the entire experiment. It consists of 5 independent stages (rounds).
2. **Rule-Game.** In this part you and other players will decide a rule, by means of a specific procedure of discussion and voting.
3. **Basic Game with rule.** You will play the Basic Game with the norm. [3. Again the Basic Game with a change].

The payoff table is the same for all participants, 14 players including yourself. This table will help you to make your choices. The instructions about the payoff table will be given in the next steps. The instructions for the Rule-Game will be provided after the Basic Game.
At the end of the experiment you will be paid in cash.

Basic Game

The decision situation

You have an endowment of 10 Euro, that you can invest. You can decide to invest between two different funds, called Private Fund and Collective Fund, respectively.
You decide how many Euro to allocate to the different funds. Any combination is acceptable, provided that your digits are integer numbers in the range 0 to 10 (included), and that the sum of the amounts invested is 10 Euro.
In general:

- Any Euro spent in the Private Fund guarantees you will receive at least the same amount. Examples: if you decide to invest 10 Euro, you will receive at least 10 Euro; if you invest 8 Euro you will receive at least 8 Euro.
- The Collective Fund pays a variable return, which depends on the amount present in the Collective Fund itself. The amount in the Collective Fund is the sum of all contributions that you and other players will decide to invest in this fund. The greater the amount present in the Collective Fund, the more money the fund will return.
  The Computer calculates how many Euro are invested in the Collective Fund; it applies a rate of 0.8%, and such increased amount will be equally divided into 14 parts, one for each player. You will receive 1/14 of the Collective Fund, independently of your initial investment in this fund.
  Only in the case when the Collective fund reaches 140 Euro, does it return 15 euro to each player.
  Example: you decide to invest 4 Euro in the Collective Fund. As soon as other players enter their investment, the computer will calculate the total amount present in the Collective Fund and its relative interest. For instance, if the Collective Fund has 100 Euro, the computer will announce 108 Euro, which divided into 14 equal parts, will provide 7.7 Euro to each player.
  The real values obtained from the investment will be approximated (example 1,12 becomes 1; 2,49 becomes 2.5; 3,39 becomes 3.5 and so on)

Your payoff

Your final payoff is the sum of your initial investment in the private Fund, plus 1/14 of the Collective Fund. Example: you invest 4 Euro in the Collective Fund and, consequently, the remaining 6 Euro are invested in the Private Fund. If the computer announces 100 Euro, your payoff will be 14 Euro:

$$6 \quad + \quad \frac{100(1+0.08)}{14} = 13.7 \rightarrow 14 \text{ Euro}$$

From the Private Fund From the Collective Fund =6 Euro + 7.7 Euro

The Payoff Table

The payoff table helps you to understand your possible payoff.
In the first column you find any possible allocation to the Collective Fund (from 0 to 10 Euro included). In the first line you find all possible levels of Collective Fund that the computer may announce (from 0 to 140 Euro included).
Your possible payoff corresponds to the intersection of your investment choice in the Collective Fund, with the column of the possible amount announced by the computer. Any cell already includes the sum of your investment returns, from both the private and the collective investment. You can check that the payoff in the example above is really the intersection of line 4 Euro, with column 100 Euro. (See Fig.1).
The announcement is made after you and other players key in your investment choice. The announcement of the Collective Fund, and your relative payoff, indicates the end of a round.
Your initial investment, the Collective Fund and your payoff are recorded at the top of the computer screen (see Fig. 2).

The procedure of the Basic Game

At the beginning, the computer will ask you to key in your ID. After that, click OK. From here on, all procedures will be computerized. Please, key in your ID whenever required. After the first Collective Fund announcement, you will have to make four more choices. All rounds are independent of the others, that is, at the beginning of a new round you always have 10 Euro available. The Basic Game will end after the fifth announcement is made. The payment for this game is made at the end of the experiment, by randomly extracting one round among the five you have played. During the entire game you are not allowed to communicate.

	Possible Total Amounts Present in the Collective Fund										
What you invest in the Collective Fund	**0-13**	**14-27**	**28-41**	**42-55**	**56-69**	**70-83**	**84-97**	**98-111**	**112-125**	**126-139**	**140**
0	10.5	11.5	12.5	13.5	14.5	15.5	16.5	18	19	20	
1	9	10.5	11.5	12.5	13.5	14.5	15.5	17	18	19	
2	8	9	10	11.5	12.5	13.5	14.5	16	17	18	
3	7	8	9	10	11.5	12.5	13.5	15	16	17	
4	6	7	8	9	10	11.5	12.5	14	15	16	
5	5.5	6	7	8	9	10	11.5	13	14	15	
6	4.5	5.5	6	7	8	9	10	11.5	13	14	
7	3.5	4.5	5.5	6	7	8	9	10.5	12	13	
8	2.5	3.5	4.5	5.5	6	7	8	9.5	10.5	12	
9	2	2.5	3.5	4.5	5.5	6	7	8.5	9.5	11	
10	1	2	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	15

Fig.1 Payoff Table

Control Questions

Please answer the following questions:

1) If you decide to invest 0 Euro in the Private Fund, and the computer announces 70 Euro, what is your final payoff? _____
2) If you decide to invest 0 Euro in the Collective Fund, and the computer announces 70 Euro, what is your final payoff? _____
3) If you decide to invest 3 Euro in the Private Fund, and the computer announces 12 Euro, what is your final payoff? _____
4) If you decide to invest 3 Euro in the Collective Fund, and the computer announces 12 Euro, what is your final payoff? _____

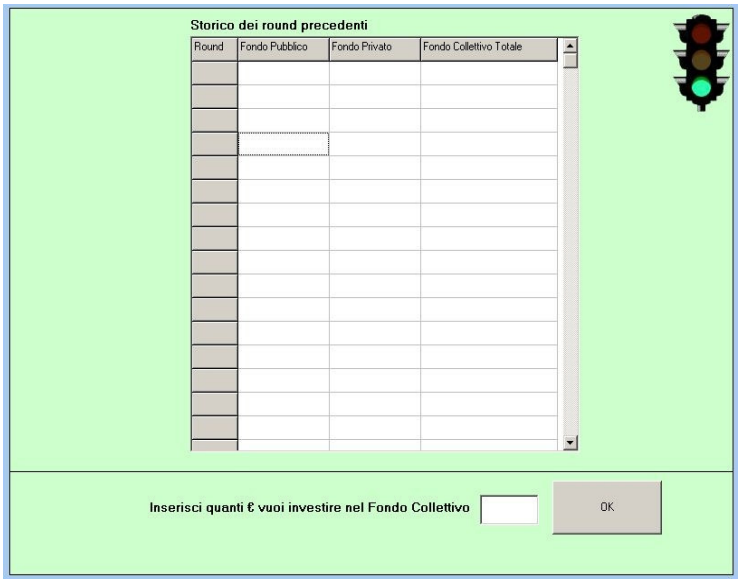

Fig.2 Basic Game's Computer screen (Italian version)

Rule-Phase

The aim of this game is to create a rule which significantly reduces the individual investments in the Collective Fund from 0 to 4 Euro included, that is, to promote the investment from 5 to 10 Euro included.

This rule will be inserted in your next Basic Game.

The rule consists of 5 components, which decide:

- When the control takes place;
- The number of players that are audited;
- The possibility to reward people who contribute with more than 4 Euro included;
- The type of reward;
- The type of sanction to be applied to players who contribute from 0 to 4 Euro included.

The game consists of a sequence of five phases, one for each rule component.

All components have a set of alternatives (options). As you will see, these options may be related to some costs.

You can briefly discuss the set of options with other players. To communicate, you will use a **chat**, where your name will be kept anonymous by means of your ID.

At the end of the chat, you will proceed to the voting stage. Your vote is free and anonymous.

The winner option for each phase is the one which has the majority of preferences. If two options have the same number of preferences, you will vote again. If there is parity another time, the computer will randomly select the winner option.

After the rule is completed, you will play the Basic Game, being aware now that the norm is actually in force.

Please note that:

- The computer will present all phases, one at a time;
- After you read all the available options, the chat will be open for a maximum period of time indicated by the computer.
- When the available time elapses, the chat will be closed and it will not be possible to enter it again.
- You can vote only when the chat is closed
- Any winner option will be announced by the computer.
- Any winner option will be displayed on the lower part of the computer screen.

The Discussion Phase

The communication within the chat is NOT free. You can exchange opinions about any single option, its advantages/disadvantages, and so on, but it is strictly forbidden to communicate the amount you will contribute in subsequent rounds.

The discussion phase is open for a period, which the experimenter will announce at the beginning of each phase. It is possible to close the discussion before the expiry of the available period. This may occur when you and all other players deem the information exchanged in the chat to be sufficient. The discussion phase will be closed when all of you will communicate "I'm ready to vote". In any case, the discussion phase will be closed as soon as the available time is over. When the chat is closed, you will proceed to the voting stage.

Phases

First Phase. "When to control" Component. (Discussion phase: maximum 8 minutes)

In order to significantly reduce the number of allocations from zero to four Euro (included), how often is it necessary to audit?

Options:

A ☐ Establish now the selected audited round. If A is the winner option, you will propose the round you prefer to be controlled. This option costs 5% of the collective final fund.

B ☐ One round randomly extracted at the end of the game. This control will cost 3% of the collective final fund

C ☐ At the end of each round. This control will cost 40% of the collective final fund.

D ☐ Two rounds randomly extracted at the end of the game. This control will cost 6% of collective fund.

E ☐ Three rounds randomly extracted at the end of the game. This control will cost 9% of the collective final fund.

It is very important to know that:

Your effective payoff will always be determined by randomly extracting ONE round at the end of the Basic Game with Rule, BUT:
If the winner option is A or C, your payoff will coincide with the one of a randomly extracted round.
If the winner option is B, the payoff coincides with the controlled round.
If the winner option is D or E, your payoff will coincide with one round randomly extracted among that set of rounds.

Second Phase. "Number of players to be audited" Component. (Discussion phase: maximum 5 minutes)

In order to significantly reduce the number of allocations between zero and four Euro (included), how many players should be audited?

Options:

A ☐ One player (this option costs 0.1% of the final Collective Fund)

B ☐ Two players (this option costs 0.2% of the final Collective Fund)

C ☐ Three players (this option costs 0.3% of the final Collective Fund)

D ☐ Five players (this option cost 0.5% of the final Collective Fund)

Third Phase. "Reward possibility" Component. (Discussion phase: maximum 4 minutes).

Do you want to provide rewards to audited player(s), who will have contributed with more than four Euro?

Options:

A ☐ Yes

B ☐ No

Fourth Phase. "Type of Reward" Component. (Discussion phase: maximum 5 minutes)

The reward to the audited player(s) who has (have) contributed with more than four Euro, consists of

Options:

A ☐ A bonus coinciding with 2% of the Collective Fund. This amount will be paid without any implication to the Collective Fund provided. In other words, this bonus will be a windfall.

B ☐ A bonus coinciding with 2% of the Collective Fund. This amount will be paid by the audited player(s) if she/he is (they are) not contributor(s). In the case that the control does not reveal the presence of any non-contributor, this amount will be paid by all other uncontrolled players.

Fifth Phase. "Type of Sanction" Component. (Discussion Phase: maximum 8 minutes)

What is the sanction to the audited member(s), in the case she/he has (they have) contributed from zero to four Euro (included)?

Options:

A monetary sanction equivalent to:

A1 ☐ 2% of the net Collective Fund

A2 ☐ 10% of her/his (their) payoff

A proportional monetary sanction, related to the degree of her/his (their) level of non-contribution. Options:

B1 ☐ a percentage of the net Collective Fund. In particular, if q=0 she/he pays 5% of the fund; if q=1 she/he pays 4% of the fund; if q=2 she/he pays 3% of the fund; if q=3 she/he pays 2% of the fund; if q=4 she/he pays 1% of the fund.

B2 ☐ a percentage of her/his payoff. In particular, if q=0 she/he pays 10% of her/his payoff; if q=1 she/he pays 8% of her/his payoff; if q=2 she/he pays 6% of her/his payoff; if q=3 she/he pays 4% of her/his payoff; if q=4 she/he pays 2% of her/his payoff.

C ☐ She/he will completely lose her/his payoff.