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Elected Officials' Opportunistic Behavior on Third-Party Punishment: An experimental Analysis

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Elected Officials' Opportunistic Behavior on Third-Party Punishment: An experimental Analysis*

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Abstract

In this paper we analyze how the punishment behavior of a democratically elected official varies when facing an electoral process (opportunism). To this aim, we conduct an economic experiment in which officials are third party punishers in a public goods game. We consider two different scenarios which differ in the degree of cooperation within the society. We find that officials increase their punishment when they face elections in both scenarios. Contrary to candidates' expectations, voters always vote for the least severe candidate.

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1 Introduction

Many real life political systems are characterized by third-party punishment. An example of common-pool resource regimes which rely on sanctions is the EU Stability and Growth Pact that was created to enforce budgetary discipline among EU member states. Another example is the Kyoto Protocol that aims to reduce global greenhouse gas emissions by implementing legally binding agreements. In both cases, sanctions are imposed by a central authority, which is democratically elected.

Which are the motivations driving the implemented policies? The roots of the standard political competition theory assume that the sole motivation of representatives is to win elections (Downs, 1957a).[1] Wittman (1973) was the first to propose a model in which candidates' policy proposals result from the conflict between opportunism and ideology.[2] Levitt (1996) estimates with field data that ideology represents roughly 60% of motivations of US senators, while party line, the interests of own constituency and general voters' interests each explain more than 10% of senators' voting behavior. The goal of this paper is to complement the existing analysis on opportunism on candidates' preferences in an electoral process, exploiting the experimental methodology.[3]

To achieve this aim, we analyze third-party punishment in a public goods game (PGG, henceforth). In the first stage of this game, a group of experimental subjects simultaneously decide how much to contribute to a public good. In the second stage, the contributions from the first round are shown to a different group of subjects who then have the opportunity to deduct points from the first group of subjects. We compare the benchmark case - PGG with punishment - with an extension in which punishers face elections after deciding how much to punish. In the extended case, we add a new stage in which a group of subjects vote in pairwise comparisons to decide which

[1] Regarding this assumption, Roemer (2001,p. 3) states that "probably" 95% of the literature in political economy since Downs has assumed purely opportunistic representatives.

[2] The concept of opportunism in political economics is well defined by Downs, 1957b (see page 137) as "political parties in a democracy formulate policy strictly as a means of gaining votes".

[3] The main advantage of this methodology compared to field data is the control of various external factors which may arise in this setting. For instance, politicians are permanently under the pressure of many interest groups, such as the political party they belong to, factions within the party, the region-level government, lobby groups with varying interests and so forth. Many of these groups' pressures are difficult to quantify or even unobservable. In addition, there are reputational and repeated-game arguments at work in real life, from which the researcher has to abstract while analyzing field data.

of the punishers from the first PGG they prefer to be their punishers in a second PGG with punishment they will play. To do so, they are provided with the proposed punishment policies from the first PGG. Only the winning punishers will have the opportunity to punish again in the second PGG.

The level of norm violation observed may be a useful source of data for candidates to predict voters' preferences on punishment. For instance, if the group of contributors is very cooperative, candidates may expect voters to want a severe punishment to deviators. To check this hypothesis we perform the experiment with two groups of contributors: One relatively more cooperative and another considerably less cooperative.

Our results are as follows. First, we observe that punishers spend their money by punishing non-cooperative behavior without any future reward. Nevertheless, punishment behavior increases significantly when subjects face a subsequent election. This suggests that candidates believe that voters prefer a severe punisher in order to enhance cooperation and adjust their behavior accordingly. Finally, when we compare the effect of elections on punishment in a more cooperative and a less cooperative group of contributors we do not find any significant increase except when punishment is conditioned to the contribution level.

Most of the papers about third-party punishment in PGG focus on the effect of a third-party punishment on the level of cooperation (see Fehr and Fischbacher, 2004, Charness *et al.*, 2008, or Kroll, Cherry, and Shogren, 2007 among others). In our paper, we focus exclusively on punishment behavior ignoring its consequences on cooperation. In this regard, Lopez-Perez and Leibbrandt (2011) find that egalitarian motives play an important role in third-party punishers' behavior. They only consider altruistic third party punishers. In our work, we focus on the possible change in the punishment when third-party punishers are elected rather than be solely altruistic.

This study follows the literature started by McKelvey and Ordeshook (1983) and continued by Morton (1993) analyzing the the motivations of elected officials. Moreover, our paper is related with more recent lab experiments on electoral incentives and electoral delegation such as Woon (2014) and Hamman*et al.*, 2011. Otherwise, we focus on the potential change in punishment policies in a context of a PGG due to a political competition process.

The rest of the paper is organized as follows. A detailed explanation of the experimental design is presented in Section 2. The main results of the experiment are provided in Section 3, while concluding remarks are presented in Section 4.

2 Experimental design

The experiment was conducted at the University of Granada with 198 participants, who were recruited via posters in the Faculty of Economics. All sessions were run in the lab using z-Tree software (Fischbacher, 2007). No one was allowed to participate in more than one session. On average, each participant received around 13.18€ for a one-hour session. At the end of the experiment, all the subjects filled out a questionnaire which allows us to control for potential heterogeneity across subjects and study the pure effects of our treatment variations. In what follows, we explain the experimental design in more detail.

The experiment consisted of two stages. The first stage was the standard PGG and it was common for both treatments. This is a n-player game in which every player $i = 1, ..., n$ is given an initial endowment of w experimental points and has the opportunity to contribute an amount of c_i units to a public good, $0 \leq c_i \leq w$. For a given contribution profile $(c_1, ..., c_n)$, the payoff function for player i is given by:

$$\pi_i (c_1, ..., c_n) = w - c_i + r \sum_{j=1}^{n} c_j \qquad \frac{1}{n} < r < 1.$$

The parameter r determines the marginal *per capita* return from a contribution profile. Given a contribution profile, a player is always better off contributing zero to the public goods game, assuming selfish preferences. Thus, the unique Nash equilibrium is $(0, ..., 0)$. In the experiment, we followed standard values used in the experimental literature, setting $w = 50$ experimental points and $r = 0.1$. The conversion rate for points to euros was 100:1 (100 points = 1€).

The PGG was played by four groups of 20 contributors ($n = 20$). Each contributor made a single decision that remains fixed for 48 rounds. The reason for including this nonstandard feature will be explained later in Stage 2. We then had 48 identical contribution profiles from each group of contributors. Table 1 shows an example of the structure of the data collected from a single group playing the PGG (i stands for contributor and R stands for round).

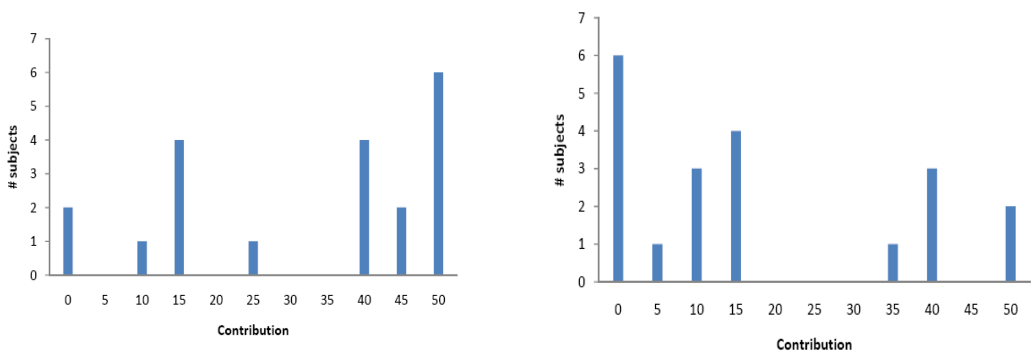
Table 1. Contribution Profiles

$i\backslash R$	1	2	3	...	48
1	c_1	c_1	c_1	c_1	c_1
2	c_2	c_2	c_2	c_2	c_2
...	...	...	...	...	...
20	c_{20}	c_{20}	c_{20}	c_{20}	c_{20}

We selected the most contributing and the least contributing groups (on average) from the four groups of subjects in Stage 1, which we labelled as *cooperative* and *non-cooperative* scenarios throughout the paper.[4] The histograms of the contributions in the two selected groups are reported in Figure 1.

Figure 1. Histograms of the contributions in the PGG.

Cooperative scenario   Non-cooperative scenario



The Stage 2 consists in a third party punishment to contributors in the first stage. The stage 2 is applied for both the cooperative and the non-cooperative scenario. We used two groups of 48 punishers for each scenario. Each punisher had the chance to reduce contributors' payoffs in one round of the PGG. Therefore, all punishers faced the same contribution profile so we can compare their intensity in punishment. We are aware that this is not the standard experimental design used in experiments on PGG with punishment. However, we use this design to avoid the problem of punishers' decisiveness

[4]The term "non-cooperative scenario" does not refer to the situation in which nobody contributes . We use the term non-cooperative rather than low contribution scenario to avoid confusion with individuals' low contributions throughout the text.

in the implementation of punishment. With this design all punishers are sure that their punishment will be implemented.[5]

In particular, punishers were endowed with 100 points and after observing the contributors' decisions in the previous stage (PGG) they had to decide how many points they wanted to sacrifice in order to reduce contributors' payoff. For each point the punishers used, 3 points were reduced from the punished contributor's payoff in one round. Punishers could sacrifice any amount of points from 0 to 100 to punish each contributor (as long as the sum of all the points used to punish is smaller or equal to 100). At the end of the experiment the punishers were paid for the points they kept.[6]

The aim of this work is to study how much does punishment depend on whether punishers face a reelection or not. In order to do that we designed two treatments: Treatment 1 in which third party punishers did not face a subsequent election process and Treatment 2 in which they did. The election process was to select a new group of punishers for a new group of contributors in a new PGG with punishment.

In order to avoid deception, we performed two subsequent instrumental stages for Treatment 2, that is, the following elecction process and the new PGG with punishment (after stage 2). Nevertheless, we were not interested in the results of these additional stages. To this aim, we use a new group of 11 subjects per scenario (who were different from those contributors in Stage 1) to perform the role of voters first and contributors later. More precisely, they had had to select among the punishers from stage 2 those who will be their punishers in a second PGG with punishment. The punishers were randomly matched in pairs and new contributors had to vote for their preferred candidate from each pair of punishers. The punisher who got more votes in each pair was the winner. The reward for winning was 200 experimental points (20 Euros), which were given to the winners of the election to perform the role of punishers in a second PGG with punishment.

Table 2 summarizes the game structure, treatment differences and the number of participants in the experiment.[7]

[5]To avoid deception, contributors were informed that only two out of four groups could be punished in the following stage, without specifying any selection criteria.

[6]The instructions for the punishment stage in Treatment 1 are provided in the Appendix. Instructions for other stages or treatments are available upon request.

[7]Notice that the number of participants in each treatment, i.e. N, is the sum of the participants in both cooperative and non cooperative scenarios.

Table 2. Summary of the experimental design

	Stage 1	Stage 2	Instrumental Stages	
Game	PGG 1	Punish. 1	Elections+PGG2	Punish. 2
T1 (Baseline)	Yes	Yes	No	No
Participants(N)	40	48		
T2 (Voting)	Yes	Yes	Yes	Yes
Participants(N)	40	48	22	24
TOTAL				198 subjects

3 Results

We examine first the average amount of experimental currency points spent on punishment in each treatment and scenario (see Table 3). Differences are highly significant, independently of the level of the punished contribution profile ($z = -2.900$, $p = 0.002$ and $z = -3.012, p = 0.001$ for non-cooperative and cooperative scenarios, respectively).[8] On the other hand, there is no statistical difference between contribution profiles ($z = -0.204, p = 0.419$ and $z = -0.368, p = 0.357$, for voting and no-voting, respectively).

Table 3: Average amount of points spent on punishment

	T1(Baseline)	N	T2(voting)	N
non-coop.	14.88	24	35.41	24
coop.	15.55	22	35.92	26

Table 4 shows the fraction of punishers spending zero. This behavior corresponds to the equilibrium behavior of self-interested individuals. These fractions are larger for the no-voting treatments ($z = -3.628$, $p = 0$ and $z = -3.318$, $p = 0.001$ for non-cooperative and cooperative scenarios, respectively). Table 4 detects some differences between the cooperative and

[8]All reported tests are Mann-Whitney one-tailed tests, unless stated otherwise.

the non-cooperative scenarios. These differences are not statistically significant though ($z = -0.661$, $p = 0.255$ and $z = -0.508$, $p = 0.306$ for voting and no-voting treatments, respectively).

Table 4: Fraction of punishers spending 0 points.

	no-voting	N	voting	N
non-coop.	54.16%	24	8.33%	24
coop.	40.90%	22	3.80%	26

In order to provide a better insight into the treatment effects, we analyze average punishment in relation to individual contributions. To do so, Figure 1 plots the average amount of money spent on punishment as a function of the corresponding contribution levels. The y-axis depicts the number of punishing points, while the x-axis lists the contribution levels. The left (right) panel of Figure 1 reports the results for non-cooperative (cooperative) scenario.

Figure 2. Average punishment by contribution levels

(a) Non-cooperative scenario | (b) Cooperative scenario

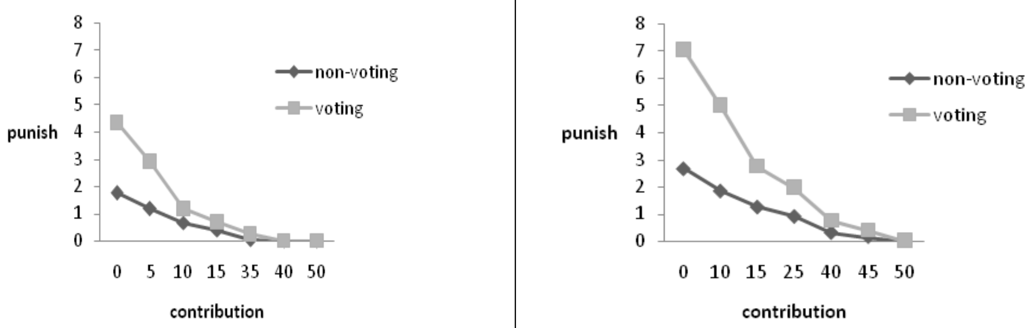


Figure 2 reveals that the more individuals deviate from a certain cooperation norm, the more serious is their punishment on average. This effect is present under all treatment conditions and is consistent with the experimental evidence (see Fehr and Gachter, 2002).

Concerning the effect of the electoral process, Figure 2 confirms that there is considerably more punishment in the voting treatment.[9] This effect is statistically significant ($z = -2.140$, $p = 0.016$ and $z = -2.086$, $p =$

[9]Regarding voters behavior, interestingly voters prefer candidates who punish less severely (candidates punishing less won the election). Although this result may seem

0.018 for non-cooperative and cooperative scenarios, respectively). Moreover, we observe that this effect is larger for low contribution levels, while there seems to be only a negligible effect on the punishment of highly contributing individuals. The difference between the punishment behavior in the voting and non-voting treatments seems to rise as contribution levels decrease. This suggests that the role opportunism plays in punishers' behavior increases with the deviation from the contribution norm. This is confirmed with the Page's trend test for both the cooperative and non-cooperative scenarios ($L = 2863, p < 0.001, L = 2631, p < 0.001$, respectively).[10]

We now provide an econometric analysis of the above findings. We estimate eight econometric models. We first focus on estimations [1-2] reported in Table 5. These estimations do not take into account the structure of punishment (contribution levels). Rather, they analyze the global feature of punishment in the data. In estimations [1] and [2], the dependent variable is the amount of points each subject spent on punishment.[11] The independent variables used for all the analyses are the treatment dummy, *voting*, the scenario *coop*, (it takes the value 1 when the scenario is the cooperative one and 0 otherwise) and their interaction, $voting \times coop$. Formally, $voting_i = 0(1)$ for the non-voting (voting) treatment subjects and $coop_i = 0(1)$ for the non-cooperative (cooperative) scenario.[12] We also control for individual observed heterogeneity.[13] Given the nature of the variables, we estimate ordinary least squares and a probit model in the corresponding regressions.[14]The results are summarized in Table 5.

counterintuitive, it is usual that in the first round of a game participants do not choose a punishment system. Only once subjects know others' behavior in the first stage, they realize that the threat of punishment will increase cooperation and then, they vote for more severe punishers (see Gürerk et al. (2006)). As this experiment was designed as a one shot game, we only observe the first part of the behavior.

[10]Page's trend test is appropiate in this setting since we have a within subjects design and more than two cooperation levels (see Page, 1963 for further details).

[11]We have also conducted a probit regression where the dependent variable is the probability of spending a strictly amount of points in punishing, The aim of the latter is to check robustness of results obtained in Table 4 regarding the Nash equilbrium of profit-maximizing agents. Results hold.

[12]Note that both regressors Cop and VotingxCoop may be endogenous.

[13]We control for gender, altruism, risk aversion, life satisfaction and intelligence.

[14]We have also conducted a tobit estimation to test the robustness of the OLS model, finding that the results are qualitatively the same. The coefficient for voting is in fact higher, but the significance level remains the same.

Table 5. OLS estimations on Punishment decisions

	[1]	[2]
Voting	61.63**	36.90*
	(23.80)	(17.08)
Coop	2.01	-20.52
	(18.86)	(15.61)
Voting × Coop	-0.49	9.95
	(31.46)	(25.16)
Constant	44.63**	63.88**
	(15.15)	(23.33)
Observed Heterogeneity	*No*	*Yes*
Prob > F($\varkappa^2$)	0.003	0
(pseudo) R^2	0.138	0.514
N	96	96

The dependent variable is the number of points spent on punishment. Robust standard errors are shown in parenthesis; ** and * indicate significance at the 1% and 5% level, respectively.

Table 5 confirms that there is an increase in punishment and in the probability of punishing when individuals face elections, and that there is no difference between the non-cooperative and cooperative scenario in terms of points spent on punishment. Quantitatively, we observe that voting increases the number of punishing points by around 37 (3.7€) in the voting treatment.

An interesting question is whether the total effect of voting differs across the cooperative and non-cooperative scenarios. We observe that this is not the case, since the interaction dummy *Voting* × *Coop* is never significant. As a result, the increase in punishment due to the presence of the election is alike in the two contribution scenarios.

Conditioning the analysis on corresponding contribution levels in line with Figure 1 provides a more detailed account of the data. Recall that there are 96 subjects in total in the punishment stage and that each of them had to make 20 decisions; one for each contributor. Hence, the data set constitutes a panel. In estimations [3-4] of Table 6, we provide the estimates of a random-effect panel-data model.[15] The dependent variable is the punishment level

[15] The Hausman test confirms that it is safe to use a random-effects model ($p = 1$).

in [3] and [4] for each corresponding contribution.[16] The models contain the regressors from estimations [1-2] plus two contribution-related variables. The variable *contribution* corresponds to the punished contribution level and *contribution sq.* is the contribution squared. We added the latter because Figure 1 suggests that there is a non-linear relation between punishment and contribution.

Table 6. GLS RE estimations on Punishment decisions by contribution profile

	[3]	[4]
Contribution	-0.164**	-0.164**
	(0.014)	(0.014)
Contribution sq.	0.002**	0.002**
	(0.0002)	(0.0002)
Voting	1.033**	0.623*
	(0.336)	(0.265)
Coop	1.104**	0.729*
	(0.273)	(0.214)
Voting × Coop	-0.014	0.159
	(0.516)	(0.418)
Constant	2.500**	2.821**
	(0.242)	(0.421)
Observed Heterogeneity	*No*	*Yes*
Prob > $\varkappa^2$	0	0
(overall) R^2	0.279	0.377
N	1920	1920

[3] and [4] are GLS random effects, where the dependent variable is the number of points spent on punishment. Standard errors are shown in parenthesis, ** and * indicate significance at the 1% and 5% level, respectively.

The conclusions of these estimations differ only slightly from the "global" view above. Punishment is non-linearly decreasing in the contribution level.

[16] We have also conducted a probit regression where the dependent variable is the probability of spending a strictly amount of points in punishing a particular contribution profile. The aim of the latter is to check robustness of results obtained in Table 4 regarding the Nash equilbrium of profit-maximizing agents. Results hold.

The presence of the electoral process elevates the punishment. A remarkable result is that the kind of scenario has an effect since punishment is larger in the cooperative scenario than in the non-cooperative scenario when controlling for the contribution level punished. However, the treatment effect of voting is not statistically different when comparing the two contribution scenarios.[17]

4 Concluding Remarks

In this paper we analyze the potential change in third-party punishment when punishers are elected democratically rather than being appointed exogenously, that is, opportunistic behavior of elected officials. To this aim, we include elections in a PGG experiment with punishment. Candidates have to propose norm-enforcing policies in a social dilemma under two different conditions. In the first condition, candidates' policies are evaluated by the public via elections, while no evaluation takes place under the second condition.

We find that although people punish even in the absence of elections, the punishment is significantly higher when candidates face an electoral process. Moreover, this increase in punishment is larger for low contribution levels, while there is only a negligible effect on the punishment of highly contributing individuals. In other words, it seems that opportunism of elected officials increases with the deviation from the contribution norm.

On the other hand, we do not find significant differences when we compare the effect of elections on punishment in a more cooperative and a less cooperative group of contributors.Nevertheless, we find an increase in punishment conditioned to the contribution level in the cooperative society (with respect to the non-cooperative one) .

Finally, our experimental findings support political competition models in which parties are assumed to be policy-oriented, since third-parties punish even when they are not facing an election and they cannot obtain monetary gains. In this respect, an increasing number of scholars are recently including this assumption in their models (see Roemer, 2001). A natural continuation for this research would be to experimentally establish the relative importance of these factors (ideology vs opportunism). In this sense, this paper offers a first step to this more ambitious goal.

[17] We have conducted those regressions with the subsamples of the two scenarios separately and we find similar results as when data are pooled.

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5 Appendix. Experimental Instructions (Stage 2. Punishment,Voting Treatment)

Welcome to our experiment.

- This sheet contains the instructions for the experiment.
- You are not allowed to speak with the rest of the participants during the experiment. If you need something, please raise your hand and wait in silence. We will attend to you as soon as possible.
- We are now going to show you the decisions made by participants in a previous experiment.
- The previous task was as follows. Each participant had an initial endowment of 50 tokens. The participants had to decide how many points they were going to keep and how many points they were going to put in a group account. Subjects' payoffs depended on their decisions and also on the decisions made by other members in their own group. The payoffs were the sum of two parts: i) the number of points the subjects decided to keep and ii) the profits obtained from the group account. We will now show you four different examples of how to compute payoffs in groups composed of four subjects.

EXAMPLE 1: Let's assume that we have a group of four subjects. Each subject has 50 tokens. The profits from the group account can be computed as $0.4 \times total$, where *total* represents the sum of the contributions to the group account by all members in a specific group. If the four subjects put 50 tokens in the group account, the final payoffs obtained by each subject will be as follows:

group account	tokens kept	total group account	profit group account	payoff
50	0	200	0.4*200=80	80
50	0	200	0.4*200=80	80
50	0	200	0.4*200=80	80
50	0	200	0.4*200=80	80

In this particular example, every subject makes money exclusively from the group account. As everybody contributes the same amount to the group account, the final payoffs are the same for everyone.

EXAMPLE 2: Imagine we have the same situation as above. The only difference is that one subject puts 50 tokens in the group account and the other three subjects put 0 tokens. The final payoffs obtained by each subject are shown in the table below.

group account	tokens kept	total group account	profit group account	payoff
50	0	50	0.4*50=80	20
0	50	50	0.4*50=80	70
0	50	50	0.4*50=80	70
0	50	50	0.4*50=80	70

In this example, only the first participant contributes to the group account. So, the payoffs of the first subject are different from those of the other three.

EXAMPLE 3: In this case one subject puts 0 tokens in the group account and the other three subjects put 50 tokens. The final payoffs obtained by each subject are shown in the table below.

group account	tokens kept	total group account	profit group account	payoff
0	50	150	0.4*150=60	110
50	0	150	0.4*150=60	60
50	0	150	0.4*150=60	60
50	0	150	0.4*150=60	60

So, as you can see, individuals' payoffs depend on their decision and on the decisions made by other members of their group.

- Your task is as follows: You have 100 points. These points will be converted into euros at a rate of 10 points=1 euro. On your screen you will find the contributions made by each of the 20 members of a group to the group account in one period. You can use all, some or none of your points to reduce the points obtained by the participants in a round of the previous experiment.

- If you decide to deduct points from one of the participants in the previous experiment, for each point you spend, 3 points will be deducted from the points obtained by that participant. That is, if you use 4 points to reduce someone's points, 12 points will be deducted from their total number of points. If you use 8 points to reduce someone's points, 24 points will be deducted from their total number of points. You can use your points to reduce anyone's points. You can reduce points from more than one participant in the previous experiment.

- Only one restriction applies: you cannot spend more than the 100 points you have.

- The final number of points for all participants will be calculated as follows:

  - You will obtain: 100 points − the points you spent.

  - The subject whose points you reduced will get: the points obtained in a period during the previous experiment − 3* the points you have spent in deducting his/her points.

  - The subject whose points you have not reduced will get: the points obtained in a period during the previous experiment .

Second Stage.

- Once you have made your decision, you are going to participate in a different experiment.

- You will be randomly matched with some of the other participants in the room who have done the same task as you. We will show your decision and your partner's decision (anonymously) to a group of people.

- These people are different from the subjects who participated in the previous experiment. These new subjects will vote for the person in the pair who they prefer to do the same task you have done but in a new experiment.

- That is, there is a group of people who are going to participate in a new experiment and they have to decide who is going to be the observer in the experiment they are going to play. The only information they have about you and your partner is your decision regarding how to spend your points. If you win the elections, then you will do the same task you have to do now but with different subjects. For the second task you will have 200 points instead of 100 points.