THE JOY OF RULING

AN EXPERIMENTAL INVESTIGATION ON COLLECTIVE GIVING

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Abstract

We analyse team dictator games with different voting mechanisms in the laboratory. Individuals vote to select a donation for all group members. Standard Bayesian analysis makes the same prediction for all three mechanisms: participants should cast the same vote regardless of the voting mechanism used to determine the common donation level. Our experimental results show that subjects fail to choose the same vote. We show that their behaviour is consistent with a joy of ruling: individuals get an extra utility when they determine the voting outcome.

Keywords: Public goods, voting, joy of winning, altruism, warm-glow, responsibility, experiments.
JEL Code: C72, C9, D02, D44, H41.

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1. Introduction

Charitable giving in the United States accounted for over $373 billion in 2015, which was 2.1% of the gross domestic product.[1] The extent of donations once puzzled economists because generous behaviour was difficult to reconcile with traditional models based on rational selfish behaviour. Hochman and Rogers (1969) and Kolm (1969) addressed this puzzle by considering that charitable giving created a public good. Once the public benefit from charity becomes an argument in individual preferences, the act of giving may be purely rational.

A large body of the literature on charitable giving has focused on individual donors, who select the amount of their endowment to contribute to a public good on their own.[2] This individual approach to charitable giving is applicable in 3 out of 4 charitable gifts in the States, as individuals account for 75% of all charitable giving. However, the remaining 25% ($90 billion) comes from organizations and foundations, among others. In this paper we try to explore how different decision rules within groups or teams of individuals may influence the final donation.

The small amount of experimental literature on team dictator games highlights the intricacies of the interaction within groups. Cason and Mui (1997) find that groups give more than individuals while Luhan et al (2009) find the reverse in a fairly unstructured decision process (face to face communication and a chat mechanism, respectively). In this paper we study how the heterogeneity of the members' social preferences interact within a structured voting process when a variety of decision rules are considered.

In a standard team dictator game n players decide how much of the group endowment nw to contribute to a public good, keeping an equal share of the rest. We reframe this setting to ask groups of n individuals, each endowed with w, to decide on a *common* contribution to a public good. In a sense, our framing is similar to the one used in the political economy literature of taxation, as in Romer (1975) and Roberts (1977) in which the median voter determines the tax rate.[3]

In this paper we consider a variety of social choice mechanisms where group members vote on the common amount they all have to donate, including the extreme case in which the donation is picked randomly (the *super dictatorial*, see below). Our rules span from one favouring selfish participants (the mechanism MIN picks the *smallest* vote), to one favouring more altruistic individuals (the mechanism MAX selects the *largest* vote in the

[1] Data on charity giving are taken from Giving USA 2016 report.

[2] Warr (1982) and Roberts (1984) are precursors of this approach. The provision of a public good through voluntary contributions may generate utility by a joy-of-giving, independent of any concern for the interest of others. In these models, for example Bergstrom et al (1986) and Andreoni (1989, 1990), the motivations underlying individual voluntary donations typically combine pure altruism (linked to the recipients' well-being) and warm-glow (or impure altruism, associated to the joy of donating).

[3] Provided that tax evasion is not allowed. Voting over taxes when tax evasion is a possibility has been recently considered by Traxler (2009)

group). An intermediate rule is the mechanism AVG, in which the donation assigned by the mechanism is the average vote.[4]

One interesting characteristic of all these mechanisms we analyse is that a standard Bayesian[5] analysis shows that they are vote-equivalent: the MIN and MAX mechanisms are dominance solvable and the dominant strategy is the donation they would choose in the super dictatorial mechanism. We find that vote-equivalency is consistently violated in two different lab experiments: votes in MIN mechanisms are smaller than those in the AVG mechanism, which in fact are smaller than the votes in the MAX mechanism. In addition, votes do not depend on the size of the group.

One possible explanation for the violation of the equivalence result comes from a common feature of the MAX and MIN mechanisms: a single player determines collective decisions. In other words, both mechanisms generate single *winners*. A *joy-of-winning*, defined as the extra utility that a player gets from winning the auction or contest, has been shown to explain overbidding in first price auctions (Cooper et al, 2008) and overinvestment in contest games (Dechenaux et al, 2012). In a similar way, we define *joy of ruling* as the extra utility that a group member gets from winning the competition to rule. Any extra utility from becoming the ruler immediately implies that votes in the MIN and MAX mechanisms will differ because members, rather than choosing their dominating voting strategy, will choose lower (higher) votes in the MIN (MAX) mechanism to rule and gain the extra utility.

The rationale for this *joy of ruling* is not far from recent work on the intrinsic value of decision rights. In this branch of the literature, subjects are willing to pay non-negligible amounts of money, beyond its instrumental benefits, to rule over others (Fehr et al, 2013 and Bartling et al, 2014), and to avoid being controlled by other subjects (as in the *control premium* found by Owens et al, 2014). The suboptimal levels of delegation (as in Coats and Rankin, 2016, or Bobadilla et al, 2016) may be related to a willingness to retain (illusory) control on outcomes (as in Sloof and Siemens, 2014).

In our experiments, we elicit the *joy of ruling* by auctioning the right to impose the super dictatorial donation of a subject on all participants in the session. In addition, we elicit

[4] These mechanisms resemble some production functions in team production settings that date back to Hirshleifer (1983): the *weakest link* mechanism, where the team output is given by the minimum effort, the *best shot* mechanism, where the team output is determined by the largest effort, and the *linear* mechanism in which the team output is the average effort. For a comprehensive experimental analysis of the performance of these production functions in team production settings see Croson et al (2015). They find that contributions in the weakest-link are smaller than in the linear and the best shot mechanism. Despite similar qualitative results, there are notable differences between the team production setting and our collective decision mechanism: in the former, "votes" are costly –meaning that group members individually bear the cost of their own effort- and therefore team members obtain different levels of material payoffs whereas in our setting, all players get the same material payoff, e.g. the same combination of private-public good provision but enjoy different utility levels because of the existence of heterogeneous preferences over the provision of the public good.

[5] In a Bayesian framework, each player is characterized by a type –defined by their social preferences - and the beliefs held about the types of other players.

subjects' types -i.e. their donation in a standard dictator game- and carefully control for their beliefs on other subjects' types. Our measure of *joy of ruling* (subjects' bids) significantly predicts the probability that a participant will cast different votes in the MIN and MAX mechanisms. A structural model controlling for the endogeneity of beliefs (in which beliefs are assumed to depend on type) shows that *joy of ruling* is particularly strong in the MAX mechanism. Beliefs increase with type in all mechanisms, confirming the false consensus effect observed in other studies of group behaviour (as in Gächter et al, 2012). Interestingly, the super-dictatorial mechanism shows that we should be careful when designing collective giving institutions. Altruistic individuals feel *responsible for others* (as documented by Charness and Jackson, 2009) and tend to act as benevolent dictators, driving down their dictatorial decisions to concur with the decisions made by others.

The rest of the paper is as follows. Section 2 contains the theoretical analysis. Sections 3 and 4 describe the experimental design and discuss the experimental results. Finally, Section 5 concludes.

2. A Theory of Collective Giving

Consider a group of n individuals deciding on the amount of a public good to produce. Each group member has an endowment w and there is a technology that converts the private good into the public good. In Bergstrom et al (1986)'s standard *Voluntary Provision Paradigm*, each member decides independently which amount of their endowment to devote to the public good. Each member is characterized by a utility function whose arguments are their consumption of the private good x_i and the total amount of the public good $G = \sum_{j=1}^{n} g_j$.[6]

In this paper we focus on provision decisions made at the group level, rather than by the independent decisions of the members. There are many ways to aggregate individual preferences into a social preference for the public good. Consider a family of mechanisms in which each member sends unilaterally a message $\hat{\theta}$ about their type θ and the mechanism assigns, given the message profile $\{\hat{\theta}_1, \dots, \hat{\theta}_n\}$ the same contribution level for all members. A natural way of conceiving the type of a player is to think of it as the amount of the endowment that they would contribute to the public good if they decided on their gift voluntarily and independently (e.g. under the *Voluntary Provision Paradigm*). A type $\theta = 0$ would correspond to a selfish player and a type $\theta = w$ would correspond to a fully altruistic player.

[6] Andreoni (1989, 1990) extends the framework by assuming that the gift to the public good also enters in the utility function. None of the conclusions we arrive at in this paper depends on the existence of this warm-glow associated to giving. To keep things simple, we stick to the standard analysis in Bergstrom et al (1986).

An example of a mechanism within this family consists of randomly picking one element of the message profile. For this *super dictatorial* mechanism, each player will find optimal to send the message g_i^{SD} which solves the following super dictatorial decision problem:[7]

$$\begin{array}{ll} Max_{\{g_i\}} & U_i(x_i, G) \\ & \left.\begin{array}{l} x_i + g_i = w \\ G = ng_i \\ 0 \leq g_i \leq w \end{array}\right\} \end{array} \quad s.t. \tag{1}$$

The "super dictatorial" contribution level g_i^{SD} is related to the *Reciprocity Principle* in Sugden (1984), which would explain positive contributions to public goods. Accordingly, if a player could choose a single level of contribution for all the group members, this is the level the player would choose. Other examples of mechanisms within this family are those that select (i) the smallest message -*MIN Mechanism*-, (ii) the largest message -*MAX mechanism*- and (iii) the mean message -*AVG mechanism*-.

The implementation of different mechanisms opens the door to different research questions. In this paper we do not analyse the process by which a group agrees to use a particular aggregating mechanism, as mechanisms are exogenously imposed. We do not study the participation constraint either (e.g. whether some members will abstain from participating in the group mechanism). Although these questions are interesting and deserve future attention, we focus on analysing the incentives that the different mechanisms give to the group members to strategically manipulate the mechanism in their favour.

Beyond the exploration of different statistics determining the group donation, these mechanisms have interesting features. While in the AVG mechanism, the common contribution level is jointly determined by all group members, in the MIN and MAX mechanisms, the common contribution is decided by a single player. Moreover, intuition suggests that the MIN mechanism favours selfish types while altruistic types would be favoured in the MAX mechanism as they may impose their preferred donation on the rest of the group. A more rigorous analysis of the games defined by the mechanisms reveals a surprise that violates this intuition. In the Bayesian games defined by the MAX and the MIN mechanisms, reporting the super dictatorial type g^{SD} is a weakly dominant strategy. This is the content of Theorem 1.

Theorem 1. *In the Bayesian games defined by the MAX and MIN mechanisms, the super dictatorial decision g^{SD} is a (weakly) dominant strategy.*
Proof. See Appendix A

[7] Note that for the super dictatorial mechanism, there is no strategic interaction among players, because the procedure by which a message is chosen is independent from the messages that others send to the mechanism. This is why the optimal message is the solution to the unipersonal decision problem in (1). The super dictatorial decision g_i^{SD} exists as long as the utility function complies with the standard quasi-concavity assumption.

The intuition behind Theorem 1 is straightforward. The highest utility a player can get in a setting where all group members end up contributing the same amount to the public good is by definition the utility level attached to their super dictatorial donation level. By selecting their super dictatorial donation in the MAX and MIN mechanisms a player still stands a chance of achieving their highest utility if the mechanism selects it. If not selected because it is not the highest (smallest) message, then any alternative message would be either neutral –if it does not affect the mechanism choice- or detrimental to her if it affects it –because that would imply pushing further in the wrong direction, e.g. selecting a too high (low) message.

The relationship between the super dictatorial decision g^{SD} and the player's true type θ_i reveals an interesting issue. The constraints in (1) can be collapsed into the following *budget* constraint: $x_i + \frac{1}{n}G = w$, where the "price" of the public good G is the inverse of the group size n. Hence, only if player i thinks of the private and the public as independent goods, the super dictatorial contribution g_i^{SD} will coincide with player i's type, both MAX and MIN mechanisms become incentive compatible and the truthful revelation of a player's type is a dominant strategy.[8]

Lemma 1. *Truthful revelation of types is a dominant strategy in the MAX and the MIN mechanisms if the private and public goods are independent*

We next describe some properties of the AVG mechanism –although a complete Bayesian analysis of the AVG mechanism is beyond the scope of this paper. While the AVG mechanism is not dominance solvable, it holds some resemblance to the standard voluntary provision paradigm analysed in Bergstrom et al (1986). Assume that players' types are common knowledge and focus on the Nash equilibrium $\{g_1^*, \ldots, g_2^*\}$ of the AVG mechanism. The maximization problem that governs player *i's* optimal response can be rewritten as follows

$$\left.\begin{aligned} Max_{\{x_i,G\}} \quad & U_i(x_i, G) \\ s.t. \quad & x_i + \frac{1}{n}G = w \\ & G \geq G_{-i} \end{aligned}\right\} \qquad (2)$$

This formulation has two differences with respect to the Voluntary Contribution Paradigm. First, the individual is not endowed with the "social income" $w + G_{-i}$ but with his own income w. Second, the price of the public good is again the inverse of the

[8] Player i will under-report (over-report) their type if the private and the public goods are complementary (substitute).

population size, and therefore group size affects player i's decision depending on whether the private and the public goods are independent or not.[9]

Finally, for any symmetric profile of types the three mechanisms share the same equilibrium (compare (2) to (1) and note that the restriction $G \geq G_{-i}$ in (2) is not binding by symmetry). As an example, consider the case of n identical members with Cobb-Douglas utility functions (note that for a Cobb-Douglas function, the cross-price elasticity is zero and Lemma 1 applies).

Coob-Douglas Case. *Suppose a group of n individuals with identical preferences* $u_i(x_i, G) = \alpha ln x_i + (1-\alpha) ln G$ *in the AVG mechanism. Let* $\hat{\theta}_i$ *denote the message that player i sends. Let the Nash equilibrium of the mechanism be* $(\hat{\theta}_1^*, \ldots, \hat{\theta}_n^*)$. *The equilibrium message of player i is the solution to the following maximization problem (we intentionally restrict the example to equality constraints)*

$$Max_{\{\hat{\theta}_i\}}\, \alpha ln\left(w - \frac{\hat{\theta}_i + \sum_{j\neq i}\hat{\theta}_j^*}{n}\right) + (1-\alpha) ln\left(\hat{\theta}_i + \sum\nolimits_{j\neq i}\hat{\theta}_j^*\right)$$

The first order condition is $\frac{-\alpha}{nw-\left(\hat{\theta}_i+\sum_{j\neq i}\hat{\theta}_j^*\right)} + \frac{1-\alpha}{\hat{\theta}_i+\sum_{j\neq i}\hat{\theta}_j^*} = 0$. *Solving for* $\hat{\theta}_i$ *we obtain the optimal response of player i* $\hat{\theta}_i = n(1-\alpha)w - \sum_{j\neq i}\hat{\theta}_j^*$.*For the symmetric equilibrium,* $\hat{\theta}_i^* = \hat{\theta}_j^* = \hat{\theta}^*$ *for* $, j = 1, \ldots, n\ i \neq j$, *we get the equilibrium message* $\hat{\theta}^* = (1-\alpha)w$, *which is precisely the true type, e.g. the amount that a Cobb-Douglas player would donate in a public good game. Hence, the (Nash) equilibrium is independent of the group size n and equal to the dominant strategy in the MAX and the MIN mechanisms.*

Now that we have analysed the different mechanism from a theoretical angle, we describe in detail the laboratory experiments we used to investigate collective giving under the three mechanisms. Because the equivalence among the three mechanisms in terms of the equilibrium structure only hold for a symmetric profile of preferences (e.g. types) and we know from lab experiments that experimental subjects' heterogeneity is the norm, in our empirical exercise we will be mostly concerned with the equivalence between the MAX and the MIN mechanisms (which is actually based on dominance arguments –a weaker notion than equilibrium-, and refer to it as the *Equivalence Theorem*. However, we will also include in our exercise the analysis of the behaviour AVG mechanism to check whether the more demanding version of the equivalence is observed in the lab.

3. A double experimental test

In the previous section, we have used standard terminology from the literature in Bayesian mechanisms. In the experimental implementation we did not ask subjects to send messages about their type (e.g. to report their types) but to cast votes. In the remainder of

[9] This is in sharp contrast to the results in the voluntary provision game. As the group grows in size, the equilibrium gift tends to zero under pure altruism, whereas zero convergence is not obtained under pure warm glow (and no altruism, see Ribar and Wilhelm, 2002).

the paper, we will refer to voting behaviour and votes in the different mechanisms rather than type reporting and reported type or messages. Only when referring to subjects' donations in a Standard dictator game will we refer to their decisions as the subject's type. We will come back to this notation issue later.

3.1. Experimental Design

In our first experiment, Experiment I, we test the *Equivalence Theorem* using a 3x3 factorial design: three group sizes (1, 3 and 10) and three mechanisms (AVG, MIN and MAX). Table 1 provides a summary of the design, including the order in which the three mechanisms were played. This design allows a within-subject test of the *Equivalence Theorem* (as all subjects went through the three mechanisms in three stages) and a between-subject analysis of any group size effect (as group size was never altered across the three stages of the game). Groups of size 1 serve as a control treatment.

Table 1. Experimental design - Experiment I

		Group size		
		Dictator N=1	Small N=3	Large N=10
Stage	Mechanism			
1	AVG	AVG-1	AVG-3	AVG-10
	↓	↓	↓	↓
2	MIN	MIN-1	MIN-3	MIN-10
	↓	↓	↓	↓
3	MAX	MAX-1	MAX-3	MAX-10

Participants in Experiment I were informed of the order in which the mechanisms were to be played. They were also told that they were to be allocated to groups of variable size (with a minimum of 1 and a maximum of 10).[10] Participants made a single decision per stage without feedback, so their decisions are independent. At the end of the experiment, participants were informed about their payoffs and group decisions. The group size was kept fixed for every subject across periods to allow for a within subjects analysis.[11] As the group size was announced at the beginning of each stage, subjects were not aware of their group size in subsequent stages when making a decision in a given stage.

The experiment was run in a standard and fully anonymous and private environment, and all participants faced the three mechanisms in the same order: AVG, MIN and MAX.[12] Even when order effects cannot be fully ruled out, we are quite confident that two voluntary omissions helped to alleviate the concern: subjects received no feedback at the end of each stage and the lack of any emphasis on the particular sequence chosen (see the

[10] As the number of subjects attending every session was not a round number, the perception that subjects were participating in different group sizes was toughened, and credible.

[11] Participants only knew their group size when entering the first stage. Subjects were also informed that different group sizes were predefined from a natural base (n=1) to an arbitrary and reasonable ceiling (n=10).

[12] This implies that dictators (n=1) made three decisions under three equivalent rules. The reason for that was to get a baseline to compare.

instructions for details). We also asked subjects to predict the outcome of each mechanism without the inclusion of their own reported type.[13]

The experiment was framed as a real donation decision, as a real charity would benefit from the group decision generated by a voting mechanism (see the instructions for details). For each mechanism, subjects were individually endowed with 10€, and their vote referred to how many Euros, out of their endowment, they voted to allocate to the recipient. Hence, in the overall experiment, each subject was endowed with 30€. Three additional Euros were awarded for every correct prediction.[14]

3.2 Experimental procedures

The computerized experiment was conducted at the experimental laboratory LINEEX in 2007, using the z-tree software (Fischbacher, 2007). Experiments lasted for around 60 minutes and the average payoff was 24.71€. Participants were undergraduate students, mainly enrolled in different Business and Economics degrees at the University of Valencia, and had no previous experience in distribution or bargaining games. The total number of subjects was 96, distributed in 14 groups of size 1, 14 groups of size 3 and 4 groups of size 10. For every mechanism, we have 14 independent observations (votes) when the group size is 1, 42 when the group size is 3 and 40 when the group size is 10.[15] Instructions were read aloud before the experiment began. After the instructions were read and before the game started, subjects completed a simple questionnaire to assure they had understood the simple logic of the game.[16]

The game was conducted using the double blind procedure as in Hoffman et al. (1994), in which neither the experimenter nor anyone else except the individual could have known the individual decisions. We replaced the collective anonymity of the recipient by a reputable Spanish charity,[17] following Eckel and Grossman (1996). This provides variance in the voting behaviour that would help us have an extensive dataset. At the end of the experiment, subjects were informed about group outcomes, the predictive success of their predictions, and their earnings. Donations were made in real time using a video projector and the NGO webpage. Each participant received their individual earnings in a sealed envelope with a computer code while seated in their fully private, individual cubicles.

[13] They had to predict the average reported type of the other participants in their group in the AVG mechanism, the smallest reported type of the other participants in their group in the MIN mechanism and the largest reported type of the other participants in their group in the MAX mechanism.

[14] Note that this prediction exercise is insubstantial for n=1. They were however requested to predict their own vote to make procedures and payoffs homogeneous.

[15] Recall that no information feedback was provided until the end of the experiment; as was explained in the previous subsection.

[16] A translated version of the questionnaire is also available upon request from the authors. 91 out of 96 subjects passed the quiz on the first attempt. The remaining five did it in the second attempt with no additional explanations.

[17] *SOS Ayuda en Acción* is a Spanish charity that takes care of homeless children all over the world. It goes without saying that subjects did not know about the individual identity of the recipients.

3.3 Experimental results

Table 2 below displays the mean vote across mechanisms and group sizes. For the dictator game (group size=1), Wilcoxon signed ranked tests at the individual level show, not surprisingly, that there are no significant differences across the three mechanisms (p=0.8655 for the difference between AVG and MIN, p=0.7925 for the comparison between AVG and MAX and p=0.8124 for the difference between MIN and MAX), with an average vote of 16% of the endowment.[18]

Table 2. Mean vote in Experiment I

Mechanism		Dictator Game	Groups Small	Groups Large	Groups Merged Sample
	AVG	1.57	1.95	2.15	2.05
	↓	(2.27)	(2.44)	(2.83)	(2.63)
	MIN	1.64	1.29	1.70	1.49
	↓	(2.37)	(1.77)	(2.54)	(2.17)
	MAX	1.64	2.98	2.85	2.91
		(2.23)	(3.38)	(2.83)	(3.11)
Number of independent observations		42	126	120	246

(Std. Dev. in brackets)

The natural test of the Equivalence Theorem is the comparison of (mean) votes across the MIN and the MAX mechanisms for a given group size larger than 1. The same non-parametric test (Wilcoxon signed rank) shows that the vote is significantly lower in MIN than in MAX (p=0.0051 for the small group of three and p=0.0002 for the large group of ten members). This comparison generates our first result:

Result 1. *The Equivalence Theorem does not hold. For every group size, votes are significantly larger in the MAX mechanism than in the MIN mechanism*

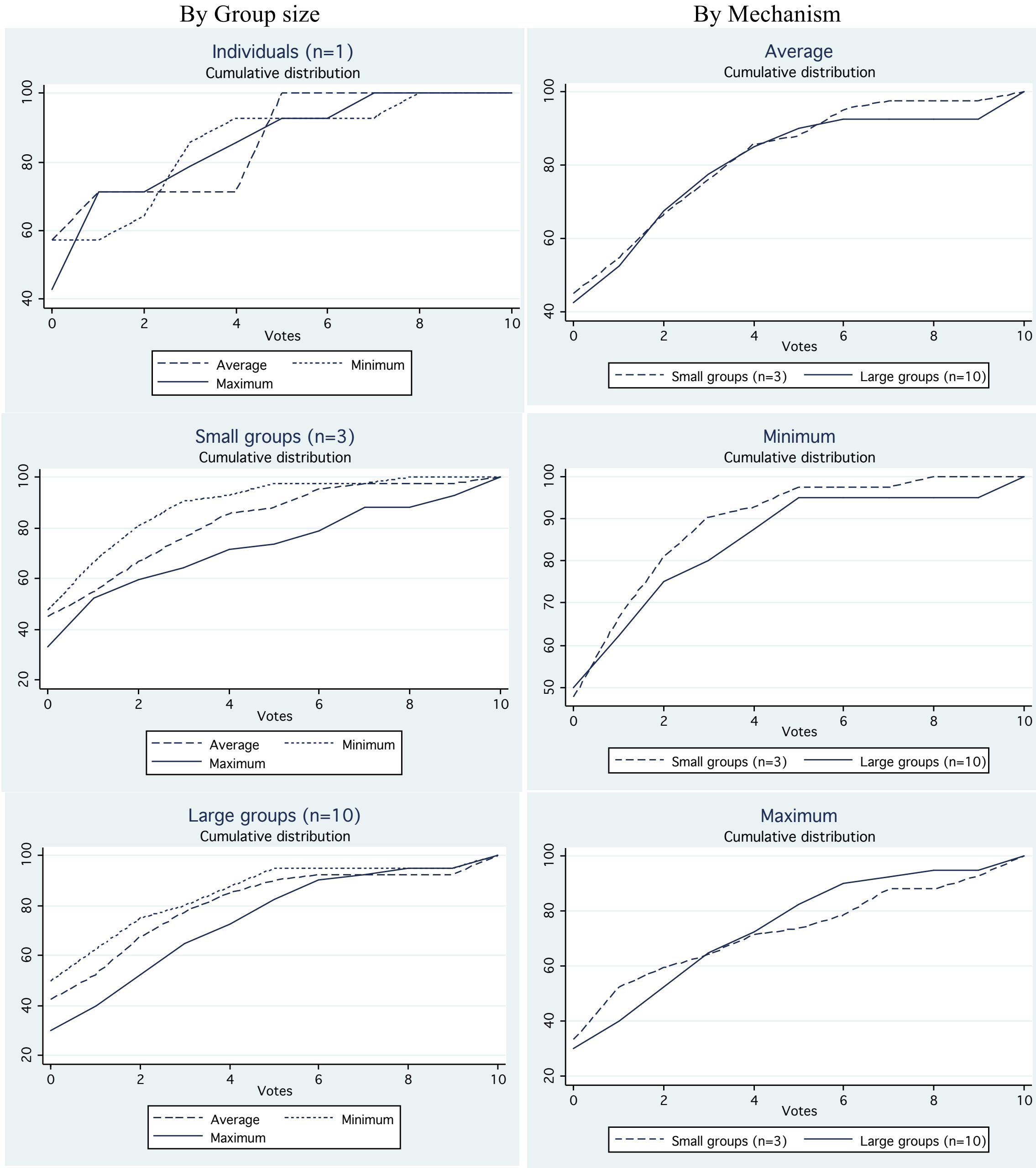
Beyond the comparison of means, the distribution of votes is ordered in the sequence MIN-AVG-MAX for each group size. The left panel in Figure 1 shows that for small groups, the distribution of votes in MAX first-order stochastically dominates the distribution in AVG, which in turn dominates the distribution in the MIN mechanism. For large groups of ten participants, a similar picture emerges except for very high votes (7 and above).

A quite different result emerges when analysing the interaction between voting behaviour and group size, for each mechanism. Mann-Whitney tests at the individual level show that for every mechanism, votes are not significantly different across group sizes (p=0.8725, 0.7929 and 0.8500 for AVG, MIN and MAX respectively). This result is consistent with Chavanne et al (2011), when reporting similar donation levels in dictator games with rebates for different group sizes. The result would also be consistent with the theoretical framework introduced in section 2 if participants perceived private and public

[18] Our charity effect is not as strong as observed by Eckel and Grossman (1996), whose percentage of donations went up to 30%, although it is slightly larger than that observed by Hoffman et al (1994) which maintained the recipient's anonymity (9%).

goods as independent. The right panel of Figure 1 strongly confirms this result comparing vote distributions across group sizes. The analysis of these interactions produces Result 2:

Figure 1. Cumulative distribution of votes in Experiment I



Result 2. *No significant differences between group sizes are observed in voting behaviour for the investigated mechanisms, consistent with private and public goods being independent.*

Pooling the experimental data for groups of size 3 and 10 (as displayed in the last column in Table 2), is useful to summarize the main findings from Experiment I: the mean vote in MAX (2.91) is almost *twice* as large as the average reported type in MIN (1.49), and this difference is strongly significant (Wilcoxon test, p<0.0001).

We pose the question as to whether the violation of the Equivalence Theorem was predicted by participants. The answer is a clear 'Yes'. Average predictions are again ordered in the sequence MIN-AVG-MAX (0.88, 2.43 and 4.06, respectively), and all three pair-wise comparisons are statistically significant at the 1% level (Wilcoxon test, p-value<.0001).[19]

4. Experiment II: The joy of ruling

Experiment I yields two somewhat contradictory results. The absence of a group size effect is consistent with a truthful revelation of types, in line with the dominant strategy described in section 2 for MAX and MIN. On the other hand, the mean vote is significantly higher in the MAX than in the MIN. We explore this contradiction in a second experiment, borrowing some ideas from the behavioural analysis of auctions and contests.

In both MAX and MIN, the outcome is determined by a single player, e.g. by the *winner* of the auction-type mechanism. In the auction literature the so-called *joy-of-winning* has been used to explain overbidding in first price auctions (see for example, Cooper et al, 2008). The *joy-of-winning* is defined as the extra utility that a player gets from winning the auction. A similar concept is used in contest theory to explain the overinvestment observed in the lab (see Dechenaux et al, 2012). In our setting we define the *joy of ruling* as the extra utility that a team member gets from their donation being selected by the mechanism and imposed on all the team members. *Joy of ruling* may take our participants away from the standard equilibrium behaviour. Proposition 1 formally states this intuition in a very simple way:

Proposition 1. *If a player enjoys a joy of ruling, then their vote in the MAX (MIN) mechanism will be larger (smaller) than their dominant strategy if they hold positive beliefs around the dominant strategy.*
Proof. See Appendix A

We next describe Experiment II, conceived as a test of the *joy of ruling* hypothesis, as described in Proposition 1.

4.1 Experimental design and procedures

Relative to Experiment I, in the second experiment we specifically address three issues: we elicit player's types using a standard dictator game (DG), their beliefs on the distribution of types, and the intensity of *joy of ruling*, auctioning the right to make one

[19] The average success rate is 25.20%, with the highest score in the MIN mechanism (52.44%) and the lowest in the MAX mechanism (8.54%).

decision for a very large group. Experiment II is divided into two blocks and participants were aware of this fact from the very beginning of the experiment. They received detailed instructions about the decisions in each block only at the beginning of each one. Table 3 provides a summary of the design.

Table 3. Experimental Design - Experiment II

First block (Six decisions)	Second block (Two predictions)
Stage 1: Types	
D1: Standard Dictator Game (DG)	**Q1**: Percentage of zero donations in D1 **Q2**: Average positive donation in D1
Stage 2: Voting	
D2, **D3** and **D4**: Three donation mechanisms (i) AVG → MIN → MAX (ii) MAX → AVG → MIN (iii) MIN → MAX → AVG	
Stage 3: Joy of ruling	
D5: Choosing a common donation (SD) **D6**: Bidding for imposing a common decision (Bid)	

Participants faced 8 different tasks in total: six decisions in block 1 and two predictions in block 2. They first participated in a standard Dictator game (decision D1, DG), and we used this decision to learn about their individual type. Participants then made three consecutive decisions (D2, D3 and D4), closely replicating Experiment I, and were randomly assigned to one of three different sequences (AVG-MIN-MAX, MAX-AVG-MIN, MIN-MAX-AVG). Given the results of Experiment I, we kept the group size constant and assigned all participants to groups of 3 members.

Anticipating the violation of the Equivalence Theorem, participants were asked to select a donation level for all participants (including themselves) in the session (decision D5; one decision would be selected at random and implemented). As Experiment II consisted of one session with 45 subjects, the group size is much larger than those used in Experiment I (3 and 10). The comparison of D1 and D5 in Experiment II is a strong test of any group size effect.

In the last decision (D6, BID), individuals participated in a second price auction. They could bid to impose their D5 decision (*super dictators*, SD) on all other participants. The highest bidder earned their endowment minus the second largest bid, and other participants earned the endowment minus the donation chosen by the highest bidder in D5. As truthful revelation is expected –note that it is a second price auction-, D6 measures the intensity of the *joy of ruling* when participants may impose their decision on a large group.

Finally, and consistent with the Bayesian environment in which the experiment is framed, subjects made incentivized predictions about other participants' types (e.g. about their D1 choices). For the sake of simplicity, the predictive exercise consisted of two parts: (i) the percentage of zero donations, and (ii) the average of all positive donations. Since gathering individual beliefs about the distribution of types in the population was too ambitious, we opted to elicit two main fields: the fraction of selfish players in the population (Q1) and the average type of non-selfish players (Q2). We can compute the expected donation level $Q = (1 - Q1) \times Q2$ from them.

As in Experiment I, subjects did not receive any information feedback until the very end of the experiment, so decisions are independent. Subjects were paid for one randomly selected decision from the first block and for the accuracy of their predictions using a simple and linear scoring rule. [20]

The double blind procedures were identical to those used in Experiment I. The computerized experiment was conducted in the same laboratory, LINEEX, in 2013, using the same z-tree software (Fischbacher, 2007) in only one session. It lasted slightly less than 60 minutes and the average payoff was €13.88. All 45 participants were undergraduate students, most of them from Business and Economics degrees at the University of Valencia, with no prior experience in similar experiments. Instructions were read aloud before the experiment started, and subjects completed a quiz to maximize the understanding of the instructions. As in Experiment I, donations were made to the same reputable public Spanish charity.

4.2 Experimental results

Table 4 displays the aggregate results for the six decisions made in the first block. The average donation in the Standard Dictator Game (D1) is 37.8% of the endowment, much larger than the mean donation in Experiment I but more in accordance with the charity effect observed by Eckel and Grossman (1996), whose percentage of donations went up to 30%.[21]

Table 4. Descriptive statistics from Block I in Experiment II

	Stage					
	Type D1	Voting D2-D3-D4			Joy of Ruling D5-D6	
	DG	MIN	AVG	MAX	SD	BID
Group size	*1*	*3*	*3*	*3*	*45*	*45*
Average	3.78	2.95	3.02	3.55	3.26	4.53
	(2.59)	(2.23)	(2.34)	(2.64)	(1.89)	(2.59)
# observations	45	45	45	45	45	45

(Std. Dev. in brackets)

[20] A correct prediction was rewarded with €2.50, and one euro was deducted for every ten percentage points/€1 difference in Q1 and Q2, respectively.

[21] We do not have a good rationale for this difference. Note that the two experiments have very different structures and subjects made the same decision in very different framings. While participants in the individual condition of Experiment I obtained their earnings almost exclusively from their individual decisions, participants in Experiment II knew their first decision would be used to compute their final earnings with only a relatively small probability.

We first investigate the *Equivalence Theorem* and the existence of any group size effect. As in Experiment I, standard Wilcoxon signed-ranked tests at the individual level reveal that the mean vote is significantly larger in the MAX mechanism (3.55) than in the MIN mechanism (2.95) (p=0.0396), although the difference between the mean votes in the MIN and the AVG mechanisms is not statistically significant (Wilcoxon signed-ranked test, p=0.2191). Votes increase in the sequence of mechanisms MIN-AVG-MAX, as in Experiment I, and we summarize this in Result 3:

Result 3. *As in Experiment I, the Equivalence Theorem is violated in Experiment II.*

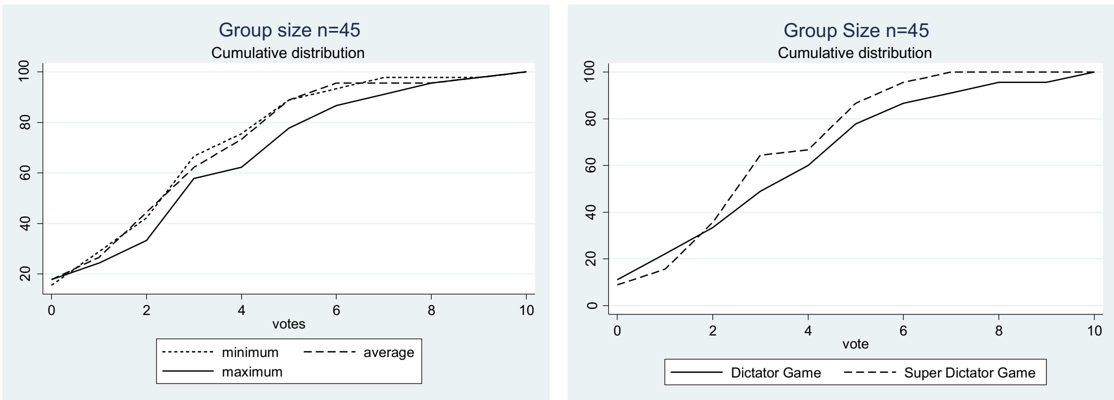
In the *super-dictator* decision SD (D5), subjects had to select a donation for all participants in the experiment. As the average decision (3.26) is not statistically different from D1 (the standard dictator game, Wilcoxon test, p=0.2045) we conclude that even with a very large group of 45 individuals there is no group size effect:

Result 4. *As in Experiment I, there is no group size effect in Experiment II.*

Figure 2 below displays the cumulative distribution of votes in Experiment II and confirms Results 3 and 4.

Figure 2. Cumulative distribution of votes in Experiment II

Across Mechanisms | Dictator vs Super dictator



Results 3 and 4 replicate the main findings in Experiment I. Our within subject design is useful to compare individual decisions. Table 5 compares votes in the MAX and MIN mechanisms in both experiments, and classifies them in three groups following the Equivalence Theorem.

Table 5. An analysis of the Equivalence Theorem at the Individual Level

Experiment	Group size	#	MAX>MIN	MAX=MIN	MAX<MIN
I	10	40	18 (45.0%)	21 (52.5%)	1 (2.5%)
	3	42	17 (40.5%)	19 (45.2%)	6 (14.3%)
II	3	45	18 (40.0%)	19 (42.2%)	8 (17.8%)

(Percentages over the number of observations in brackets)

For small groups of 3 participants, 45.2% of subjects cast identical votes in both mechanisms in Experiment I, and 42.2% in Experiment II. Results are remarkably similar. In both experiments, substantially more participants cast a larger vote in the MAX than in the MIN mechanism: 40.5% versus 14.3% in Experiment I, and 40% versus 17.8% in Experiment II, again supporting the violation of the Equivalence Theorem.

Result 5. *The Equivalence Theorem does not hold for more than half of the subjects in Experiments I and II*

Decision 6 captures the intensity of the joy of ruling, as it measures how much participants are willing to pay to impose their dictatorial decision (D5) on all other participants in the session (*rule* over them). If the *joy of ruling* experienced by subjects is linked to the violation of the Equivalence Theorem, bids in D6 should be positively associated with this violation. We define a dummy variable that takes the value of 1 if the experimental subjects make the same choice in the MAX and MIN (complying with the Equivalence Theorem) otherwise the value is 0. As independent variables, we use the player's type (D1), and their *joy of ruling* intensity (D6). Table 6 displays the marginal effects for the covariates, computed at the means.

Table 6. Probability of compliance with the Equivalence Theorem

Variable	Marginal Effect
Type (D1)	0.0325
	(0.0350)
Joy of ruling (D6)	-0.0922***
	(0.0338)
Log likelihood	-26.667
Number of observations	45

(Std Dev. in parenthesis) *** 1% level, marginal effects after probit regressions

The estimates are in line with our prediction. The probability of compliance does not depend on the player's type. In other words, selfishness does not imply a higher probability of violating the Equivalence Theorem. Joy of ruling has a highly significant and negative marginal effect; individuals bidding high to impose their decision on others comply significantly less with the Equivalence Theorem. The magnitude of the effect is substantial, as for each additional Euro a participant bids, the probability of violating the Equivalence Theorem increases by nearly 10%.

We now investigate voting behaviour in the MIN and MAX mechanisms. The Bayesian model predicts that voting positively depends on types, the beliefs about others' votes, and joy of ruling (e.g. in the MIN condition, higher expected minimums and stronger joy of ruling increase the incentives to vote low). Given that in a Bayesian framework a player's belief is typically assumed to depend on their type, we estimate a structural model with two equations: one for voting behaviour as explained above, and the other for beliefs.

Table 7 contains the estimation of this structural model using maximum likelihood, controlling for the order in which the mechanisms were played and some demographics.[22]

As eliciting the probability distribution of the minimum (maximum) vote in the MIN (MAX) mechanism was procedurally demanding and complex, we use Q1 (Q2) as a proxy of the relevant beliefs in the MIN (MAX) mechanism. A higher proportion of selfish players (Q1) is naturally associated with a higher probability of facing a low minimum vote in your group. Similarly, a higher expected donation of non-selfish players comes associated with a large probability of getting a high vote in your group. In the AVG mechanism we use Q the expected donation in the Dictator Game.[23]

Table 7. Individual determinants of voting behaviour in Experiment II

Maximum likelihood		Mechanism	
Structural	MIN	AVG	MAX
Dep Variable: Vote			
Type (D1)	0.4049**	0.3069**	0.2794*
	(0.159)	(0.120)	(0.162)
Beliefs (Q1/Q/Q2)	0.0018	0.3899**	0.5903*
	(0.013)	(0.159)	(0.315)
Joy of ruling (D6)	0.1600	0.2839***	0.2560**
	(0.118)	(0.081)	(0.109)
Dep Variable: Beliefs			
Type (D1)	-4.8470***	0.3958***	0.3293***
	(1.641)	(0.111)	(0.095)
Controls	Yes	Yes	Yes
Observations	45	45	45
Log pseudo likelihood	-724.397	-588.990	-595.929
Coefficient of determination	0.636	0.730	0.656

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

We first analyse the belief equation. Type is strongly significant in all mechanisms: the more altruistic a player is, the more altruistic they believe others are. The sign in the MIN mechanism is negative because beliefs refer to the expected proportion of selfish players (while they refer to non-selfish behaviour in the other two cases).

We now focus on the voting equation. While in all three mechanisms, type is again positive and significant, as predicted by the Bayesian model, only in MAX and AVG *joy of ruling* (D6) and beliefs play a positive and significant effect on voting. The vast violation of the Equivalence Theorem is consistent with the presence of joy of ruling in

[22] Control variables are Order, Female, Age, Economics and Trust (see the coefficients of these control variables in Table 1A in the appendix).

[23] The econometric results in Table 7 are robust to different specifications. If we use the expected donation Q the results hold with very minor changes (Type (D1) for the MAX mechanism is less marginally significant). As adding a quadratic term of Type does not improve the models' goodness of fit (and the quadratic term is insignificant in all cases but the MAX mechanism), we report the simpler model in Table 7, and include it in the analysis of the super dictatorial decision D5 in Table 8 (see the discussion below).

the MAX mechanism. We summarize these findings in our Result 6:

Result 6. *We find evidence of joy of ruling in the AVG and MAX mechanisms, but not in the MIN mechanism.*

We do not have a good explanation as to why voting behaviour in the MIN does not depend on the joy of ruling. Imposing decisions may be less appealing when "allocating peanuts" or when it reveals mean decisions to others. Interestingly, the joy of ruling plays a significant role in the AVG mechanism, when there is no capacity to rule on the decisions of others, consistently with preference conformism (e.g. behaving as the others do; Fatas et al 2017 documents well this phenomenon).

We finally investigate the determinants of the super dictatorial decision (D5), and the joy of ruling (D6). Following the Bayesian framework, we estimate a structural model with the super dictatorial decision, the joy of ruling and the belief equations. Table 8 contains the maximum likelihood estimation of this model (with the same controls as those used in Table 7).

Table 8. Individual determinants of behaviour in Experiment II

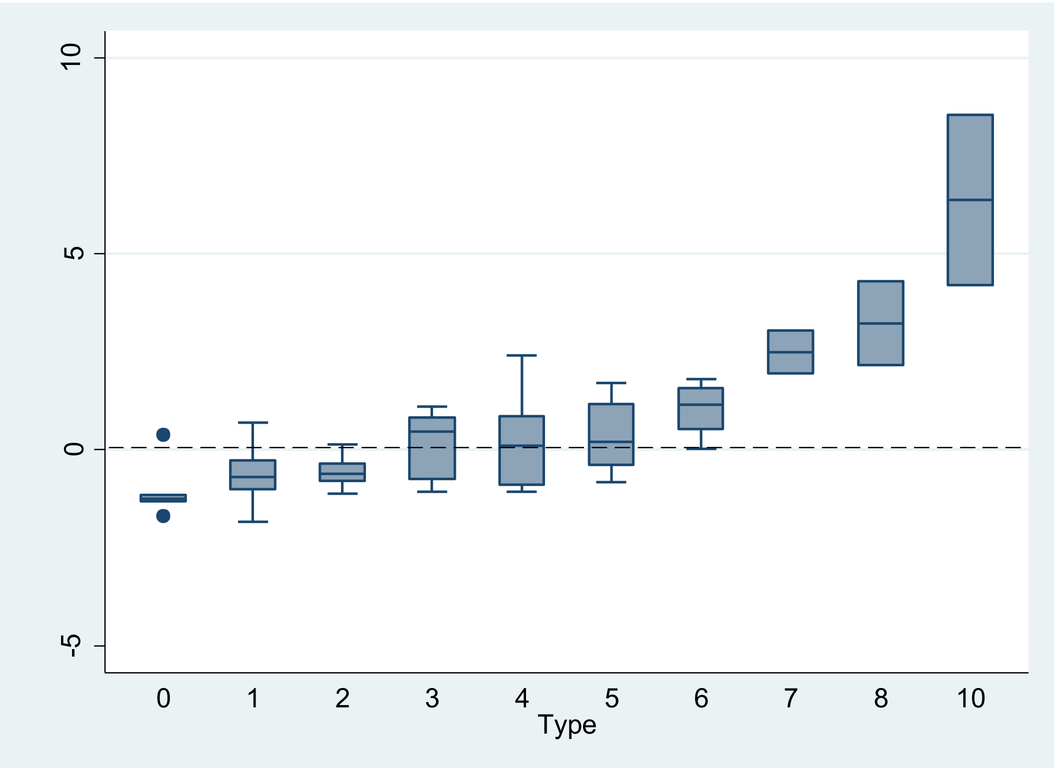
Maximum likelihood Structural		
Dep Variable: Super dictatorial decision (D5)		
	Type (D1)	0.6012*** (0.211)
	Type Squared ($D1^2$)	-0.0458** (0.022)
	Beliefs (Q)	0.4659* (0.262)
	Joy of ruling (D6)	0.1439 (0.248)
Dep Variable: Beliefs		
	Type (D1)	0.3958*** (0.111)
Dep Variable: Joy of ruling (D6)		
	Type (D1)	-0.090 (0.276)
	Beliefs (Q)	0.9690 (0.796)
	Super dictatorial decision (D5)	-0.0170 (1.060)
Controls		Yes
Observations		45
Log pseudo likelihood		-726.6803
Coefficient of Determination		0.719

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Consistent with our model, the super dictatorial decision (D5) depends positively on subjects' types (D1), but not on their joy of ruling (D6), as its coefficient is not significantly different from zero. This result is consistent with the idea that their decision as *super dictators* (D5) does not depend on how much participants are willing to pay to impose that decision on others (D6). Their super dictatorial decision does positively depend on their beliefs: the less selfish they believe other participants are, the larger the imposed contribution; choosing differently when deciding for the whole group, possibly because they feel responsible for others (as in Cason and Mui, 1997, Masclet et al, 2009 and Charness and Jackson, 2009).

As suggested by the negative and significant coefficient of the quadratic type variable, the super dictatorial decision does not depend linearly on the subject's own type. Figure 3 displays the estimated adjustment when imposing a contribution level on others (defined as the difference between the own type, decision D1, and the estimated super dictatorial decision from the super dictatorial equation).[24] More altruistic subjects (those with large donations in D1) act as benevolent dictators and downwardly adjust their super-dictatorial decision.

Figure 3. Estimated adjustment in the super dictatorial decision (D5)



The last estimate shown at the bottom of Table 8 strongly suggests that the intensity of joy of ruling is not driven by participants' types, beliefs or super-dictatorial decisions. We summarise this analysis in our last result:

[24] Figure 3 is a standard whisker and box graph. The box contains the 25%-75% quartiles, the bar corresponds to the median, and whiskers include the adjacent values in each condition.

Result 7. *Super-dictatorial decisions depend on participants' beliefs, consistent with a sense of responsibility when deciding for others.*

5. Conclusions

Donation decisions are many times made by groups. In this paper, we model collective giving mechanisms that aggregate *individual* preferences for donations into a *social* preference for the public good. Players reveal how much they wish to donate (*individual votes*), and the mechanism imposes a common donation level to all members (a *collective giving*).

We investigate the performance of three mechanisms: AVG, MAX and MIN, in which the imposed donation on all members is the average, the largest, and the smallest vote, respectively. Standard theories of both pure and impure altruism predict the same votes in the MAX and the MIN mechanisms, because both mechanisms share the same dominant voting strategy. We find however that this prediction is violated in the lab: subjects cast larger votes in the MAX than in the MIN mechanism (with votes in the AVG mechanisms being in between).

We propose an explanation based on the concept of joy of ruling, defined as the extra utility that a player gets from winning the contest to rule and impose their donation on the remaining members. A similar concept of joy of winning has been well documented in the auction (Cooper and Fang, 2008) and conflict (Sheremeta et al, 2012) literature to account for deviations from equilibrium predictions. A joy of ruling makes players in the MIN (MAX) mechanism cast a vote below (above) the dominant one because it increases their chances of winning the right to rule. This "extra" vote implies a break of the equivalence theorem.

When subjects compete for the right to impose a "super dictatorial" donating decision over a large group of other participants, their bids are positively and significantly correlated with their chances of violating the equivalence theorem. Votes in the MAX and AVG mechanisms (but not in the MIN) increase with the bid, suggesting that the joy of ruling drives behaviour in the MAX but not the MIN mechanism. Besides the joy of ruling, we also find traces of responsibility in subjects' behaviour regarding the super dictatorial decision. The common donation imposed over the large group depends on their beliefs about the altruism of others and their own type: more altruistic oriented subjects tend to act as benevolent dictators, and selfish oriented individuals do not adjust their decisions.

Even when we admit the risks of automatically extrapolating our results to real-world situations, the existence of a joy of ruling and a sense of responsibility calls for some caution when designing collective giving institutions. The different, sometimes conflicting, behavioural effects we document may be sensitive to the exogenously imposed aggregation mechanism, particularly when participants cannot opt-out of the collective donation. Endogenously determined mechanisms allowing subjects to self-select their preferred donation rule could substantially change both votes and the resulting common donation, mitigating some of the effects observed in this paper. We leave the analysis of alternative mechanisms for future research.

Since our results are consistent with previous findings in the behavioural analysis of auctions and contest, our results may illustrate a common phenomenon in collective giving. The joy of ruling we observe is consistent with individuals intrinsically valuing the right to make a particular decision: the right to impose their preferred donation on the rest of the group. As in Fehr et al (2013), Bartling et al (2014) and Owens et al (2014), our participants prefer to rule over others, and avoid their being controlled.

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APPENDIX A. Proofs

Proof of Theorem 1.

(a) MAX Mechanism. Focus on the best response function of individual i to any profile of reported types $\hat{\theta}_{-i}$. By substituting the restrictions of the maximization problem in the utility function, the best response function is obtained from the solution of the following maximization problem

$$max_{\{\hat{\theta}_i\}} U_i\left(w - max\{\hat{\theta}_i, \hat{\theta}_{-i}\}, n \square max\{\hat{\theta}_i, \hat{\theta}_{-i}\}\right)$$

Step a.1. Consider first the profile $\hat{\theta}_{-i} = \{0, \cdots, 0\}$. In this case, $max\{\hat{\theta}_{-i}\} = 0$ and therefore player i's best response solves $max_{\{\hat{\theta}_i\}} U_i\left(w - \hat{\theta}_i, n\hat{\theta}_i\right)$. Given that the utility function is strictly quasi-concave, this maximisation problem has a unique solution g_i^{SD}.

Step a.2. Focus now on those vote profiles $\hat{\theta}_{-i}$ for which $max\{\hat{\theta}_{-i}\} \leq g_i^{SD}$. In this case, player i will report g_i^{SD}. Hence, g_i^{SD} is best response to those strategy profiles with $max\{\hat{\theta}_{-i}\} \leq g_i^{SD}$.

Step a.3. We finally consider those vote profiles such that $max\{\hat{\theta}_{-i}\} > g_i^{SD}$. In this case, the strict quasi-concavity assures that all reported types larger than $max\{\hat{\theta}_{-i}\}$ yield a strictly lower utility level than that associated with voting g_i^{SD}. This completes the proof. **qed**

(b) MIN Mechanism. The proof follows the same lines as those of Proposition 1. The best response function comes from the solution of the following maximization problem

$$max_{\{\hat{\theta}_i\}} U_i\left(w - min\{\hat{\theta}_i, \hat{\theta}_{-i}\}, n\, min\{\hat{\theta}_i, \hat{\theta}_{-i}\}\right)$$

For all profiles such that $min\{\hat{\theta}_i, \hat{\theta}_{-i}\} = \hat{\theta}_i$, player i will solve the problem $max_{\{\hat{\theta}_i\}} U_i\left(w - \hat{\theta}_i, n\hat{\theta}_i\right)$ whose solution is g_i^{SD}. For all profiles such that $min\{\hat{\theta}_{-i}\} < g_i^{SD}$, player i is indifferent between reporting $min\{\hat{\theta}_{-i}\}$ or reporting g_i^{SD}. This completes the proof. **qed**

Proof of Proposition 1. Firstly, we consider the MAX Institution. Let b denote the benefit from setting the group contribution level. Let $F_i(M|\theta_i)$ be player i's belief about the highest message M sent by the other players given his own type. Then, player i's problem is

$$Max_{\{\hat{\theta}_i\}} \underbrace{\int_0^{\hat{\theta}_i} \left[u_i\left(w - \hat{\theta}_i, n\hat{\theta}_i\right) + b\right] dF_i(M|\theta_i)}_{\substack{Player\ i's\ message\ is\ selected \\ by\ the\ mechanism}} + \underbrace{\int_{\hat{\theta}_i}^{w} u_i(w - M, nM)\, dF_i(M|\theta_i)}_{\substack{Player\ i's\ message\ is\ not\ selected \\ by\ the\ mechanism}}$$

The first order condition is

$$\frac{\partial\left(\int_0^{\hat{\theta}_i}[u_i(w-\hat{\theta}_i,n\hat{\theta}_i)+b]dF_i(M|\theta_i)+\int_{\hat{\theta}_i}^{w}u_i(w-M,nM)dF_i(M|\theta_i)\right)}{\partial\hat{\theta}_i}+b\frac{\partial\left(\int_0^{\hat{\theta}_i}dF_i(M|\theta_i)\right)}{\partial\hat{\theta}_i}=0$$

We can actually prove that the equilibrium message will not be the super dictatorial decision g_i^{SD}. In order to prove it, we evaluate this first order condition at the dominant strategy g_i^{SD}. By definition, the first term on the left-hand side is zero, because g_i^{SD} is the optimal behaviour in the absence of joy of ruling. This implies that the value of the first order condition evaluated at g_i^{SD} is $bf_i\left(g_i^{SD}\middle|\theta_i\right)$, which is different from zero, where $f_i\left(g_i^{SD}\middle|\theta_i\right)$ is the derivative of $F\left(g_i^{SD}\middle|\theta_i\right)$. This means that if $b>(<)0$, then player i improves by sending a message larger (smaller) than g_i^{SD}.

The analysis of the MIN Institution is analogous. **qed**

APPENDIX

[Not to be included in the main text; included as an appendix at the end of the manuscript, or online]

Table 1A: Behavioural determinants of type, including controls, Experiment II

Maximum likelihood	(1)	(2)	(3)
Structural	MIN	AVG	MAX
Dep Variable: Vote			
Type	0.4049***	0.3069**	0.2794*
	(0.158)	(0.120)	(0.162)
Beliefs	0.0018	0.3899**	0.5903*
	(0.0172)	(0.159)	(0.315)
Joy of ruling	0.1600	0.2839***	0.2560**
	(0.102)	(0.081)	(0.109)
Order	-0.1617	-0.0969	-0.0831
	(0.250)	(0.259)	(0.276)
Age	0.0121	0.2201	0.1759**
	(0.062)	(0.071)	(0.078)
Female	1.5596***	1.7505***	1.3810**
	(0.420)	(0.466)	(0.570)
Economics	1.5777	-0.3378	2.3262*
	(1.220)	(0.510)	(1.256)
Trust	0.6683	-0.4767	0.2822
	(0.794)	(0.500)	(0.777)
Constant	-0.5896	-1.721	-5.7363*
	(2.076)	(1.711)	(2.139)
Dep Variable: Beliefs			
Type	-4.8470***	0.3958***	0.3293***
	(1.641)	(0.111)	(0.064)
Order	0.6299	-0.1414	-0.1612
	(3.643)	(0.192)	(0.179)
Age	-0.0080	-0.0157	-0.0268
	(1.055)	(0.055)	(0.042)
Female	-3.8950	-0.0817	-0.1729
	(6.739)	(0.376)	(0.334)
Economics	10.6549	-0.4626	-0.4110
	(13.479)	(0.697)	(0.525)
Trust	-11.6817	0.7465	0.5379
	(7.375)	(0.456)	(0.380)
Constant	50.9440*	1.7428	3.1884
	(27.172)	(1.342)	(1.040)
Controls	Yes	Yes	Yes
Observations	45	45	45
Log likelihood	-724.397	-588.990	-595.929
CD	0.636	0.730	0.656

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 2A: Individual determinants of dictatorial behaviour and joy of ruling in Experiment II

Maximum likelihood Structural	(1)
Dep Variable: Super dictatorial decision	
Type	0.6012***
	(0.211)
Type Squared	-0.0458**
	(0.022)
Beliefs	0.4659*
	(0.262)
Joy of ruling	0.1439
	(0.248)
Order	-0.2501
	(0.258)
Age	0.0109
	(0.040)
Female	1.0711*
	(0.390)
Economics	-0.1013
	(0.399)
Trust	-0.9312**
	(0.315)
Constant	-0.1524
	(1.298)
Dep Variable: Beliefs	
Type	0.3958***
	(0.111)
Order	-0.1414
	(0.192)
Age	-0.0157
	(0.055)
Female	-0.0817
	(0.376)
Economics	-0.4626
	(0.697)
Trust	0.7465
	(0.456)
Constant	1.7428
	(1.342)
Dep Variable: Joy of ruling	
Type	-0.090
	(0.276)
Beliefs	0.9690
	(0.796)
Super dictatorial decision	-0.0170
	(1.060)

Order	-0.6999
	((0.494)
Age	0.0410
	(0.105)
Female	-0.0608
	(1.361)
Economics	0.9540
	(1.022)
Trust	-0.1112
	(1.670)
Constant	2.7843
	(2.314)
Controls	Yes
Observations	45
Log pseudo likelihood	-726.6803
Coefficient of Determination	0.719

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The variable Trust is a binary variable defined using the answer to the following question: "Generally speaking, would you say that most people can be trusted or that you cannot be careful in dealing with people"?