Review of Managerial Science
https://doi.org/10.1007/s11846-023-00698-x

ORIGINAL PAPER

# Incentives for cooperation in groups: sociality meets decision rights

**Britta Butz**[1] · **Pablo Guillen Alvarez**[2] · **Christine Harbring**[1]

Received: 30 March 2022 / Accepted: 19 August 2023


**Abstract**
We investigate the effect of a donation incentive tied to contributions to a public good when group members can decide on the size of their donation. An up to 20% donation of the public good was implemented either exogenously or endogenously by group members. In the *Vote* treatment, groups could either decide in favor of or against a donation of 20% of the public good; in the *Vote Share* treatment, subjects could decide on a donation share of between 0 and 20%. Results show that a large percentage of the participants vote in favor of implementing a donation share in both treatments. In groups voting in favor of a 20% donation share or endogenously implementing a high donation share in the *Vote Share* treatment contributions to the public good are higher compared to an exogenously implemented donation share.

**Keywords** Donations · Decision right · Public good game · Team incentives · Laboratory experiment · Charitable giving

**JEL Classification** C72 · C92 · D64 · D70 · J33 · M52

## 1 Introduction

Nowadays, corporate social initiatives seem to be of great relevance to a large proportion of the workforce. Survey results indicate that 79% of job seekers consider the corporate social initiatives of a firm when choosing a workplace. 76% of workers would accept a reduced salary when accepting a corporate position within a company that considers its social responsibilities. For employees aged 27–35, those results are even stronger (CONE Communications 2016). A more recent survey underlines that 86% of participating employees prefer to work for a company that

✉ Christine Harbring
christine.harbring@org.rwth-aachen.de

[1] RWTH Aachen University, Templergraben 64, 52062 Aachen, Germany

[2] The University of Sydney, Camperdown, NSW 2050, Australia

Published online: 24 September 2023

takes over social responsibility, 91% of business leaders think that corporations must act responsibly, and 83% of consumers expect companies to shape the landscape of corporate social responsibility (PWC Consumer Intelligence Series Survey on ESG 2021). This perceived necessity for corporate social responsibility is one of the reasons why companies continue to develop social activities and programs within their workplaces in order to attract, motivate, and retain talented employees.

One common social strategy that is implemented in companies is engagement with charity organizations through giving donations. A case-specific example of such an implementation is that Whole Foods Market holds "5% Days", where five percent of their net sales are donated to local nonprofits (Whole Foods Market 2021). Peg Cancienne, the Customer Connection Specialist, at Whole Foods Glendale, states: "[…] I know that the 5% Days are important to a number of our team members. [….] 5% Days are seen as opportunities to spread some goodwill, and this is appreciated by everyone—customers, organizations, and our team members all benefit. It is a true win–win-win partnership!" (E-Mail from 17.10.2017).[1] Aside from obvious perceivable benefits, such as improved customer loyalty and desirability of job offers (e.g. Brønn and Vrioni 2001; Kim and Park 2011), corporate social presence may also have a positive impact on the performance of employees within the firm (e.g. Charness et al. 2016a, b; Crumpler and Grossman 2008; Eckel and Grossman 1996; Kajackaite and Sliwka 2017; Tonin and Vlassopoulos 2014a, b).

Our research builds on a previous project [see Butz and Harbring (2020)] showing that donation payments directly tied to contribution levels in a public good game lead to a significant rise in contributions. The idea of the basic setup of this previous paper and the current one, is that we assume that the preference to act socially increases cooperation in the public good game and the willingness to donate to a charity. Following a social preference, an individual may aim at increasing others' payoffs and the well-being of the recipients of charitable donations. This may be due to altruism or a "warm glow", i.e., a positive feeling often mentioned following the act of giving.

The paper now follows on and shows there may be even further potential for improving donation payments. While Butz and Harbring (2020) analyzes the effect of tying charitable donations to contributions to a public good and how the donations are financed, a second study (Butz and Harbring 2021) shows the effect of disclosing identities in this socially incentivized public good game. We now tackle the question of how donations should be implemented as part of the incentive toolbox of organizations. We allow participants to endogenously decide on the donations to be made and analyze the effect on the behavior in the public good game.

By deciding to donate part of the contributions to a charity, participants may signal their social type to other group members, who may act reciprocally in case they are conditional cooperators who cooperate as long as others cooperate. Fischbacher et al. (2001) indicated that there might be 50% of conditional cooperators in such a public good game. Thus, by allowing participants to endogenously

[1] A further example is "1% for the planet", which provides a platform for businesses to donate 1% of their sales to environmental causes (One percent for the planet 2021).

determine whether a fraction of contributions will be donated, they have an instrument to signal their own social type and may enable coordination on more cooperative outcomes.

Entitling individual workers to decide on the donation may additionally encourage employees' contribution due to the positive effect of self-determination. Employees strive to be self-determined, and they show a keenness to structure their own work environment autonomously (e.g. Bartling et al. 2013; Charness et al. 2012; Falk and Kosfeld 2006; Fehr et al. 2013; Frey and Benz 2008). Related literature indicates that endogenous decision-making may lead to higher work motivation and work performance (e.g. Deci et al. 2017; Foss et al. 2009; Kuvaas 2008; Patall et al. 2008; Patall 2012). Self-determination also seems to be important regarding corporate social initiatives. The "Employee Engagement Report 2016" indicates that 78% of employees would like to take an active role in their business's CSR activities (CONE Communications 2016). Furthermore, also previous experimental research indicates that delegating decision rights on corporate social actions seems to be a promising avenue for enhancing the performance of employees (Tonin and Vlassopoulos 2014a).

To conclude, the following research was undertaken to provide insights on how sociality combined with endogenous decision making can be used to create value in firms by encouraging cooperation in groups. We investigate whether and, if so, to what extent the entitlement of individuals to decide about the amount of a donation tied to group performance in a social dilemma game might influence cooperation levels in groups.

We conducted a laboratory experiment in order to shed some light on this research question. Participants in our experiment played a finitely repeated public good game which could include a donation share of up to 20%. In the case of a donation, the sum of contributions to the public good was reduced by the donation amount. We varied whether the donation share was set exogenously by the experimenter or endogenously decided on by the group members. Two voting mechanisms are analyzed: (i) participants may vote in favor of or against a share of 20% of donations deducted from the sum of contributions to the public good that are given to a charity (denoted as *Vote*) and (ii) participants may state a share from 0 to 20% that will be donated (denoted as *Vote Share*). Groups of four participants are implemented in a standard public good game, and the decision is either implemented dependent on the majority vote in *Vote,* or the average of shares is deducted in *Vote Share*. The baseline settings are a public good game with no donations (*Baseline*) and a public good game with a donation share of 20% (*Baseline Donation*).

We find that in both treatments with endogenous decisions on donations, there is a considerable preference for giving to charity. In *Vote,* about half of the participants decide in favor of the share of 20% of donations that is deducted from their group's contributions, and in *Vote Share,* 72% of participants favor a positive fraction of donations which amounts to 5.3% on average. Contributions to the public good game are particularly high for those who voted in favor of (high) donations in the treatments with the voting mechanism compared to the *Baseline Donation* in which the maximum share of donations is exogenously set. Moreover, cooperation behavior seems to be more stable in the Vote settings over all groups compared to

*Baseline Donation*. Interestingly, it does not make a difference which of the two voting mechanisms is implemented.

Thus, we find indications for a higher rate of cooperation and a more stable degree of cooperation in a social dilemma game when we allow participants to endogenously decide on charitable donations tied to cooperation rates compared to exogenously implementing a donation share. This may be due to the positive effect of self-determination as well as the possibility to signal one's own social type by deciding for a donation to be implemented. Interestingly, this effect occurs not at the beginning of the experiment, but in the second half and even stabilizes cooperation in later rounds. That would perhaps indicate that this is not an initial effect that may wear off fast but a more persistent behavioral pattern.

Please note that we analyze cooperation behavior in a public good game and assume that contributions in such a social dilemma situation model the strategic setting of a team in an organization. Higher contributions to the public good, i.e., higher rates of cooperation, could then result in higher performance levels in teams. When designing this experiment, the initial idea was to shed light on potential performance effects in group settings with social incentives.

Our study contributes to the experimental literature on the benefits of social incentives. We focus on the potential motivating effect of self-determination. While our study is close to previous research [see Tonin and Vlassopoulos (2014b)] we analyze social incentives tied to a group outcome in a social dilemma game not tied to an individual performance level. Thus, in our context being entitled to decide on the donation may positively influence cooperation behavior in a group and may also signal the willingness to give to charity to others in the group. Thus, with our design we investigate the positive effects of self-determination on cooperation behavior in a social dilemma game with social incentives.

Our findings could be interpreted as a guide to design incentive packages and implementing social responsibility activities in corporations. If so, we may conclude that it could be beneficial to allow employees to participate in the process of determining how charitable donations may be implemented in the organization particularly if it affects payment procedures in groups. If we assume that a corporation aims at donating a certain amount, it may be sensible to determine donations internally in order to increase cooperative behaviors within the organization and benefit from the potentially positive effect of self-determination. Of course, this experiment is just a first indicator, and further studies investigating the mechanisms driving cooperation in the context of charitable behavior by organizations are needed.

## 2 Related literature

In this section, we first outline the relevant literature on the effects of delegating decision rights in the workplace. Regarding our setting, it seems to be especially important to highlight research into the delegation of decision rights: whether and how a social incentive, i.e., making a donation, should be included in a wage package. Theory predicts that delegation of decision rights leads to a higher willingness to cooperate and to the more personal initiative of the controlling party (e.g. Aghion

et al. 2004; Aghion and Tirole 1997; Grossman and Hart 1986) since people seem to strive towards autonomy (e.g. Deci and Ryan 1985, 2000; Ryan and Deci 2000). Several studies have experimentally examined these predictions.

Some research indicates that holding decision rights seems to have a motivational value per se. For example, Fehr et al. (2013) studies the motivation and incentive effects of authority in an authority-delegation game in a principal-agent setting. Results indicate that controlling the decision right itself increases effort levels significantly, while not holding the decision right decreases effort levels and results in decreased payoffs for the controlling party as well as the subordinate. Additionally, an under delegation of decision rights was observed compared to the equilibrium that would have made the principal and agent better off (Fehr et al. 2013). Other articles support the finding that decision rights themselves hold intrinsic value for the controlling person (e.g. Bartling et al. 2014; Owens et al. 2014).

Charness et al. (2012) uses a gift-exchange game to analyze how the delegation of decision rights influences employees' effort levels. In their setting, the firm (principal) could either keep the decision right on a worker's (agent) wage or could delegate that decision to the worker. After a wage had been set, either by the principal or the agent, the agent decided on the effort level. Results reveal that effort levels significantly improve when wages are set endogenously, even if wages do not differ. Furthermore, payoffs are higher for the firm as well as for the employee, which yields a win–win situation when decision rights are transferred to the worker (Charness et al. 2012). These results are also robust in a setting with two workers (Charness et al. 2016a, b). Other studies support the positive effect which being delegated a decision right has on productivity (e.g. Bartling et al. 2013), while another stream of research demonstrates the negative effects of control on productivity levels (e.g. Falk and Kosfeld 2006; Frey 1993).

Fershtman and Gneezy in their (2001) article, included delegation rights for the proposer as well as for the responder in an ultimatum game, where they could pass on their decision rights in the game to another agent. Results show a significant increase in the proposer's payoff if her decision right is delegated to the agent. Possible reasons might be the weakening of the negative reciprocal behavior of the responder towards the proposer when the agent holds the decision right instead of the proposer. Further, the proposer might anticipate this behavior and strategically decide to delegate her decision right to the agent [see Fershtman and Gneezy (2001)].

In our setting, participants are able to decide whether and to what extent to include a social incentive—charitable donations—in their group payment scheme. Therefore, it is especially relevant to outline research results on decision rights, including sociality.

Indications of the effects of decision rights on social incentives can be found in the so-called mission-match literature. The idea is for workers to appreciate how important that a job itself has a social mission, i.e., to give donations (e.g. Cassar 2019; Fehrler and Kosfeld 2014), and, on the other hand, that the worker's mission fits the company's mission (e.g. Carpenter and Gong 2016; Koppel and Regner 2014). Koppel and Regner reports a principal-agent experiment in which the performance of the agent not only defines the principal's output but also generates

charitable donations. In their setting, both the principal and the agent could select one of five charities, while it was varied which chosen charity received the donation amounts at the end. Their findings indicate that it is not only important for the agent to work for her own chosen charity but also that the principal's selection matches hers (Regner and Koppel 2019). Further, experimental field research by Jeworrek and Mertins supports the finding that the mission of a job has a positive effect on the performance level of a worker. However, it seems to be relevant that an employee self-selects into a job that includes a social aspect (Jeworrek and Mertins 2019).

Kajackaite and Sliwka (2017) analyze possible mechanisms for the described research results. In a laboratory experiment, they let the principal decide whether to donate money to a charitable organization from her endowment. Afterward, the agent was informed about the donation decision and could choose how much money to transfer from his endowment to the principal. Their findings indicate that transferred amounts rise significantly when the principal donates. Distributional concerns and reciprocal altruism are indicated to be drivers of their results.

Besides altruistic preferences, people might also be driven by a *warm glow* feeling when endogenously deciding whether to give a donation. Research indicates that the actual act of giving causes a positive feeling, and it might be important to actively participate, e.g., by giving your own money, in the process (e.g. Andreoni 1989, 1990; Crumpler and Grossman 2008; Imas 2014). Therefore, having the chance to actively decide in favor of a donation incentive might also increase *warm glow* feelings.

Most closely related to our study is the work of Tonin and Vlassopoulos (2014b). Whereas they investigate the effect of a social incentive on the efforts of individuals who are working independently of others, we analyze whether the inclusion of decision rights on a social incentive leads to higher cooperation in teams. Tonin and Vlassopoulos (2014b) implemented either financial incentives, social incentives, or a combination of both into a field real-effort task. The social incentive was either a variable or a lump-sum charitable donation. They report a 13% increase in productivity when including a social incentive for participants with low initial productivity. Additionally, they included a choice mechanism where participants could divide a variable incentive between themselves and the charity. Each share given to the charity was doubled by the experimenter. Results show that 52% of participants gave a donation share to the charity. Furthermore, they also found a significant positive effect on the performance when participants endogenously decide about the donation share (Tonin and Vlassopoulos 2014a).

Further, our research is based on a previous project of Butz and Harbring (2020), as we are able to use two of the treatments again. We include them as baseline settings and use the data in our analysis to compare them to the introduction of decision rights in a socially incentivized public good game. Thus, the experimental design also follows this first project. In a second study, Butz and Harbring (2021) show the effect of disclosing identities in this socially incentivized public good game. Interestingly, revealing identities with donations that are financed by the participants increases cooperation compared to an anonymous setting, while it decreases contributions in a setting in which donations are financed by the experimenter.

Butz and Harbring (2020), an exogenously set donation share of 20% based on the public good contributions were either subsidized by the experimenter or paid from the group members' contributions to the public good game. The research question of this first study was whether the donation share dependent on contributions to a public good could increase cooperation at all and which type of financing the donation share (a deduction from individual contributions or an external subsidy by the experimenter) had a positive effect. Results show that cooperation is significantly higher when donations to charitable organizations are subsidized by the experimenter, while charitable donations being financed by the participants' contributions can compensate for a lower efficiency level. They outline reciprocal altruists [see also Kajackaite and Sliwka 2017)] as one important subgroup driving their results. As research indicates that decision rights themselves might have a positive impact on employees' motivation and effort levels, the question arises of whether companies should decide to implement a donation incentive of this kind and impose it on employees [as implemented in Butz and Harbring (2020)] or whether employees should be involved in the decision making process as investigated in the study at hand.

This paper compares the baseline settings of Butz and Harbring (2020) with donations to charitable organizations being financed by the group members' contributions to a public good game or no donations to settings in which we let participants endogenously decide to implement the internally financed donation share. Consequently, our results might demonstrate whether it is advisable for a company to delegate the decision right on implementing the donation incentive to the employees or to set the decision exogenously by the company.[2]

## 3 Experimental design

### 3.1 Treatments

We conducted a public good game laboratory experiment to capture the degree of cooperation within a team (Ledyard 1995) and the willingness to donate to a charity. In total, we had four treatments using a between-subject design. Each group was formed of four participants in a partner-matching design. In the *Baseline Donation* treatment, we had an (exogenously set) 20% donation share to model a corporate social act of giving determined by an organization (Crumpler and Grossman 2008). In the decision treatments, participants could either vote in favor of or against a 20% donation, or they could state a donation share of between 0 and 20%, the average of which was implemented. The donation amount was directly tied to the sum of contributions to the public good and was financed by deducting the amount from the doubled group's contributions. The design of the public good game followed standard procedure. As in previous studies, we conducted an experiment using a repeated

[2] Please note that the dissertation project Butz (2020) is based upon the study at hand as well as on Butz and Harbring (2020, 2021).

public good game over ten rounds with a fixed partners protocol. We gave participants an endowment of 20 tokens, and the marginal per capita return (MPCR) was set to 0.5 (Andreoni 1988, 1995).

Table 1 illustrates the different payoff functions. The *Baseline* treatment considers the defined characteristics of the public good game without any donation payment. In the *Baseline Donation* treatment, a group donation share $d_j$ of 20% of the doubled contributions of all group members is implemented. This amount is subtracted from the total sum of contributions, which means that only 80% of the doubled contributions are distributed among the group members. In this setting, autonomy is lowest, as donation payments are exogenously set.

In the *Vote* treatment, participants are allowed to decide whether a donation payment of 20% is supposed to e implemented or not. This decision is made by the group. Participants are able to vote in favor of ($d_j = 0.2$) or against ($d_j = 0$) the 20% donation payment. The decision is based on a majority vote. If a tie occurs, the decision will be made by a virtual coin toss. The donation amount $d_j * 2 * \sum_{i=1}^{4} g_i$ is deducted from the group's payoff.

Finally, in the *Vote Share* treatment, participants are also able to decide about the share $d_j$ of the donation payment. This share can range from zero to twenty percent. Each participant decides individually on an individual share $d_i \in [0, 0.2]$, with the average amount of the four group members $d_j = \frac{1}{4} * \sum_{i=1}^{4} d_i$ being taken as the amount to be donated and proportionally subtracted from the group's payoff. Decisions were made once in the beginning and hold for the whole ten-round game.

In all cases, each participant individually decides which charitable organization should receive their share of the donation. They had to choose one out of five charities (Deutscher Kinderschutzbund xxxx; Tafel Deutschland xxxx; Unicef xxxx; UNO-Flüchtlingshilfe xxxx; WWF xxxx).[3]

### 3.2 Procedure

All treatments were conducted in the AIXperiment laboratory at RWTH Aachen University, Germany. The *Baseline* and *Baseline Donation* are taken from Butz and Harbring (2020) and were conducted in May 2017, while the *Vote* treatments were conducted in December 2019. In total, we ran 12 sessions, which lasted, on average, 100 min each. Participants were recruited via ORSEE (Greiner 2015), and the experiment was implemented with z-Tree (Fischbacher 2007).

Data were collected from 328 participants, of whom 56% were male and 44% female. Participants were mainly undergraduate students (93%) but also doctoral candidates, trainees, and employees (7% in total). The average age was 24 years. Payoffs were, on average, 14.27 € (including show-up fee). Charitable organizations received a total of 606.21 € from the experiment. Participants were randomly assigned their seats in the laboratory and also to groups of four. They did not know

[3] Those organizations are: The Federal Association of the Child Protection Association Germany, *Tafel Deutschland* distributes food that is donated, Unicef protects and supports children worldwide, UN refugee agency, and WWF protects the natural environment.

**Table 1** Treatments

| Treatment | Payoff Function $\pi_i(g_1 \dots g_4) =$ | Group donation | | |
|---|---|---|---|---|
| | | Decision right | Share $d_j \in [0, 0.2]$ | Donation amount |
| Baseline | $20 - g_i + \frac{1}{4} * 2 * \sum_{i=1}^{4} g_i$ | No decision right | 0 | 0 |
| Baseline donation | $20 - g_i + 0.8 * \frac{1}{4} * 2 * \sum_{i=1}^{4} g_i$ | No decision right | 0.2 | $0.2 * 2 * \sum_{i=1}^{4} g_i$ |
| Vote | $20 - g_i + (1 - d_j) * \frac{1}{4} * 2 * \sum_{i=1}^{4} g_i$ | Decision yes/no | $dj \in \{0, 0.2\}$ | $d_j * 2 * \sum_{i=1}^{4} g_i$ |
| Vote share | $20 - g_i + \left(1 - \frac{1}{4} * \sum_{j=1}^{4} d_i\right) * \frac{1}{4} * 2 * \sum_{i=1}^{4} g_i$ | Decision on share | $\frac{1}{4} * \sum_{i=1}^{4} d_i$ | $\frac{1}{4} * \sum_{i=1}^{4} d_i * 2 * \sum_{i=1}^{4} g_i$ |

Please note that the two treatments *Baseline* as well as *Baseline Donation* had already been part of the first study of Butz and Harbring (2020) and also of Butz and Harbring (2021) that focused on the effect of revealing participants' identities. Our treatment *Baseline Donation* is denoted as *IntDon* in the two previous studies. We use this data gathered in the previous study to compare them with our two new treatments *Vote* and and *Vote Share*. The latter have been conducted 2.5 years after the baseline settings were implemented as part of larger research project on the effect of donations in social dilemma games. We find no indication of different behavior due to this time span

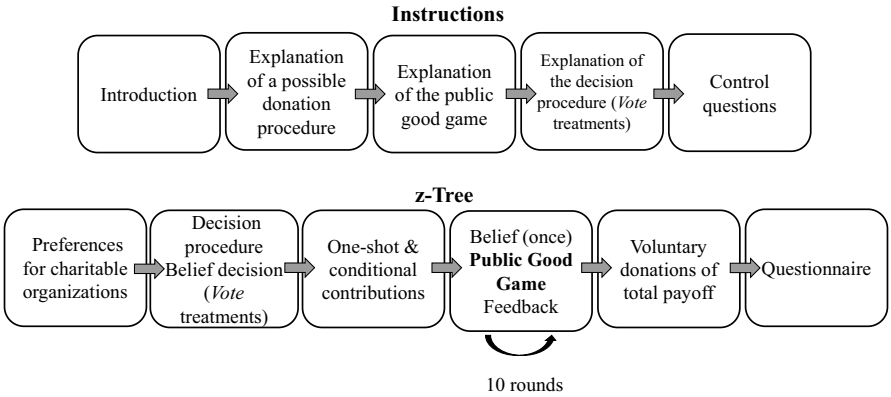


**Fig. 1** Timeline of the experiment

which of the other participants was in their group.[4] The timeline of the experiment is illustrated in Fig. 1. At the beginning of the experiment, participants received instructions that introduced the currency "token" with an exchange rate of one token for 5 euro cents. Moreover, participants learned that the experiment might include charitable donation payments (also included in *Baseline*). The amount donated was transferred directly after the session with two randomly chosen participants as observers who received an extra payment of 2 €, while everybody else was also welcome to also watch the transfer [for a similar procedure, see e.g. Koppel and Regner (2014)]. Subsequently, the public good game was described depending on the treatment, which included the explanation of the decision procedure in the *Vote* and *Vote Share* treatments. Furthermore, participants were informed that all rounds were payoff-relevant. To make sure that instructions had been understood, participants had to answer control questions before the decisions were made (see Online Appendix exemplified instructions).

The actual experiment started by asking all participants to rank the five charities according to their personal preferences. They knew that only the charity ranked first would receive donations, i.e., a quarter of the total group donation. The complete ranking was elicited for potential further analyses. Brief information was given about each of the charities [for a similar procedure, see e.g. Regner and Koppel (2019), Tonin and Vlassopoulos (2014b)].Participants were not informed about the other group members' decisions.[5]

[4] We asked participants in the post-experimental questionnaire whether there were friends or others they knew in the session such that we could use this information as a control variable to approximate social distance. We found no effect of this variable on behavior.

[5] Research indicates that the matching or mismatching of the missions chosen by the participants might influence cooperation levels (e.g. Cassar 2019). Therefore, we keep the influence of this parameter as constant as possible by not informing participants about the other group members' decisions on the charitable organization.

Subsequently, the different decision mechanisms in the *Vote* and *Vote Share* treatments were implemented. The decision took place once in the beginning, and participants knew that their decision would hold for the whole game. Before the decision results were displayed, participants had to state their beliefs about the other group members' donation decisions. In the *Vote* treatment, participants were asked for their beliefs about how many of the other group members had decided in favor of the twenty percent donation. In the *Vote Share* treatment, participants had to state their beliefs about the average donation share of the three other group members. After that, the decision results were shown, which indicated under which conditions the public good game would be played for the whole experiment.

Then, we followed the procedure of Fischbacher et al. (2001) and conducted a one-shot public good game using a contribution table, capturing the conditional contribution depending on the other group members' average contributions.[6] Information about contribution levels and payoffs in this part was not revealed before the end of the experiment. After this one-shot game, participants were informed about the ten-round repeated public good game, which would be played under the same conditions. In the first round of the repeated public good game, we asked participants to state their beliefs about the other group members' contributions [see e.g. Gächter and Renner (2010)]. Participants received a payoff[7] depending on the deviation of the stated belief and the actual average contributions of the group members (20 tokens—|deviation*5|). We informed participants that this payoff would be set to zero when the deviation exceeded 4. Subsequently, the repeated game started. After each round, information about the participant's own individual contributions, the average group contribution, and the individual pay-off of that participant were revealed. Additionally, groups were informed about the group's donation. At the end of the experiment, participants received information about their aggregated payoff and the total donation amounts.[8]

Before participants received their final payoff, we asked them whether they would like to voluntarily donate from their earnings that were displayed on their screen in euro. Participants could select one of the five charities or could state whether they wanted to make an additional donation. Participants were not allowed to donate more than their experimental earnings.[9]

[6] This procedure is implemented to identify motives for behavior without any strategic considerations in repeated settings, e.g. cooperating only to avoid sanctions by others.

[7] We decided to only incentivize the beliefs elicited in the beginning of the repeated public good game as we consider these beliefs as essential for identifying social motives of behavior. We do not provide incentives for the other beliefs as we did not want to complicate the experimental procedure any further for participants.

[8] Note that participants decided on a donation share for the one-shot public good game which was then also implemented in the repeated setting. We implemented the same share to be able to compare contribution behavior for a given donation share in a one-shot and a repeated game.

[9] We analyzed the willingness to donate to a selected charity after the different experimental settings to investigate potential spill-over effects on donations. Ek (2017) finds in an experimental study that participants' prosocial behavior may be crowded out in a subsequent setting particularly when the donations are going to a similar charity. Another strand of literature (Merritt et al. 2010, Blanken et al. 2015) indicates that individuals who initially behave morally show immoral behavior subsequently which is denoted as "moral licensing". Both effects would lead to potentially lower donations in the aftermath of the experi-

In closing, participants filled out a questionnaire that included questions about demographics, altruism (Rushton et al. 1981), reciprocity (Cornelissen et al. 2010), risk attitude (Masclet et al. 2009), and trust (Gächter et al. 2004). Furthermore, we asked some feedback questions to gain more insight into how participants decided about their contributions and whether the donation incentive and the decision right actually influenced their decision making. Additionally, we asked whether the participants were satisfied with the donation share that was implemented in their group on a scale from very dissatisfied (1) to very satisfied (5).[10]

### 3.3 Predictions

In our setting, contributions do not only relate to the efficiency of the group and individual payoffs but also the degree of sociality involved in their decision making. Within this framework, we vary the degree of endogenous decision making on whether a donation scheme is implemented and, if it is, to what extent. Two mechanisms stand out as being highly important in predicting cooperation levels in this setting.

Referring to self-determination theory, particularly the human need for autonomy, might be a relevant driver for the intrinsic motivation to cooperate in our setting (Deci et al. 2017; Deci and Ryan 1985, 2000; Ryan and Deci 2000). Allowing people to endogenously decide about their payment scheme gives them the ability to create an environment suited to their own needs and also gives them a feeling of autonomy. Empirical evidence shows that a higher degree of autonomy in the workplace leads to improved job satisfaction and performance (e.g. Bartling et al. 2013; Frey and Benz 2008; Kuvaas 2008) and that reduced autonomy may lead to decreased effort (e.g. Charness et al. 2012; Falk and Kosfeld 2006; Fehr et al. 2013). Further, experimental evidence from Tonin and Vlassopoulos (2014a) supports the idea that performance improves due to the decision right, i.e. giving participants the right to decide about the amount of the donation increases effort levels significantly.

Additionally, the endogenous decision scheme might enable participants to signal their social type, which is particularly relevant for our social dilemma setting. Both the act of giving donations and the act of contributing to a public good seem to correlate with preferences of altruism and the feeling of a *warm glow* (Dawes and Thaler 1988; Fehr and Schmidt 2001). Therefore, participants might be able to derive assumptions from the voting results about the social type of other group members and other group members' willingness to cooperate. A vote in favor of a

Footnote 9 (continued)
ment in the donation treatments compared to the baseline setting. We actually find that donations are lower in *Baseline Donation* and *Vote* treatments compared to *Baseline*. Though, this difference does not apply to *Vote Share* where particularly some groups who already donate more than the median of groups (*Vote Share High*) donate much after the experiment had taken place. Though, as this is not the major research question of this paper we do not focus on this analysis. More information is provided by Butz (2020).

[10] The questionnaire and a variables overview can be found in the appendix.

donation payment or a decision in favor of a high donation share might signal such willingness to cooperate and increase contributions.

Following the argumentation of Kajackaite and Sliwka: On the basis of the signal of altruistic preferences, participants might reciprocate with higher cooperation levels and act as reciprocal altruists (Butz and Harbring 2020; Kajackaite and Sliwka 2017). In our setting, participants might be able to signal their altruistic type by voting in favor of the 20% donation share (or a high share), which then might lead to higher cooperation levels, especially for group members who value the altruistic preferences of others.

However, also negative effects might occur when the decision is made endogenously by the participants. Negative effects might especially be observed when participants are not satisfied with or are disappointed about the outcome of the group decision, e.g., a donation is set even though the participant dislikes giving donations, or a low donation share is implemented even though the participant would prefer a high donation share. Both types of deviation might negatively influence participants' cooperation within a public good game.

Nevertheless, considering self-determination and the possibility of signaling one's social type due to endogenous decision making, we expect that cooperation levels will rise in the *Vote* and *Vote Share* treatments compared to the *Baseline* treatments. The effect might be even stronger for the *Vote Share* treatment as the feeling of autonomy might be stronger due to the possibility of influencing the donation share directly and not being forced to choose one of the extreme options.

## 4 Results

### 4.1 Descriptive and nonparametric statistics

In this section, we first give an overview of the main treatment results. Further, we look more deeply into the treatment variations *Vote* and *Vote Share* in comparison to the *Baseline* treatments.

Table 2 gives an overview of average results per treatment over the ten-round public good game, the first round, the first five rounds, the last five rounds, and the last round. The table also depicts the averages of the one-shot public good game at the beginning of the experiment as well as the beliefs elicited after the first round of the repeated public good game. We also provide averages dependent on the realized share in the endogenous settings *Vote* (i.e., *Vote0* or *Vote20*) and *Vote Share* (i.e., *Vote Share Low* or *Vote Share High* for decisions below and above the median of selected group shares the *Vote Share* treatment). Table 2 also includes the average donation share that was implemented in the groups and the average donation amount per participant that was generated in each round of the repeated public good game. These variables might also be important success indicators for a company, especially in terms of its CSR strategies.

The first analysis is conducted independently of the size of the donation share. Following the described steps above, we now report significant results. It can be seen that contributions in the *Baseline Donation* are always lower compared to

**Table 2** Overview of behavior in treatments

| | Baseline | Baseline donation | Vote | Vote0 | Vote20 | Vote share | Vote share low | Vote share high |
|---|---|---|---|---|---|---|---|---|
| Contributions rounds 1–10 | 8.67 | 7.84 | 9.20 | 8.32 | 10.21 | 8.99 | 8.16 | 9.82 |
| | (0.309) | (0.310) | (0.231) | (0.329) | (0.314) | (0.221) | (0.317) | (0.304) |
| Contributions rounds 1–5 | 10.41 | 9.88 | 10.27 | 9.64 | 11.00 | 9.83 | 8.77 | 10.88 |
| | (0.425) | (0.483) | (0.309) | (0.449) | (0.414) | (0.308) | (0.443) | (0.420) |
| Contributions rounds 6–10 | 6.93 | 5.80 | 8.13 | 7.01 | 9.42 | 8.16 | 7.55 | 8.77 |
| | (0.424) | (0.412) | (0.337) | (0.470) | (0.469) | (0.312) | (0.451) | (0.430) |
| Contributions round 10 | 4.18 | 2.82 | 5.11 | 3.70 | 6.73 | 5.95 | 5.12 | 6.79 |
| | (0.779) | (0.743) | (0.710) | (0.820) | (1.017) | (0.710) | (0.986) | (1.017) |
| One-shot contribution | 10.98 | 10.48 | 9.78 | 9.23 | 10.404 | 10.63 | 9.17 | 12.10 |
| | (0.283) | (0.314) | (0.218) | (0.317) | (0.292) | (0.211) | (0.301) | (0.281) |
| Beliefs | 11.45 | 11.07 | 9.87 | 9.35 | 10.46 | 9.58 | 8.34 | 10.81 |
| | (0.232) | (0.252) | (0.504) | (0.767) | (0.627) | (0.511) | (0.744) | (0.665) |
| Donation share | 0 | 0.2 | 0.093 | 0 | 0.2 | 0.053 | 0.035 | 0.072 |
| | | (0.000) | (0.100) | | (0.000) | (0.024) | (0.013) | (0.016) |
| Donation amount | 0 | 3.13 | 1.36 | 0 | 2.92 | 0.79 | 0.41 | 1.17 |
| | | (2.198) | (1.872) | | (1.724) | (0.689) | (0.031) | (0.755) |
| N | 56 individuals | 56 individuals | 112 individuals | 60 individuals | 52 individuals | 104 individuals | 52 individuals | 52 individuals |
| | 14 groups | 14 groups | 28 groups | 15 Groups | 13 groups | 26 groups | 13 groups | 13 groups |

All values given in the table are averages. Standard deviations are depicted in parentheses underneath the means

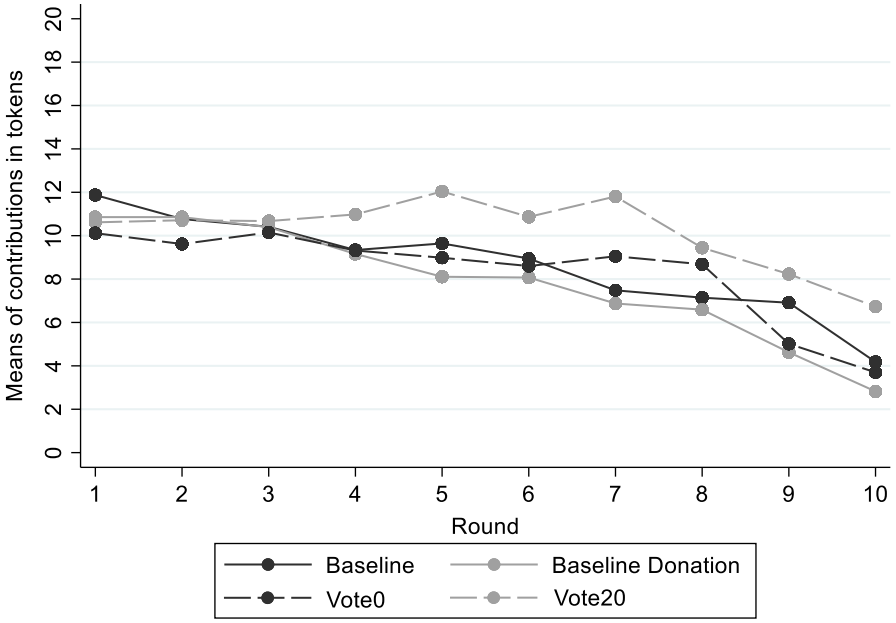


**Fig. 2** Means of contributions over rounds vote vs baselines

all other treatments. Average contributions of round 10 reveal significantly lower contributions in *Baseline Donation* compared to *Vote* ($p=0.0555$, Mann–Whitney $U$ test (MWU), and *Vote Share* ($p=0.0164$, MWU).[11] Further, we find significantly higher beliefs for the *Baseline* in comparison to the *Vote Share* treatment ($p=0.0316$, MWU).

The results also show that the average implemented donation share is 9.3% in the *Vote* treatment, whereas it is 5.3% in *Vote Share*. The highest donations per person and round could be generated in the *Baseline Donation* treatment with 3.13 tokens, followed by the *Vote* treatment with 1.36 tokens and 0.79 tokens in the *Vote Share* treatment (*Baseline Donation* vs. *Vote*: $p=0.0029$, MWU and *Baseline Donation* vs. *Vote Share*: $p=0.0000$, MWU).[12] Please note that there is no significant difference between the donations raised in both Vote treatments.

[11] All non-parametric tests are conducted two-tailed.

[12] As outlined above, reciprocal altruists might be one important subgroup influencing contribution levels in our setting. Based on our questionnaire, we define a group as reciprocal altruists. Analyzing reciprocal altruists, we do not find evidence that they influence contribution levels more strongly when donations are implemented endogenously compared to exogenously set donation payments.

#### 4.1.1 Vote treatment

In the *Vote* treatment, 42% of the participants decided in favor of the implementation of the 20% donation. Subsequently, the 20% donation was implemented in 46% of the groups. Results show that the belief about others' voting decisions is dependent on a person's own decision-making. Figure 2 depicts the means of contributions over rounds for the *Baseline*, *Baseline Donation*, as well as the *Vote* treatment, considering groups without an implemented donation (*Vote0*) and groups with an implemented donation (*Vote20*) separately. The figure illustrates that the *Vote20* contributions lie above all other groups, especially in the second half of the game.

In the following, we concentrate on the comparison between the *Baseline* and *Vote0* as well as the *Baseline Donation* and *Vote20* groups, as between those groups, only the decision right was added, while the donation's size was kept constant. Further, we compare *Vote0* and *Vote20* in order to consider the effect of the endogenously selected donation incentive.

Mean contributions in the repeated public good game are higher in *Vote20* compared to *Baseline Donation.* Contributions rise by 30.23% when the donation is endogenously implemented compared to an exogenous implementation of the donation. However, this difference is not significant. For the last round, we find significantly higher contributions for *Vote20* compared to *Baseline Donation* ($p = 0.0434$, MWU). Similar contribution levels are revealed when comparing the *Baseline* and *Vote 0* treatments. Further, contributions are higher in *Vote20* compared to *Vote0*, while the difference is not significant. The stated belief is significantly higher in the *Baseline* compared to the *Vote0* group ($p = 0.0610$, MWU).[13]

To get a deeper understanding of the endgame effects, we designate participants as "endgamers" if they contribute nothing in the last round(s) and simultaneously contribute zero in fewer than half of the preceding rounds (Keser and van Winden 2000). We find significantly more endgamers in *Baseline Donation* (53.57%) compared to *Vote20* (32.69%; $p = 0.0457$, MWU).[14]

[13] Further, we differentiate between groups that decided in favor of or against the donation by majority and groups where a tie occurred and the decision was made by a random draw. Note that participants were not informed whether the decision was made by majority or by a random mechanism due to a tie. In 18 groups, the decision was made by majority. In 13 of these majority groups the donation was not implemented (*Vote0 Majority*), while in 5 groups the donation share was implemented (*Vote20 Majority*). In 10 groups a tie occurred. In 2 tie groups the donation was not implemented by a random draw (*Vote0 Tie*), while in 8 groups the donation share was implemented (*Vote20 Majority*). Note that due to the small sample size, we are not able to test for significant differences concerning the *Vote0Tie* groups and that descriptive results show only tendencies that need to be interpreted tentatively. The *Vote0Tie* group reveals lower contributions for all main variables compared to all other groups. Moreover, 62.5% of the participants can be classified as endgamers, which is more compared to the other groups. Thus, should groups be undecided regarding the donation of 20%, i.e. a tie results, and the random draw implements no donation, contributions are considerably lower compared to the other settings. The *Vote20Majority* group reveals highest contribution levels on average. Further, only 10% of the participants in *Vote20Majority* can be classified as endgamers. This percentage is significantly lower compared to *Vote0Majority* (46.59%), *Vote20Tie* (56.88%).

[14] The other groups reveal the following percentage of endgamers: *Baseline*: 42.86%; *Vote*: 41.07%; *Vote Share*: 36.54%; *Vote0*: 48.33%; *Vote Share High*: 40.38%; *Vote Share Low*: 40.38%.

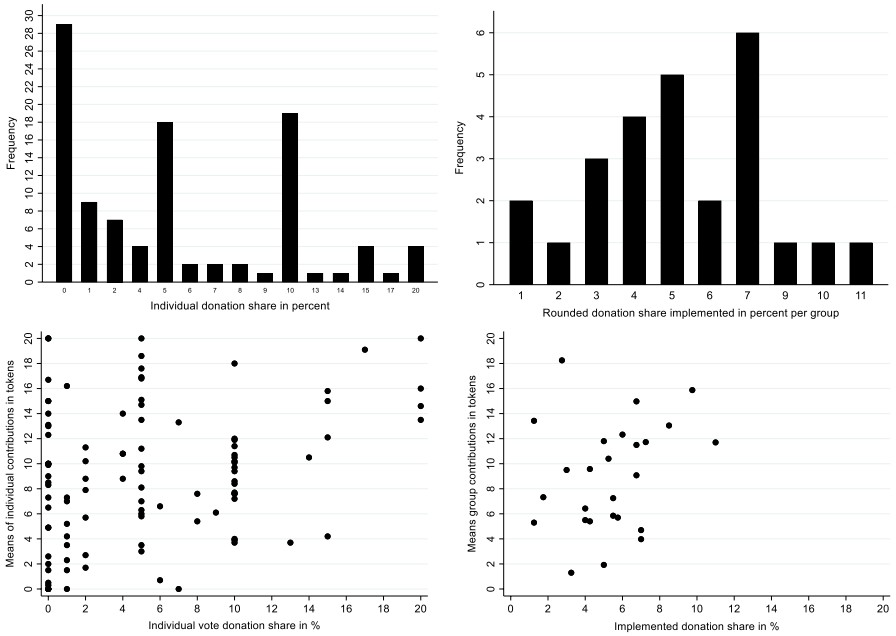


**Fig. 3** Decisions vote share

Finally, we also analyzed the contributions in the treatment *Vote* dependent on the voting decision and the actual voting decision implemented in the group. Though, the sample size of some subgroups becomes quite small, and the results are not very systematic. For example, we find weak indications of significantly higher contributions of participants who voted in favor of donations when donations are actually implemented compared to those not voting in favor of donations with donations nevertheless being implemented. On average, they donate 2.18 tokens more to the public good. Most of the other findings are not significant. The differences we find can just be interpreted as weak indicators as they are based on a very small number of observations.

### 4.1.2 Vote share treatment

In the *Vote Share* treatment, each participant could decide on an individual donation share of between 0 and 20%. The average donation share of the four group members was implemented in the public good game. Figure 3 summarizes the frequency of decisions regarding the donation share. Participants used the whole range of possible individual shares, while the majority decided in favor of a donation share of 0, 5, or 10%. The implemented donation shares lie between 1.25 and 11%. Further, we give an overview of the individual donation share and the mean individual contributions, as well as the implemented donation share and the means of group contributions. The scatter plots visualize the tendency for a higher individual share as well as a higher implemented donation share to result

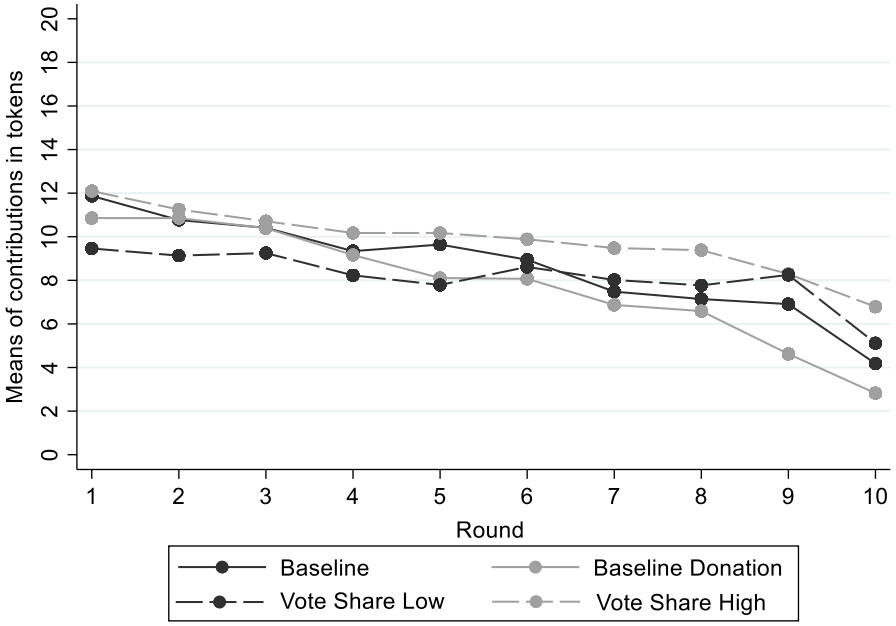


**Fig. 4** Means of contributions over rounds vote share vs baselines

in higher contributions. Finally, we may assume a weak relationship between the individual vote and the belief about the other group members' votes which indicates that participants chose their individual vote depending on the belief about what the other group members might vote for.

Figure 4 shows the means of contributions over rounds, and Table 2 gives an overview of the main variables for the *Vote Share* treatment in comparison to the *Baseline* treatments. Further, we did a median split for the implemented donation shares for decisions below and above the median of selected group shares in the *Vote Share* treatment. The *Vote Share Low* group includes all groups with a donation share smaller than or equal to the median (5.375%), and the *Vote Share High* includes all groups with implemented donations above the median.

In this section, we compare the *Baseline* treatments with both the *Vote Share Low* and the *Vote Share High* group, as well as the *Vote Share Low* with the *Vote Share High* group. As indicated above, contributions in the last round are significantly higher in *Vote Share* compared to *Baseline Donation* ($p = 0.0164$, MWU). Comparing the contributions of the repeated public good game reveals the highest contributions in the *Vote Share High* group compared to all other groups. In the first round, average contributions to the public good are significantly lower in *Vote Share Low* compared to *Baseline* ($p = 0.0964$, MWU) and *Vote Share High* ($p = 0.0507$, MWU). Contributions in the last five rounds are significantly higher in *Vote Share High* compared to *Baseline Donation* ($p = 0.0989$). Also, contribution levels are significantly lower in *Baseline Donation* in the last round compared to *Vote Share Low* ($p = 0.0981$) and *Vote Share High* ($p = 0.0140$).

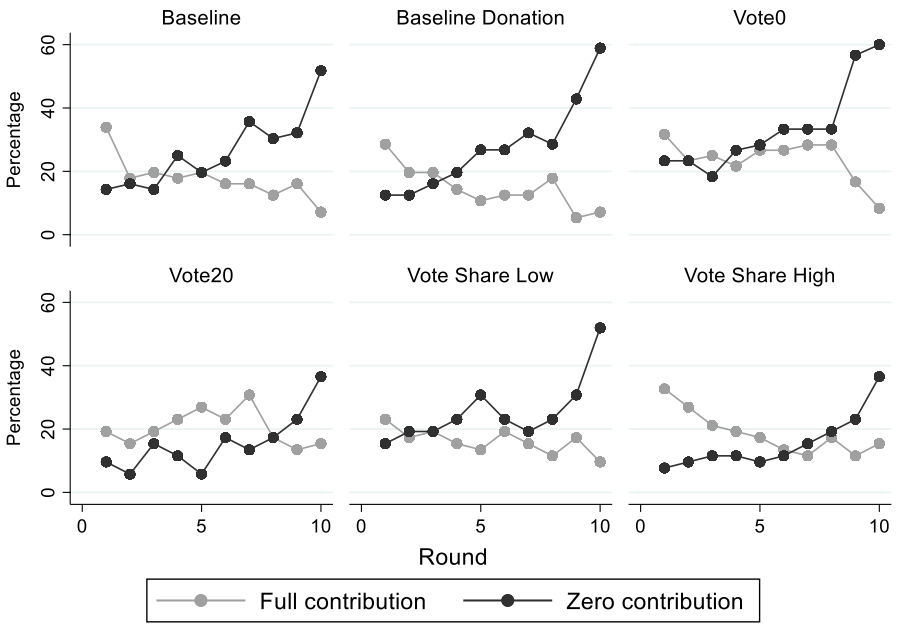


**Fig. 5** Percentage of full/zero contributors

In *Baseline Donation* (53.57%), significantly more participants play as endgamers compared to *Vote Share* (36.54%; p = 0.0564) and *Vote Share High* (32.69%; $p = 0.0457$, MWU).[15] For the one-shot contribution, we find significantly higher contributions in the *Vote Share High* group compared to the *Vote Share Low* group ($p = 0.0251$, MWU). Further, the *Vote Share Low* group stated significantly lower beliefs compared to the *Baseline* ($p = 0.0028$, MWU), *Baseline Donation* ($p = 0.139$, MWU), and *Vote Share High* groups ($p = 0.0061$, MWU).[16]

Table 2 also shows the donation shares that were implemented and the amount of the donation that was generated on average per person and round. While in the *Vote Share* treatment, a donation share of an average of 5.3% was implemented, the average is 3.5% within the *Vote Share Low* groups and 7.2% within the *Vote Share High* groups. Donation amounts are significantly higher in *Vote Share High* compared to *Vote Share Low* ($p = 0.0016$, MWU), and both are significantly lower than in *Baseline Donation.*

[15] The *Vote Share Low* group has 40.38% endgamers.

[16] In order to gain insight into the effect of the respective decision mechanism we also compare *Vote0* with *Vote Share Low* and *Vote20* with *Vote Share High*. Note, that this comparison has some limitations, as the donation shares differ between the compared groups. Our results reveal no significant differences between those groups for the one-shot contribution, belief, contributions in the repeated public good game, and contributions in the last round.

#### 4.1.3 Full and zero contributions

Finally, we take a closer look at those participants who fully cooperate (a 20 tokens-contribution) and those who completely freeride (a 0 tokens-contribution). Figure 5 shows the fraction of participants who contribute zero or twenty tokens in each round of the public good game. The figure nicely demonstrates the difference between *Vote20* as well as *Vote Share High* in comparison to the other groups. In all groups, the number of full contributors exceeds the number of zero contributors in the first round. This relation reverses in the fourth round in the cases of the *Baseline*, *Baseline Donation*, *Vote0*, and *Vote Share Low* groups. In contrast, lines cross after the seventh round in the *Vote20* and *Vote Share High* groups. In the last round, 15.38% are full contributors in the *Vote20* and *Vote Share High* groups, while in all other groups, the percentage of full contributors lies between 7.14 and 9.62%. Further, the percentage of zero contributors lies above 51.79% for all groups except *Vote20* and *Vote Share High* (both 36.54%).[17]

### 4.2 Regression analysis

We ran a regression analysis separately for both decision mechanisms, *Vote* and *Vote Share,* respectively, including both baseline treatments (*Baseline* and *Baseline Donation*). Further, we split regressions for rounds 1–5 and rounds 6–10, as it is particularly interesting to analyze whether effects on cooperation occur already at the beginning and how cooperation evolves over time. All regressions include a dummy for the *Baseline* treatment. Further, we include dummies for *Vote0* and *Vote20* in the *Vote* regressions as well as dummies for *Vote Share High* and *Vote Share Low* in the *Vote Share* regressions to indicate which donation share was implemented. We included the average contribution of the other group members in the previous round in Model II-IV as we provided feedback on the group's contribution to participants after a round. Model III also includes the conditional willingness to cooperate, which was measured by letting participants state their contributions regarding the average contribution of the other group members at the beginning of the experiment. Model IV includes the belief about the other group members' average contribution in the first round and all other control variables.[18] Following the described steps above, we now report those results which show significant effects for our main variables.

#### 4.2.1 Vote treatment

Regression results in the last five rounds reveal a significantly positive effect on contribution levels for groups which included the 20% donation by vote compared to an exogenously set donation (see Table 3). Model IV indicates that participants in

[17] Note that there are no systematic differences dependent on the voting mechanism between the *Vote* and the *Vote Share* treatments regarding the number of full and zero contributors.

[18] See appendix for full regressions including controls.

**Table 3** Vote: Tobit regression on individual contribution rounds 6–10

| Variables | Model I | Model II | Model III | Model IV |
|---|---|---|---|---|
| *Baseline* | 1.556 | 1.590 | 1.718 | 0.0777 |
| | (2.292) | (2.160) | (2.093) | (1.641) |
| *Vote0* | 0.946 | 0.891 | 1.350 | 0.509 |
| | (2.776) | (2.607) | (2.504) | (2.180) |
| *Vote20* | 5.132** | 5.133** | 5.384** | 3.611* |
| | (2.483) | (2.369) | (2.320) | (1.857) |
| Average group members' contributions (previous round) | | 0.0810*** | 0.0800*** | 0.0658** |
| | | (0.0299) | (0.0291) | (0.0255) |
| Conditional cooperator | | | 4.209*** | 2.793** |
| | | | (1.233) | (1.100) |
| Belief | | | | 0.591*** |
| | | | | (0.0889) |
| Control variables | | | | ALL |
| Round | − 1.849*** | − 1.810*** | − 1.808*** | − 1.814*** |
| | (0.172) | (0.179) | (0.180) | (0.190) |
| Constant | 17.78*** | 15.08*** | 12.07*** | 10.29 |
| | (2.194) | (2.177) | (2.314) | (6.916) |
| Observations | 1,120 | 1,120 | 1,120 | 985 |
| *R*-squared | 0.0157 | 0.0185 | 0.0243 | 0.0671 |

Included treatments: *Baseline, Baseline Donation, Vote*. Robust and clustered standard errors of 56 groups in parentheses. Controls in Model IV: age, gender, studying business and economics, number of experiments participated in, income, number of acquaintances in session, number of friends in session, positive reciprocity, negative reciprocity, altruism, GSS, trust, risk. Models II-IV: First-round observations are omitted, as the averages of the group members' contributions in the previous round are not available. Model IV: Some observations are missing due to participants who did not state their monthly income

*$p < 0.1$

**$p < 0.05$

***$p < 0.01$

*Vote20* contribute 3.611 tokens more to the public good compared to participants in *Baseline Donation*. Further, the regression reveals a significantly positive effect on contributions for the group members' average contributions, for conditional cooperation, as well as for the stated beliefs. Additionally, results show a significant negative effect on contributions over rounds.[19]

[19] A Tobit regression on contribution levels over all rounds and for rounds 1–5 does not indicate significant effects of the treatment variables.

**Table 4** *Vote Share*: Tobit regression on individual contribution rounds 6–10

| Variables | Model I | Model II | Model III | Model IV |
|---|---|---|---|---|
| Baseline | 1.512 | 1.535 | 1.693 | 0.416 |
| | (2.221) | (2.124) | (2.049) | (1.682) |
| Vote share low | 2.500 | 2.432 | 2.307 | 2.215 |
| | (2.445) | (2.365) | (2.238) | (1.999) |
| Vote share high | 4.300** | 4.313** | 4.524** | 2.770 |
| | (2.097) | (2.014) | (1.983) | (1.757) |
| Average group members' contributions (previous round) | | 0.0585** | 0.0585** | 0.0361* |
| | | (0.0258) | (0.0242) | (0.0203) |
| Conditional cooperator | | | 5.095*** | 4.058*** |
| | | | (1.178) | (1.166) |
| Belief | | | | 0.437*** |
| | | | | (0.0842) |
| Control variables | | | | ALL |
| Round | − 1.442*** | − 1.394*** | − 1.393*** | − 1.337*** |
| | (0.188) | (0.185) | (0.185) | (0.191) |
| Constant | 14.85*** | 12.73*** | 9.069*** | 18.42*** |
| | (2.276) | (2.125) | (2.227) | (5.858) |
| Observations | 1,080 | 1,080 | 1,080 | 945 |
| R-squared | 0.0119 | 0.0135 | 0.0227 | 0.0502 |

Included treatments: *Baseline, Baseline Donation, Vote Share*. Robust and clustered standard errors of 54 groups in parentheses. Controls in Model IV: age, gender, studying business and economics, number of experiments participated in, income, number of acquaintances in session, number of friends in session, positive reciprocity, negative reciprocity, altruism, GSS, trust, risk. Models II–IV: first-round observations are omitted, as the averages of the group members' contributions in the previous round are not available. Model IV: some observations are missing due to participants who did not state their monthly income

*$p < 0.1$

**$p < 0.05$

***$p < 0.01$

### 4.2.2 Vote share treatment

The regression analysis on individual contributions for the *Vote Share* treatment indicates a significantly positive effect on contributions for groups voting in favor of a high donation share in Models I–III (see Table 4). Additionally, the average contributions of group members, the degree of conditional cooperation, as well as the stated beliefs show significantly positive effects on contribution levels while contributions decrease significantly over rounds.[20]

[20] A Tobit regression on contribution levels over all rounds and for rounds 1–5 does not indicate significant effects of the treatment variables.

## 5 Summary

To conclude, results indicate that allowing participants to decide on a donation share in a public good setting increases contribution levels significantly in the second half of the repeated game for those groups preferring (high) donation shares compared to a situation with an exogenously set donation share. Independently of the voting results, treatment comparisons indicate that being entitled to decide may lead to significantly higher contributions in the last round of the repeated public good game. It should be noted that this effect occurs over the course of the experiment and is not initiated by some first decisions. Endogenous decisions on donations may, thus, increase cooperative behavior in the long run and stabilize cooperation behavior. Finally, note that there are hardly any differences dependent on the type of voting mechanism.

### 5.1 Vote treatment

In the *Vote* treatment, almost half of the participants voted in favor of implementing a 20% donation share in the public good game, which indicates a positive attitude of many participants towards deliberately including a social incentive in their respective groups' payoff scheme. Further, results for the *Vote* treatment indicate a positive effect on stabilizing contribution levels when letting participants endogenously decide on implementing a 20% donation share in comparison to exogenously implementing this donation by the experimenter in the public good game. Particularly, groups contribute more to the public good when they endogenously decide in favor of the donation compared to groups who decide against it. Note that contributions rise, even though the personal outcome of the public good game is reduced by the donation payment.

Results indicate that implementing the decision right particularly supports keeping cooperation levels high over rounds, as seen in the proportion of endgamers, which is significantly lower in the *Vote20* group compared to the other groups. Regression results support that positive effects on contribution levels occur in the second part of the repeated public good game.

### 5.2 Vote share treatment

In total, 72% selected a donation share higher than 0% in the *Vote Share* treatment, which indicates the interest in deliberately integrating a donation share in the group's payoff package. Implemented donation shares ranged from 1.25 to 11%.

In the *Vote Share* treatment, our results show that contributions are significantly higher in the second half of the game for groups that implemented a high donation share compared to groups where the 20% donation was implemented exogenously. As shown in the regression analysis, these effects are robust for the second half of the repeated public good game. Results also reveal significantly

fewer participants behaving as endgamers in the *Vote Share High* groups compared to *Baseline Donation* groups.

## 6 Discussion and implications

We analyze the effect of endogenous decisions on social incentives in a group setting. Our findings are in line with the results of Tonin and Vlassopoulos (2014a), that is, the endogeneity of decisions on social incentives may enhance performance. Our results indicate that this may be true also for cooperation rates in a social dilemma game. This effect may be in turn due to the higher autonomy we provide, which is outlined in the literature on self-determination (e.g. Bartling et al. 2014; Deci and Ryan 1985; Deci et al. 2017). As an alternative explanation, our results may raise from the opportunity to signal one's own type regarding social preferences, as described by Kajackaite and Sliwka (2017). Participants may get a signal from the implemented donation share that at least some others in the group prefer to act prosocially, e.g., due to altruistic preferences. They know that prosocial behavior should affect cooperation positively and, thus, participants may decide to cooperate more, particularly if the reciprocal ones. As participants have no complete information on individual decisions, they may be careful first and then become more confident over rounds. This may also explain the stabilizing effect on cooperation in later rounds.

Either explanations fits our results, and our design cannot disentangle the effect of self-determination and signaling one's type of sociality. This could be an avenue for future research. However, our initial motivation for this research was inspired by group settings in organizations with social incentives, and both effects can hardly be separated.

Unfortunately, we could only tentatively give insight into some subsamples, e.g., in cases a share was implemented that was not unanimously voted for, as our subsamples were too small to derive more robust results. This could also be an option for future research, i.e., to investigate these different groups dependent on voting behavior and implemented decisions in detail. Moreover, we assume that participants may signal their social type by deciding on a donation share which may help to coordinate more cooperative outcomes. In our setting, participants were just informed about the implemented share and not about individual decisions. Supplying this extra information could help participants to coordinate even better, and group cohesion may then support cooperative behaviors in more homogeneous groups.

To conclude, our findings reveal that contributions tend to be higher on average in the *Vote* and *Vote Share* treatments compared to the *Baseline Donation*. Particularly in the last round, contributions are significantly higher in *Vote*, *Vote20*, *Vote Share*, *Vote Share Low,* and *Vote Share High* compared to *Baseline Donation*. Therefore, it may be advisable to let employees endogenously decide about implementing a donation incentive instead of exogenously implementing a donation share.

Interestingly, cooperation levels do not significantly differ between the *Baseline* treatment without donations and *Vote* treatments, while the *Vote* treatments include

the generation of a costless donation payment of 20% in almost half of the groups. This donation payment could be an integral part of a company's CSR strategy, which may lead to further positive effects for the company, such as higher customer loyalty and employer attractiveness.

**Supplementary Information** The online version contains supplementary material available at https://doi.org/10.1007/s11846-023-00698-x.

**Funding** Open Access funding enabled and organized by Projekt DEAL.



## References

Aghion P, Tirole J (1997) Formal and real authority in organizations. J Polit Econ 105(1):1–29. https://doi.org/10.1086/262063

Aghion P, Dewatripont M, Rey P (2004) Transferable control. J Eur Econ Assoc 2(1):115–138. https://doi.org/10.1162/154247604323015508

Andreoni J (1988) Privately provided public goods in a large economy: the limits of altruism. J Public Econ 35(1):57–73. https://doi.org/10.1016/0047-2727(88)90061-8

Andreoni J (1989) Giving with impure altruism. Applications to charity and Ricardian equivalence. J Polit Econ 97(6):1447–1458. https://doi.org/10.1086/261662

Andreoni J (1990) Impure altruism and donations to public goods: a theory of warm-glow giving. Econ J 100(401):464–477

Andreoni J (1995) Warm-glow versus cold-prickle. The effects of positive and negative framing on cooperation in experiments. Q J Econ 110(1):1–21. https://doi.org/10.2307/2118508

Bartling B, Fehr E, Schmidt KM (2013) Discretion, productivity, and work satisfaction. J Inst Theor Econ 1(169):4–22. https://doi.org/10.2139/ssrn.2096838

Bartling B, Fehr E, Herz H (2014) The intrinsic value of decision rights. Econometrica 82(6):2005–2039. https://doi.org/10.3982/ECTA11573

Blanken I, Van De Ven N, Zeelenberg M (2015) A meta-analytic review of moral licensing. Pers Soc Psychol Bull 41(4):540–558

Brønn PS, Vrioni AB (2001) Corporate social responsibility and cause-related marketing: an overview. Int J Advert 20(2):207–222. https://doi.org/10.1080/02650487.2001.11104887

Butz B, Harbring C (2020) Donations as an incentive for cooperation in public good games. J Behav Exp Econ 85:101510

Butz B, Harbring C (2021) The effect of disclosing identities in a socially incentivized public good game. Games 12(2):32

Butz B (2020) Corporate social responsibility and cooperation in teams: an experimental approach. Dissertation RWTH Aachen University. Apprimus Verlag. https://publications.rwth-aachen.de/record/809155

Carpenter J, Gong E (2016) Motivating agents: how much does the mission matter? J Law Econ 34(1):211–236. https://doi.org/10.1086/682345

Cassar L (2019) Job mission as a substitute for monetary incentives: benefits and limits. Manage Sci 2(65):896–912. https://doi.org/10.1287/mnsc.2017.2903
Charness G, Cobo-Reyes R, Jiménez N, Lacomba JA, Lagos F (2012) The hidden advantage of delegation: Pareto improvements in a gift exchange game. Am Econ Rev 102(5):2358–2379. https://doi.org/10.1257/aer.102.5.2358
Charness G, Cobo-Reyes R, Lacomba JA, Lagos F, Perez JM (2016a) Social comparisons in wage delegation: experimental evidence. Exp Econ 19(2):433–459. https://doi.org/10.1007/s10683-015-9448-x
Charness G, Cobo-Reyes R, Sánchez Á (2016b) The effect of charitable giving on workers' performance: experimental evidence. J Econ Behav Organ 131:61–74. https://doi.org/10.1016/j.jebo.2016.08.009
CONE Communications (2016) Employee engagement study. http://www.conecomm.com/research-blog/2016-employee-engagement-study
Cornelissen T, Heywood JS, Jirjahn U (2010) Profit sharing and reciprocity. Theory and survey evidence. SSRN Electron J 292:1–32. https://doi.org/10.2139/ssrn.1597142
Crumpler H, Grossman PJ (2008) An experimental test of warm glow giving. J Public Econ 92(5–6):1011–1021. https://doi.org/10.1016/j.jpubeco.2007.12.014
Dawes RM, Thaler RH (1988) Anomalies. Cooperation. J Econ Perspect 2(3):187–197. https://doi.org/10.1257/jep.2.3.187
Deci EL, Ryan RM (2000) The "what" and "why" of goal pursuits: human needs and the self-determination of behavior. Psychol Inq 11(4):227–268. https://doi.org/10.1207/S15327965PLI1104_01
Deci EL, Olafsen AH, Ryan RM (2017) Self-determination theory in work organizations: The state of a science. Ann Rev Org Psychol Org Behav 4:19–43
Deci EL, Ryan RM (1985) Intrinsic motivation and self-determination in human behavior. Springer
Die Tafel Deutschland. Tafel: Lebensmittel retten. Menschen helfen. https://www.tafel.de/
Eckel CC, Grossman PJ (1996) Altruism in anonymous dictator games. Games Econ Behav 16(2):181–191. https://doi.org/10.1006/game.1996.0081
Ek C (2017) Some causes are more equal than others? The effect of similarity on substitution in charitable giving. J Econ Behav Org 136:45–62
Falk A, Kosfeld M (2006) The hidden costs of control. Am Econ Rev 96(5):1611–1630. https://doi.org/10.1257/aer.96.5.1611
Fehr E, Schmidt KM (2001) Theories of fairness and reciprocity—evidence and economic applications. Adv Econ Econometr 35(1):208–257
Fehr E, Herz H, Wilkening T (2013) The lure of authority: motivation and incentive effects of power. Am Econ Rev 103(4):1325–1359. https://doi.org/10.1257/aer.103.4.1325
Fehrler S, Kosfeld M (2014) Pro-social missions and worker motivation: an experimental study. J Econ Behav Org 100:99–110. https://doi.org/10.1016/j.jebo.2014.01.010
Fischbacher U (2007) Z-tree: Zurich toolbox for ready-made economic experiments. Exp Econ 10(2):171–178. https://doi.org/10.1007/s10683-006-9159-4
Fischbacher U, Gächter S, Fehr E (2001) Are people conditionally cooperative? Evidence from a public goods experiment. Econ Lett 71(3):397–404. https://doi.org/10.1016/S0165-1765(01)00394-9
Foss NJ, Minbaeva DB, Pedersen T, Reinholt M (2009) Encouraging knowledge sharing among employees: How job design matters. Hum Resour Manage 48(6):871–893. https://doi.org/10.1002/hrm.20320
Frey BS (1993) Does monitoring increase work effort? The rivalry with trust and loyalty. Econ Inq 31(4):663–670. https://doi.org/10.1111/j.1465-7295.1993.tb00897.x
Frey BS, Benz M (2008) Being independent is a great thing: subjective evaluations of self-employment and hierarchy. Economica 75(298):362–383
Gächter S, Renner E (2010) The effects of (incentivized) belief elicitation in public goods experiments. Exp Econ 13(3):364–377. https://doi.org/10.1007/s10683-010-9246-4
Gächter S, Herrmann B, Thöni C (2004) Trust, voluntary cooperation, and socio-economic background. Survey and experimental evidence. J Econ Behav Org 55(4):505–531. https://doi.org/10.1016/j.jebo.2003.11.006
Greiner B (2015) Subject pool recruitment procedures: organizing experiments with Orsee. J Econ Sci Association 1:114–125. https://doi.org/10.1007/s40881-015-0004-4
Grossman SJ, Hart OD (1986) The costs and benefits of ownership: a theory of vertical and lateral integration. J Polit Econ 94(4):691–719. https://doi.org/10.1086/261404
Imas A (2014) Working for the "warm glow": on the benefits and limits of prosocial incentives. J Public Econ 114:14–18. https://doi.org/10.1016/j.jpubeco.2013.11.006

Jeworrek S, Mertins V (2019) Mission, motivation, and the active decision to work for a social cause. J Econ Manag Strategy 28(4):656–669. https://doi.org/10.1111/jems.12313
Kajackaite A, Sliwka D (2017) Social responsibility and incentives in the lab: Why do agents exert more effort when principals donate? J Econ Behav Organ 142:482–493. https://doi.org/10.1016/j.jebo.2017.08.013
Keser C, van Winden F (2000) Conditional cooperation and voluntary contributions to public goods. Scand J Econ 102(1):23–39. https://doi.org/10.1111/1467-9442.00182
Kim S-Y, Park H (2011) Corporate social responsibility as an organizational attractiveness for prospective public relations practitioners. J Bus Ethics 103(4):639–653. https://doi.org/10.1007/s10551-011-0886-x
Deutscher Kinderschutzbund. Unser verband: Groß und stark. https://www.dksb.de/de/unsere-arbeit/schwerpunkte/
Koppel H, Regner T (2014) Corporate social responsibility in the work place. Exp Econ 17(3):347–370. https://doi.org/10.1007/s10683-013-9372-x
Kuvaas B (2008) A test of hypotheses derived from self-determination theory among public sector employees. Empl Relat 31(1):39–56. https://doi.org/10.1108/01425450910916814
Ledyard J (1995) Public goods: a survey of experimental research. In: The handbook of experimental economics, pp. 111–194
Masclet D, Colombier N, Denant-Boemont L, Lohéac Y (2009) Group and individual risk preferences. A lottery-choice experiment with self-employed and salaried workers. J Econ Behav Org 70(3):470–484. https://doi.org/10.1016/j.jebo.2007.11.002
Merritt AC, Effron DA, Monin B (2010) Moral self-licensing: when being good frees us to be bad. Soc Pers Psychol Compass 4(5):344–357
One Percent for the Planet (2021) Let's create a new environmental legacy together. http://www.onepercentfortheplanet.org/
Owens D, Grossman Z, Fackler R (2014) The control premium: a preference for payoff autonomy. Am Econ J: Microecon 6(4):138–161. https://doi.org/10.1257/mic.6.4.138
Patall EA, Cooper H, Robinson JC (2008) The effects of choice on intrinsic motivation and related outcomes: a meta-analysis of research findings. Psychol Bull 134(2):270–300. https://doi.org/10.1037/0033-2909.134.2.270
Patall EA (2012) The motivational complexity of choosing: a review of theory and research. In: The oxford handbook of human motivation. https://doi.org/10.1093/oxfordhb/9780195399820.013.0015
PWC (2021) Consumer intelligence series survey on ESG. https://www.pwc.com/us/en/services/consulting/library/consumer-intelligence-series/consumer-and-employee-esg-expectations.html
Regner T, Koppel H (2019) What drives motivated agents? The "right" mission or sharing it with the principal. J Behav Exp Econ 83:101463
Rushton PJ, Chrisjohn RD, Fekken CG (1981) The altruistic personality and the self-report altruism scale. Pers Ind Differ 2(4):293–302. https://doi.org/10.1016/0191-8869(81)90084-2
Ryan RM, Deci EL (2000) Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. Am Psychol 55(1):68–78. https://doi.org/10.1037//0003-066X.55.1.68
Tonin M, Vlassopoulos M (2014a) Corporate philanthropy and productivity: evidence from an online real effort experiment. Manage Sci 61(8):1795–1811. https://doi.org/10.1287/mnsc.2014.1985
Tonin M, Vlassopoulos M (2014b) An experimental investigation of intrinsic motivations for giving. Theor Decis 76(1):47–67. https://doi.org/10.1007/s11238-013-9360-9
Unicef. Unicef: Kinderhilfswerk der vereinten nationen. https://www.unicef.de/informieren/ueber-uns/unicef-international
UNO-Flüchtlingshilfe. Leben retten—rechte schützen. https://www.uno-fluechtlingshilfe.de/ueber-uns/verein.html
Whole Foods Market (2021) Caring for local and global communities. https://www.wholefoodsmarket.com/mission-values/caring-communities
WWF. WWF pressebilder organisation. http://www.wwf.de/pressebilder/wwf-pressebilder-organisation/