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Valeria Fanghella  
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# **“What you don’t know, can’t hurt you”: Self-image motivation in charitable giving**

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## **Abstract**

While people frequently behave prosocially, they also tend to avoid situations that call for prosocial behavior. We study this phenomenon in the context of a donation request in the absence of social interactions, thereby focusing on the effect of self-image motivation. We conduct an incentivized online experiment involving two consecutive dictator games with a charity. In the first stage, we employ a 2×2 between-subject design, varying the characteristics of the dictator game and the information provided: (i) standard dictator game or dictator game with a costly opt-out, and (ii) with or without social information (mean donation in a previous session). The second stage is a standard dictator game for all participants. We find that the opt-out option leads to significantly fewer donations to the charity, supporting our hypothesis that opting out is a strategy to preserve the self-image while not donating. The provision of social information increases opt-outs, although not statistically significant. Finally, we observe distinct behaviors in the second stage based on the options and decisions in the first stage, suggesting a role for self-image motivation in temporal dynamics of prosocial behavior.

**Keywords:** dictator game; opt-out option; self-image; charitable giving; social information.

**JEL classification:** C90, D91.

## 1 Introduction

Prosocial behavior, a fundamental aspect of human social interactions, is often intertwined with a paradox. While people frequently behave prosocially, they also have a propensity to avoid situations that call for prosocial behavior. This propensity manifests in a multitude of real-world contexts—such as walking away from solicitors (Andreoni et al., 2017; Trachtman et al., 2015) or refusing to open the door to them (DellaVigna et al., 2012). Laboratory studies have also revealed that some individuals pay to quietly exit a dictator game (DG), forgoing an obvious gain (e.g., Broberg et al., 2007; Dana et al., 2006; Klinowski, 2020; Lazear et al., 2012). A recurring element of these studies is the presence of social interactions, such as with a solicitor making a donation request or with a recipient awaiting the offer of a dictator. Within these contexts, individuals' donations may be motivated by a desire to meet others' expectations and to signal to others that they are altruistic. Hence, avoiding the request becomes a strategy for pursuing self-interest while upholding a positive social image.

This study departs from the existing literature by focusing on self-image as a driver for avoiding prosocial requests. Self-image motivation differs from social image motivation, as it revolves around individuals' motivation to behave prosocially to signal to themselves (rather than to others) that they are altruistic (Bénabou & Tirole, 2011).

To investigate this, we conducted a pre-registered, incentivized online experiment ( $N = 1400$ ), where participants played two consecutive DGs with a charity. In the first stage, we varied the type of DG and the information provided to participants with a  $2 \times 2$  between-subjects design: (i) standard DG or DG with a costly opt-out; (ii) with or without social information (about mean donation by participants in a previous session, including non-donors). The first factor captured the propensity to avoid a donation request, with the DG with the costly opt-out (from here on, we omit “costly”) allowing participants to renounce a fixed part of their endowment to avoid playing the DG (Dana et al., 2006). The second factor was aimed at studying the interplay between self-image motivation and social information. Notably, it allowed us to investigate whether exposure to others' good behavior increases the probability of avoiding the game, as social information may create a feeling of obligation to comply with others' behavior to maintain a positive self-image. The second stage involved a standard DG for all participants, which measured temporal dynamics by distinguishing for the motivation to donate in the first decision.

Our design is ideal for studying the effect of self-image motivation on the decision to avoid a donation request. The recipient, a charity, is unaware of the existence of the experiment and of the source of the donation. Thus, it cannot be disappointed by a low donation or interpret a donation as a signal of participant's altruism. Furthermore, decisions are anonymous, meaning that a participant is the sole audience for their own behavior (Tonin & Vlassopoulos, 2013). Opting out can thus only be explained by self-image motivation, which allows participants to "overlook" the donation request and maintain a positive view of themselves even without donating (Adena & Huck, 2020).

Our study contributes to the literature in three ways. First, we delve into the phenomenon of avoiding prosocial requests in the absence of social interactions. In this situation, opting out is driven by the desire to maintain one's self-image while behaving selfishly. Importantly, we make the opt-out option costly, allowing us to assess the strength of self-image motivation. When the opt-out option is free, participants face no cost while potentially gaining benefits from opting out, making it an appealing choice. Our design allows us to determine whether self-image motivation is strong enough that participants would pay to avoid the donation request. Dana et al. (2006) indicate that when opting out is costly and social expectations are absent, barely any dictators opt out. On the other hand, the two studies we are aware of that have observed opting out without social interactions both included a free opt-out option (Adena & Huck, 2020; Tonin & Vlassopoulos, 2013).

Second, we explore the interplay between self-image motivation and social information. While social information is often used to encourage prosocial (e.g., Agerström et al., 2016; Frey & Meier, 2004; Shang & Croson, 2009) and pro-environmental (Andor & Fels, 2018; Farrow et al., 2017) behavior, recent research indicates that it may create disutility among non-compliers (Allcott & Kessler, 2019). Preliminary evidence in line with such an interplay between self-image and social information is put forward by Klinowski (2020). The author shows that when high descriptive norms (previous donation by one participant) are presented before the decision on whether to donate, they increase the number of free opt-outs. According to Klinowski, this result occurs because opting out becomes socially acceptable when others have already made large donations. In this interpretation, opting out is not driven by the need to conform to others' behavior to maintain a positive self-image; instead, knowing that others behave prosocially frees individuals from feeling compelled to do the same.

Our study differs from that of Klinowski (2020) by focusing on social information in the form of a descriptive norm (mean donation by participants in a previous session, including non-donors) and

making the opt-out option costly. As Klinowski (2020), we also predict an increase in opt-outs when social information is provided, but through a different mechanism. We propose that, in order to maintain a positive self-image, participants may feel that they have to comply with others' behaviors. Consequently, participants primarily driven by self-image motivation, who originally intended to contribute an amount below the descriptive norm, may opt out to avoid a negative self-image arising from donating less than others. In this view, social information is potentially utility-reducing (as in Allcott & Kessler, 2019).

Third, we explore the impact of self-image motivation on a subsequent donation request. In doing so, our research introduces a novel perspective to the literature on temporal dynamics of prosocial behavior (e.g., Brañas-Garza et al., 2013; Dolan & Galizzi, 2015; Schmitz, 2019), shedding light on why these dynamics may vary among individuals.

The remainder of the paper proceeds as follows. In Sections 2 and 3, we describe the pre-registered experimental design and behavioral predictions, respectively. Section 4 presents the results, followed by Section 5, which discusses the main findings and concludes.

## **2 Materials and methods**

### **2.1 Participants and procedure**

We conducted the experiment on the online platform Prolific in January 2022. To prevent the description of the study from affecting self-selection into participation, it was presented as a general study on decision-making. First, participants gave consent and were informed that in addition to the participation payment of £1, they had a 10 percent chance to earn up to £10 as an additional bonus, depending on their decisions during the study. We also informed them that their decisions would remain anonymous. Next, participants chose one out of three charities with which they preferred to be associated for the rest of the experiment. After that, participants were randomly assigned to one of four treatments (stage 1).

Stage 1 was a DG with the charity chosen by the participant. The type of DG and the information provided varied according to a 2 x 2 between-subjects design. The DG was either a standard DG or a DG with an opt-out option. In the DG with opt-out, participants could decide not to play the DG against a cost, which was 10 percent of the endowment (£1). Half of participants in both of these groups were

randomly assigned to receive social information in the form of a descriptive norm (mean donation by participants in a previous session, including non-donors). The primary aims of stage 1 were to investigate (a) how many would “pay” to avoid playing the DG in the absence of social interactions and (b) to what extent doing so is influenced by social information.

In stage 2, all participants played a standard DG with the charity of their choice. This stage allowed us to capture how participants behave when they face a second donation request, depending on the options seen and the choices made in stage 1. Participants were only informed about the content of stage 2 after stage 1 to avoid strategic compensation behavior—i.e., participants reducing their donations in stage 1 because they knew that they could compensate by increasing it in stage 2 (Gneezy et al., 2014). After the experiment, participants completed a survey about preferences and attitudes.<sup>1</sup> This section also included an attention check to identify participants not paying attention.

In both stages, we included comprehension checks to ensure that participants understood the payment mechanism and the instructions of the games. Participants could not proceed to the following section unless they had answered the questions correctly. The initial endowment was £10 for each stage. Participants were told that only one of the two stages would be implemented (randomly chosen) for payment at the end of the experiment (as standard in the literature, see e.g., Brañas-Garza et al., 2013). This because “paying for all decisions makes wealth and portfolio effects possible, as well as cross-task contamination” (p. 142, Charness et al., 2016). Indeed, since we expect a treatment effect in stage 1, we would be unable to disentangle income effects from moral compensation effects in stage 2. We ensured incentive compatibility by paying a random subset of participants (1 out of 10). We explained the payment mechanism at the beginning of stage 1 and repeated it at the beginning of stage 2. As long as decisions are incentivized, random lottery payments produce results consistent with paying all (Clot et al., 2018; Umer, 2023).

Before conducting the main study, we ran a pilot study on Prolific with 45 participants (not included in the main study) in order to collect data on mean donation for the social information and to test if

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<sup>1</sup> More details about survey items and descriptive statistics are available in Supplementary Material, Section 2. In the same section, we also report participants’ characteristics by treatment. Table S1 shows that the randomization was pretty successful, except for gender, which is slightly unbalanced across treatments. We rule out that this unbalance drives our results in Supplementary Material, Section 5.

instructions were clear. The pilot study included a standard DG and a DG with opt-out with a charity selected by the participant (from the same set as in the main study). In the standard DG, the mean donation was £5.5.

The main study had a total of 1400 participants.<sup>2</sup> All participants lived in the UK and spoke English as first language. The mean completion time was 8.5 minutes. Participants received a fixed participation payment of £1 (for a payment of about 7 £/hour). Once data collection was completed, 10 percent of participants were randomly selected to receive the bonus payment according to their decision in either stage 1 or stage 2. We transferred them the amount corresponding to the payment bonus minus the stated donation, which was sent to the selected charity.<sup>3</sup>

Preregistration of the experimental design and hypotheses, along with the full experimental instructions, are available at this [link](#).<sup>4</sup> Screenshots of the original experimental instructions are reported in Supplementary Material, Section 1.

## **2.2 Experimental design**

### **2.2.1 Charity selection**

Focusing on pro-environmental behavior as an instance of prosocial behavior, we asked participants to choose one from a set of three environmental charities, comprising WWF, Greenpeace, and Friends

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<sup>2</sup> Out of the 1442 participants who started the main study, 1404 participants completed it. We rejected 4 participants; two of them because they took less than 5 minutes to complete the experiment and failed the attention check; one completed the survey in less than one minute with the wrong completion code; and one used a Prolific ID that was not associated to any identifier in the Prolific database. At the beginning of the data collection, a few participants saw a table in which the payoffs for the charity and the participant were interchanged. To address this issue, we reached out to the 14 participants who might have been affected by this issue and asked them to verify their allocations. Our results remain unchanged whether we include or exclude them in the analyses (results are available upon request).

<sup>3</sup> Overall, 146 participants received a bonus, for a total of £798.5, and we donated £460, £78 and £123.5, to WWF, Greenpeace, and Friend of the Earth, respectively. We used the same incentive mechanism also for the pilot study. Of the 146 participants receiving a bonus, 4 were drawn from the sample of the pilot study and 142 from the main study.

<sup>4</sup> We made some minor changes to the hypotheses formulation after having received peer feedback. The new hypotheses better fit the collected data and respond to our research questions. We report these changes in Supplementary Material, Section 3. In the same section we also report testing of the original hypotheses and show that they lead to the same conclusions as the updated formulations.

of the Earth.<sup>5</sup> We explained that they would be associated with the selected organization for the rest of the study without saying what decisions they would make in the later parts. Providing a few alternatives is common practice in this type of setting (e.g., Schmitz, 2019) because it reduces the probability that participants do not find an organization that they like while preventing choice overload (Iyengar & Lepper, 2000). We provided a short description of each charity based on information publicly available on the charity's website. We randomized the order of presentation of the charities.

### **2.2.2 Stage 1: Dictator game, opt-out option and social information**

At this stage, participants were randomly assigned to one of four treatments with a 2×2 between-subject design, where we varied the type of DG (standard or with opt-out) and the provision of social information.

In the standard DG (*Standard*) participants chose how to split an endowment of £10 between themselves and the environmental charity of their choice. In the DG with opt-out (*Optout*), participants could choose to pay £1 to skip the decision on how to split the endowment between themselves and the environmental charity. Opting out is inefficient and Pareto dominated by opting in, as the DG includes two allocations, (£9, £1) and (£10, £0), that dominate the opt-out allocation (£9, £0). We used a procedure similar to that of Dana et al. (2006) (and replicated by, e.g., Broberg et al., 2007; Klinowski, 2020) for the DG with opt-out, with two main differences.

First, in previous studies, another participant served as recipient, but remained uninformed about the DG in case the dictator opted out (Broberg et al., 2007; Dana et al., 2006; Klinowski, 2020). Here, to focus on self-image, we used a charity as beneficiary that would never know about dictators' decisions in any case. Second, Dana et al. (2006) introduced the opt-out option after participants played the DG, whereas we made participants decide whether to opt out before playing the DG (as in Lazear et al. 2012). Participants who chose to opt out did not see the screen with the DG and proceeded to the next

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<sup>5</sup> These organizations are quite popular in the UK and are seen as efficient in their resource use (<https://www.theguardian.com/environment/2013/nov/27/1-in-10-uk-adults-environmental-group>, last accessed on 10/01/2022).

part of the experiment.<sup>6</sup> This approach enables self-deception because opting out “hides” the donation request from participants. As a result, participants could overlook the donation request and maintain a positive self-image even if they did not donate. Additionally, if participants first made the donation decision and then encountered the opt-out option, their prior choice may have already boosted their self-image, influencing their subsequent decision to opt out (Tonin & Vlassopoulos, 2013).

The social information was presented to half of participants playing either the standard DG (*Standard-SN*) or the DG with opt-out (*Optout-SN*). Social information was provided in the form of a descriptive norm. Specifically, participants were informed about the mean donations by participants who played the standard DG in the pilot study, considering also those allocating zero. Hence, as e.g., Allcott (2011) and Frey & Meier (2004), we chose to use information about the mean behavior of the studied sample. Thus, no deception was involved. We used the following text: “For your information, we conducted earlier a similar survey on Prolific: participants gave on average £5.5 to the environmental organization”. This information was provided to participants before the sharing decision in the *Standard-SN* treatment, and before the decision to opt out in the *Optout-SN* treatment.

In all treatments, participants chose how to split the endowment between themselves and the charity by selecting from a list of possible allocations. In order to force participants to either offer or keep more than the equal split, the equal split was not an option (as in Bellemare et al. 2008). Available allocations thus started from (£0, £10) and incremented in steps £1 until reaching the allocation of (£4, £6). The next available allocations were (£4.5, £5.5) and (£5.5, £4.5). Allocations then continued to increment by £1, from (£6, £4) to (£10, £0). We randomized the order of presentation of the allocations in the list (ascending versus descending). Our randomization procedure assigned a higher proportion of participants to the treatments with the opt-out option, as follows: 30 percent to each of *Optout* and *Optout-SN*, and 20 percent to each of *Standard* and *Standard-SN*. Our sample size has 0.80 power to detect a fairly small effect size of social information and opt-out on donation ( $d = 0.24$ ) and

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<sup>6</sup> A possible alternative reason for opting out is to reduce the time required to complete the survey. However, we asked participants whether they wanted to opt out just before the donation decision, making the difference in completion time between those who opt out or not negligible ( $p = 0.93$  from ANOVA).

for the effect of social information on opt-out ( $d = 0.22$ ), considering the threshold of statistical significance at 0.05.

### **2.2.3 Stage 2: Dictator game**

All participants played a standard DG with the environmental charity of their choice. The endowment was £10. As in stage 1, the allocation decision was made out of a list of possible allocations that did not include the equal split. The order of presentation of the list was randomized and was kept consistent with the order used in stage 1 for each participant.

## **3 Behavioral predictions**

In our setup, playing the DG is a dominant strategy. The costly opt-out option is Pareto dominated by allocations more favorable to the decision-maker (£10, £0) or to the recipient (£9, £1). However, there is empirical evidence that some individuals avoid prosocial requests to preserve their image while pursuing their self-interest. Indeed, the amount given to the recipient can signal the decision-maker's altruism, to the recipient when there is a defined one (social image), but also to the decision-maker herself (self-image). Therefore, individuals driven by image motivation may feel compelled to donate to signal that they are altruistic, although they would rather behave selfishly. Opting out represents a strategy to keep a large payoff and simultaneously preserve the social- and the self-image. In our setting, we only focus on self-image motivation because choices are anonymous and there is no participant recipient with expectations to meet (Tonin & Vlassopoulos, 2013). Opting out allows individuals to act as if the donation request did not exist and, thus, permits them to preserve their self-image even in the absence of a donation (Adena & Huck, 2020). In our experiment, this self-deception is facilitated by eliciting participants' decision to opt out before seeing the donation request.

We hypothesize that some participants donate to preserve their self-image. They are thus sensitive to the presence of the opt-out option and opt out as long as the expected benefits of doing so are

higher than the costs.<sup>7</sup> Since we expect fewer donations when opt-out is possible, we should see a reduction in mean donations when the opt-out option is present, as hypothesized below.

*Hypothesis 1.* In stage 1, mean donation is higher in the *Standard* treatment than in the *Optout* treatment.

In the social information treatments, the descriptive norm is made salient and is expected to increase giving (Frey & Meier, 2004; Krupka & Weber, 2009).<sup>8</sup> Individuals tend to conform to peer behavior, to conditionally cooperate, or to use others' donations as a signal of charity quality. Thus, on average, we expect to replicate the commonly observed positive effect of social information on donations in the *Standard* treatment.

*Hypothesis 2.* In stage 1, in the standard DG, mean donation is higher when social information is displayed (*Standard-SN*) than when it is not displayed (*Standard*).

The effect of social information may also affect self-image motivation. Individuals may see others' behavior as the right thing to do. Thus, donating less than others may negatively affect the self-image, because one falls short of others' good behavior. The negative implications for the self-image of donating a low amount are, now that social information is salient, higher. Therefore, we expect that participants who would have given (i) because driven by self-image motivation and (ii) an amount below the descriptive norm, are more likely to opt out when social information is provided than when it is not provided, thus leading to an overall increase in opt-outs in the *Optout-SN* treatment.

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<sup>7</sup> Note that by fixing the cost to opt out at £1, we are not able to detect participants donating for self-image motivation with willingness to pay lower than £1. The decision to fix the price in this way is primarily to compare our results with those from Dana et al. (2006) and replications, and secondly, to ensure comprehension, as a multiple price list mechanism like the one by Broberg et al. (2007) may be difficult to implement in the online environment, which allows for less control over participants' behavior than the laboratory.

<sup>8</sup> Except for pure altruists, who see others' and personal donations as substitutes. Thus, their marginal utility from donating reduces with the information that others donate more. In our experiment, we give only one value of descriptive norm; thus, we may expect it crowds out (in) for those who thought that the social norm of giving was lower (higher) than the descriptive norm.

*Hypothesis 3.* In the DG with opt-out, more participants opt out when social information is displayed (*Optout-SN*) than when it is not displayed (*Optout*).

Our last set of predictions refers to the behavior in the second DG. In stage 2, we examine how participants behave in a subsequent donation request depending on the options they saw in stage 1 and the choices they made. In order to eliminate the effect of accumulation of earnings, we only pay one randomly selected stage (Charness et al., 2016). We also prevented strategic behavior by informing participants about the donation in stage 2 after having completed stage 1 (Gneezy et al., 2014). Replicating a standard DG for all four treatments allows us to reveal the effect of self-image on subsequent prosocial behavior. Theoretically, rational decision-makers with prosocial preferences should behave consistently across the two stages, as only one decision is implemented. However, a first prosocial behavior tends to guarantee benefits to individuals, such as warm-glow and improved self-image, which may license them to reduce their donation in subsequent decisions (e.g., Brañas-Garza et al., 2013; Schmitz, 2019). Thus, we expect an overall reduction in donation from stage 1 to stage 2 when the first game is a standard DG (*Standard*). We expect the same pattern among participants opting into the DG in the *Optout* treatment, as they may also have residual benefits from their donation in stage 1.

*Hypothesis 4.* Mean donation is lower in stage 2 than in stage 1 in the *Standard* treatment.

*Hypothesis 5.* Mean donation among participants opting in is lower in stage 2 than in stage 1 in the *Optout* treatment.

Finally, we expect that participants opting out in stage 1 donate a positive amount in stage 2. This is because they cannot avoid the DG in stage 2, and thus donate a positive amount to self-signal that they are altruistic. The need for self-signaling their altruism is even more necessary because they did not establish a positive self-image in stage 1, since they avoided the donation request.

*Hypothesis 6.* Those who opted out in stage 1 donate a positive amount in stage 2.

#### **4 Empirical approach**

To test whether mean donations across treatments differ, we perform pairwise comparisons by correcting for multiple hypothesis testing, following List et al. (2019). Unlike a two-by-two

comparison of treatments (or a regression framework), this statistical technique adjusts for the familywise error rate and provides more reliable significance values comparing all treatments simultaneously. For Hypotheses 4 and 5, we compare mean donations for the same treatment between the two stages using paired t-tests. We test Hypothesis 6 through t-tests for mean donations equal to 0 for participants who opted out in stage 1. All our statistical tests have two-tailed alternative hypotheses. As a robustness check, we report the results of alternative model specifications in Supplementary Material, Section 5, which lead to the same conclusions as the analyses reported in the main text.

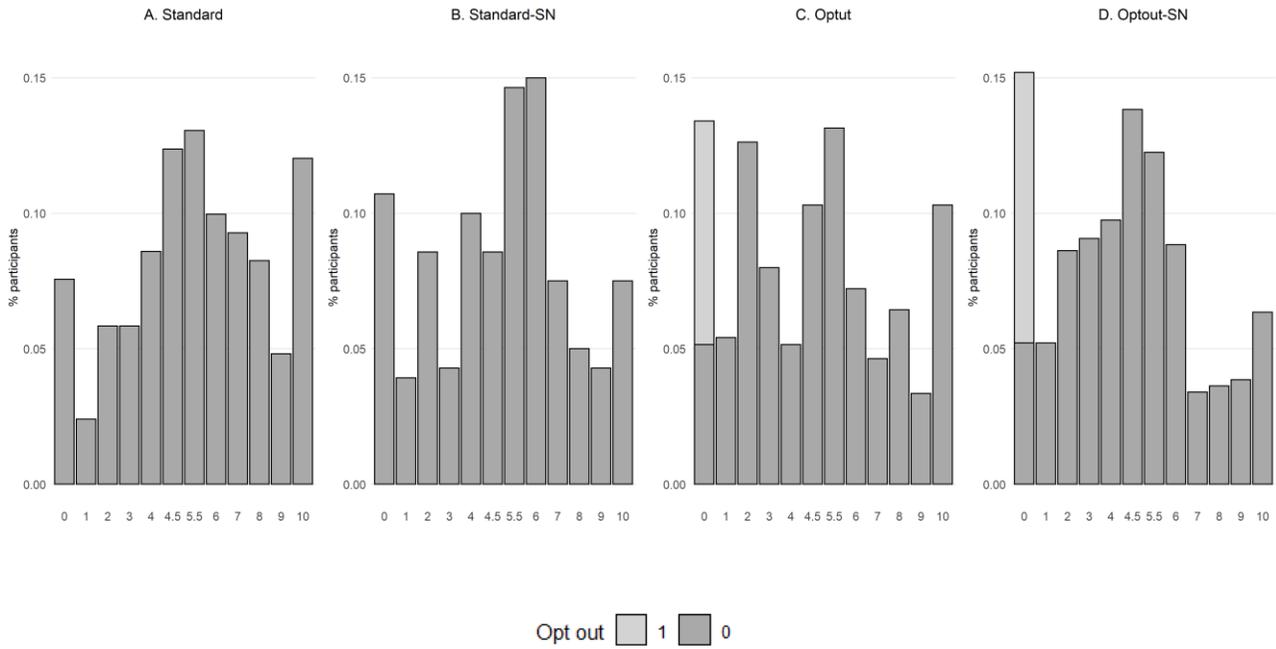
An overview of the descriptive statistics of the results is reported in Table 1. Distributions of donations in each stage and per treatment are reported in Figure 1 and Figure 2.

**Table 1. Mean donations in stage 1 and stage 2, and number of opt-outs, per treatment**

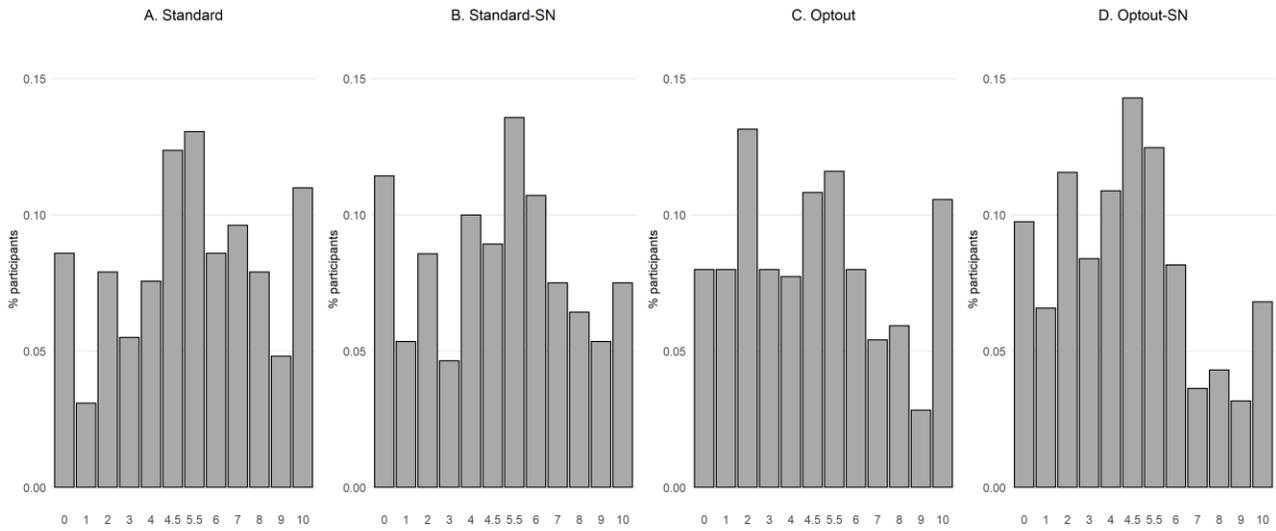
Treatment	<i>Standard</i>	<i>Standard-SN</i>	<i>Optout</i>	<i>Optout-SN</i>	P-value <sup>1</sup>
N	291	280	388	441	
<i>Stage 1</i>					
Mean donation	5.48 (2.82)	4.89 (2.81)	4.55 (3.09)	4.22 (2.85)	< 0.001***
Share of opt-out	-	-	0.082 (0.27)	0.100 (0.30)	0.39
Extensive margin	0.92 (0.26)	0.89 (0.31)	0.87 (0.34)	0.85 (0.36)	0.01*
Intensive margin	5.93 (2.44)	5.48 (2.37)	5.25 (2.71)	4.98 (2.40)	< 0.001***
<i>Stage 2</i>					
Mean donation	5.29 (2.89)	4.83 (2.92)	4.66 (2.96)	4.37 (2.74)	< 0.001***
Extensive margin	0.91 (0.28)	0.89 (0.32)	0.92 (0.27)	0.90 (0.30)	0.47
Intensive margin	5.78 (2.50)	5.45 (2.50)	5.07 (2.73)	4.84 (2.45)	< 0.001***

Note: *extensive margin* represents the share of participants donating a positive amount (for stage 1 this variable is 0 also for opt-outs); *intensive margin* represents the amount donated conditional on donating a positive amount. Standard deviations in parentheses. <sup>1</sup>P-value from ANOVA. \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001.

**Figure 1. Distribution of donations in stage 1 per treatment**



**Figure 2. Distribution of donations in stage 2 per treatment**



## 5 Results

### 5.1 Behavior in stage 1

Results from our pairwise mean comparisons are reported in Table 2. In line with hypothesis 1, our results show that including an opt-out option reduces donations. The difference in mean donations between the *Standard* and *Optout* treatments is £0.93, which is almost 10 percent of the initial endowment and is statistically significant at  $p < 0.001$ . The reduction in mean donation can be attributed to the 9 percent of participants who opted out of the DG in the *Optout* treatment. The opt-out rate we find is lower than those observed in studies using a similar experimental design but with social interactions (Broberg et al., 2007; Dana et al., 2006; Klinowski, 2020). This suggests that the motivation to preserve a positive self-image is less compelling than the motivation to maintain a positive image in the eyes of others. We will return to this point in Section 6.

Interestingly, environmental identity is positively correlated with the decision to opt in and donate a positive amount and negatively correlated with the decision to opt in and not donate, and even more strongly, with the decision to opt out (see Table S4 in Supplementary Material). This indicates that participants driven by preferences over the charity's payoff donated, whereas those primarily concerned with their self-image but less concerned about the charity's payoff tended to avoid the donation request.

Table 2. Pairwise comparisons of mean donations in stage 1

Mean donations comparison	Difference in means	P-value <sup>1</sup>
Standard vs Standard-SN	0.587	0.030*
Standard vs Optout	0.933	< 0.001***
Standard vs Optout-SN	1.254	< 0.001***
Standard-SN vs Optout	0.346	0.127
Standard-SN vs Optout-SN	0.667	0.004**
Optout vs Optout-SN	0.322	0.205

Note: <sup>1</sup> P-values from pairwise mean comparison corrected with Theorem 3.1 in List et al. (2019). \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

However, we do not find any evidence for social information to increase mean donations (in contrast to hypothesis 2). Instead, social information reduced mean donation by £0.59, which is significant at  $p = 0.03$ . This is due to a lower intensive margin in the *Standard-SN* treatment than in the *Standard* treatment ( $p = 0.034$ ), while there is no significant effect on the extensive margin ( $p = 0.19$ ). Ex-post,

it seems that the descriptive norm we communicated to participants (£5.5) was not high enough to incentivize them to donate, with the mean donation and the intensive margin in the control group being the same or above the descriptive norm (see Table 1).

Social information thus appears to affect participants' behavior negatively: it anchored participants' donations for those who donated a positive amount to £5.5 in the *Standard-SN* treatment (see Table 1). Moreover, it caused a shift in the distribution of donations, albeit not statistically significant. Fewer participants donated more than the descriptive norm in the *Standard-SN* treatment than in the *Standard* treatment (-5 percentage points), while more participants donated the same amount as the descriptive norm (+1.5 percentage points) or less (+3.5 percentage points). This asymmetric effect between participants who would have donated more or less than the norm is consistent with loss aversion (Kahneman & Tversky, 1979), as donating more than the others could be considered a "loss" and less a "gain". Thus, social information affected behavior, but, on average, it anchored donations to an amount lower than what would have been without this information.

Next, we find directional evidence that social information increases opt-outs. Ten percent of participants opted out when informed about the descriptive norm, compared to eight percent when this information was not reported. Although the difference goes in the direction stated in Hypothesis 3, it is not statistically significant (see Table 1). The difference is equivalent to 1.7 percentage points, which is rather small, and the effect size might have been too small to be detected with our sample size (type 2 error). However, despite the modest absolute difference in the number of opt-outs between the *Optout* and *Optout-SN* treatments, the relative increase of 20.7 percent in opting out is noteworthy. With a larger population, the impact of social information on avoiding a donation request could be substantial.

The suggestive positive effect of social information on opt-outs in the *Optout-SN* treatment may appear inconsistent with its negative effect on mean donation in the *Standard-SN* treatment. To reconcile these seemingly contrasting results, we shall consider that the social information has a different effect depending on how much participants would donate without it. Social information typically increases donations for those who would donate less than the descriptive norm, and it reduces donations for those who would donate more. Opting out may be more common among participants who would donate less than the social norm, because a relatively small donation may be enough to preserve the self-image. Thus, for these participants, the descriptive norm included in our

social information may have exceeded the intended contribution if they were to opt in, making them more likely to opt out. This may reconcile why social information reduces donations in the *Standard-SN* treatment while (slightly) increases opt-outs in the *Optout-SN* treatment. Had we used a higher descriptive norm, social information may have increased donations in the *Standard-SN* treatment and opt-outs in the *Optout-SN* treatment significantly. Be that as it may, future research is needed to formally test our conjecture.

## 5.2 Difference between stage 1 and stage 2

Hypothesis 4 posits a reduction in donations in stage 2 among participants initially exposed to the standard DG. Accordingly, Table 3 shows that we can reject the null hypothesis that donations are equal across the two stages for the *Standard* treatment ( $p = 0.02$ ). Next, we find directional evidence in support of hypothesis 5, with a non-statistically significant ( $p = 0.08$ ) reduction in donations among participants who could, but did not, opt out in the *Optout* treatment.

**Table 3. Test on equality of mean donations between stage 1 and stage 2, per treatment**

Treatment	Difference in means, stage 2-stage 1	P-value <sup>1</sup>
<i>Standard</i>	-0.192	0.021*
<i>Standard-SN</i>	-0.064	0.435
<i>Optout</i> <sup>a</sup>	-0.084	0.080
<i>Optout-SN</i> <sup>a</sup>	-0.053	0.279

Note: <sup>a</sup> Participants opting out are excluded. <sup>1</sup>P-value from two-tailed paired t-test. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

Interestingly, the acceptance of hypothesis 4, on the one hand, and the non-acceptance of hypothesis 5, on the other hand, show that there are different compensation behaviors when participants have to play the DG compared to when they decide to opt into it. In the *Standard* treatment, where opting out is not possible in stage 1, individuals driven by self-image motivation and those driven by preferences for the charity's payoff donated. Putting together the behavior of participants with these two types of motivation yields a significant reduction in donations from stage 1 to stage 2. In contrast, participants who opted into the DG in stage 1 in the *Optout* treatment and donated to the charity, did so because they have preferences over the charity's payoff; such preferences appear to make them behave consistently across the two stages. For them, what matters most is the charity's payoff, whereas warm-glow or improved self-image from giving in stage 1 is less relevant and does not lead to a significant reduction in donations in stage 2. Hence, the often observed decline in prosocial

behavior following an initial prosocial act may primarily result from individuals driven by self-image motivation. After having established a positive self-image, they feel licensed to reduce their prosocial behavior.

Table 3 also shows that in both types of DG, donations do not significantly decline over time when social information is provided. Different explanations may account for this result. One explanation is that there may be little self-image benefits of donating to comply with others' behavior, and thus participants may feel that they still need to establish their self-image in stage 2. Alternatively, social information may have acted as an anchor, and participants stick to it in stage 2 too. This seems relevant for the *Standard-SN* treatment, as the intensive margin is close to the descriptive norm also in stage 2 in this treatment. In sum, our results suggest a positive effect of social information provided in a first decision on subsequent ones, but our design does not allow us to disentangle the different explanations underlying this result. We encourage further research on this topic, as only a handful of studies have yet addressed it, with mixed findings (Carlsson et al., 2020; Jessoe et al., 2021; Lasarov et al., 2022).

Finally, we confirm hypothesis 6, which focuses on participants opting out in stage 1, and posits that they donate a positive amount in stage 2. Accordingly, we find that 68.4 percent of participants who opted out in stage 1 donated a positive amount in stage 2, and the mean donation is statistically significantly higher than 0 in stage 2 for both the *Optout* and *Optout-SN* treatments ( $N = 32$ , mean = £2.34, SE = 0.42,  $p < 0.001$  for *Optout*;  $N = 44$ , mean = £1.92, SE = 0.35,  $p < 0.001$  for *Optout-SN*). As a comparison, participants who opted into the DG in the *Optout* and *Optout-SN* treatments, but gave nothing in stage 1, have a mean donation in stage 2 that is not significantly different from 0 ( $N = 43$ , mean = £0.25, SE = 0.23,  $p = 0.28$ ).

## **6 Discussion and conclusions**

The share of participants who used the costly opt-out option to avoid the donation request in our study is 9.2 percent. This share is lower compared to previous studies with similar settings but with a participant beneficiary (Broberg et al., 2007; Dana et al., 2006; Klinowski, 2020; Lazear et al., 2012). For example, with a payment scheme similar to ours, approximately 28 and 43 percent of the sample opted out of the DG in study 1 and study 2 (*replication* treatment) in Dana et al. (2006). In these studies, it is assumed that the primary motivation behind opting out is the fear of making a donation that falls short of the recipient's expectations or that signals to others that one is not altruistic (Dana

et al., 2006). In contrast, in our study, the recipient is a charity, who would never know the source of the donation. Thus, opting out must be motivated by the desire to preserve one's self-image while behaving selfishly, by "overlooking" the donation request. A lower share of opt-outs in our study may thus imply that self-image motivation plays a lesser role than social image motivation as driver for prosocial behavior.

An alternative explanation for why we find a lower share of opt-outs than previous studies may be that individuals are more willing to share with charities than with another participant (Umer et al., 2022). This explanation is supported by our finding that giving in our DG with a charity is on the higher end of the range found in previous DGs (Engel, 2011). Future research is needed to disentangle these two effects and isolate the driver underlying the smaller share of opt-outs when the recipient is a charity.

Next, we observe an unexpected negative effect of social information on donations when the DG could not be avoided. Our social information conveyed the descriptive norm, formulated from a different sample of the same population, including also non-donors (as, for example, Frey & Meier 2004). Ex-post, the social information amount we chose may not have been high enough to increase donations, as it was too close to the average, "common" behavior in the control group. Information about the high prevalence of the prosocial behavior might have been more effective (Klinowski, 2020; Shang & Croson, 2009). However, high descriptive norms are not always easy to report because they might require manipulating the reference sample used as basis to create the norm (e.g., Bicchieri & Xiao, 2009) or manipulating the norm itself (e.g., Agerström et al., 2016). Alternatively, they might communicate the contribution of a single, high-performing participant (e.g., Klinowski, 2020; Shang & Croson, 2009), possibly creating suspicion about how the participant was selected. If using random draws from the population, it may be more effective to inform about the extensive margin (as in Frey & Meier 2004 and Krupka & Weber 2009), than the intensive margin (as we did). Future research should systematically investigate this aspect to better understand the impact of different frames of social information on prosocial behavior.

Although social information reduced donations in the standard DG, we find directional evidence that it increased the choice to avoid the DG. In line with our result, D'Adda et al. (2018) find a non-significant effect of social pressure alone on demand for information about the emissions caused by air conditioning. Yet, they find that when social pressure is combined with other treatments that

generate a feeling of moral obligation to act pro-environmentally, it causes significant information avoidance. Similarly, Klinowski (2020) shows that the effect of social information on avoidance of a donation request depends on the level of the descriptive norm. Collectively, these results suggest that social norms (in their different forms) can lead to avoidance of a prosocial request, but only when they are high enough. Since our social information was relatively low, it may have caused a few opt-outs, possibly insufficient to detect a statistically significant effect. Hence, an extension of our study with a higher descriptive norm is needed to provide robust evidence for the interplay between self-image motivation and social information. Moreover, it is worth exploring the mechanism underlying the interaction between self-image motivation and social information: does social information have negative (as proposed by us) or positive (as proposed by Klinowski (2020)) implications for the self-image that leads to avoidance of the donation request?

Finally, we offer a self-image perspective to elucidate temporal dynamics in prosocial behavior. Notably, the behavior in the second stage appears to hinge on the motivation to give. When preferences over the charity's payoff drive giving, participants tend to exhibit consistent behavior over time. Instead, when self-image motivation drives donation, participants tend to reduce the amount given in the second donation.

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## **Supplementary Material**

### **List of contents**

1. Screenshots of the original experimental instructions
2. Descriptive statistics and survey items
3. Changes compared to the pre-registration and test of pre-registered hypotheses
4. Relation between participants' characteristics and donor profile
5. Robustness tests

# 1 Screenshots of the original experimental instructions

## Charity selection [common to all treatments]

You are going to be associated to an environmental association for Parts 2 and 3 of the study. You have the choice between three associations: WWF, Friends of the Earth and Greenpeace. You find below a description of each association to help you make your choice.

*All the information provided on this page is taken from the official websites of the associations.*



We are the world's leading conservation organization. At every level, we collaborate with people around the world to develop and deliver innovative solutions that protect communities, wildlife, and the places in which they live.

**Mission and vision:**

Our mission is to build a future in which people live in harmony with nature. To deliver this mission, we work to conserve and restore biodiversity, the web that supports all life on Earth; to reduce humanity's environmental footprint; and to ensure the sustainable use of natural resources to support current and future generations.

*WWF was founded in 1961 and now works in nearly 100 countries all over the world*

## GREENPEACE

Greenpeace is a network of independent organisations, which uses peaceful, creative confrontation to expose global environmental problems, and develop solutions for a green and peaceful future.

**Mission and vision:**

Our goal is to ensure the ability of the earth to nurture life in all its diversity. That means we want to: (1) protect biodiversity in all its forms; (2) prevent pollution and abuse of the earth's ocean, land, air and fresh water; (3) end all nuclear threats; (4) promote peace, global disarmament and non-violence.

*Greenpeace was founded in 1972 and now works in 55 countries all over the world*



## Friends of the Earth

We are the world's largest grassroots environmental network. We challenge the current model of economic and corporate globalization, and promote solutions that will help to create environmentally sustainable and socially just societies.

**Mission and vision:**

Our vision is of a peaceful and sustainable world based on societies living in harmony with nature. This will be a society built upon people's sovereignty and participation. It will be founded on social, economic, gender and environmental justice and be free from all forms of domination and exploitation, such as neoliberalism, corporate globalization, neo-colonialism and militarism.

*Friends of the Earth was founded in 1971 and now works in 75 countries all over the world*

Which environmental association do you choose?

- WWF
- Greenpeace
- Friends of the Earth

### Stage 1 [treatments Standard and Standard-SN]

During this part of the study, you are allocated an amount of £ 10. You are asked to make a decision regarding this £ 10.

You will participate in an activity. The activity is the following:

You choose how to split the £ 10 between WWF and yourself. You decide how much money, between £ 0 and £ 10 to give to WWF. Whatever remains represents your bonus payment of this stage. For example, you may decide to give £ 8 and keep £ 2 for yourself, or you may decide to give £ 2 and keep £ 8 for yourself.

If you are randomly selected to be paid for this stage your decision will be implemented: **we will give the amount of money that you indicated to WWF\* and to you the remaining amount.**

*\* The researchers in charge of this experiment ensure that all money allocated to the environmental organization during this study will actually be paid to the organizations indicated. You will receive a proof of donation on your Prolific account.*

In sum:

- During the activity, you will decide how much, between £ 0 and £ 10, to give to WWF. Whatever remains represents your bonus payment of this stage.
- Whatever you decide will be implemented if you are randomly selected to be paid for this stage.

Before proceeding, we would like to make sure that you understand the instructions. Please state whether each of the sentences below is true or false. You must answer correctly in order to go to the next page.

	True	False
In the activity I choose how much to give between £ 0 and £ 10 to WWF	<input type="radio"/>	<input type="radio"/>
If I am selected to be paid for my decision of this part, WWF will not receive the amount I give to it in this part	<input type="radio"/>	<input type="radio"/>
If I am selected to be paid for my decision of this part, I will receive £ 10 minus the amount I give to WWF in this part	<input type="radio"/>	<input type="radio"/>
If I am not selected to be paid, WWF will not receive the amount I give to it	<input type="radio"/>	<input type="radio"/>

### Stage 1 [treatments Optout and Optout-SN]

During this part of the study, you are allocated an amount of £ 10. You are asked to make a decision regarding this £ 10.

You will participate in an activity. The activity is the following:

You choose how to split the £ 10 between WWF and yourself. You decide how much money, between £ 0 and £ 10 to give to WWF. Whatever remains represents your bonus payment of this stage. For example, you may decide to give £ 8 and keep £ 2 for yourself, or you may decide to give £ 2 and keep £ 8 for yourself.

If you are randomly selected to be paid for this stage your decision will be implemented: **we will give the amount of money that you indicated to WWF\* and to you the remaining amount.**

*\* The researchers in charge of this experiment ensure that all money allocated to the environmental organization during this study will actually be paid to the organizations indicated. You will receive a proof of donation on your Prolific account.*

#### In sum:

- During the activity, you will decide how much, between £ 0 and £ 10, to give to WWF. Whatever remains represents your bonus payment of this stage.
- Whatever you decide will be implemented if you are randomly selected to be paid for this stage.

Before proceeding, we would like to make sure that you understand the instructions. Please state whether each of the sentences below is true or false. You must answer correctly in order to go to the next page.

	True	False
In the activity I choose how much to give between £ 0 and £ 10 to WWF	<input type="radio"/>	<input type="radio"/>
If I am selected to be paid for my decision of this part, WWF will not receive the amount I give to it in this part	<input type="radio"/>	<input type="radio"/>
If I am selected to be paid for my decision of this part, I will receive £ 10 minus the amount I give to WWF in this part	<input type="radio"/>	<input type="radio"/>
If I am not selected to be paid, WWF will not receive the amount I give to it	<input type="radio"/>	<input type="radio"/>

### Decision screen for opt out [treatment Optout]

Do you want to participate in the activity?

- Yes
- No

Decision screen for opt out [treatment Optout-SN]

For your information, we conducted earlier a similar survey on Prolific: participants gave on average £ 5.5 to the environmental organization.

Do you want to participate in the activity?

- Yes
- No

Decision screen for donation, stage 1 [treatments Standard, Optout, Optout-SN; in Optout and Optout-SN only participants answering yes to the preceding question see this screen]

Please choose how to split the £ 10 between you and WWF by selecting only one of the following allocation options.

Amount to you	Amount to the organization	Your choice
£ 10	£ 0	<input type="checkbox"/>
£ 9	£ 1	<input type="checkbox"/>
£ 8	£ 2	<input type="checkbox"/>
£ 7	£ 3	<input type="checkbox"/>
£ 6	£ 4	<input type="checkbox"/>
£ 5.5	£ 4.5	<input type="checkbox"/>
£ 4.5	£ 5.5	<input type="checkbox"/>
£ 4	£ 6	<input type="checkbox"/>
£ 3	£ 7	<input type="checkbox"/>
£ 2	£ 8	<input type="checkbox"/>
£ 1	£ 9	<input type="checkbox"/>
£ 0	£ 10	<input type="checkbox"/>

Decision screen for donation, stage 1 [treatment Standard-SN]

Please choose how to split the £ 10 between you and WWF by selecting only one of the following allocation options.

For your information, we conducted earlier a similar survey on Prolific: participants gave on average £ 5.5 to the environmental organization.

Amount to you	Amount to the organization	Your choice
£ 10	£ 0	<input type="checkbox"/>
£ 9	£ 1	<input type="checkbox"/>
£ 8	£ 2	<input type="checkbox"/>
£ 7	£ 3	<input type="checkbox"/>
£ 6	£ 4	<input type="checkbox"/>
£ 5.5	£ 4.5	<input type="checkbox"/>
£ 4.5	£ 5.5	<input type="checkbox"/>
£ 4	£ 6	<input type="checkbox"/>
£ 3	£ 7	<input type="checkbox"/>
£ 2	£ 8	<input type="checkbox"/>
£ 1	£ 9	<input type="checkbox"/>
£ 0	£ 10	<input type="checkbox"/>

## Stage 2 [all treatments]

During this part of the study, you are again allocated an amount of £ 10 and you are asked to make a decision regarding this £ 10.

You can again split the £ 10 between WWF and yourself. You must decide how much money, between £ 0 and £ 10 to give to WWF.\* Whatever remains represents your bonus payment of this stage.

*\* The researchers in charge of this experiment ensure that all money allocated to the environmental organization during this study will actually be paid to the organizations indicated. You will receive a proof of donation on your Prolific account.*

Remember that only the decisions in one of the two parts (Parts 2 and 3) will be implemented, not both. That is, if you are randomly selected to receive the bonus payment, you will either receive the one resulting from your decisions in Part 2 or Part 3, not both amounts. The same is true for the environmental organization that you picked: it will receive the amount you give to it either in Part 2 or Part 3, not both amounts.

Before proceeding, we would like to make sure that you understand the instructions. Please state whether each of the sentences below is true or false. You must answer correctly in order to go to the next page.

	True	False
I choose how much to give between £ 0 and £ 10 to WWF	<input type="radio"/>	<input type="radio"/>
If I am selected to be paid, WWF will receive the sum of the amounts I give to it in Parts 2 and 3	<input type="radio"/>	<input type="radio"/>
If I am selected to be paid for my decision of this part, I will receive £ 10 minus the amount I give to WWF in this part	<input type="radio"/>	<input type="radio"/>

Decision screen for donation, stage 2 [all treatments]

Please choose how to split the £ 10 between you and WWF by selecting only one of the following allocation options.

Amount to you	Amount to the association	Your choice
£ 10	£ 0	<input type="checkbox"/>
£ 9	£ 1	<input type="checkbox"/>
£ 8	£ 2	<input type="checkbox"/>
£ 7	£ 3	<input type="checkbox"/>
£ 6	£ 4	<input type="checkbox"/>
£ 5.5	£ 4.5	<input type="checkbox"/>
£ 4.5	£ 5.5	<input type="checkbox"/>
£ 4	£ 6	<input type="checkbox"/>
£ 3	£ 7	<input type="checkbox"/>
£ 2	£ 8	<input type="checkbox"/>
£ 1	£ 9	<input type="checkbox"/>
£ 0	£ 10	<input type="checkbox"/>

## 2 Descriptive statistics and survey items

Table S4. Descriptive statistics per treatment

	<i>Standard</i>	<i>Standard-SN</i>	<i>Optout</i>	<i>Optout-SN</i>	P-value <sup>1</sup>
N	291	280	388	441	
female	0.62	0.55	0.57	0.65	0.03
age (years)	38.8 (13)	39.6 (12.8)	39.8 (13)	39.8 (13)	0.73
graduate degree	0.57	0.58	0.57	0.57	0.98
income (k€)	22.7 (16.4)	23.8 (15.4)	23 (14.8)	23 (15.7)	0.85
student	0.13	0.1	0.14	0.13	0.52
envID	3.66 (0.89)	3.64 (0.87)	3.67 (0.81)	3.65 (0.80)	0.95
donating frequency	2.51 (1.19)	2.6 (1.19)	2.6 (1.18)	2.51 (1.16)	0.58
volunteering frequency	2.32 (1.39)	2.31 (1.39)	2.17 (1.36)	2.28 (1.36)	0.45
support WWF	4.18 (0.73)	4.23 (0.69)	4.21 (0.69)	4.18 (0.68)	0.71
support FriendsEarth	3.28 (0.94)	3.37 (0.93)	3.40 (0.96)	3.38 (0.90)	0.44
support Greenpeace	3.54 (0.81)	3.57 (0.84)	3.64 (0.80)	3.59 (0.81)	0.42
Charity selection					
WWF	0.63	0.65	0.63	0.65	0.87
Friends of the Earth	0.21	0.20	0.20	0.22	0.88
Greenpeace	0.16	0.15	0.18	0.13	0.35

Note: *envID* is measured as unweighted mean response to the following items (Panzone et al., 2018): “Being environmentally responsible is an important part of who I am”; “I view myself as an environmentally responsible person”; “Being environmentally responsible is not really important to me” (R); “I strongly aspire to be environmentally responsible”. *donating frequency* and *volunteering frequency* represent how often participants donate money and volunteer for environmental organizations, respectively (Zhang & Thøgersen, 2020). Support for each environmental charity is measured as unweighted mean response to the following items: “I am familiar with the association”; “I trust the association”; “I support their actions”. All responses are given on 5-point Likert scale. <sup>1</sup>P-value from ANOVA.

### 3 Changes compared to the pre-registration and test of pre-registered hypotheses

We pre-registered six hypotheses. In the manuscript, Hypotheses 2, 3 and 6 remain unchanged, while we made minor changes to Hypotheses 1, 4 and 5, as explained in Table S2. The revised hypotheses refer to the effect of the opt-out option in the absence of social information. Indeed, we anticipated that social information would affect why and how much people donate. Failing to distinguish for the presence of social information may thus confound the results. Testing the original set of hypotheses (reported in Table S3) yields virtually the same conclusions as the revised hypothesis testing discussed in the main text. The only difference is that in the original formulation, we accept hypothesis 5 with  $p = 0.05$ , whereas in the updated formulation we fail to reject the null hypothesis being the  $p$ -value above the threshold of statistical significance ( $p = 0.08$ ). The original formulation posited a reduction in donations among participants opting into the DG considering both the *Optout* and *Optout-SN* treatments, while the updated formulation only focuses on the *Optout* treatment. In any case, the reduction in donations among participants forced to play the DG in the *Standard* treatment is more than twice than that of participants deciding to play the DG in the *Optout* treatment, suggesting that temporal dynamics depend on the motivation to donate in the first decision.

**Table S5. Original and updated hypotheses**

HP	Original	Updated	Explanation
1	In stage 1, mean donation is higher in treatments <i>Standard&amp;Standard-SN</i> than in treatments <i>Optout&amp;Optout-SN</i> .	In stage 1, mean donation is higher in the <i>Standard</i> treatment than in the <i>Optout</i> treatment.	By isolating the impact of the opt-out option and excluding the influence of social information on the decision to opt-out, we examine the propensity to avoid a donation request in a standard DG with a charity.
4	Mean donation is lower in stage 2 than stage 1 in treatments <i>Standard&amp;Standard-SN</i> .	Mean donation is lower in stage 2 than in stage 1 in the <i>Standard</i> treatment.	We anticipate that social information affects decisions in stage 1, thereby potentially influencing also behavior in stage 2. We thus examine the behavior of participants in stage 2 when no additional stimuli are provided, differentiating for whether participants have to play the DG (Hypothesis 4) or decide to opt into it (Hypotheses 5).
5	The amount donated among agents opting in is lower in stage 2 than stage 1 for treatments <i>Optout&amp;Optout-SN</i> .	Mean donation among participants opting in is lower in stage 2 than in stage 1 in the <i>Optout</i> treatment.	

Note: *Standard&Standard-SN* refers to aggregating treatments *Standard* and *Standard-SN*. *Optout&Optout-SN* refers to aggregating treatments *Optout* and *Optout-SN*.

**Table S6. Test of the hypotheses included in the pre-registration**

HP	Test	P-value	Interpretation
1	Two-sided t-test for equality in mean donations between conditions without ( <i>Standard&amp;Standard-SN</i> ) and with opt-out ( <i>Optout&amp;Optout-SN</i> ), stage 1	<0.001***	The presence of the opt-out option reduces donations
4	Two-sided paired t-test for equality in mean donations between stage 1 and stage 2 for conditions without the opt-out option ( <i>Standard&amp;Standard-SN</i> )	0.03*	Mean donations reduce in stage 2 when opt out is not possible in stage 1
5	Two-sided paired t-test for equality in mean donations between stage 1 and stage 2 among those who opt into the DG in stage 1 ( <i>Optout&amp;Optout-SN</i> )	0.05*	Mean donations reduce in stage 2 among those who opt into the DG in stage 1

Note: *Standard&Standard-SN* refers to aggregating treatments *Standard* and *Standard-SN*. *Optout&Optout-SN* refers to aggregating treatments *Optout* and *Optout-SN*. \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001.

#### 4 Relation between participants' characteristics and donor profile

**Table S7. Multinomial probit results for the relation between characteristics and decisions in stage 1 in treatment *Optout* (marginal effects)**

	(1)			(2)		
	Donors	Non-donors	Avoiders	Donors	Non-donors	Avoiders
envID	0.050*** (0.015)	-0.019* (0.009)	-0.032*** (0.012)	0.042*** (0.016)	-0.014 (0.009)	-0.028* (0.013)
female	0.073*** (0.026)	-0.048*** (0.017)	-0.026 (0.021)	0.073*** (0.026)	-0.048*** (0.017)	-0.025 (0.021)
age	0.001 (0.001)	-0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	-0.001 (0.001)	0.001 (0.001)
income	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
graduate	0.022 (0.026)	0.009 (0.015)	-0.031 (0.021)	0.024 (0.026)	0.009 (0.015)	-0.033 (0.022)
volunteering frequency				0.002 (0.01)	-0.001 (0.006)	0.001 (0.008)
donating frequency				0.025* (0.011)	-0.012 (0.006)	-0.013 (0.009)
student				0.03 (0.035)	-0.004 (0.021)	-0.026 (0.028)
N	826			814		

Note: *Donors* are participants who opt in and donate a positive amount; *Non-donors* are participants who opt in and do not donate; *Avoiders* are participants who opt out. Robust standard errors in parentheses. \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001.

## 5 Robustness tests

### 5.1 Interactions between treatments and gender

Table S8. OLS regression results on treatment effects on donations in stage 1 (Column 1), including interactions between treatments and gender (Column 2); on probability to opt out (Column 3), including interactions between treatments and gender (Column 4); on donations in stage 2 (Column 5), including interactions between treatments and gender (Column 6)

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Standard-SN</i>	-0.510*	-0.442			-0.381	-0.432
	(0.223)	(0.354)			(0.227)	(0.354)
<i>Optout</i>	-0.919***	-0.786*			-0.611***	-0.591
	(0.217)	(0.336)			(0.214)	(0.326)
<i>Optout-SN</i>	-1.305***	-1.215***	0.019	0.015	-0.969***	-0.861***
	(0.204)	(0.329)	(0.020)	(0.035)	(0.205)	(0.327)
envID	0.860***	0.859***	-0.032*	-0.032*	0.988***	1.027***
	(0.094)	(0.094)	(0.014)	(0.014)	(0.152)	(0.331)
female	0.963***	1.092***	-0.027	-0.031	0.885***	0.885***
	(0.155)	(0.327)	(0.022)	(0.030)	(0.094)	(0.094)
age	0.018***	0.018***	-0.000	-0.000	0.021***	0.021***
	(0.006)	(0.006)	(0.001)	(0.001)	(0.006)	(0.006)
income	0.010	0.010	-0.000	-0.000	0.011*	0.011*
	(0.005)	(0.005)	(0.001)	(0.001)	(0.005)	(0.005)
graduate	-0.267	-0.270	-0.031	-0.031	-0.348*	-0.349*
	(0.156)	(0.156)	(0.021)	(0.021)	(0.152)	(0.152)
<i>Standard-SN</i> x female		-0.107				0.097
		(0.455)				(0.461)
<i>Optout</i> x female		-0.221				-0.033
		(0.442)				(0.432)
<i>Optout-SN</i> x female		-0.143		0.007		-0.169
		(0.420)		(0.042)		(0.420)
constant	0.950*	0.867	0.245***	0.246***	0.560	0.542
	(0.431)	(0.460)	(0.060)	(0.060)	(0.431)	(0.456)
<i>p-value of Optout = Optout-SN</i>	0.05					
R <sup>2</sup>	0.126	0.126	0.016	0.016	0.128	0.128
N	1395	1395	826	826	1395	1395

Note: baseline treatment: *Standard* in Columns 1 and 2; *Optout* in Columns 3 and 4. Robust standard errors in parentheses. \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001.

## 5.2 Alternative model specifications

Table S9. Hurdle model results on treatment effects on donations in stage 1 and stage 2 (marginal effects)

	Donations stage 1			Donations stage 2		
	E	I	Avg	E	I	Avg
<i>Standard-DN</i>	-0.025 (0.023)	-0.410 (0.212)	-0.509* (0.230)	-0.019 (0.024)	-0.305 (0.218)	-0.378 (0.234)
<i>Optout</i>	-0.057* (0.023)	-0.675*** (0.196)	-0.909*** (0.214)	0.008 (0.021)	-0.697*** (0.199)	-0.603*** (0.212)
<i>Optout-DN</i>	-0.084*** (0.023)	-0.965*** (0.191)	-1.288*** (0.207)	-0.019 (0.022)	-0.941*** (0.194)	-0.950*** (0.207)
envID	0.049*** (0.010)	0.721*** (0.086)	0.882*** (0.089)	0.043*** (0.009)	0.763*** (0.087)	0.901*** (0.088)
female	0.073*** (0.018)	0.669*** (0.145)	0.955*** (0.154)	0.069*** (0.016)	0.711*** (0.146)	0.983*** (0.151)
age	0.001 (0.001)	0.014*** (0.005)	0.018*** (0.006)	0.001* (0.001)	0.016*** (0.005)	0.021*** (0.006)
income	0.001 (0.001)	0.008 (0.005)	0.010* (0.005)	0.001 (0.001)	0.009 (0.005)	0.011* (0.005)
graduate	0.004 (0.018)	-0.331* (0.142)	-0.274 (0.155)	-0.015 (0.016)	-0.297* (0.143)	-0.346* (0.152)
N		1395			1395	

Note: *E* represents extensive margin; *I* represents intensive margin, *Avg* represents both steps of the hurdle model. Robust standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

**Table S10. Differences-in-differences results for treatment effect and temporal dynamics**

	(1)
<i>Standard-SN</i>	-0.511* (0.223)
<i>Optout</i>	-0.536* (0.215)
<i>Optout-SN</i>	-0.866*** (0.201)
stage 2	-0.193* (0.083)
<i>Standard-SN</i> x stage 2	0.129 (0.117)
<i>Optout</i> x stage 2	0.109 (0.096)
<i>Optout-SN</i> x stage 2	0.141 (0.097)
envID	0.852*** (0.093)
female	0.956*** (0.151)
age	0.021*** (0.006)
income	0.010+ (0.005)
graduate	-0.371* (0.149)
constant	0.949* (0.423)
p-value <i>Standard-SN</i> x stage 2 + stage 2 = 0	0.435
p-value <i>Optout</i> x stage 2 + stage 2 = 0	0.080
p-value <i>Optout-SN</i> x stage 2 + stage 2 = 0	0.291
R <sup>2</sup>	0.121
N	2638
# clusters	1319

Note: participants opting out are excluded. The dependent variable is donation at each stage. Baseline treatment: *Standard*. Clustered robust standard errors in parentheses. \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001.

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