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Mind the framing when studying social preferences in the domain of losses

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Abstract

There has been an increasing interest in altruistic behaviour in the domain of losses recently. Nevertheless, there is no consensus in whether the monetary losses make individuals more generous or more selfish. Although almost all relevant studies rely on a dictator game to study altruistic behaviour, the experimental designs of these studies differ in how the losses are framed, which may explain the diverging findings. Utilizing a dictator game, this paper studies the impact of loss framing on altruism. The main methodological result is that the dictators' prosocial behaviour is sensitive to the loss frame they are embedded in. More specifically, in a dictator game in which the dictators have to share a loss between themselves and a recipient, the monetary allocations of the dictators are more benevolent than in a standard setting without a loss and in a dictator game in which the dictators have to share what remains of their endowments after a loss. These differences are explained by the different social norms that the respective loss frames invoke.

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1. Introduction

There is ample scientific evidence that individuals exhibit concerns for the well-being of others, fairness, and reciprocity (see Andreoni, 2006; Fehr and Schmid, 2006; Cooper, 2014 for excellent reviews). Such concerns are dubbed as 'social preferences' or 'other-regarding' preferences. Interestingly, despite the voluminous scientific literature, little is known about social preferences of individuals in the domain of losses.

In this paper, we investigate how monetary losses affect altruism, i.e., individuals' concerns for the well-being of others. Altruism plays a vital role in the modern welfare state and often facilitates socially desirable allocations in the society that would be otherwise unattainable (Fong et al., 2005; Bowles and Hwang, 2008). Altruism is also a prominent driver of charitable donations with the size of the market for charitable giving in the USA reaching to few percent of the GPD on a yearly basis (List, 2011). Further, altruism is a decisive factor at the workplace as employees' actions at work can depend on their benevolent feelings toward their supervisors, colleagues, and customers (Rotemberg, 2006; Dur, 2009; Bandiera et al., 2010). If individuals become more selfish when suffering monetary losses, (macro-)economic shocks such as financial crises can deteriorate individuals' support for redistributive policies and shrink donations to charities. Likewise, increased selfishness can distort the relationships among employees at the workplace, reducing the performance (hence profitability) of firms and entire industries. These examples illustrate why understanding individuals' benevolence toward others in the times of financial distress can be of vital importance for policymakers.

In recent years, there has been an increasing interest in the impact of monetary losses on altruism, though the findings are rather divisive. Experimental studies conclude that compared to an ordinary setting, monetary losses make individuals either more generous (Thunström, 2019; Cochard et al., 2020), more selfish (e.g., Fiedler and Hillenbrand, 2020; Benistant and Suchon, 2021) or do not change their behaviour (Antinyan, 2014). The common aspect of these studies is the implementation of variants of the Dictator Game (DG from here onwards), which is one of the

most prominent economic games for scrutinizing other-regarding preferences (e.g., Engel, 2011).[1] Regrettably, despite the common methodological approach, we cannot directly compare these studies to understand the reasons for the contradictory findings, since the experiments differ in important design choices. Most importantly, the studies diverge in how they frame the loss in DG and in the origin of the dictators' endowments (i.e., provided either as a windfall gift or earned in a real effort task). For example, in Cochard et al. (2020) and Thunström (2019) both the dictator and the recipient receive an equal endowment e as a windfall gift. The dictator has to share a loss l between herself (l_d) and the recipient (l_r). The earning of the dictator equals $e - l_d$, while the earning of the recipient equals $e - l_r$, with $l_r + l_d = l$. In Benistant and Suchon (2021), the dictator participates in a real effort task to earn the endowment e. Once the task is completed with 1/3 probability either the endowment of the dictator remains unchanged or reduces to $e - a$ (loss treatment) or increases to $e + a$ (gain treatment) with $0 < a < e$. The dictator is then asked to share an $e - a$ amount of money between herself and the recipient in all the treatments of the experiment.[2] The experimental design of Antinyan (2014) is similar to that of Benistant and Suchon (2021), with two major differences: the subjects do not participate in a real effort task and the experiment is not fully incentivized.[3]

The different methods used to frame the loss in the DG can be a good candidate for explaining the conflicting findings across studies. To this date there is ample experimental evidence that individual decisions are frame-sensitive (e.g., Druckman, 2001; Barr and Serra, 2009; Ellingsen et al., 2012; Steinel et al., 2022). While in some studies dictators share a given endowment after suffering loss l (Antinyan, 2014; Benistant and Suchon, 2020) in other studies dictators share loss l between themselves and the recipient (Thunström 2019, Cochard et al., 2020). These differences in the loss frames (which implies differences in the choice sets) can invoke different social norms in the DG (List, 2007).

Heterogeneity in the endowment source may be another candidate for interpreting the disparities across previous studies, since the dictators behave differently depending on whether

[1] The classical DG is a simple two-player game in which player A (called either the dictator or the allocator) is endowed with a certain amount of money and has to decide how much money to send to player B (the recipient). The latter cannot influence the decision of the allocator and has to accept any amount of money allocated to her.

[2] In the experiment e equals 10 euros, while a equals 5 euros. In all treatments the dictator is asked to share $e - a = 5$ euros between herself and the dictator.

[3] The dictators are endowment with e. With a ½ probability the endowment can be reduced to $e - a$, where $0 < a < e$. Regarding the incentives, only three pairs in each session were randomly picked for payment.

the endowments are earned or provided as windfall gifts (e.g., Cherry et al., 2002; Oxoby and Spraggon, 2008). In this regard, dictators may be less willing to share an earned rather than a windfall endowment in the loss domain, which could explain the increased selfishness in Benistant and Suchon (2021) compared to other studies (e.g., Antinyan, 2014; Thunström, 2019; Cochard et al., 2020).

To reconcile the contradictory findings in the literature, we designed two large-scale and fully incentivized experiments in which we manipulated the framing of the exogenous losses incurred by subjects. In Study 1, the dictators received their endowments as windfall gifts, while in Study 2 the dictators participated in a real-effort task a là Charness et al. (2014), decoding sets of letters into two-digit numbers to earn the endowments. The two studies were similar in all remaining aspects. More specifically, in the *Control* treatment the dictator was either given (Study 1) or earned (Study 2) $3 endowment. She was requested to share the endowment between herself and an anonymous recipient with $0 endowment. In *Loss Manipulation 1* treatment (*LM1* from here onward), the dictator was either given (Study 1) or earned (Study 2) $6 endowment. Before playing the dictator game a $3 reduction from the endowment occurred with a 1/2 probability. The dictator was requested to share either $3 or $6 endowment with an anonymous recipient. In *Loss Manipulation 2* (*LM2* from here onward), the dictator was either given (Study 1) or earned (Study 2) $3 endowment. In both studies, the recipient was given $3 endowment as a windfall gift. With 1/2 probability the dictator suffered $3 loss and was asked to share the loss with the recipient. In case of no loss, the game was automatically over with both the dictator and the recipient earning $3.[4]

To exclude income effects and assure identical payoff possibilities, in *LM1* and *LM2* we only focus on those dictators who incurred in losses (in other words with discard 1/2 of the sample in each treatment).[5] Under these circumstances, i) any payoff allocation in *LM2* is achieved in *Control* and *LM1* and vice versa (Korenok et al., 2018); ii) the sum of the recipient's and dictator's final payoffs always equal $3. Thus, within each study, comparing the dictators' behaviour in the *Control* with that in *LM1* and *LM2*, we can understand whether monetary losses affect altruism vis-à-vis the

[4] Since the amount of loss was equal $0, there was nothing to share.
[5] Since the allocation to loss *vs* no loss condition within each treatment is defined randomly, our approach does not undermine the internal validity of the experiment.

benchmark scenario with no loss. Similarly, comparing the dictators' behaviour in *LM1* with that in *LM2* we will directly uncover the impact of the loss framing on altruism.

The main methodological message of this study is that the framing of the loss defines the prosocial behaviour of the dictators. More specifically, in *LM2*, in which the dictators have to share a loss between themselves and a recipient (e.g., Thunström, 2019; Cochard et al., 2020) the monetary allocations of the dictators are more benevolent than in *Control* in which the dictators play a standard DG without a loss and in *LM1* in which the dictators have to share the remainder of their endowments after a loss (e.g., Antinyan, 2014; Benistant and Suchon, 2021). Furthermore, the fraction of *selfish* dictators is higher, while the fraction of *highly altruistic* dictators is lower in *LM1* than in *LM2*.[6]

Our work contributes to the limited literature that studies the impact of monetary losses on the altruism of individuals (e.g., Thunström, 2019; Cochard et al., 2020; Fiedler and Hillenbrand, 2020; Benistant and Suchon, 2021).[7] First, it provides more evidence of the impact of financial distress on altruism. Second, it strives to understand the potential reason for contradictory findings across different studies. The rest of the paper is structured as follows. Section 2 details the experimental design and the protocol. Section 3 discusses the results. Section 4 provides a discussion of the mechanisms driving these results, while Section 5 concludes the paper.

2. Experimental design and protocol

2.1. Experimental design

To understand the impact of loss framing on altruism, we conducted two on-line experiments building on the traditional DG with anonymous recipients (Forsythe et al., 1994). In Study 1, the dictators received the endowments as windfall gifts, while in Study 2 the dictators participated in a real-effort task a là Charness et al. (2014), decoding sets of letters into two-digit numbers to earn

[6] For the definition of *selfish* and *highly altruistic* dictators please refer to section 3.

[7] There are studies that investigate how individuals bargain over losses compared to gains (e.g., Buchan et al., 2005; Zhou and Wu, 2011). However, given the strategic component present in these studies it is not possible to disentangle decision makers' egoistically driven strategic concerns from their other-regarding preferences. Thus, we won't discuss these studies in the current paper for the sake of brevity.

the endowment. The two studies were similar in all remaining aspects. Both studies consist of three treatments detailed below.

Control. The dictator either has (Study 1) or earns (Study 2) an endowment of $3, while the recipient is always endowed with $0 which is known by the dictator. The dictator's task is to decide how much money to send to the recipient and she is free to send any amount she would like to. The dictator's earnings are calculated as her endowment ($3) minus the amount sent to the recipient. The recipient's earnings are calculated as her endowment ($0) plus the amount received from the dictator. In Study 2, the dictator knows that her recipient did not participate in any real effort task before taking part in the DG.

Loss Manipulation 1 (LM1). The dictator either receives (Study 1) or earns (Study 2) an endowment of $6. With a 1/2 probability $3 is deducted from the dictator's endowment. The recipient is always endowed with $0 which is known by the dictator. The dictator's task is to decide how much money to send to the recipient and she is free to send any amount she would like to. The dictator's earnings are calculated as her endowment (either $6 or $3) minus the amount sent to the recipient. The recipient's earnings are calculated as her endowment ($0) plus the amount received from the dictator. In Study 2, the dictator knows that her recipient did not participate in any real effort task before taking part in the DG.

Loss Manipulation 2 (LM2). The dictator either receives or earns an endowment of $3. With a 1/2 probability the dictator loses $3. To make this treatment comparable with *LM1* the instructions make it clear that it's the dictator who faces the loss rather than both the dictator and the recipient.[8] The recipient is endowed with $3 which is known by the dictator. If the dictator experiences the loss, her task is to decide how to share the loss with the recipient. The dictator is free to bear any amount of the loss she would like to. The earnings of the dictator are calculated as her endowment ($3) minus the amount of the loss she has chosen to bear. The recipient's earnings are calculated as her endowment ($3) minus the share of the loss the dictator chooses the recipient to bear.[9] In Study 2, the dictator knows that her recipient did not participate in any real effort task before taking part in DG and received the $3 endowment as a windfall gift. This design choice aims to make

[8] Recall that in *LM1* it's the dictator who bears the loss, since $3 is deduced from the endowment of the dictator.
[9] If with1/2 probability the dictator does not face a loss, then there is no loss to share. Thus, the game automatically ends with the dictator earning $6 and the recipient earning $3.

LM2 comparable with the other treatments of Study 2, in which the recipient does not exert any effort.

In all treatments, after the dictators have made the respective allocation decisions in the DG, they are requested to explain these decisions in 2-3 sentences. The detailed experimental instructions can be found in Appendix C. Table 1 provides a simplified treatment summary.

Table 1. Treatment summary

	Dictator			Recipient's endowment
	Endowment No loss	Endowment Loss	Action	
Control	\$3	-	Share endowment	\$0
LM1	\$6	\$3	Share endowment	\$0
LM2	\$3	\$0	Share loss of \$3	\$3

Note. Brief summary of the treatments.

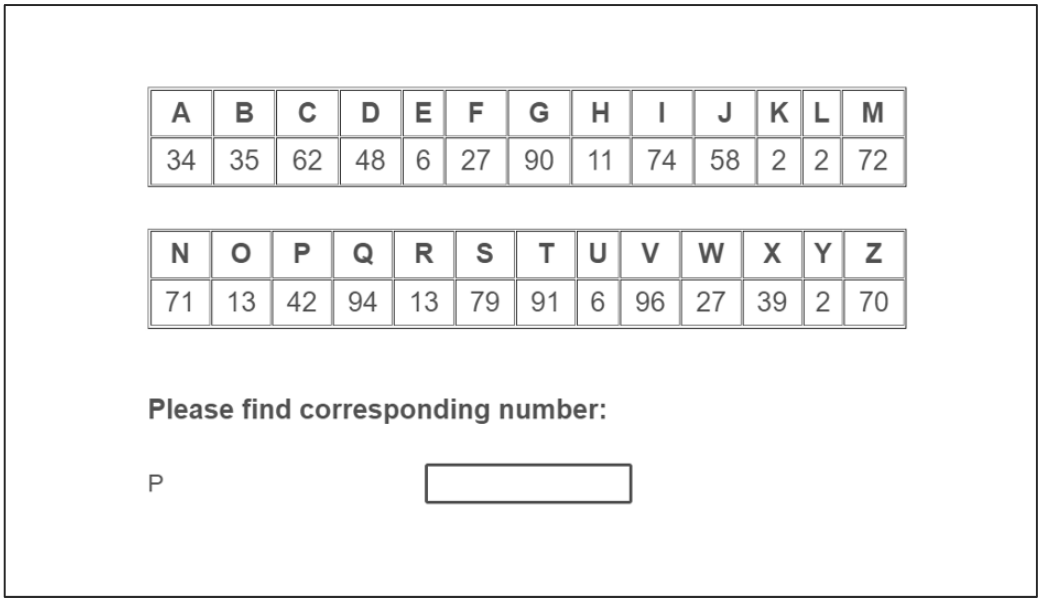
2.2. Experimental Protocol

The experimental protocols of Study 1 and Study 2 were approved by the School Research Ethics Committee of Cardiff Business School, the Cardiff University. The experiment was administered via Qualtrics, while the subject pool was recruited via Prolific, which is a professional platform designed for academic researchers (Palan and Schitter, 2018). An URL link in Prolific directed the subjects to Qualtrics to take part in the experiments. Upon landing on the Qualtrics page, the participants were provided with the general description of either Study 1 or Study 2 and were requested to provide their participation consent. In both studies, in case of consenting to the conditions, the participants were randomly assigned to one of the three treatments (*Control, LM1, or LM2*), and to one of the two roles (dictator or recipient). The participants received experimental instructions only of the respective treatment and role (see Appendix C). At the end of the experimental instructions a control question was introduced to check the participants' comprehension of the instructions. No participant could continue the experiment until she answered this question correctly.

In Study 1, the instructions were immediately followed by the DG game, while in Study 2 the subjects participated in a real-effort decoding task before the DG game to earn their endowments (the task was estimated to last for about 5 minutes). The subjects were provided with several tables

consisting of letters and numbers where each of the letters was paired with a specific number. The task requested the subjects to convert a given letter to the number that corresponded to this letter. Figure 1 provides an example of such a table. In this figure, the task requests to convert letter "P" to number "42". Each subject had to convert 40 letters.

Figure 1. Decoding task



Note: Example of a table provided to the subjects in the decoding task.

In both studies, the DG was followed by an incentivized belief elicitation task which measured the recipient's first- and the dictator's second-order beliefs. More specifically, we asked the recipient either about the size of the transfer (*Control, LM1*) she expected to receive or about the size of the monetary loss (*LM2*) she expected to bear. Similarly, we asked the dictator to state her beliefs on the recipient's expectations. Both players could earn additional $0.20 if their answers matched. All participants had to answer a post-experimental questionnaire, which was common for Studies 1 and 2.

In total 2,790 participants took part in both studies (Study 1: 1,400, Study 2: 1,390). The experiment was open to residents of the United States whose first language was English. Those individuals who took part in Study 1 were not allowed to take part in Study 2. The studies were administered in two distinct weeks. No major holidays or other public events were scheduled within these weeks. The studies commenced on Tuesday at 2 pm (PST) of each week and were concluded within 24 hours.

On average, the subjects earned $5.02 (including a show-up fee of $1.75) for an experiment that lasted for about 7 minutes on average. The average participant was roughly 33 years old, with around 65% of the sample being female. Table 2 summarizes the number of participants, the average age, and the fraction of females per treatment both for the dictators and the recipients.

Table 2. Summary of treatments

Treatment	Obs.	Age	Female
Dictators			
Study 1			
Control S1	142	31.021	0.688
LM1 S1 ($3 loss)	140	29.8	0.643
LM1 S1 ($0 loss)	139	30.696	0.691
LM2 S1 ($3 loss)	139	30.479	0.587
LM2 S1 ($0 loss)	140	29.353	0.647
Study 2			
Control S2	154	35.916	0.658
LM1 S2 ($3 loss)	136	36.890	0.640
LM1 S2 ($0 loss)	136	36.588	0.684
LM2 S2 ($3 loss)	134	35.537	0.754
LM2 S2 ($0 loss)	135	37.045	0.657
Recipients			
Study 1			
Control S1	142	30.0357	0.696
LM1 S1 ($3 loss)	140	30.2318	0.628
LM1 S1 ($0 loss)	139	30.630	0.609
LM2 S1 ($3 loss)	139	30.0217	0.691
LM2 S1 ($0 loss)	140	30.8333	0.694
Study 2			
Control S2	154	36.3071	0.669
LM1 S2 ($3 loss)	136	36.6764	0.622
LM1 S2 ($0 loss)	136	35.8296	0.570
LM2 S2 ($3 loss)	134	36.1703	0.6
LM2 S2 ($0 loss)	135	37.0075	0.632
Total (entire sample)	2,790	33.345	0.653

Note: Brief summary of the experimental sample.

In general, the treatments in both studies are balanced in terms of the observable characteristics under our disposal (age, gender, education, and political orientation). Tables A1–A4 in Appendix A illustrate the results of the balancing tests for the Studies 1 and 2, respectively.

3. Results

Before proceeding to the discussion of the results, please recall once more that in *LM1* and *LM2* we only focus on those dictators who incurred losses. This allows us to exclude income effects and assure identical payoff possibilities. For each study we separately discuss the extensive and the intensive margins of allocations.

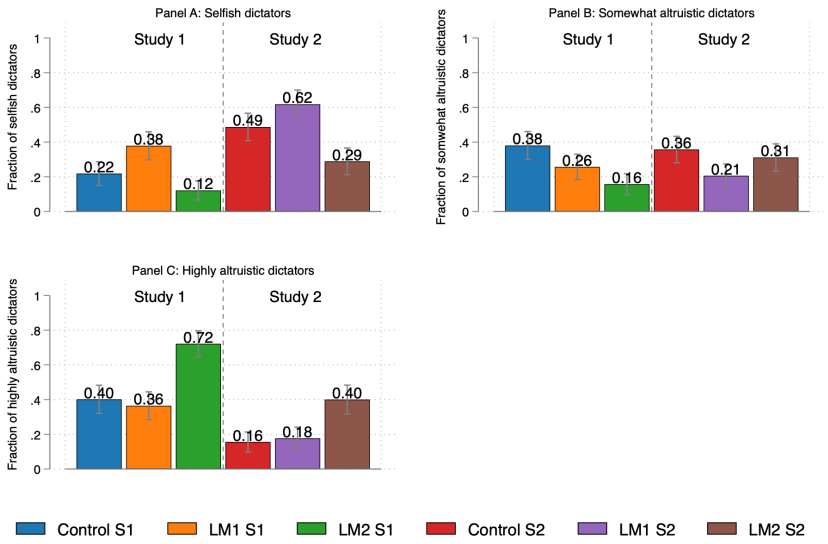
The extensive margin captures the fraction of dictators who opted for a given allocation decision. We analyze how the fraction of *selfish*, *somewhat altruistic*, and *highly altruistic* dictators changed across different treatments. We classify the dictators based on the payoffs given the comparability of this variable across treatments. A dictator is defined as *selfish* if her recipient earns \$0 as a result of her allocation decision, while she earns \$3 which is the maximum possible amount. In other words, the *selfish* dictator sends \$0 to the recipient in *Control* and *LM1* and allocates \$3 loss in *LM2*. Similarly, a dictator is defined as *somewhat altruistic* if her recipient earns between (\$0, \$1.5) as a result of her allocation decision. Thus, the fair dictator sends any amount between \$0 and \$1.5 to the recipient in *Control* and *LM1* and allocates any amount of loss between \$1.5 and \$3 in *LM2*. Lastly, a *highly altruistic* dictator sends at least \$1.5 to the recipient in *Control* and *LM1* and bears at least \$1.5 loss in *LM2*. Thus, the recipient of a *highly altruistic* dictator earns at least \$1.5.

The intensive margin of allocations is concerned with the extent or the intensity of the prosocial behaviour. To evaluate the intensive margin, we again focus on the payoffs. More specifically, for each study we compare the average payoffs of the recipients across treatments.

The discussion of the results in this section is mainly based on non-parametric tests. In Appendix B, we provide the results of alternative analysis based on parametric regression models that control for the observable socio-demographic characteristics discussed in Appendix A. The results are qualitatively similar.

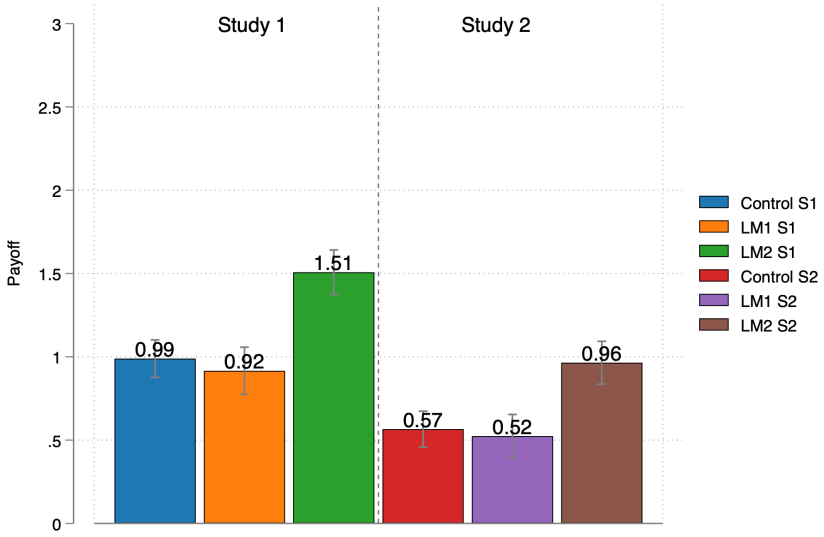
Panels a)-c) of Figure 2 refer to the extensive margin of allocation decisions and depict the fraction of *selfish*, *somewhat altruistic*, and *highly altruistic* dictators, respectively. Similarly, Figure 3 refers to the intensive margin of allocation decisions and illustrates the average payoffs of the recipients with the corresponding 95% confidence intervals.

Figure 2. Extensive margin of allocations



Note: The figure illustrates the fraction of *selfish, somewhat altruistic, and highly altruistic* dictators. The first three columns in each panel refer to Study 1 in which the dictators received the endowments as windfall gifts. The last three columns in each panel refer to Study 2 in which the dictators exerted effort to earn the endowments.

Figure 3. Intensive margin of allocations



Note: The figure illustrates the average payoff of the recipient in each treatment with the corresponding 95% confidence interval. The first three columns refer to Study 1 in which the dictators received the endowments as windfall gifts. The last three columns refer to Study 2 in which the dictators exerted effort to earn the endowments.

It is worth noting, that the manipulation of the endowment source heterogeneity was quite effective. In Study 2, the fraction of *selfish* dictators increased, and the fraction of *highly altruistic* dictators declined compared to the respective Study 1 treatments (e.g., *Control* in Study 1

compared to the *Control* in Study 2). Similarly, the average recipient payoffs were lower in Study 2 treatments compared to the respective Study 1 treatments. Tables A5 and A6 in Appendix A suggest that these differences are statistically significant both in the extensive (according to χ^2 tests) and in the intensive (according to Mann-Whitney U tests) margins. Hence, the effort provision makes individuals less benevolent in the dictator game, which is aligned with the extant literature (Cherry et al., 2002; Oxoby and Spraggon, 2008).

3.1. Study 1

In this sub-section, we evaluate the impact of the loss on the pro-social behaviour of dictators in Study 1. More specifically, we test the statistical significance of the treatment differences portrayed in Figures 2 and 3.

Regarding the extensive margin, in *LM1*, loss framing significantly increased the fraction of *selfish* dictators ($\chi^2(1) = 8.657$, p=0.003) and shrunk the fraction of *somewhat altruistic* dictators ($\chi^2(1) = 4.919$, p=0.027) compared to the control treatment. The decrease in the fraction of *highly altruistic* dictators was non-significant ($\chi^2(1) = 0.411$, p=0.521). In sum, the loss framing in *LM1* seems to result in a higher fraction of ego-centric individuals compared to the *Control*.

The loss framing in *LM2* significantly reduced the fraction of *selfish* ($\chi^2(1) = 4.685$, p=0.030) and *somewhat altruistic* dictators ($\chi^2(1) = 17.829$, p=0.000). On the contrary, the fraction of *highly altruistic* dictators increased roughly twofold compared to the control ($\chi^2(1) = 29.305$, p=0.000). In sum, the loss framing in *LM2* seems to result in a lower fraction of ego-centric individuals compared to the *Control*.

To obtain direct evidence on differences in the dictator behaviour across *LM1* and *LM2*, we compare these two treatments. There are significantly more *selfish* ($\chi^2(1) = 24.686$, p=0.000), more *somewhat altruistic* ($\chi^2(1) = 4.262$, p=0.039) and fewer *highly altruistic* ($\chi^2(1) = 35.979$, p=0.000) dictators in *LM1* than in *LM2*. In sum, the loss framing in *LM1* results in higher fraction of ego-centric individuals than the loss framing in *LM2.*

Regarding the intensive margin, non-parametric Mann-Whitney U tests suggest that there is no treatment effect between *Control* and *LM1* ($z = 1.190$, p= 0.234), while the differences between

LM2 and *Control* (z = -6.080, *p*=0.000) and *LM1* and *LM2* (z = -6.084, *p*=0.000) are statistically significant. In sum, the dictators are more generous in *LM2* compared to the *Control* and *LM1*.

As a robustness check, we applied the procedure developed by List et al. (2019) to account for the multiplicity of null hypotheses being tested and to control the familywise error rate (FWER) – the probability of one or more false rejections. Table 3 displays the following three quantities: the differences in means between two treatment groups, the multiplicity-unadjusted *p*-values, and the multiplicity-adjusted p-values à la List et al. The bolded rows in Table 3 indicate the comparisons that become non-significant after accounting for the multiplicity of the null hypotheses and controlling the FWER.

Table 3. Study 1 comparisons with multiplicity adjusted p-values

Treatment Comparison	Difference in Means	Unadjusted p-values	Adjusted *p*-values (Theorem 3.1)
Intensive margin			
Control vs. LM1	0.073	0.432	0.633
Control vs. LM2	0.518	0.000	0.000
LM1 vs. LM2	0.591	0.000	0.000
Fraction of selfish dictators			
Control vs. LM1	0.160	0.003	0.014
Control vs. LM2	**0.097**	**0.034**	**0.120**
LM1 vs. LM2	0.257	0.000	0.000
Fraction of somewhat altruistic dictators			
Control vs. LM1	**0.123**	**0.026**	**0.110**
Control vs. LM2	0.223	0.000	0.000
LM1 vs. LM2	**0.100**	**0.036**	**0.096**
Fraction of highly altruistic dictators			
Control vs. LM1	0.019	0.641	0.641
Control vs. LM2	0.160	0.000	0.000
LM1 vs. LM2	0.179	0.000	0.000

Notes: The table reports all pairwise comparisons across multiple treatments and a control. *The treatment comparison* column depicts the treatment under comparison. *The difference in the means* column shows the difference in the outcome variable between the two treatments. *Unadjusted p-values* and *adjusted p-values* illustrate the multiplicity-unadjusted and multiplicity-adjusted p-values. The bolded rows indicate the comparisons that become non-significant after accounting for the multiplicity of the null hypothesis.

Overall, the main conclusions of the section are robust to multiplicity adjustments, despite few comparisons losing their significance.

Result 1: The framing of the loss plays a crucial role in determining dictators' choices: i) individuals are more prosocial in the intensive margin in *LM2* than in *LM1*; ii) the fraction

of *selfish* dictators is higher, while the fraction of *highly altruistic* dictators is lower in *LM1* than in *LM2*.

3.2. Study 2

In this sub-section, we evaluate the impact of the loss on the pro-social behaviour of dictators in Study 2. We again test the statistical significance of the treatment differences portrayed in Figures 2 and 3.

The loss in *LM1* significantly increased the share of *selfish* ($\chi^2(1) = 4.976$, p=0.026) dictators and shrunk the fraction of *somewhat altruistic* dictators ($\chi^2(1) = 8.088$, p=0.004) compared to the *Control*. Meanwhile, the fraction of *highly altruistic* dictators did not significantly change compared to the control ($\chi^2(1) = 0.223$, p=0.637). These results are consistent across Studies 1 and 2.

The loss in *LM2* shrunk the fraction of *selfish* ($\chi^2(1) = 11.822$, p=0.001) dictators compared to the *Control*. The change in the fraction of *somewhat altruistic* dictators is non-significant compared to the *Control* ($\chi^2(1) = 0.684$, p=0.408), meanwhile, the fraction of *highly altruistic* dictators increased ($\chi^2(1) = 21.763$, p=0.000). These results, but the one referring to *somewhat altruistic* dictators, are again consistent across Studies 1 and 2.

Similar to Study 1, the direct comparison of *LM1* and *LM2* suggests significant differences in the share of *selfish* ($\chi^2(1) = 29.541$, p=0.000), *somewhat altruistic* ($\chi^2(1) = 3.916$, p=0.05), and *highly altruistic* ($\chi^2(1) = 16.514$, p=0.000) dictators. The only difference across the studies is that, in Study 2, the fraction of *somewhat altruistic* dictators increases in *LM2* compared to *LM1*, while in Study 1 these fraction decreases.

Regarding the intensive margin, non-parametric Mann-Whitney U tests suggest that there is no treatment effect between *Control* and *LM1* ($z = 1.295$, p=0.196), while the differences between *LM2* and *Control* ($z = -4.788$, p=0.000) and *LM1* and *LM2* ($z = -5.189$, p=0.000) are statistically significant. These findings are consistent with those in Study 1.

Again, we test the robustness of the previous findings by applying the procedure developed by List et al. (2019). The results are depicted in Table 4. Most of the comparisons preserve their significance after accounting for the multiplicity of the null hypotheses and controlling the FWER.

Table 4. Study 1 comparisons with multiplicity adjusted p-values

Treatment Comparison	Difference in Means	Unadjusted p-values	Adjusted *p*-values (Theorem 3.1)
Intensive margin			
Control vs. LM1	0.042	0.620	0.841
Control vs. LM2	0.399	0.000	0.000
LM1 vs. LM2	0.441	0.000	0.000
Fraction of selfish dictators			
Control vs. LM1	**0.131**	**0.025**	**0.1**
Control vs. LM2	0.198	0.000	0.000
LM1 vs. LM2	0.329	0.000	0.000
Fraction of somewhat altruistic dictators			
Control vs. LM1	0.151	0.005	0.029
Control vs. LM2	0.046	0.403	0.777
LM1 vs. LM2	**0.105**	**0.0403**	**0.140**
Fraction of highly altruistic dictators			
Control vs. LM1	0.010	0.807	0.807
Control vs. LM2	0.122	0.001	0.005
LM1 vs. LM2	0.112	0.007	0.037

Notes: The same remarks as in Table 3 apply.

The results in Study 2 are largely aligned with those of Study 1, suggesting that the framing of the loss is decisive even with earned endowments.

Result 2: Even when the dictators exert effort to earn their endowments i) individuals are more benevolent in the intensive margin in *LM2* than in *LM1*, ii) the fraction of selfish dictators is higher while the fraction of highly altruistic dictators is lower in *LM1* than in *LM2*.

4. Discussion

The main conclusion of this study is that the framing of the loss defines the prosocial behaviour of the subjects. More specifically, in *LM2* in which the dictators have to share loss between themselves and recipients (e.g., Thunström, 2019; Cochard et al., 2020) the monetary allocations of the dictators are more benevolent than in *Control* in which the dictators play a standard DG without loss and in *LM1* in which the dictators have to share the remainder of their endowments after loss (e.g., Antinyan, 2014; Benistant and Suchon, 2021). Furthermore, the fraction of *selfish* dictators is higher, while the fraction of *highly altruistic* dictators is lower in *LM1* than in *LM2*. The DGs analyzed in the three treatments are highly comparable since they have identical payoff possibilities: i) any payoff allocation in *LM2* can be achieved in *Control* and *LM1* and vice versa; ii) the sum of the recipient's and dictator's final payoffs always equals $3.

The abovementioned results are consistent with an explanation that the choice sets in the DGs invoke different social norms (List, 2007). More specifically, the DG in *LM2* resembles a "taking" game, in which the dictator decides how much money to take from a recipient, while the DGs in *LM1* and *Control* resemble a "giving" game, in which the dictator decides how much money to give to a recipient (Dreber et al., 2013). In line with the "do-no-harm" principle, according to which individuals are unwilling to impose harm on others to benefit themselves (Baron, 1995; Van Beest et al., 2003, 2005; Leliveld et al., 2009), the decisions involving taking from a recipient can be perceived as less socially appropriate (Krupka and Weber, 2013) and morally more costly (Korenok et al., 2018) than the decisions involving not giving to the recipient even if identical payoffs are produced in the end. This can partially be explained by the dictators' perceptions that taking from the recipients' endowments is a violation of their entitlements (Oxoby and Spraggon, 2008). Two pieces of data provide further evidence in favor of these claims.

First, the qualitative responses provided by the dictators who chose to bear the big chunk of the loss in *LM2* (i.e., more than $1.5), contain such justifications as the dictators' unwillingness to inflict a loss on the recipients, concerns for fairness, concerns for the recipients' entitlement to the endowment among others. Table 5 depicts examples of dictators' revealed concerns.

Table 5. Examples of dictators' allocation justifications

"My task, my loss. I knew that going in so didn't want to fully penalize someone else. But...didn't want to be all alone in my misfortune, either. So, took a loss of $2.00 and gave the other a loss of $1.00."
"It'd be unfair if I didn't bear most of the loss but I don't want to bear all of it either."
"I felt that I had earned the $3 since I had to do the work and participant 2 did not. So I didn't want to lose everything. However, I felt guilty taking their money. So, I only took $1 and left the remaining $2 for them."
"Since I was in control of money distribution I felt it was my weight to bear the majority of the loss. I believe it was fair for me to take twice the amount of loss than the other participant."
"I wouldn't want to cause someone else to lose a significant amount because of my decision, but I also wouldn't want to walk away completely empty handed."
"I decided to take much loss because the loss is mine and not of participant B so I wouldn't want participant B bearing much of my loss so as not to inconvenience participant B. Also it is the best thing to do morally."
"Participant B doesn't have a choice in the matter making it unfair to take any of their initial endowment even if it was a 50/50 split of the total."
"It would be unfair for them to lose money on my behalf."
"I would feel terrible making someone lose any money in a situation where they have no say in how the loss is divided. There's no negotiation, no discussion- maybe they didn't "earn" their $3 like I did, but who's that petty? Who would be that cruel?"
"It would not be fair to take away from Participant B."

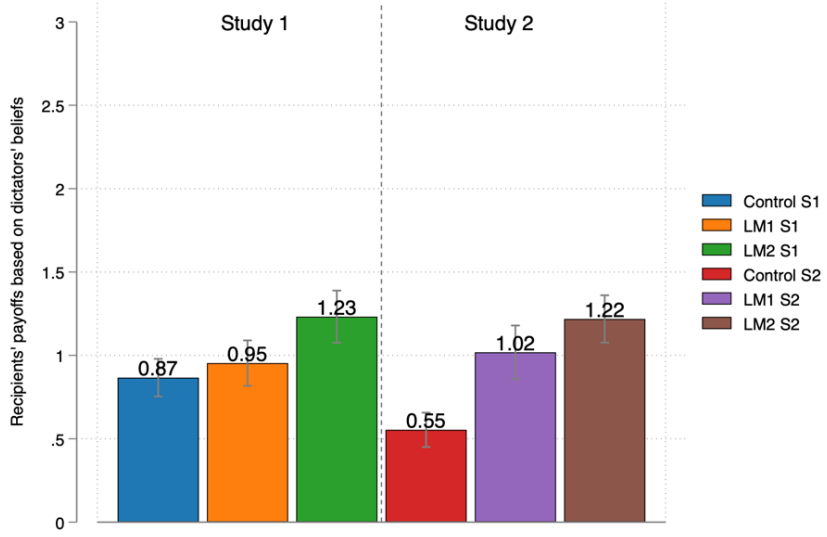
Second, the dictators' second-order beliefs on the amount of money (*Control*, *LM1*) or on the amount of loss (*LM2*) allocated to the recipients reveal that the dictators believe that the recipients expect a more prosocial behaviour by the dictators in *LM2* than in *LM1* and *Control*.[10] For the sake of comparability, Figure 4 depicts the recipients' payoffs based on the dictators' second-order beliefs.[11]

In Study 1, while there is no difference between *Control* and *LM1* ($z = -0.165$, $p=0.869$), the differences between *LM2* and *Control* ($z = -3.660$, $p=0.000$) and *LM1* and *LM2* ($z = -3.169$, $p=0.002$) are statistically significant. Similarly, in Study 2, the differences between *LM2* and *Control* ($z = -7.069$, $p=0.000$) and *LM1* and *LM2* ($z = -2.815$, $p=0.005$) are statistically significant. We also evidence an increase in expected prosocial behaviour in *LM1* compared to the *Control* ($z = -4.135$, $p=0.000$), however we do not have an explanation for this result.

[10] The dictators in *Control* and *LM1* were asked the following question after the allocation decision in DG: *"In your view, how much money does participant B expect you will send to him/her? Please indicate the amount below."* Similarly, the dictators in *LM2* were asked the following question after the allocation decision in DG: *"In your view, how much loss does participant B expect to bear? Please indicate the amount below."*

[11] For example, if the dictator expects the recipient to bear $2 loss in *LM2*, the recipients' payoff is $1 ($3-$2=$1). Similarly, if the dictator expects the recipient to receive $1 in *Control* and *LM1*, her payoff equals $1 ($0+$1=$1).

Figure 4. Recipients' payoffs based on dictators' second order beliefs



Note: The figure illustrates the average payoff of the recipients based on the dictators' second-order beliefs in each treatment with the corresponding 95% confidence interval. The first three columns refer to Study 1 in which the dictators received the endowments as windfall gifts. The last three columns refer to Study 2 in which the dictators exerted effort to earn the endowments.

5. Conclusion

In recent years, there has been an increasing interest in altruistic behaviour in the domain of losses (Antinyan, 2014; Thunström, 2019; Cochard et al., 2020; Fiedler and Hillenbrand, 2020; Benistant and Suchon, 2021). Nevertheless, there is no consensus in whether the monetary losses make individuals more generous or more selfish. Although all of these studies rely on experimental approach and use a DG to study altruism, the experimental designs differ in how the losses are framed and how the endowments are provided to the dictators. Such crucial differences across studies can explain the contradictory findings.

In this paper, we study how the framing of the loss affects altruism in two large-scale and fully incentivized experiments. The main methodological message of the study is that the prosocial behaviour of the dictators is sensitive to the loss frame they are embedded in. More specifically, in a DG in which the dictators have to share a loss between themselves and a recipient, the monetary allocations of the dictators are more benevolent than in a standard DG without a loss and in a DG in which the dictators have to share the remainder of their endowments after a loss. Most likely, different loss frames invoke different social norms that affect the generosity of the dictators,

with sharing losses being perceived as socially unacceptable on the ground that it entails imposing harm on others.

In sum, the researchers should mind the framing when studying human behaviour (particularly altruism) in the domain of losses.

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Appendices

Appendix A. Supplementary tables

First, this section mainly discusses whether the experimental arms are balanced in terms of the observable characteristics under our disposal. The analysis is implemented both for the dictators and the recipients. Since the data of *LM1 S1 ($0 loss)*, *LM2 S1 ($0 loss)*, *LM1 S2 ($0 loss)*, and *LM2 S2 ($0 loss)* are not used in the paper, the observations belonging to these sub-groups are dropped. Please refer to Table 2 of the manuscript and Section 3 for more details. Few of the variables under scrutiny have missing observations, which results in minor differences in the number of observations across columns.

Table A1. Balancing tests for Study 1 (dictators)

	Female	Age	Working	School	Bachelor	Post-Graduate	Conservative	Liberal
LM1 S1	-0.076	-1.078	0.002	-0.008	-0.008	0.016	-0.069	0.030
	(0.057)	(1.175)	(0.058)	(0.059)	(0.059)	(0.043)	(0.038)*	(0.058)
LM2 S1	-0.119**	-0.514	-0.020	-0.022	-0.030	0.052	-0.048	0.001
	(0.057)	(1.225)	(0.059)	(0.059)	(0.058)	(0.045)	(0.039)	(0.059)
Constant	0.683***	30.549***	0.606***	0.444***	0.408***	0.148***	0.148***	0.599***
	(0.039)	(0.939)	(0.041)	(0.042)	(0.041)	(0.030)	(0.030)	(0.041)
F stat.	2.221	0.437	0.083	0.072	0.139	0.678	1.707	0.169
Adj. R^2	0.006	-0.003	-0.004	-0.004	-0.004	-0.001	0.004	-0.004
N	422	422	422	422	422	422	422	422

Note: Results from ordinary least square (OLS) model (robust standard errors in parentheses). Dependent variable: Female- a binary variable which equals one for females and 0 otherwise; Age-an integer, indicating the age of the respondent; Working- a binary variable which equals one if the respondent is a full-time/part-time employer or self-employed; School or Lower - a binary variable which equals one if the respondent indicates at most a high school diploma as the highest level of education achieved and 0 otherwise; Bachelor- a binary variable which equals one if the respondent indicates bachelor's degree as the highest level of education she achieved and 0 otherwise; Post-graduate- a binary variable which equals one if the respondent indicates a master's or a doctoral degree as the highest level of education she achieved and 0 otherwise; Conservative- a binary variable which equals one if the respondent holds conservative political views and zero otherwise; Liberal- a binary variable which equals one if the respondent holds liberal political views and zero otherwise. Independent variables: LM1- a binary variable which equals one in LM1 treatment and zero otherwise; LM2- a binary variable which equals one in LM2 treatment and zero otherwise. Significance levels: * p<0.1; ** p<0.05; *** p<0.01

Table A2. Balancing tests for Study 1 (recipients)

	Female	Age	Working	School	Bachelor	Post-Graduate	Conservative	Liberal
LM1 S1	-0.052	0.059	-0.084	0.012	0.013	-0.026	-0.034	0.093
	(0.058)	(1.226)	(0.058)	(0.058)	(0.059)	(0.046)	(0.040)	(0.059)
LM2 S1	0.014	-0.070	-0.169***	0.091	-0.065	-0.026	-0.055	0.093
	(0.057)	(1.160)	(0.059)	(0.059)	(0.059)	(0.046)	(0.039)	(0.059)
Constant	0.652***	29.634***	0.641***	0.373***	0.437***	0.190***	0.148***	0.521***
	(0.040)	(0.811)	(0.040)	(0.041)	(0.042)	(0.033)	(0.030)	(0.042)
F stat.	0.730	0.005	4.192	1.393	1.032	0.211	1.010	1.655
Adj. R^2	-0.001	-0.005	0.015	0.002	0.000	-0.004	0.000	0.003
N	419	422	422	422	422	422	422	422

Note: All remarks of Table A1 apply.

Table A3. Balancing tests for Study 2 (dictators)

	Female	Age	Working	School	Bachelor	Post-Graduate	Conservative	Liberal
LM1 S2	-0.003	0.982	0.054	-0.018	-0.038	0.056	0.013	-0.031
	(0.057)	(1.621)	(0.056)	(0.058)	(0.058)	(0.044)	(0.044)	(0.058)
LM2 S2	0.090*	-0.518	0.044	-0.022	0.017	0.005	0.007	0.062
	(0.054)	(1.594)	(0.056)	(0.058)	(0.059)	(0.042)	(0.043)	(0.057)
Constant	0.643***	35.474***	0.630***	0.422***	0.435***	0.143***	0.156***	0.597***
	(0.039)	(1.113)	(0.039)	(0.040)	(0.040)	(0.028)	(0.029)	(0.040)
F stat.	1.874	0.429	0.532	0.082	0.439	0.888	0.047	1.300
Adj. R^2	0.004	-0.003	-0.002	-0.004	-0.003	-0.000	-0.005	0.001
N	425	425	425	425	425	425	425	425

Note: All remarks of Table A1 apply.

Table A4. Balancing tests for Study 2 (recipients)

	Female	Age	Working	School	Bachelor	Post-Graduate	Conservative	Liberal
LM1 S2	-0.045	0.579	0.080	-0.026	0.058	-0.031	0.023	0.009
	(0.057)	(1.604)	(0.058)	(0.056)	(0.059)	(0.046)	(0.040)	(0.058)
LM2 S2	-0.079	0.049	0.158***	0.058	0.009	-0.067	0.039	0.028
	(0.058)	(1.615)	(0.056)	(0.058)	(0.059)	(0.044)	(0.041)	(0.058)
Constant	0.649***	35.766***	0.545***	0.357***	0.435***	0.208***	0.117***	0.565***
	(0.039)	(1.154)	(0.040)	(0.039)	(0.040)	(0.033)	(0.026)	(0.040)
F stat.	0.957	0.082	3.942	1.060	0.535	1.145	0.471	0.116
Adj. R^2	-0.000	-0.004	0.013	0.000	-0.002	0.001	-0.003	-0.004
N	423	425	425	425	425	425	425	425

Note: All remarks of Table A1 apply.

This section also provides statistical evidence for the discussion in Footnote 9 of the manuscript. See Tables A5 and A6 below.

Table A5: Comparison of respective "effort" and "windfall" treatments (extensive margin)

Study 1	Study 2	χ^2 test
Selfish dictators		
Control	Control	$\chi^2(1)=23.205$, p=0.000
LM1	LM1	$\chi^2(1)=15.773$, p=0.000
LM2	LM2	$\chi^2(1)=11.885$, p=0.001
Somewhat altruistic dictators		
Control	Control	$\chi^2(1)=0.170$, p=0.680
LM1	LM1	$\chi^2(1)=1.018$, p=0.313
LM2	LM2	$\chi^2(1)=9.124$, p=0.003
Highly altruistic dictators		
Control	Control	$\chi^2(1)=22.413$, p=0.000
LM1	LM1	$\chi^2(1)=12.297$, p=0.000
LM2	LM2	$\chi^2(1)=28.870$, p=0.000

Table A6: Comparison of respective "effort" and "windfall" treatments (intensive margin)

Study 1	Study 2	Mann-Whitney U test
Control	Control	z=5.674, p=0.000
LM1	LM1	z= 4.208, p=0.000
LM2	LM2	z= 5.845, p=0.000

Appendix B. Parametric analysis

In Appendix B, we provide the results of parametric regressions to support the non-parametric analysis in Section 3. In the regressions, we control for the dictator's observable characteristics under our disposal: age, gender, education, working status, and political orientation. These variables are detailed in the caption of Table A1 in appendix A. We estimate the following regression equation:

$$Y_i = \beta_0 + \sum_{l=1}^{2} \beta_l T_{il} + \beta_3 X_i + \varepsilon_i \qquad (1),$$

where Y_i is the outcome variable of interest. T_{il} is an indicator variable denoting whether individual *i* belongs to treatment *l*. X_i is a vector of control variables, which includes the dictator's age, gender, education, working status, and the political orientation. We are interested in the coefficients of β_1 and β_2, which identify the outcome variable in the treatment groups compared to the control group. Additionally we are interested in the comparison between β_1 and β_2.

We focus on the outcome variables detailed below.

- Extensive margin
    - *Selfish* dictator*:* $Y_i = 1$ if the dictator is selfish and 0 otherwise;
    - *Somewhat altruistic* dictator*:* $Y_i = 1$ if the dictator is somewhat altruistic and 0 otherwise;
    - *Highly altruistic* dictator*:* $Y_i = 1$ if the dictator is highly altruistic and 0 otherwise.
- Intensive margin
    - *Recipient's payoff*

Tables B1 and B2 detail the results of Study 1 and Study 2, respectively. The results are qualitatively similar with the non-parametric analysis discussed in Section 3 of the manuscript.

Table B1. Study 1 regression results

	Selfish	Somewhat altruistic	Highly altruistic	Recipient's payoff
LM1	0.155***	-0.112**	-0.043	-0.076
	(0.054)	(0.056)	(0.058)	(0.091)
LM2	-0.102**	-0.227***	0.329***	0.538***
	(0.046)	(0.052)	(0.057)	(0.090)
Female	-0.028	-0.030	0.059	0.000
	(0.044)	(0.045)	(0.049)	(0.083)
Working	0.009	0.053	-0.062	-0.076
	(0.043)	(0.047)	(0.050)	(0.083)
School or lower	-0.032	0.024	0.008	0.023
	(0.066)	(0.070)	(0.071)	(0.105)
Bachelor	-0.095	-0.077	0.172**	0.312***
	(0.062)	(0.063)	(0.067)	(0.107)
Conservative	0.024	-0.078	0.053	-0.007
	(0.073)	(0.076)	(0.082)	(0.130)
Liberal	0.062	-0.071	0.009	-0.079
	(0.046)	(0.049)	(0.053)	(0.087)
Constant	0.250***	0.436***	0.314***	0.934***
	(0.086)	(0.090)	(0.092)	(0.157)
F stat.	3.888	4.472	10.570	8.144
Adj. R^2	0.054	0.049	0.123	0.118
N	419	419	419	419
LM 1 *vs*. LM2	F(2,410)=13.05	F(2,410)=9.82	F(2,410)=27.41	F(2,410)=23.87
	p=0.000	p=0.000	p=0.000	p=0.000

Note: Results from ordinary least square (OLS) model (robust standard errors in parentheses). All remarks of Table A1 apply. The omitted category for the respondent's educational level –*Bachelor* and *School or lower*– is the postgraduate level education (master's degree or higher). The omitted category for the political values–*Liberal* and *Conservative*–is the *neutral* political orientation.

Table B2. Study 2 regression results

	Selfish	Somewhat altruistic	Highly altruistic	Recipient's payoff
LM1	0.137**	-0.144***	0.007	-0.063
	(0.058)	(0.052)	(0.044)	(0.086)
LM2	-0.193***	-0.024	0.217***	0.367***
	(0.057)	(0.056)	(0.052)	(0.087)
Female	-0.067	0.025	0.042	0.049
	(0.049)	(0.045)	(0.042)	(0.075)
Working	-0.083	-0.047	0.130***	0.180**
	(0.052)	(0.048)	(0.042)	(0.079)
School or lower	0.006	-0.065	0.059	0.032
	(0.073)	(0.068)	(0.058)	(0.102)
Bachelor	-0.029	-0.038	0.066	0.100
	(0.068)	(0.064)	(0.054)	(0.098)
Conservative	0.085	-0.208***	0.122*	0.071
	(0.078)	(0.062)	(0.069)	(0.134)
Liberal	-0.027	-0.032	0.059	0.040
	(0.054)	(0.053)	(0.044)	(0.077)
Constant	0.592***	0.448***	-0.040	0.350***
	(0.091)	(0.086)	(0.070)	(0.127)
F stat.	5.568	3.534	4.965	5.427
Adj. R^2	0.072	0.029	0.079	0.066
N	423	423	423	423
LM 1 *vs*. LM2	F(2,414)=16.15	F(2,414)=4.52	F(2,414)=10.16	F(2,414)=12.64
	p=0.000	p=0.012	p=0.000	p=0.000

Note: Results from ordinary least square (OLS) model (robust standard errors in parentheses). All remarks of Table A1 and B1 apply.

Appendix C. Instructions

C.1. Instructions – Dictator (Study 1)[16]

Control

You are labelled as participant A, and you are given $3 (let's call it **"initial endowment"**). You are matched with another Prolific participant, labeled as **participant B** who has an initial endowment of $0 (in other words, we do not give any money to participant B). Each participant A is matched with a unique participant B.

Given your endowment ($3), your task is to decide how much money you want to send to participant B. The latter does not make any decision in this study. You can send as much money to participant B as you want to.

Loss Manipulation 1

You are labeled as participant A, and you are given $6 (let's call it "**initial endowment"**). You are matched with another Prolific participant, **labeled as participant B** who has an initial endowment of $0 (in other words, we do not give any money to Participant B). Each participant A is matched with a unique participant B.

As soon as you click "NEXT," you will be presented with one of two possible **scenarios**, each occurring by chance with 50% probability. **Either you will preserve your $6 (there will be no change in your initial endowment), or you will be left with $3 (you will lose half of your initial endowment). In both scenarios, the initial endowment of participant B will remain unchanged and equal to $0.** Given your endowment (either $6 or $3), your task is to decide how much money you want to send to participant B. The latter does not make any decision in this study. You can send as much money to participant B as you want to.

Information: Please note that we will publish an anonymous list of participants (your prolific ID will be completely covered), which will show that in 50% of the cases, participants A ended up with $6 while in 50% of the cases, participants A lost $3 and ended up with $3. **The decisions (i.e., how much money participants A send to participant B) will not be made public.** We will send you the link to the designated webpage after the study is concluded so that you can check that the study has been implemented in line with the provided instructions. You can identify yourself with the unique code generated at the end of the study.

Loss Manipulation 2 – Instructions

You are labeled as participant A, and you are given $3 (let's call it **"initial endowment"**). You are matched with another Prolific participant **labeled as participant** B who is also given an initial endowment of $3. Each participant A is matched with a unique participant B.

As soon as you click "NEXT," you will be presented with one of two possible **scenarios**, each occurring by chance with 50% probability. **Either you will lose $0 or you will lose $3. In both scenarios, the endowment of participant B will remain unchanged and equal to $3.** If you encounter a $3 loss, your task is to decide how to divide the loss between

[16] Instructions for Study 2 differ only in the endowment generation mechanism for the Dictator - see Appendix C.3.

you and participant B. The latter does not make any decision in this study. You are free to divide your loss with participant B in any way you would like to.

Information: Please note that we will publish an anonymous list of participants (your prolific ID will be completely covered), which will show that in 50% of the cases, participant A encountered $0 loss while in 50% of the cases participant A encountered $3 loss. **The decisions (i.e., how participants A divide the loss between themselves and participants B) will not be made public.** We will send you the link of the designated webpage after the study is concluded so that you can check that the study has been implemented in line with the provided instructions. You can identify yourself with the unique code generated at the end of the study.

C.2. Instructions – Recipient (Study 1)[17]

Control

You are labeled as participant B, and you are given $0 (let's call it **"initial endowment"**). You are matched with another Prolific participant, **labeled as participant A** who has an initial endowment of $3. Each participant B is matched with a unique participant A.

Given the endowment ($3), participant A's task is to decide how much money he/she wants to send to you (participant B). You do not make any decision in this study. Participant A can send you as much money as he/she wants to.

Loss Manipulation 1

You are labeled as participant B, and you are given $0 (let's call it **"initial endowment"**). You are matched with another Prolific participant, **labeled as participant A** who has an initial endowment of $6. Each participant B is matched with a unique participant A.

With a 50% chance participant A can lose half of his/her initial endowment. Your initial endowment (participant B) will always remain unchanged and equal to $0. Given the endowment (either $6 or $3), participant A's task is to decide how much money he/she wants to send to you (participant B). You do not make any decision in this study. Participant A can send you as much money as he/she wants to.

Information: Please note that we will publish an anonymous list of participants (your prolific ID will be completely covered), which will show that in 50% of the cases, participants A ended up with $6 while in 50% of the cases, participants A lost $3 and ended up with $3. **The decisions (i.e., how much money participants A send to participant B) will not be made public.** We will send you the link to the designated webpage after the study is concluded so that you can check that the study has been implemented in line with the provided instructions. You can identify yourself with the unique code generated at the end of the study.

Loss Manipulation 2

You are labeled as participant B, and you are given $3 (let's call it "**initial endowment**"). You are matched with another Prolific participant **labeled as participant A** who is also given an initial endowment of $3. Each participant B is matched with a unique participant A.

[17] Instructions for Study 2 differ only in the endowment generation mechanism for the Dictator - see Appendix C.3.

With a 50% chance participant, A will lose $3 and with a 50% chance participant, A will lose $0. You do not face such losses in the study. If participant A encounters a $3 loss, his/her task is to decide how to divide the loss between him/her (participant A) and you (participant B). You do not make any decision in this study. Participant A is free to divide the loss with you (participant B) in any way he/she would like to.

Information: Please note that we will publish an anonymous list of participants (your prolific ID will be completely covered), which will show that in 50% of the cases, participant A encountered $0 loss while in 50% of the cases participant A encountered $3 loss. **The decisions (i.e., how participants A divide the loss between themselves and participants B) will not be made public.** We will send you the link of the designated webpage after the study is concluded so that you can check that the study has been implemented in line with the provided instructions. You can identify yourself with the unique code generated at the end of the study.

C.3. Real effort Task Instructions (Study 2)

You are labeled as participant A. The study consists of two stages.

In Stage 1, you have to participate in a task to earn $6 (let's call it "**initial endowment**"). Below we provide an example of the task, which consists of converting letters into numbers. Your screen displays two boxes, with two rows in each box. The first row in both boxes indicates letters and the second row indicates their correspondence in numbers. You are given a letter and you must enter the corresponding number. You must validate your answer by pressing the 'OK' button. You will be requested to convert 40 letters into numbers. Usually, this task is completed within 5 minutes.

A	B	C	D	E	F	G	H	I	J	K	L	M
34	35	62	48	6	27	90	11	74	58	2	2	72

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
71	13	42	94	13	79	91	6	96	27	39	2	70

Please find corresponding number:

P

Once you finish the task, Stage 2 will start. **[The remaining instructions in Stage 2 are similar to those in C.1 and C.2, however there are differences to emphasize the endowment source heterogeneity]**.

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