Are groups really more dishonest than individuals?

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Abstract

A common finding of the literature on dishonesty is that groups are more dishonest than individuals. We revisit this finding by replacing the experimenter, implicitly hurt by subjects' dishonesty, with an explicit third-party: a local charity. With the charity we do not find groups to be more dishonest than individuals. Instead, groups can even help moderate the extent of the dishonesty.

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1 Introduction

The die-under-the-cup paradigm has been successful at studying dishonesty in the laboratory (Fischbacher and Föllmi-Heusi, 2013; see Abeler et al., 2019 for a a review). This paradigm asks subjects to roll a die and report the number they see. Their payoff does not depend on the number seen but on the number reported, so subjects have an incentive to be dishonest. The literature finds that groups are more dishonest than individuals.[1]

In most of the studies using the die-under-the-cup paradigm to compare individuals and groups, dishonesty only harms the experimenter. Since this is not made explicit to the subjects, the negative externalities associated with dishonesty have little prominence. Outside the laboratory, however, those harmed by dishonesty are often explicit, for example when financial advisers mislead their clients or when aid workers steal from development funds. Negative externalities are thus more salient.

Salient negative externalities may lead to a different outcome in a group setting. Group members may abstain from expressing their preference for behaving dishonestly. Honest members may also more readily communicate moral reminders (Pruckner and Sausgruber, 2013). As a result, groups may become more honest than individuals.

We test this intuition by replacing the experimenter with a local charity. Since dishonesty now harms the charity there are clear real-world consequences and the negative externalities are more salient. We observe that, with the charity, groups stop being more dishonest than individuals. In fact, groups can even help reduce the extent of the dishonesty. One of the reasons is that, with the charity, participants stop sharing opinions that support dishonesty.

We base our experimental design on Kocher et al. (2018). In this design subjects do not privately roll a die under a cup but see a video of a die roll. Kocher et al. (2018) observe similar levels of dishonesty compared to earlier studies where subjects roll their die privately. This design allows us to study not only the extensive margin—whether individuals or groups are dishonest—but also the intensive margin—how dishonest they are—for which we need to know the number subjects actually see. Some subjects decide on a number to report alone while others make their decision in a group: these between-subject comparisons allow us to see which one, individual or group, is more dishonest. Further, group

[1] See Barr and Michailidou (2017); Chytilová and Korbel (2014); Conrads et al. (2013); Gino et al. (2013); Kocher et al. (2018); Muehlheusser et al. (2015); Soraperra et al. (2017); Weisel and Shalvi (2015).

members can chat to coordinate on a number to report, which allows us to study how communication shapes group dishonesty.

In our *Base* treatments, where dishonesty only harms the experimenter, we replicate the findings of the literature: while individuals and groups both report dishonestly, groups are much more dishonest than individuals.

We extend this design in our *Charity* treatments. Compared to the *Base* treatments, the monetary incentives remain the same but reporting a higher number now reduces the money donated to a local charity. Dishonesty is thus associated with clear negative externalities. We use a charity and not another subject because we want subjects to bring into the laboratory pre-existing "homegrown" norms (Schram and Charness, 2015) such as "one should not steal", which makes being dishonest unambiguously immoral.

Our first main result is that, with the charity, groups are no more dishonest than individuals. In fact, dishonest groups take significantly less from the charity than dishonest individuals. Our second main result is that dishonesty can be contagious: subjects who were members of a dishonest group are more likely to act dishonestly in the future.

To understand why the charity reduces dishonesty, we compare individual and group behaviour between the *Base* and *Charity* treatments. We find that the charity does not change individual dishonesty. This finding is consistent with Fischbacher and Föllmi-Heusi (2013) who observe that changing the consequences of dishonesty has little influence on individual dishonesty.

On the other hand, groups are more dishonest in the *Base* treatments than in the *Charity* treatments. Looking at the chat data, we find that subjects in the *Charity* treatments send fewer messages calling for a dishonest report than those in the *Base* treatment. This suggests that the shift in dishonesty is driven by group members being more reluctant to appear dishonest when the charity is involved.

We explore other explanations in additional treatments. In the *CharityR* treatments we increase the negative externality even further by sending the charity an anonymised copy of the decisions made by the subjects and of the messages exchanged in the chat. We do not find any strong difference between the *Charity* and the *CharityR* treatments, suggesting that the effect comes mostly from the interactions in the group chat. It is also possible that the *CharityR* treatments suffer from low-intensity: subjects might simply not care about their anonymised data being revealed to the charity and so the treatment might not increase the negative externality as intended. Introducing the charity might also have already made groups as honest as possible.

Another explanation is that the charity makes groups more pro-social than individuals. Previous research has indeed found that groups are more pro-social than individuals (Cason and Mui, 1997) and introducing the charity might have triggered other-regarding preferences in groups. In our design being pro-social means not over-reporting, which is confounded with not being dishonest. We test this alternative explanation in the *Dictator* treatments, where we remove the die roll and simply ask individuals and groups to split money between themselves and the charity. We do not find any difference between individuals and groups, which suggests that, in our setup, groups are not significantly more pro-social than individuals.

These findings relate to the literature on dishonesty that uses, not the die-rolling task, but the sender-receiver game of Gneezy (2005). In this game, the sender must send a message to the receiver and can lie to get a higher payoff, so by design there are consequences to a third-party and thus salient negative externalities. Similarly to what we observe, individuals and groups do not differ in terms of dishonesty (Sutter, 2009).

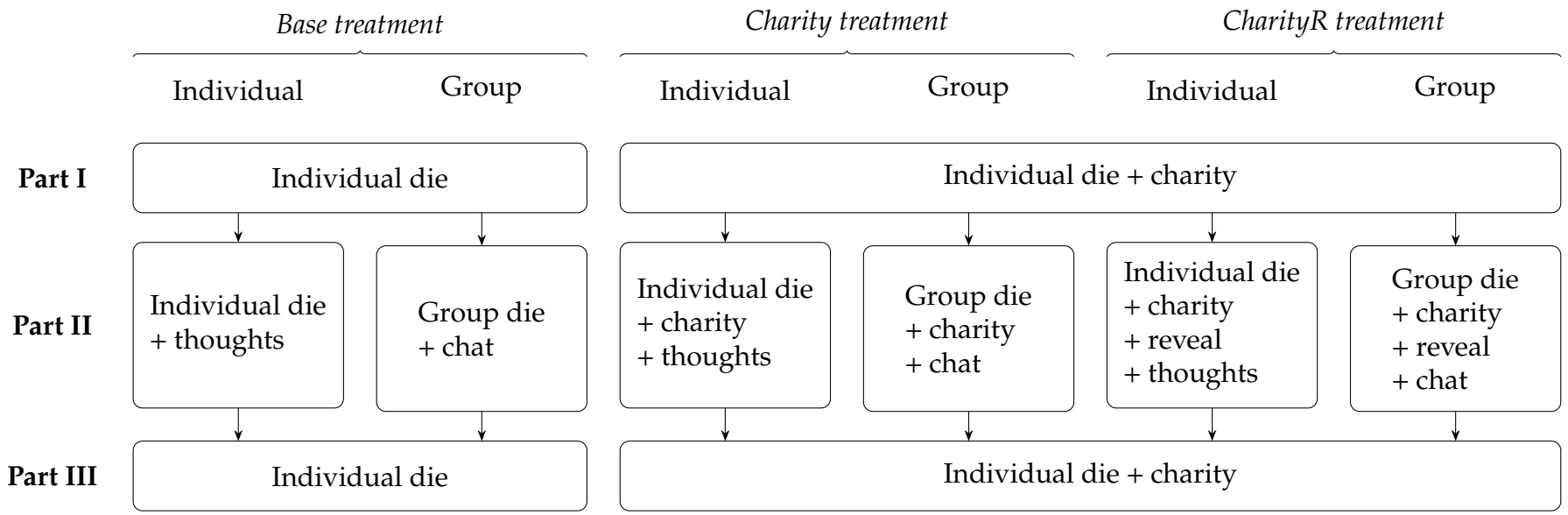
Another of our contributions is to show that it is sometimes appropriate to bring more of the real-world in the laboratory. Based on the existing evidence from the die-rolling literature one could conclude that decision-making in groups is detrimental because it leads to more dishonesty. In few situations, however, is the person or the organisation harmed by dishonesty completely absent. When employees steal from their company, or when citizens cheat on their tax declaration, there is a clear victim. We show that, as soon as we reintroduce a victim, groups become no more dishonest than individuals—if anything they even regulate the extent of the dishonesty.

In the next Section we present the *Base*, *Charity* and *CharityR* treatments. Section 3 reports the results from these treatments. In Section 4 we consider pro-sociality as an explanation for our results and present the *Dictator* treatments. Finally, Section 5 concludes.

2 Experimental design

2.1 Treatments

Our main experiment involves six treatments, grouped into three categories: *Base*, *Charity* and *CharityR*. Figure 1, which we will use throughout, summarises our design.



Notes. **+ charity**: subjects' decisions also affect the donations the experimenter makes to a local charity.
+ thought: subjects can write their thoughts about their decision (for maximum 5 minutes).
+ chat: subjects of the same group can chat (for maximum 5 minutes).
+ reveal: subjects' decisions are revealed to the charity.

Figure 1: Summary of the experimental design.

Table 1: Payoffs to subjects and donations to the charity.

Die	⚅	⚀	⚁	⚂	⚃	⚄
Points	0	1	2	3	4	5
Payoff to subject	0 €	2 €	4 €	6 €	8 €	10 €
Donation to charity (*Charity* and *CharityR* treatments)	10 €	8 €	6 €	4 €	2 €	0 €

***Base* treatments.** To the left of the Figure are our *Base* individual (*I-Base*) and group (*G-Base*) treatments, which replicate the "IndividualDeliberation" and "GroupPC" treatments of Kocher et al. (2018).

There are three Parts to each treatment. In Parts I and III, subjects watch a video of a die roll and are asked to *truthfully* report the result of the roll which can be ⚀, ⚁, ⚂, ⚃, ⚄ or ⚅ with equal probability. Table 1 shows that the reported die-roll number is converted into points so that ⚅ corresponds to 0 points, ⚀ to 1 point, ⚁ to 2 points, and so on. Each point is worth 2 €.

What differs between the *I-Base* and *G-Base* treatments is the second part. In the *I-Base* treatment, subjects do the same **i**ndividual task as in Parts I and III. In the *G-Base* treatment, however, subjects form **g**roups of three, all observe the same die-roll video, and then independently report what they observed. Group members each receive the points shown in Table 1 if they all reported the same number, and 0 points otherwise. For example, each group member receives 3 points (6 €) if all three report ⚂. On the other hand, each group member receives 0 points (0 €) if they fail to report the same number.

To coordinate, group members can chat anonymously for up to 5 minutes through the experimental software. To keep the treatments comparable, we also follow Kocher et al. (2018) and give 5 minutes to subjects in Part II of the *I-Base* treatment to, if they wish, type their thoughts about the experiment.

Because subjects know that the experimenter knows which video they saw, this design could elicit a lower level of dishonesty. Note, however, that we focus, not on absolute dishonesty, but rather on the difference in dishonesty between individuals and groups.

***Charity* treatments.** The *Charity* individual (*I-Charity*) and group *(G-Charity)* treatments are identical to their respective *Base* treatments, except they make explicit that a passive third-party, a local charity, is hurt when subjects report a larger number: each extra Euro given to the subject as a result of their report is not given to a local charity. For example, as shown on Table 1, if a subject reports ⚂

the subject gets 6 € and the charity gets 4 €. In Part II of the *G-Charity* treatment, group members and the charity receive 0 € if the group members do not report the same die number.

***CharityR* treatments.** In the *CharityR* treatments, we further reveal to the charity the die number observed and reported in Part II of the individual (*I-CharityR*) and group (*G-CharityR*) treatments, as well as the written thoughts (*I-CharityR*) and chat logs (*G-CharityR*). All of this information is anonymous. Parts I and III are unchanged.

2.2 Procedures

When the experiment started, subjects were told that the experiment was made of three independent parts. At the beginning of each part they received specific instructions and answered some control questions where we made sure that they understood how their report could affect them and, if applicable, the charity. In particular the control questions made clear that, even if their stated task was to truthfully report the die roll, their payoffs and the donations to the charity only depended on their report.

We chose a small local charity whose members perform as clowns in nearby hospitals to entertain sick children. This choice minimises the chance that subjects lied to indirectly favour themselves, for instance if we had chosen a student organisation. In the initial instructions of the *Charity* and *CharityR* treatments, we gave subjects a broad description of the charity; they were then given 5 minutes to visit its website and Facebook page to learn about its activities. In the *CharityR* treatments, we also gave subjects a sample of the information that we would send to the charity via email. Subjects knew they would be included in blind carbon copy to the email.

We provided information about the charity only in the *Charity* and *CharityR* treatments. Our main concern with presenting the charity also in the *Base* treatment related to subjects' confusion: they might look for explanations to our presentation of the charity if it does not play any role in the experiment. Our intention was also to replicate Kocher et al. (2018) in our *Base* treatment, and they had no charity whatsoever.

The experiment was conducted at the LERN of the University of Erlangen-Nuremberg between June 2018 and March 2019. Subjects were recruited via ORSEE (Greiner, 2015). We recruited 30 subjects for each of the individual treatments and 90 subjects for each of the group treatments, ensuring the same number of

independent observations in each case. The experiment was programmed with zTree (Fischbacher, 2007).[2] The instructions are presented in Appendix D.2.

Following Kocher et al. (2018) we randomly generated in the first session one sequence of die rolls for each group and used the same sequence in the next sessions. We can therefore directly compare the die-roll reports across treatments. This procedure also ensured that subjects of the same group observed the same die roll in Parts I and III.

At the end of each session, one of the three parts was selected at random to determine the earnings of the subjects and the donations to the charity. To convince subjects that the charity and the donations were real, we made the anonymous donations immediately from within the laboratory, and subjects were actively encouraged to monitor the process. Subjects knew this when they started the experiment.

Each session lasted approximately 60 minutes. The mean earnings for subjects in the *Base*, *Charity* and *CharityR* treatments, including a show-up payment of 4 €, were 13.45 €, 12.06 € and 10.84 €, respectively.

2.3 Predictions

Since our *Base* treatments replicate Kocher et al. (2018), and since they observed more dishonesty with groups than with individuals, we can expect that too. Kocher et al.'s (2018) favoured explanation is that "it is the exchange of arguments and moral views within the group that shift group members' expectations and behavior".

The same might happen in the *Charity* and *CharityR* treatments, and so groups may be across the board more *dishonest* than individuals. In addition, and in particular when the charity is involved, diffusion of responsibility might play a role (Choo et al., 2019; Darley and Latàn, 1968). When individuals report a higher number than the one they have seen, it is clearly their fault if the charity does not get a large amount of money. But in a group setting, they can hide behind the group: the charity not receiving a lot of money is not only their fault but also the fault of the group.

On the other hand, with the charity, groups might become more *honest* than individuals. For groups in the *G-Base* treatment who observe less than 5 points, the equilibria where all report honestly and all report the maximum possible are intuitively focal. Groups in the *G-Charity* and *G-CharityR* treatments may

[2]We are grateful to Martin Kocher, Simeon Schudy and Lisa Spantig for making their zTree code available to us, which we adapted to our experiment.

still be dishonest but report less than 5 points to ensure that the charity receives something. The equilibria between all reporting honestly and all reporting the maximum possible can thus also be focal. Even if all group members would prefer to report the maximum possible points, not wanting to be seen as the one breaking a norm such as "one should not steal from a deserving cause" can make it difficult for them to express such preferences. In this case, the group's decision may be honest even when the majority of group members would have over-reported when making the decision alone.

3 Results

Figure 2 shows, for all treatments and all parts, the numbers reported (y-axis) as a function of the numbers seen (x-axis). In the group treatments and to compare with the individual treatments, we follow Kocher et al. (2018) and look at the median of the points reported in each group.

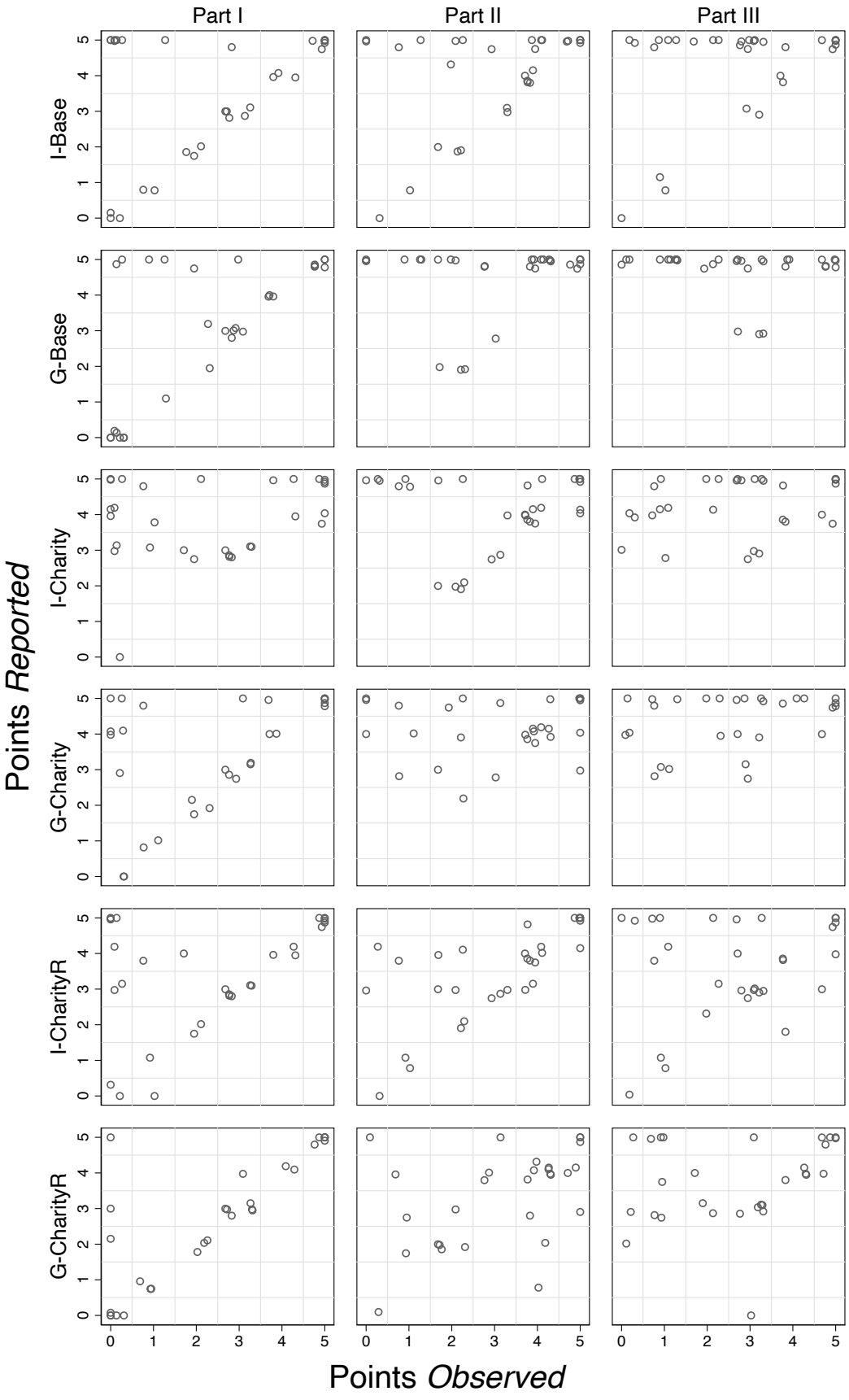
3.1 Groups are not always more dishonest than individuals

For the time being, we focus on Part II. Here almost every group managed to coordinate: 100%, 93% and 97% of the groups in the *Base*, *Charity* and *CharityR* treatments reported the same number. We thus omit observations in which members failed to coordinate in Part II.

We say that individuals or groups *over-report* if their report gets them more points than if they had reported honestly.[3] Figure 3 shows the proportion of individuals and groups who over-report in Part II of each treatment. As in Kocher et al. (2018), we find that in the *Base* treatments groups over-report more than individuals: 67% of groups over-report compared to 40% of individuals ($\chi^2(1) = 4.286$, $p = 0.038$; all statistical tests are two-sided). Note that our die sequences are different from the ones used by Kocher et al. (2018) (see Appendix D.1 for a comparison), which further strengthens the replicability of their findings:

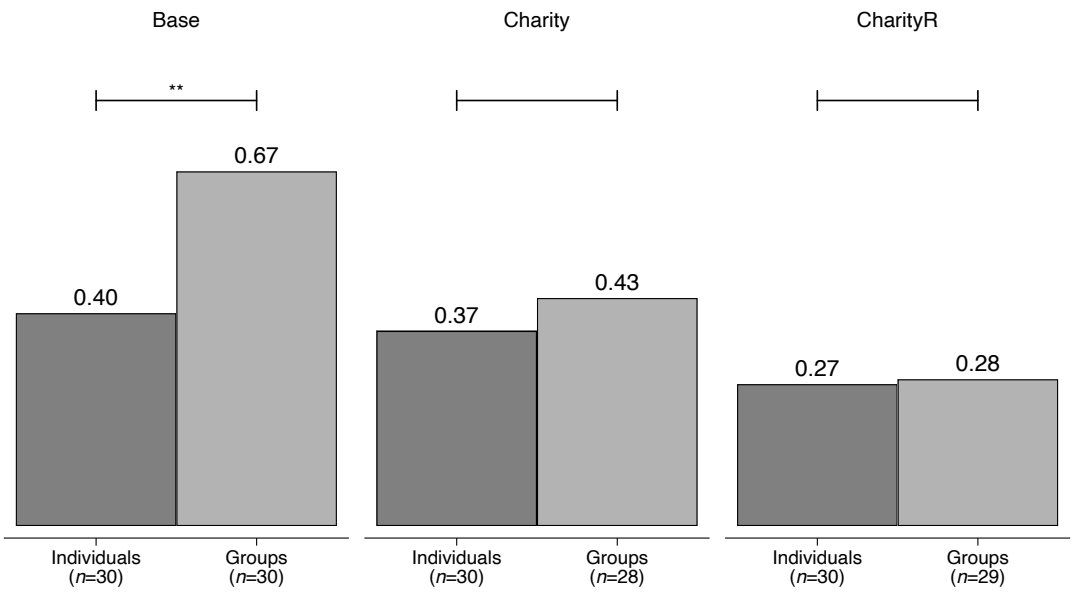
Observation (Replication of Kocher et al., 2018)**.** *Groups over-report more frequently than individuals when over-reporting harms the experimenter.*

[3]All subjects made individual decisions in Part I. Here, we do not find any significant differences in the proportion of individual and group treatment subjects who over-report in the *Base* ($\chi^2(1) = 0.054$, $p = 0.815$) and *CharityR* ($\chi^2(1) = 0.742$, $p = 0.389$) treatments. There is, however, some differences in the *Charity* ($\chi^2(1) = 2.963$, $p = 0.085$) treatments, where individuals are slightly more dishonest than groups. In the Appendix we thus also report regressions controlling for behaviour in Part I.



Note. In the individual treatments, each dot represents the point observed and reported by a participant. In the group treatments, each dot represent the point observed (all group members observe the same points in Parts I, II and III) and the median point reported by a group.

Figure 2: Points observed and points reported across treatments and parts (jittered).



Note. Pearson's $\chi^2(1)$ tests; ***, ** and * denote $p < 0.01$, $p < 0.05$ and $p < 0.10$.

Figure 3: Proportion of individuals and groups that over-report in Part II.

In the treatments involving the charity, however, we do not find that groups over-report more frequently than individuals. Figure 3 shows that the proportions of over-reporting groups and individuals are 43% and 37% ($\chi^2(1) = 0.231$, $p = 0.630$) in the *Charity* treatments, and 28% and 27% ($\chi^2(1) = 0.006$, $p = 0.937$) in the *CharityR* treatments. The differences remain insignificant ($\chi^2(1) \leqslant 0.348$, $p \geqslant 0.555$) even if we exclude instances where subjects observed a die number corresponding to 5 points, for which they could not have over-reported.

If we look, not at the proportion of individuals or groups who over-report, but at the reported points, a similar picture emerges: groups report significantly higher points than individuals in the *Base* treatments (Mann-Whitney $U = 325$, $p = 0.019$), but there are no significant differences in the reported points of individuals and groups in the *Charity* ($U = 407$, $p = 0.827$) and *CharityR* ($U = 419$, $p = 0.806$) treatments. These observations lead us to our first result:

Result 1. *There is no significant difference in over-reporting between groups and individuals when over-reporting harms the charity. This holds even when the charity is informed.*

To give more meaning to these numbers, we can look at the extra revenue individuals and groups extract by over-reporting (Appendix A). In Part II of the *Base* treatments, individuals on average claim 2.14 € more than if they had

reported honestly, and group members, 3.26 €. In line with the previous findings, the difference shrinks in the *Charity* treatments: individuals claim 2.26 € more, but group members now claim only 1.80 € more. In the *CharityR* treatments, the numbers for individuals and group members are even lower, respectively 0.94 € and 0.26 €.

It is clear from Figure 3 that groups not over-reporting more than individuals with the charity is not driven by individuals increasing their over-reporting: the proportion of over-reporting individuals in the *Base* treatment is not significantly different from those in the *Charity* ($\chi^2(1) = 0.070$, $p = 0.791$) and *CharityR* ($\chi^2(1) = 1.200$, $p = 0.273$) treatments.[4]

Instead, Figure 3 shows that the proportion of over-reporting groups in Part II falls sharply when we introduce the charity: the proportion of over-reporting groups in the *Base* treatment is significantly higher than those in the *Charity* ($\chi^2(1) = 3.320$, $p = 0.068$) and *CharityR* ($\chi^2(1) = 9.032$, $p = 0.003$) treatments.

Also, revealing subjects' behaviour to the charity has little influence: the proportion of over-reporting individuals in Part II of the *I-Charity* and *I-CharityR* treatments are not significantly different ($\chi^2(1) = 0.693$, $p = 0.405$). Similarly, the proportion of over-reporting groups in Part II of the *G-Charity* and *G-CharityR* treatments are not significantly different ($\chi^2(1) = 1.458$, $p = 0.227$).

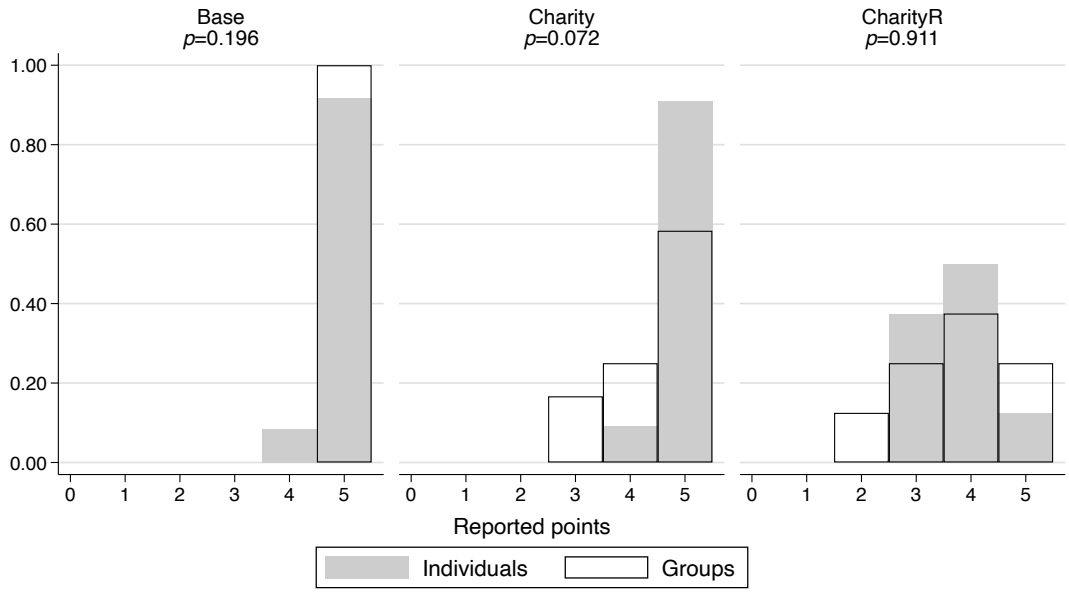
These observations lead us to the next result:

Result 2. *The proportion of over-reporting groups, but not of over-reporting individuals, falls when the charity is introduced. Revealing information to the charity, however, has no effect.*

Focus now on these over-reporting individuals and groups. There are no significant differences in the points they observed in the *Base* ($U = 107$, $p = 0.583$), *Charity* ($U = 65$, $p = 0.924$) and *CharityR* ($U = 30$, $p = 0.787$) treatments, so we can concentrate on the points they report.

Figure 4 shows the histogram of the reported points of these over-reporting individuals or groups. In the *Base* treatments, they report a similar number of points ($U = 110$, $p = 0.196$): almost always the maximum possible. This is also the case in Kocher et al. (2018). In the *Charity* treatments, however, over-reporting groups report significantly lower points ($U = 44$, $p = 0.072$) than over-reporting individuals. The difference remains significant ($U = 32$, $p = 0.089$) even after excluding instances where over-reporting individuals or groups observe 4 points,

[4]We observe the same in Part I: the proportion of over-reporting individuals in the *Base* treatments is 28%, compared to 32% for the *Charity* and *CharityR* treatments ($\chi^2(1) = 0.527$, $p = 0.468$), which we pool since at this point subjects faced the exact same task.



Note. p-values from Mann-Whitney U tests comparing the reported points of over-reporting individuals and groups.

Figure 4: Histogram of reported points by over-reporting individuals and groups in Part II.

for which they could only report 5 points. In the *CharityR* treatments the effect is in the same direction but it is not significant ($U = 31$, $p = 0.911$). Hence our third result:

Result 3. *Over-reporting groups over-report less than over-reporting individuals when group members know that over-reporting harms the charity.*

In Appendix B.1.1, we report regressions corresponding to Results 1, 2 and 3, where we further control for the die roll observed in Part II, the behaviour in Part I, and gender. All the results carry through.

In Figure 4 we can also see that, when moving from the *Base* treatment to the *Charity* treatment, the points reported by over-reporting groups fall sharply ($U = 70$, $p < 0.001$) while those reported by over-reporting individuals remain stable ($U = 66$, $p = 0.949$). When moving from the *Charity* treatment to the *CharityR* treatment, however, it is now the points reported by over-reporting individuals that fall ($U = 8$, $p < 0.001$) while those reported by over-reporting groups are not significantly different ($U = 30$, $p = 0.127$).

Finally, we observe no under-reporting in the *Base* treatments. We observe some under-reporting in the treatments involving the charity, where under-reporting would allow subjects to give to the charity more than if they had reported honestly,

but there are no differences between individuals and groups: the proportion of individuals and groups who under-report are 6.67% and 7.14% ($\chi^2(1) = 0.005$, $p = 0.943$) in the *Charity* treatments, and 10.00% and 20.69% ($\chi^2(1) = 1.303$, $p = 0.254$) in the *CharityR* treatments.

3.2 Analysis of the chat data

We have established that groups stop to over-report more than individuals when we introduce a charity. To better understand why, we look at the chat data.

Chat messages are coded as messages for over-reporting if subjects propose a number higher than the observed die roll or if subjects explicitly agree with such proposal. The coding was performed independently by two research assistants; Appendix C gives the full details. For each group, we then compute the proportion of messages for over-reporting.

Groups are often in agreement: the proportion of messages for over-reporting is 0 or 1 in 77%, 78% and 72% of groups in the *G-Base*, *G-Charity* and *G-CharityR* treatments. As can be expected, there is a positive and significant correlation between the proportion of messages for over-reporting and groups over-reporting in Part II in the *Base* (Spearman's $\rho = 0.743$, $p < 0.001$), *Charity* ($\rho = 0.910$, $p < 0.001$) and *CharityR* ($\rho = 0.869$, $p < 0.001$) treatments.

Figure 5 details the mean and 95% confidence interval of the proportion of messages for over-reporting for groups in the different treatments. We observe that this proportion is higher in the *Base* treatment relative to the *Charity* ($U = 313$, $p = 0.077$) and *CharityR* ($U = 254$, $p = 0.003$) treatments. In Table 2, we use the fractional logit model (e.g., Papke and Wooldridge, 1996, 2008) to further control for the die number observed in Part II as well as the proportion of group members who over-reported in Part I. The regressions show that the proportion of messages for over-reporting is significantly higher for groups in the *Base* treatment than in the *Charity* ($p \leqslant 0.018$) and the *CharityR* ($p < 0.001$) treatments. There are no significant differences between groups in the *Charity* and the *CharityR* treatments ($p \geqslant 0.208$). This leads us to the next result:

Result 4. *In the chat, groups exchange less messages that call for over-reporting when they know that over-reporting harms the charity.*

These findings suggest that groups over-report more than individuals in the *Base* treatments but not the *Charity* and *CharityR* treatments because group members stop voicing arguments for dishonesty when the charity is involved.

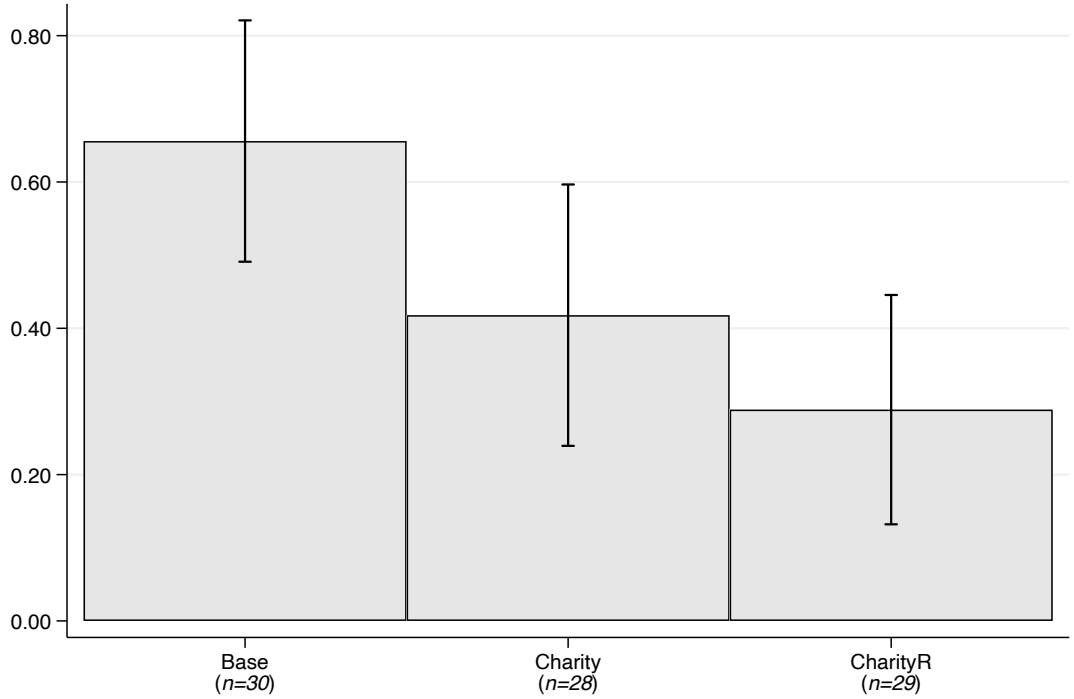


Figure 5: Mean and 95% confidence interval of the proportion of messages for over-reporting in Part II of the group treatments.

Table 2: Fractional Logit regression estimates: How the proportion of messages for over-reporting differs across groups in the group treatments.

Dependent Variable: Proportion of messages for over-reporting		
Regression	(1)	(2)
Reference group: Groups in the *G-Base* treatment.		
G-Charity	-1.38**	-1.71**
	(0.58)	(0.68)
G-CharityR	-2.07***	-2.11***
	(0.58)	(0.69)
Points observed (Part II)		-0.64***
		(0.17)
♯ of members over-report (Part I)		0.53*
		(0.29)
Constant	1.51***	2.92***
	(0.44)	(0.89)
n	69	69
Pseudo R^2	0.12	0.22
$\chi^2(1)$: *G-Charity* = *G-CharityR*	1.59	0.59

Notes. Instances where groups observed 5 points omitted.
***, ** and * denote $p < 0.01$, $p < 0.05$ and $p < 0.10$.

3.3 Spillovers of dishonesty

Finally, we study behaviour across parts to see whether dishonesty can spillover from one part to the next.

Do dishonest individuals make groups more dishonest? We first study whether over-reporting individuals make groups over-report more. We do not find any significant between-treatment differences in the number of group members who over-reported in Part I for groups in the *G-Base*, *G-Charity* and *G-CharityR* treatments (Kruskal-Wallis test, $p = 0.202$), so the above results cannot be explained by different group compositions.

Table 2 already showed us that there is a positive and significant relationship between the number of group members who over-reported in Part I and the proportion of chat messages that call for over-reporting.

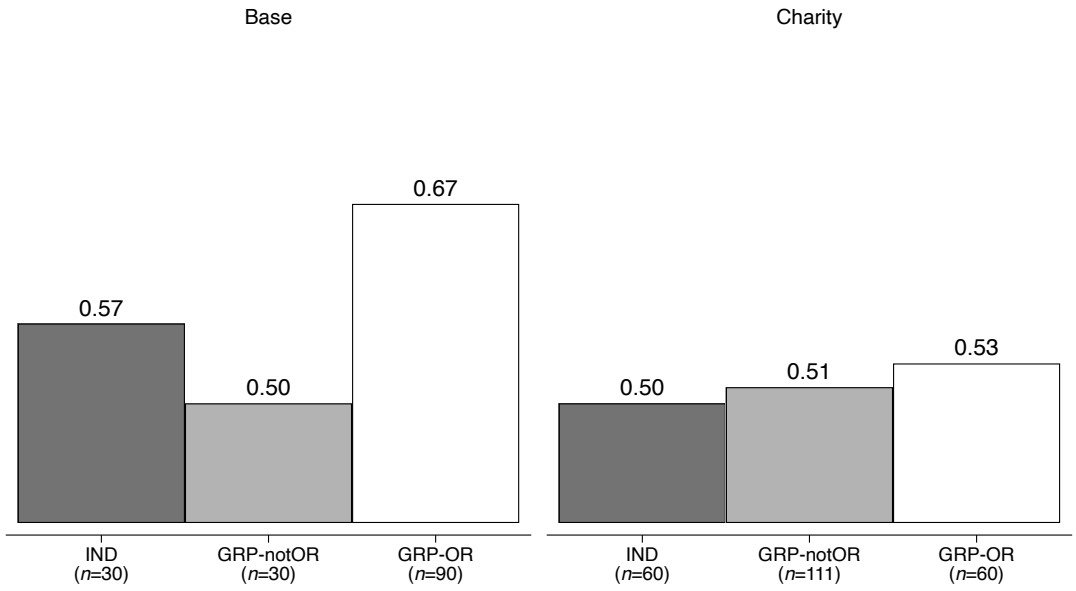
This relation, however, does not seem to translate to actions: we find no significant correlation between the number of over-reporting subjects in Part I and over-reporting in Part II for groups in the *G-Base* (Spearman's $\rho = 0.235$, $p = 0.210$), *G-Charity* ($\rho = 0.117$, $p = 0.553$) and *G-CharityR* ($\rho = -0.117$, $p = 0.544$) treatments. The regression in Appendix B.1.2 confirms this result while further controlling for points observed in Part II. Note that this holds even when we look at groups for which all members over-reported or did not over-report at all in Part I.

We therefore have the following result:

Result 5. *The number of over-reporting individuals within the group has only a limited influence on the group's decision to over-report. The same is true even when the charity is involved.*

Do dishonest groups make individuals more dishonest? Finally, we look at whether subjects who were in a group that over-reported in Part II over-report themselves in Part III. For this we compare subjects who were in a group that over-reported in Part II (GRP-OR subjects) to subjects who were in a group that did not over-report in Part II (GRP-notOR subjects) and to subjects who were not in a group in Part II (IND subjects).

Figure 6 shows the proportion of IND, GRP-notOR and GRP-OR subjects who over-report in Part III. We pool the *Charity* and *CharityR* treatments together since subjects in these treatments faced the same situation in Part III. We see that the proportion of over-reporting GRP-OR subjects is only marginally higher than of IND and GRP-notOR subjects.



Notes. All subjects made individual decisions in Part III. IND: subjects who made individual decisions in Part II. GRP-notOR (GRP-OR): subjects who made group decisions in Part II and whose group had not (had) over-reported.

Figure 6: Proportion of IND, GRP-notOR and GRP-OR individuals who over-report in Part III.

The regressions in Table 3 look at the impact of being in an over-reporting or a non-over-reporting group in Part II on the likelihood of over-reporting in Part III, controlling for behaviour in Part I, gender and points observed in Part III. The estimates show that GRP-OR subjects are significantly ($p \leqslant 0.053$) more likely to over-report in Part III relative to IND and GRP-notOR subjects in the *Base* and *Charity* treatments. Also, we do not find the likelihood of over-reporting to be significantly higher for GRP-notOR relative to IND subjects. This leads us to the following result:[5]

Result 6. *Individuals are more likely to over-report if they were previously in a group that over-reported, irrespective of whether over-reporting hurt the experiment or the charity.*

[5]We find the same result using the data from Kocher et al. (2018): subjects from over-reporting groups are significantly more likely to over-report than subjects who were not in a group ($p = 0.021$) and subjects from non-over-reporting groups ($p < 0.001$). Subjects from non-over-reporting groups report similarly as subjects who were not in a group ($p = 0.124$).

Table 3: Logit regression estimates: The spillovers from membership of over-reporting groups.

Dependent Variable: Over-report in Part III.	BASE		CHARITY	
Regression	(1)	(2)	(3)	(4)
Reference group: IND subjects				
GRP-notOR	-0.66	-0.81	0.21	-0.45
	(0.58)	(0.63)	(0.38)	(0.49)
GRP-OR	1.19*	1.45**	1.01**	1.64***
	(0.62)	(0.66)	(0.43)	(0.56)
Points observed (Part III)		-0.41**		-0.75***
		(0.18)		(0.12)
Over-report (Part I)		-2.04**		2.97***
		(0.88)		(0.52)
Constant	0.88*	1.31*	0.51*	0.82*
	(0.45)	(0.72)	(0.29)	(0.47)
n	96	96	186	186
Pseudo R^2	0.09	0.20	0.03	0.33
$\chi^2(1)$: GRP-OR = GRP-notOR	11.11***	12.42***	9.50***	9.05***

Notes. Instances where subjects observed 5 points are omitted.
Standard errors clustered at the group level.
***, ** and * denote $p < 0.01$, $p < 0.05$ and $p < 0.10$.

4 Dishonesty or pro-sociality?

We have seen that, with the charity, groups are no more likely to over-report than individuals. In fact, when they do, they over-report to a lesser extent. As Kocher et al. (2018) did, we interpret over-reporting as dishonesty and so conclude that groups are as dishonest as individuals when the charity is involved. A further analysis of the chat data corroborates this interpretation: We categorised chat messages based on the types of arguments subjects used in the chat to justify their proposal (again, see Appendix C for details). Only about 20% of the chat messages could be categorised; with this caveat in mind we find that the proportion of arguments in favour of honesty goes from 33% in the *G-Base* treatment to 56% in the *G-Charity* treatment and 43% in the *G-CharityR* treatment.

At the same time, however, the proportion of statements in favour of pro-sociality jumps from 0% in the *G-Base* treatment to 36% in the *G-Charity* treatment and 51% in the *G-CharityR* treatment. It is thus possible that groups do not become less dishonest with the charity, but become more pro-social. They would over-report less to give more to the charity, but not because of dishonesty. As a result, innate dishonesty of groups and heightened pro-sociality in the presence of the charity would cancel each other out, leading to no difference in over-reporting

between groups and individuals. To test for this alternative explanation, we designed a series of follow-up treatments: the *Dictator* treatments.

4.1 Procedure

The *Dictator* treatments keep the same three-part structure of the *Charity* treatments but remove the die roll: subjects report a number that determines points for themselves and for the charity, still as described by Table 1. Therefore, in Part I and III all subjects play the standard dictator game with the charity as recipient. In Part II, subjects in the *I-Dictator* treatment continue to play the standard dictator game while those in the *G-Dictator* treatment play the dictator game as a group: all group members independently report an amount for the group and the allocation is implemented only if they all report the same amount. By focusing on Part II and comparing individuals in *I-Dictator* and groups in *G-Dictator*, we can test whether groups are indeed more pro-social than individuals.

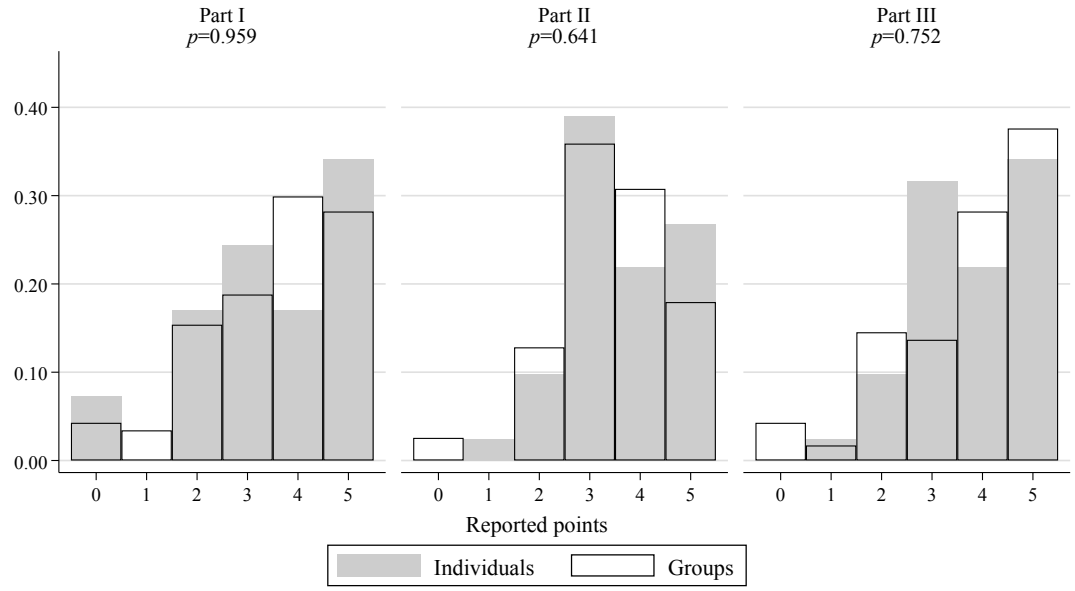
The sessions took place online, using zTree Unleashed (Duch et al., 2020), in May and June 2021. The instructions can be found in Appendix D.3. 43 subjects participated in the *I-Dictator* treatment and 126 in the *G-Dictator* treatment. After removing subjects who dropped out during the experiment—and, in the group treatment, groups in which at least one group member dropped out—we are left with 41 subjects in *I-Dictator* treatment and 117 subjects (39 independent observations) in the *G-Dictator* treatment.

4.2 Results

Figure 7 shows the distribution of points reported in each Part by individuals and by groups. The reported points is the amount that the individuals or groups intend to keep for themselves. In Parts I and III subjects make individual decisions and so are identical in the *I-Dictator* and the *G-Dictator* treatments; we find no significant between-treatment differences for these parts ($U > 2386$, $p \geqslant 0.742$). In Part II, individuals report slightly higher points than groups, but the difference is not significant ($U = 751$, $p = 0.641$). Therefore, individuals and groups behaved the same in the *Dictator* treatments.

We also follow the methodology from Cason and Mui (1997) and classify individuals and groups as *selfish* or *pro-social* types. We choose the mean number of points reported in Part I, 3.5 points, as the neutral number of points.[6] Individuals or groups that reported points above 3.5 are categorised as selfish types, and those

[6]The conclusions do not change if we use the median (4 points).



Note. p-values from Mann-Whitney U tests comparing the reported points of individuals and groups.

Figure 7: Histogram of points reported by individuals and groups in Part II of the *Dictator* treatment.

below, as pro-social types. Around 51% of individuals and groups are classified as pro-social types in Part II ($\chi^2 = 1.2927$, $p = 0.524$). We also see that selfish individuals report slightly higher points than selfish groups, but the difference is not significant ($U = 155$, $p = 0.261$). Taken together these observations lead us to a new result:

Result 7. *In the Dictator treatments, groups are as pro-social as individuals.*

This result indicates that what we observed in the previous treatments—groups over-reporting more than individuals in the *Base* treatments, but stopping to do so when the charity is involved—cannot be explained by groups being more pro-social in the presence of the charity. Instead, Result 7 points to groups becoming less dishonest with the charity as being the prime explanation of our findings.

In Appendix B.2 we also look at how parts affect each other in the *Dictator* treatment. We find that, while selfish members make groups more selfish, being in a selfish or in a pro-social group has only a limited impact on subsequent reports.

5 Conclusion

We report the results of a laboratory experiment testing whether groups are more dishonest than individuals. We replicate the study by Kocher et al. (2018) but also show that, when dishonesty harms a local charity and not the experimenter, groups are no more dishonest than individuals. In fact, groups can even help moderate the extent of the dishonesty.

These results imply that organisations should make explicit who is getting hurt if employees engage in dishonest behaviour. Employees could be tempted to coordinate to extract money from their company, for example by submitting and countersigning fake bills. The company may preemptively signal that such practices hurt the company's profits and ultimately the employees themselves. If the company is public, it could even signal that it is funded from taxes that the employees themselves pay.

The diffusion of responsibility literature (Darley and Latàn, 1968) has instead shown that people are less likely to stop dishonest behaviour if they are in a group, which results in groups being more dishonest than individuals. Note, however, that in our experiments the default is being honest—reporting the die number seen—and being dishonest requires groups to coordinate on deviating from this honest default. On the other hand, with diffusion of responsibility the default is often dishonesty. For example, in Choo et al. (2019) groups have to coordinate to whistleblow and report dishonest behaviour; the dishonest outcome happens if they do not act. They find that indeed groups are less likely to whistleblow than individuals. Studying the impact of changes in the status-quo on dishonesty is something we leave to future research.

Our results highlight that dishonesty is context-sensitive. A potential follow-up to our experiment would be to keep the experimenter as a victim of subjects' dishonesty but make it explicit, for example by stressing who funds the study. Future research could also look for other cues that similarly affect dishonesty.

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Appendices

A Excess points

For the individual task, we define an individual's *excess points* as his received points minus his observed points. For the group task (i.e., part II of the *G-Base*, *G-Charity* and *G-CharityR* treatments), we define excess points as the points received points minus the observed points of a representative group member.[7]

Table A1 detail the mean excess point over Parts I, II and III of each treatment. Focusing on Part II, we find that excess points are significantly higher in the *G-Base* relative to *I-Base* treatments (Mann-Whitney $U = 341$, $p = 0.089$). In contrast, we do not find excess points for groups and individuals to be significantly different in Part II of the *Charity* (Mann-Whitney $U = 432$, $p = 0.774$) and *CharityR* (Mann-Whitney $U = 392$, $p = 0.376$).

The numbers reported in the main text convert these excess points to Euros by multiplying them by 2.

B Additional results

In all regressions, we omit observations from the group treatments ($n = 6$ in *G-Charity* and $n = 3$ in *G-CharityR*) where group members fail to coordinate on reporting the same points in Part II.

B.1 Die-roll treatments

B.1.1 Individuals vs. Groups

Regressions for Result 1. In Table B1, we use the Logit regression model to study subjects' likelihood of over-reporting in Part II controlling for points observed in Part II, gender and whether they had over-reported in Part I—standard errors clustered at matching group level.[8] The estimates find that subjects in the *Base* treatment are significantly ($p \leqslant 0.027$) more likely to over-report in Part II when they make decisions in a group. In contrast, subjects in the *Charity* ($p \geqslant 0.336$) and *CharityR* ($p \geqslant 0.592$) are NOT significantly more likely to over-report when they make decisions in a group.

[7]Subjects always receive the reported points in the individual task. In the group task, subjects only receive the reported points if all coordinated on the same report—otherwise 0 points.

[8]Subjects in the group treatments reported their decisions independently.

Table A1: Mean excess points.

	Base		*Charity*		*CharityR*	
	Ind.	Grp	Ind.	Grp	Ind.	Grp
Part I	1.20	0.98	1.57	1.13	1.13	0.67
	(2.09)	(1.70)	(1.96)	(1.93)	(1.94)	(1.63)
Part II	1.07	1.63	1.13	0.90	0.47	0.13
	(1.64)	(1.73)	(1.93)	(2.01)	(1.20)	(1.55)
Part III	1.67	1.77	1.63	1.43	0.93	0.90
	(1.73)	(1.75)	(1.59)	(1.76)	(1.87)	(1.96)

Notes. Each cell details the mean excess points with the standard errors in parenthesis. There are 30 observations in each cell of the Individual (*I-Base*, *I-Charity* and *I-CharityR*) treatments and part II of the Group (*G-Base*, *G-Charity* and *G-CharityR*) treatments—90 observations in each other cells of the group treatments.

Table B1: Logit model regression estimates: Over-reporting in Part II by subjects in the individual and group treatments.

Dependent Variable: Over-reporting in Part II						
	Base		Charity		CharityR	
Regression	(1)	(2)	(3)	(4)	(5)	(6)
Reference group: Subjects in the individual treatments.						
Group Treatment	1.61**	1.63**	0.35	0.82	0.06	0.40
	(0.69)	(0.74)	(0.59)	(0.86)	(0.62)	(0.74)
Over-report (Part I)		1.36**		0.58		0.75
		(0.68)		(0.64)		(0.61)
Male		-0.01		1.13		0.17
		(0.59)		(0.69)		(0.46)
Points Observed (Part II)		-0.03		-1.72***		-0.82***
		(0.19)		(0.42)		(0.31)
Constant	-0.01	-0.24	-0.17	3.55***	-0.69	1.03
	(0.42)	(0.64)	(0.41)	(1.13)	(0.43)	(0.87)
n	96	96	90	90	93	93
Clusters	48	48	46	46	47	47
Pseudo R^2	0.09	0.13	0.01	0.46	0.01	0.20

Notes. We exclude instances where 5 points were observed due to perfect collinearity. Standard errors are clustered at the matching group levels.
***, ** and * denote $p < 0.01$, $p < 0.05$ and $p < 0.10$, respectively.

We find no significant influence of gender ($p \geqslant 0.105$). Subjects are more likely to over-report in Part II if they had also done so in Part I. However, the effects are only significant in the *Base* treatments ($p = 0.047$) but not the *Charity* ($p = 0.367$) and *CharityR* ($p = 0.219$) treatments. There is a negative correlation between points observed in Part II and over-reporting in Part II. However, the correlation is only significant in the *Charity* ($p < 0.001$) and *CharityR* ($p = 0.004$) treatments and not the *Base* ($p = 0.873$) treatments. This discrepancy seems to be primarily driven by subjects in *G-Base* treatments whose decisions are insensitive to the observed points.[9]

Regressions for Result 2. Regressions (1) and (2) of Table B2 show that there are no significant differences in the likelihood of over-reporting between individuals in the *I-Base* treatment and those in the *I-Charity* ($p \geqslant 0.753$), and between subjects in the *I-Base* treatment and those in the *I-CharityR* treatment ($p \geqslant 0.208$).[10] We also find no significant differences in the likelihood of over-reporting ($p \geqslant 0.338$) for individuals in the *I-Charity* and *I-CharityR* treatments. Regressions (3) and (4) of Table B2 show that groups are significantly more likely to over-report in the *G-Base* treatment relative to the *G-Charity* ($p \leqslant 0.040$) and *G-CharityR* ($p \leqslant 0.001$) treatments—no significant differences in the *G-Charity* and *G-CharityR* treatments ($p \geqslant 0.185$).

Regressions for Result 3. In Table B3, we use the Ordered Logit regression model to study the reported points (Part II) by over-reporting groups and individuals. We find no significant differences in the reported points of over-reporting groups and individuals in the *Base* ($p \geqslant 0.998$) and *CharityR* ($p \geqslant 0.853$) treatments. In contrast, we find reported points to be significantly lower ($p \leqslant 0.091$) for over-reporting groups relative to individuals in the *Charity* treatments.

B.1.2 Influence of dishonest members on group's decision.

In Table B4, we use the Logit regression model to study the likelihood of groups over-reporting in Part II controlling for the points observed in Part II and the number of group members who over-report in Part I—we omit the proportion of messages for dishonesty as a covariate as it predicts the outcome perfectly.

[9] We regressed over-reporting in Part II on points observed in Part II for subjects in the *G-Base* treatment. Whilst not significant ($p = 0.530$), the Logit model estimated coefficient is positive.

[10] We did not control for behaviour in Part I since subjects in the *Base* and *Charity* treatments face different dilemmas. Nevertheless, the conclusion will not change if we also controlled for such behaviour.

Table B2: Logit model regression estimates: Over-reporting in Part II by individuals and groups.

Dependent Variable: Over-reporting in Part II				
	Individual treatments		Group treatments	
Regression	(1)	(2)	(3)	(4)
Reference group: Subjects in the *Base* treatment.				
Charity	-0.16	-0.19	-1.47**	-1.69**
	(0.57)	(0.63)	(0.69)	(0.77)
CharityR	-0.69	-0.82	-2.23***	-2.57***
	(0.59)	(0.65)	(0.70)	(0.79)
Points observed (Part II)		-0.61***		-0.78***
		(0.19)		(0.24)
Constant	0.01	1.52**	1.60***	3.94***
	(0.40)	(0.68)	(0.55)	(1.01)
n	72	72	69	69
Pseudo R^2	0.02	0.13	0.13	0.27
$\chi^2(1)$: *Charity* = *CharityR*	0.78	0.92	1.75	1.58

Note. We exclude instances where 5 points were observed due to perfect collinearity.
***, ** and * denote $p < 0.01$, $p < 0.05$ and $p < 0.10$, respectively.

Table B3: Ordered Logit model regression estimates: Reported points in Part II by over-reporting individuals and groups.

Dependent Variable: Reported points in Part II (by individuals or groups)						
	Base		Charity		CharityR	
Regression	(1)	(2)	(3)	(4)	(5)	(6)
Reference group: Subjects in the individual treatments.						
Group Treatment	17.97	17.92	-2.03*	-2.03*	0.11	-0.18
	(5913.23)	(5868.03)	(1.19)	(1.20)	(0.93)	(0.97)
Points Observed (Part II)		0.12		-0.01		0.58
		(0.71)		(0.39)		(0.45)
n	32	32	23	23	16	16
Pseudo R^2	0.27	0.23	0.11	0.11	0.01	0.05

Notes. We exclude instances where 4 points were observed due to perfect collinearity.
***, ** and * denote $p < 0.01$, $p < 0.05$ and $p < 0.10$, respectively.

We find that the number of group members who over-reported in Part I has no significant ($p \geqslant 0.293$) influence on the group's likelihood over-reporting in Part II for all treatments.

B.2 Dictator treatments

There is a strong correlation between the points reported by a group in Part II and the average of the points reported by the group members in Part I (Spearman's $\rho = 0.755$, $p < 0.001$). This correlation suggests that selfish members make the group more selfish.

To assess the impact of Part II on behaviour in Part III, we classify subjects depending on whether in Part II they were in a selfish group (GRP-self subjects), in a pro-social group (GRP-pro subjects), or not in a group (IND subjects). We run an ordered logistic regression to look at the impact of being in one of these groups on the points reported in Part III, controlling for the points reported in Part I. The estimates are presented in Table B5. GRP-pro subjects are more likely to give more to the charity than GRP-self subjects in Part III. On the other hand, the reports of GRP-self and GRP-pro subjects are not significantly different than those of IND subjects.

C Analysis of the chat data

The chat data consists of messages that group members sent to each other in Part II of the experiment. The analysis was performed independently by two student research assistants (RAs). The data was sorted by groups and chat time. The RAs were told that group members could benefit by reporting the same number and that their decisions may or may not affect a local charity. We also included the die roll observed by groups in the *G-Base*, *G-Charity* and *G-CharityR* treatments. The RAs knew there were several treatments but did not know their name and what they were meant to test. They could infer the charity's involvement through the messages exchanged in the chat.

We only use data from groups where all members reported the same number in Part II. Panel A of Table C1 shows that the average number of chat messages per group is broadly similar across the treatments.

The RAs performed two tasks:

1. The first task was to extract from each chat message a **recommended number**. The recommended number is the suggestion made by a group member

Table B4: Logit model regression estimates: Over-reporting in Part II by number of dishonest group members—group treatment only.

Dependent Variable: Over-reporting in Part II (Group treatment)			
	G-Base	*G-Charity*	*G-CharityR*
♯ of group members over-report in Part I	0.91 (0.86)	0.64 (0.87)	0.38 (0.79)
Points observed (Part II)	0.09 (0.39)	-1.94** (0.76)	-0.93** (0.41)
Constant	0.71 (1.13)	5.00** (2.36)	1.51 (1.09)
n	24	22	23
Pseudo R^2	0.07	0.54	0.22

Note. We exclude instances where 5 points were observed due to perfect collinearity.
***, ** and * denote $p < 0.01$, $p < 0.05$ and $p < 0.10$, respectively.

Table B5: Ordered logit regression estimates: The spillovers from membership to selfish or pro-social groups in the *Dictator* treatments.

Dependent Variable: Points reported in Part III.	
Reference group: IND subjects	
GRP-self	-0.33 (0.39)
GRP-pro	-0.54 (0.35)
Points reported in Part I	1.60*** (0.31)
n	158
Pseudo R^2	0.28
$\chi^2(1)$: GRP-self = GRP-pro	3.89***

Notes. Standard errors clustered at the group level. Constant omitted
***, ** and * denote $p < 0.01$, $p < 0.05$ and $p < 0.10$.

to the other group members as to which number to report. The RAs left the recommended number blank if the chat message was not suggesting a number or if they were unable to extract a recommended number. If the chat message suggests two or more numbers (e.g., "I prefer 2 or 3"), the RAs were asked to take the average.

2. The second task was to *classify* each message into an **argument type**: pro-social, selfish, honest, or dishonest. To do so the RAs were asked to try to infer the motivation behind each message. For example, "we should report the number we saw" would be categorised as honest. The RAs left the argument type blank if they were unable to classify a message.

Panel B of Table C1 shows that around 33% of chat messages were coded by both RAs—the uncoded messages were mostly filler messages such as "Hello", "Shall we use German or English" and "Goodbye". In the treatments involving a die roll the RAs never coded differently recommended numbers; conflicts were also rare in the *Dictator* treatment. This is because the coded chats were often unambiguous about the number to report.

Subjects were less forthcoming about their motivations or justifications for their suggested number. Only about 19% of chat messages in the die-roll treatments are classified into one of the four argument-types by both RAs, and conflicts occur relative frequently (Panel D of Table C1). The RAs often had to subjectively infer the argument-types from the sequence of chat discussions within the group and the tone of language used.

To see this more clearly, we picked a set of trigger words (english and german) including the terms "honest", "fair", "charity", "kind", "donate", "true", "truth", "right", "lie" and the charity's name. As shown on Panel C of Table C1, only 4–9% of chat messages included at least one of these trigger words.

The proportion of classified argument types by both RA fall to 2% in the dictator treatment. The difference should not be too surprising since unlike the die-roll treatment, there is no natural reference point such as the observed die-roll number in the dictator treatment.

C.1 Proportion of messages for over-reporting

We converted all recommended numbers coded by the RAs to points for the group (0, 1, 2, 3, 4 or 5 points). We only focus on chat messages that are coded by both RAs—where there is conflict, we use the highest recommended points. The conclusions hold even if we focus on messages that are coded by at least one RA.

Table C1: Summary statistics of chat data

	Die roll			
Treatment	*G-Base*	*G-Charity*	*G-CharityR*	*G-Dictator*
Panel A: Chat messages.				
Number of Groups	30	28	29	39
Number of chat messages	487	444	527	643
Mean number of messages per group	16.2	15.8	18.1	16.4
Panel B: Recommended-number coding by RAs (Task 1).				
% of chats coded by *at least one* RA	52%	56%	47%	50%
% of chats coded by *both* RAs	33%	32%	32%	39%
% of chats coded differently by both RAs	0%	0%	0%	1%
Panel C: Trigger words identified.[i]				
% of chats with trigger words	4%	5%	9%	9%
Panel D: Classification of chat messages into argument-types (Task 2).				
% of chats classified by *at least one* RA	47%	49%	39%	8%
% of chats classified by *both*	23%	20%	17%	2%
% of chats classified differently by both RAs	6%	6%	5%	0%

Note. [i]: trigger words (English and German) including the terms "honest", "fair", "charity", "kind", "donate", "true", "truth", "right", "lie" and the charity's name.

Table C2: Proportion of over-reporting, exact-reporting and under-reporting messages.

Treatment	*G-Base*	*G-Charity*	*G-CharityR*	*G-Dictator*
% of over-reporting messages	71%	47%	29%	56%
% of exact-reporting messages	29%	45%	44%	
% of under-reporting messages	0%	8%	27%	44%
n observations	161	143	168	243

Note. We only consider chat messages that were assigned a recommended number by both RAs. In *G-Dictator*, over-reporting and under-reporting defined with respect to the mean reported points in Part I (3.5).

We classify a chat message in the die-roll treatments as for *over-reporting*, *under-reporting* or *exact-reporting*, if the suggested points are above, below, or equal to the observed points

Table C2 details for each treatment the proportion of over-, under- and exact-reporting messages. We see that under-reporting messages never occur in the *G-Base* treatment and rarely occur in the *G-Charity* treatment. In contrast, we observe some under-reporting messages in the *G-CharityR* treatment. All differences are significant (Fischer exact test, all $p < 0.01$). These chat messages, however, are mainly from a quarter of groups. This suggests that revealing the chat messages to the charity may have a marginal influence on the behaviour of groups. For completeness, we also report the proportion of over- and under- reporting statements in the *G-Dictator* treatment, defined as chats for which the suggested points are above and below, respectively, 3.5 points (mean points reported by all individuals in part I of the dictator treatments).

To facilitate comparisons across the die-roll treatments, we therefore focus over-reporting behaviour. To do so, we compute for each group the proportion of coded messages by both RAs that are for over-reporting. For example, a ratio of 0.5 implies that 50% of chat messages in that group which were coded by both RAs are for over-reporting. We performed the analysis of the ratios in the manuscript.

C.2 Analysis of argument-types

To study the types of arguments offered, we focus only chat messages that both RAs classified the same argument-type. Table C3 details the proportion of argument types in each treatment. Here, we see that no messages in the die-roll treatments are classified as dishonest argument-types. This can expected since it would be unusual for subjects to reveal that they prefer to act dishonestly. Also,

Table C3: Proportion of argument-types by treatments.

Treatment	*G-Base*	*G-Charity*	*G-CharityR*	*G-Dictator*
Pro-social	0%	36%	51%	80%
Selfish	67%	8%	6%	20%
Honest	33%	56%	43%	
Dishonest	0%	0%	0%	
n observations	84	60	62	10

Note. We only consider chat messages that were assigned a recommended number by both RAs.

argument-types in the *G-Base* are either Selfish or Honest.

Introducing the Charity (*G-Charity* vs *G-Base*) leads to significant differences in the argument-types (Fisher exact $p < 0.001$) with a substantial fall in selfish types and gains in honest as well as pro-social types. Finally, revealing the chat messages to the charity (*G-Charity* vs *G-CharityR*) changes the composition of argument-types, though the differences are not significant (Fisher exact $p = 0.272$). For completeness, we also report the composition of argument-types in the *G-Dictator* treatment.

D Details on the experiment

D.1 Die rolls

We pre-generated 10 sequences of die roll. Table D1 details the frequencies of points observed in our data. We also report the frequencies of points observed in Kocher et al. (2018) data (KSS2018).

D.2 Instructions to the Base, Charity and CharityR treatments

The experiments were conducted in English. The "general procedures" were printed while the instructions for Parts I, II and III were displayed on the subjects' computer screens. Where relevant, the parts of the instructions that are unique to the Charity and CharityR treatments will be marked as "*text*". In addition, the instructions that are unique to CharityR treatments will be marked as text. Finally, we will refer to the charity as the XX charity.

Table D1: Frequencies that points are observed.

	Part I		Part II		Part III	
	Our	KSS2018	Our	KSS2018	Our	KSS2018
0 points	30%	31%	10%	15%	10%	31%
1 point	10%	08%	10%	23%	20%	15%
2 points	10%	38%	20%	23%	10%	23%
3 points	20%	08%	10%	15%	30%	23%
4 points	10%	00%	30%	23%	10%	00%
5 points	20%	15%	20%	00%	20%	08%
$\chi^2(5)$	11.45^{**}		10.60^{**}		11.42^{**}	

Note. ***, ** and * denote $p < 0.01$, $p < 0.05$ and $p < 0.10$.

D.2.1 General procedures

Please switch off your electronic devices and remain silent. Also, do not talk with the other participants. For showing up on time you will receive a participation fee of 4 euros. You may also earn more during the experiment. The experiment consists of 3 parts (Part 1, Part 2 and Part 3). The three parts are independent: choices made in one part do not affect the other parts. At the beginning of each part you will see the detailed instructions for that part on your computer screen. If you have any questions, please raise your hand and an experimenter will come to your desk to answer them. During the experiment, you and the other participants will make decisions. You may also interact with other participants, in which case your own decisions and the decisions of the others may determine your earnings. The onscreen instructions will clearly show whether you interact with other participants. They will also explain how exactly your earnings will be determined.

Payment. In some part of the experiment, and depending on your decisions, you will earn points for yourself *or for a charity. We will provide further information about this charity in a minute.* At the end of the experiment, only the points from one of the 3 parts will be used to determine the payment to you *and to the charity*. Your points *and the charity's points* in this part will be converted into euros at the exchange rate of:

1 point = 2 Euros

To select the part for payment, the computer will randomly ask one participant to roll a die:

- If the die shows a ⚀ or ⚁, then points from Part 1 will be used for payment;
- If the die shows a ⚁ or ⚄, then points from Part 2 will be used for payment;
- If the die shows a ⚂ or ⚅, then points from Part 3 will be used for payment.

After converting points into euros, we will pay you your total earnings—your earnings from the selected part and the participation fee of 4 Euro. No other participant will learn about your earnings and you will not learn about the earnings of others.

We will also pay the charity via online transfer. We will do so from the experimenter room, and you are welcome at this stage to come monitor the payment and verify how much we donate.

Anonymity. We will never link your name with the decisions you will make in this experiment. You will not learn the identity of the other participants, and the other participants will not learn your identity. At the end of the experiment we will ask you to sign a receipt to confirm the payments you received and the payments for the charity that are determined by your decisions. We only use this receipt for accounting and it is not linked to your decisions.

The XX charity *Your decisions during the experiment will affect XX, a local charity based in Nuremberg. In the next few lines, we wish to give you more information about this charity and its goals.*

XX is a group of clowns that travel to the hospitals of the Franconian region to visit sick children and brighten their day. They visit children who have been hospitalised for a short time, as well as children who are seriously or chronically ill and in intensive care, oncology, cardiology or dialysis.

The clowns visit the hospitals-Klinikum Nuremberg-Süd, Klinikum Fuerth, and the University Hospital in Erlangen—at least once every two weeks and sometimes every week. During their visit they do not perform a rehearsed program but instead interact spontaneously with each child in their room. They are also in close contact with physicians, nurses, educators and psychologists, in order to adapt their visit to the needs of every children.

At the moment there are 9 clowns in the charity and they are all volunteers. 100% of the donations they receive go directly to their work as clowns in the hospitals. For example, the donations pay for the red noses, the makeup, the transportation costs to the hospitals, the flyers, and the website. XX was founded in 1999 and is recognised by the tax office of Nuremberg as a non-profit organisation particularly worthy of promotion.

Table D2: Points Table in Parts 1, 2 and 3.

	⚀	⚁	⚂	⚃	⚄	⚅
Die number entered	1	2	3	4	5	6
Points for you	1 point	2 points	3 points	4 points	5 points	0 points
Points for the charity	*4 points*	*3 points*	*2 points*	*1 point*	*0 points*	*5 points*

As a result of your decisions XX will receive some points. How many exactly will be detailed in the instructions that will appear on your computer screen at the beginning of each Part. At the end of the experiment and before paying you your earnings we will add all the points received by XX and convert them to euros. As explained above we will donate this amount to XX via online transfer.

Before we start the experiment, you will see appear on your computer screen the webpage of XX. We will give you 5 minutes to check their website. It is only in German but you can see the pictures of the clowns in "Wir Clowns" and of their visits in "Clown Nachrichten". At the top of the page you will also find links to their Facebook and Youtube, where you can see more news, pictures, and videos.

D.2.2 Part I

In Part 1 of the Experiment, you will see a video of a die roll showing ⚀, ⚁, ⚂, ⚃, ⚄ or ⚅. The video you will see is randomly selected by the computer and each of the 6 possible videos is chosen with equal probability.

Your task. Your task is to remember the number of the die roll in the video and to type it into a field showing up later. The die number you enter determines YOUR points *and the points for the CHARITY as explained by the table below* (see Table D2). For example, if you enter the die number to be "4", you will receive 4 points *and the charity will receive 1 point.*

Comprehension questions. [Subjects had to correct answers the questions to begin Part 1. The correct answer is underlined.]

1. What is your task in this part?
   - To enter the number that you have seen and memorised.
   - To enter a number different from the number you have seen and memorised.
   - To enter an arbitrary number.

2a. Suppose that you see a ⚃ and enter a "3". How many points will YOU receive? 3 points.

2b. *How many points will the CHARITY receive?* 2 points.

3a. Suppose that you see a ⚃ and enter a "2". How many points will YOU receive? 2 points.

3b. *How many points will the CHARITY receive?* 3 points.

4a. Suppose that you see a ⚃ and enter a "4". How many points will YOU receive? 4 points.

4b. *How many points will the CHARITY receive?* 1 point.

D.2.3 Part II (individual treatments)

Part 2 of the experiment is similar to Part 1, except that now you have the opportunity to record your thoughts BEFORE making your decision.

In Part 2 of the Experiment, you will see a video of a die roll showing ⚀, ⚁, ⚂, ⚃, ⚄ or ⚅. The video you will see is randomly selected by the computer and each of the 6 possible videos is chosen with equal probability.

Your task. Your task is to remember the number of the die roll in the video and to type it into a field showing up later. The die number you enter determines YOUR points *and the points for the CHARITY as explained by the table below* (see Table D2). For example, if you enter the die number to be "4", you will receive 4 points *and the charity will receive 1 point.* The next screen will describe how you can record your thoughts.

Comprehension questions. **remark: Subjects had to correct answers the questions. The questions are exactly the same as in Part I.**

How you input your thoughts. You have the possibility to record your thoughts about the number you will enter. You have 5 minutes to write down your thoughts. After 5 minutes the possibility will end. If you have finished before the 5 minutes are over, you can click on the "Leave" button (subjects see Figure D1).

After the experiment we will send a copy of what you wrote to the charity. We are distributing an illustration of the copy for you to check what kind of information we will send to the charity. As you will see, we will send the number

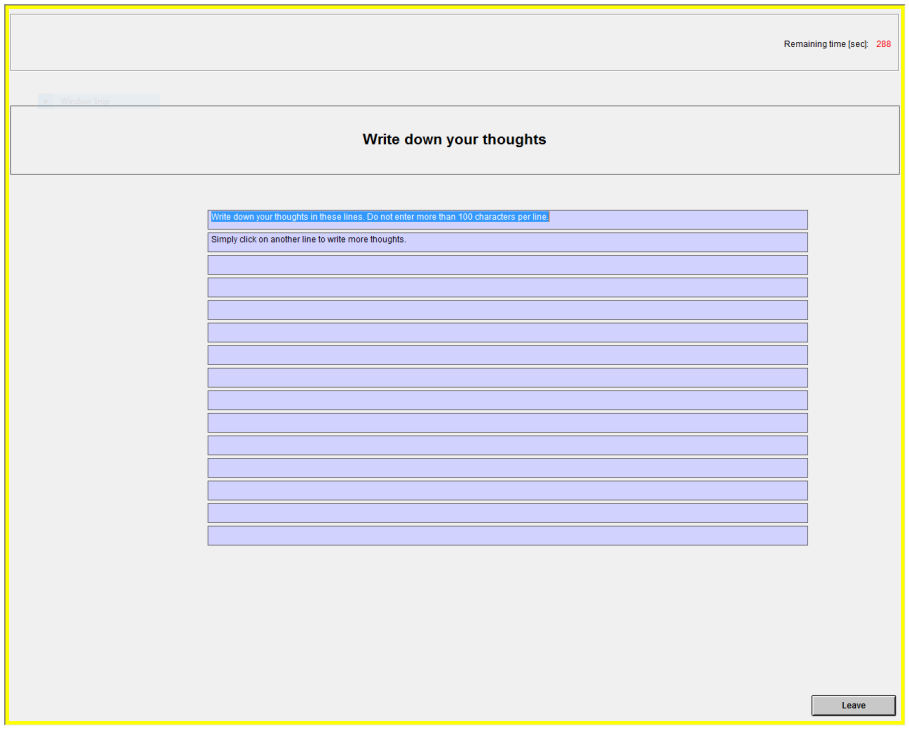

Figure D1: How subjects entered their thoughts.

you saw, the number you reported, and what you wrote. Note that, since the experiment is anonymous, the copy is anonymous as well: only the participant ID appears and it cannot be traced to you. We will send the transcript to the charity via email and we will add the email addresses of everyone who participated to today's experiment in blind carbon copy (so they will not see your email address) for you to verify that we are really sending the copy.

D.2.4 Part II (group treatments)

Part 2 of the experiment is similar to Part 1, except that now you decide in a group. We will randomly match you with 2 other participants such that you form a group of 3.

In Part 2 of the Experiment, you will see a video of a die roll showing ⚀, ⚁, ⚂, ⚃, ⚄ or ⚅. The video you will see is randomly selected by the computer and each of the 6 possible videos is chosen with equal probability. ALL MEMBERS OF YOUR GROUP WILL SEE THE SAME RANDOMLY CHOSEN VIDEO.

Your task. Your task is to remember the number of the die roll in the video and to type it into a field showing up later. YOU *and the CHARITY* will receive points from this task only when all group members enter the same number. In

contrast, YOU *and the CHARITY* will receive 0 points if any group member enters a different number. If all group members enter the same number, the number entered determines the points for YOU *and the CHARITY* as described by the table below (Table D2). For example, if all group members enter the number 4, then each group member will receive 4 points. *In addition, the CHARITY will receive 1 point from each group member (the charity receives a total of 3×1=3 points).* If any group member enters a different number, each group member receives 0 points *and the charity also receives 0 points from each group member (the charity receives a total of 3×0=0 points).* You will be able communicate with the other group members. How you do so will be explained on the next screen.

Comprehension questions. **remark: Subjects had to correct answers the questions to proceed. The correct answer is underlined.**

1. What is your task in this part?
   - To enter the number that you have seen and memorised.
   - To enter a number different from the number you have seen and memorised.
   - To enter an arbitrary number.
2. Suppose that you see a ⚄ and enter a "3". The others also enter "3".
   (a) Points YOU receive. 3 points.
   (b) *Points the Charity receives from YOU* 2 points.
   (c) *Points the Charity receives from your GROUP* 6 points.
3. Suppose that you see a ⚄ and enter a "2". The others also enter "3".
   (a) Points YOU receive. 2 points.
   (b) *Points the Charity receives from YOU* 3 points.
   (c) *Points the Charity receives from your GROUP* 9 points.
4. Suppose that you see a ⚄ and enter a "4". Someone enters "5".
   (a) Points YOU receive. 0 points.
   (b) *Points the Charity receives from YOU* 0 points.
   (c) *Points the Charity receives from your GROUP* 0 points.

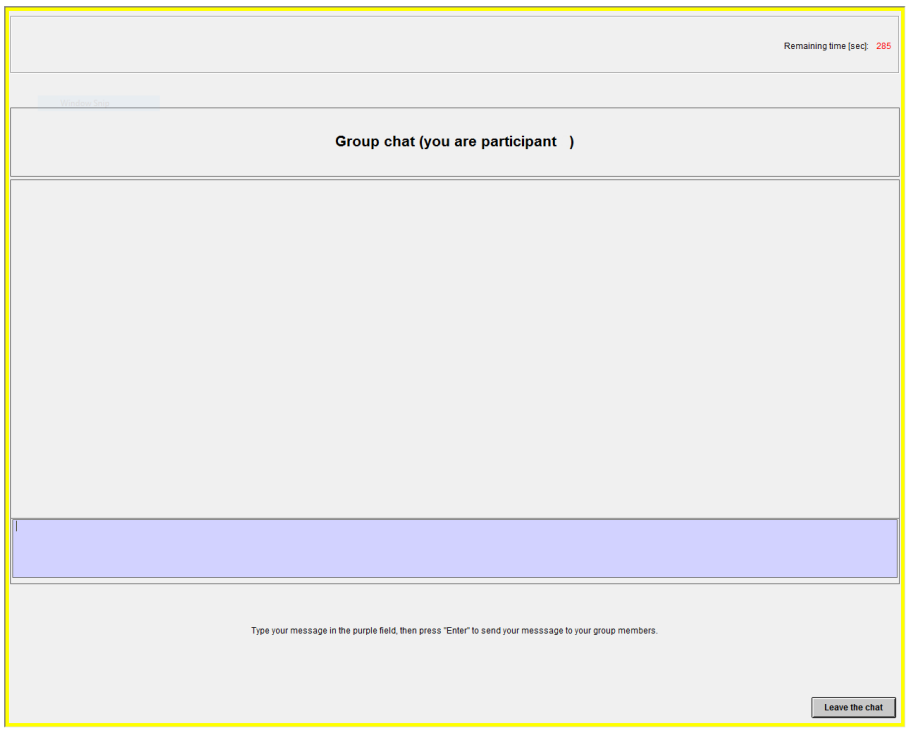

Figure D2: How subjects chat.

Group interaction. You have the possibility to communicate with the other two group members via a chat box to clarify the number each group member will enter. You have 5 minutes to communicate. The group discussion ends after the 5 minutes or as soon as all 3 members of the group have pressed the "leave chat" button. If only 1 or 2 members of the group press the button, the discussion will continue. The group discussion will only end if all members press the button or if time runs out. If you have pressed the button "leave chat" but you do not want to leave the chat, you can press the button "back". After the group discussion, each member of the group enters a number on the screen.

Generally, the course of communication is up to you. You may chat in any language as long as all group members understand the language. However, you are not allowed to make threats or to agree upon side payments within your group. If you are breaking these rules, you will be excluded from the experiment and you will not receive any payment from the entire experiment.

Within the given time, you can send as many messages to the other group members as you like. The messages you send appear automatically on the screens of your other group members. You cannot send a message to one member in particular.

The screen of the chat will look like this: (subjects see Figure D2) To write a message, click on the purple field, enter your message and press "Enter". Then,

your message appears in the grey field above the purple field. You can send as many messages as you want using the same procedure. The other participants will see your message only when you have pressed "Enter".

After the experiment we will send a copy of the chat to the charity. We are distributing an illustration of the copy for you to check what kind of information we will send to the charity. As you will see we will send the number your group saw, the number you reported, and the chat messages you sent. Note that, since the experiment and the chat are anonymous, the copy is anonymous as well: only the participant and group ID appear and these cannot be traced to you. We will send the transcript to the charity via email and we will add the email addresses of everyone who participated to today's experiment in blind carbon copy (so they will not see your email address) for you to verify that we are really sending the copy.

D.2.5 Part III

Part 3 of the experiment is the same as Part 1. That is, your task in Part 3 is exactly the same as in Part 1.

In Part 3 of the Experiment, you will see a video of a die roll showing ⚀, ⚁, ⚂, ⚃, ⚄ or ⚅. The video you will see is randomly selected by the computer and each of the 6 possible videos is chosen with equal probability.

Your task. Your task is to remember the number of the die roll in the video and to type it into a field showing up later. The die number you enter determines YOUR points *and the points for the CHARITY as explained by the table below* (see Table D2). For example, if you enter the die number to be "4", you will receive 4 points *and the charity will receive 1 point.*

Comprehension questions. [Note: Subjects had to correctly answers the questions. The questions are exactly the same as in Part I.]

D.3 Instructions to the Dictator treatments

The experiments were conducted in English. Subjects were sent a link to a PDF for the "general procedures". The instructions for Parts I, II and III were displayed on the subjects' screens. We will refer to the charity as the XX charity.

D.3.1 General procedures

Thank you for participating to this online experiment. Even if it is online, we ask you to treat it as if it was taking place in the laboratory. Please give it your full undivided attention.

For showing up on time you will receive a participation fee of 3 euros. You may also earn more during the experiment.

The experiment consists of 3 parts (Part 1, Part 2 and Part 3). The three parts are independent: choices made in one part do not affect the other parts. At the beginning of each part you will see the detailed instructions for that part on your computer screen. If you have any questions, please contact us on Zoom and we will answer your questions privately.

During the experiment, you and the other participants will make decisions. You may also interact with other participants, in which case your own decisions and the decisions of the others may determine your earnings. The onscreen instructions will clearly show whether you interact with other participants. They will also explain how exactly your earnings will be determined.

Payment In some part of the experiment, and depending on your decisions, you will earn points for yourself or for a charity. We provide further information about this charity below.

At the end of the experiment, the computer will randomly select one of the three parts. Only the points from the randomly selected part will be used to determine the payment to you and to the charity. Your points and the charity's points in this part will be converted into euros at the exchange rate of:

1 point = 2 Euros

After converting points into euros, we will pay you your total earnings—your earnings from the selected part and the participation fee of 3€—via bank transfer. No other participant will learn about your earnings and you will not learn about the earnings of others.

We will pay the charity via online payment immediately at the end of the experiment. We will share our screen on Zoom while we do the payment to allow you to monitor us.

Anonymity You will not learn the identity of the other participants, and the other participants will not learn your identity.

To send you your payment, we will ask you to provide your name, your IBAN, and your BIC. This data will be kept separate from the data generated during the experiment. Hence, no one will be able to link your behavior in the experiment to your identity.

The XX charity [same text as in the *Base*, *Charity* and *CharityR* treatment, except that there were links at the end that subjects could click to visit the website and the Facebook page of the charity.]

D.3.2 Part I

Your task You have been allocated 5 points. Your task is to decide how many points you would like to keep for yourself and how many points you would like to give to the charity.

How you enter your decisions You will be asked to report a number, which can be either 0, 1, 2, 3, 4 or 5.

Your points and the points for the charity The number that you report will determine the points that you will keep for yourself—the remaining points are for the charity.

Examples

- You report the number 3. This means that you will keep 3 points for yourself and give 5-3=2 points to the charity.
- You report the number 5. This means that you will keep 5 points for yourself and give 5-5=0 points to the charity.

Comprehension questions [Subjects had to correct answers the questions to begin Part 1. The correct answer is underlined.]

Please answer the following questions.

1. Suppose that you reported the number 2. How many points will YOU receive? 2 points
2. How many points will the CHARITY receive? 3 points
3. Suppose that you reported the number 4. How many points will YOU receive? 4 points
4. How many points will the CHARITY receive? 1 points

D.3.3 Part II (individual treatment)

Important! Part 2 of the experiment is the same as Part 1, except that now you have the opportunity to record your thoughts BEFORE making your decision.

[The remaining of the instructions and the control questions are exactly the same as in Part I]

You will have the possibility to record your thoughts about the number you will enter. You have 5 minutes (300 seconds) to write down your thoughts. After 5 minutes the possibility will end. If you have finished before the 5 minutes are over, you can click on the "Leave" button.

D.3.4 Part II (group treatment)

Important! Part 2 of the experiment is similar to Part 1, except that now you decide in a group. We will randomly match you with 2 other participants such that you form a group of 3.

Your task Each group member has been allocated 5 points. Your task is to decide how much points each group member should keep, and how much points to give to the charity.

In other words:the number reported by a group member is his/her proposed number of points that he/she would like all groups members to keep—the remaining points are for the charity.

How you enter your decisions Each group member will be asked to report a number, which can be either 0, 1, 2, 3, 4 or 5.

Your points and the points for the charity YOU and the CHARITY will receive points from this task only when all group members enter the SAME number. In contrast, YOU and the CHARITY will receive 0 points if any group member enters a different number.

In summary:

- If all group members report the same number: each group member will receive the number of points they reported, and the charity will receive the remaining points.
- If all group members do not report the same number: each group member will receive 0 points. The charity will also receive 0 points.

Examples

- All group members report the number 3. This means that each group member will keep 3 points for themselves and give 5-3=2 points to the CHARITY—the charity receives 2+2+2 points from the group.
- All group members report the number 5. This means that each group member will keep 5 points for themselves and give 5-5=0 points to the CHARITY—the charity receives 0+0+0 points from the group.
- All group members do not report the same number. This means that each group member will receive 0 points. The charity will receive 0 points—the charity receives 0+0+0 points from the group.

You will be able communicate with the other group members. How you do so will be explained later.

Comprehension questions

1. Suppose that you reported the number 2. The other group members also reported the number 2. How many points will YOU receive? 2 points
2. How many points will the CHARITY receive from you? 3 points
3. How many points will the CHARITY receive in total? 9 points
4. Suppose that you reported the number 4. The other group members also reported the number 4. How many points will YOU receive? 4 points
5. How many points will the CHARITY receive from you? 1 points
6. How many points will the CHARITY receive in total? 3 points
7. Suppose that you reported the number 2. Some other group member reports 3 points. How many points will YOU receive? 0 points
8. How many points will the CHARITY receive from you? 0 points
9. How many points will the CHARITY receive in total? 0 points

Communication You have the possibility to communicate with the other two group members via a chat box to clarify the number each group member will enter.

You have 5 minutes (300 seconds) to communicate. The group discussion ends after the 5 minutes or as soon as all 3 members of the group have pressed the

"leave chat" button. If only 1 or 2 members of the group press the button, the discussion will continue. The group discussion will only end if all members press the button or if time runs out. If you have pressed the button "leave chat" but you do not want to leave the chat, you can press the button "back". After the group discussion, each member of the group enters a number on the screen.

Generally, the course of communication is up to you. You may chat in any language as long as all group members understand the language. However, you are not allowed to make threats or to agree upon side payments within your group. If you are breaking these rules, you will be excluded from the experiment and you will not receive any payment from the entire experiment.

Within the given time, you can send as many messages to the other group members as you like. The messages you send appear automatically on the screens of your other group members. You cannot send a message to one member in particular.

D.3.5 Part III

Important! Part 3 of the experiment is the same as Part 1. That is, your task in Part 3 is exactly the same as in Part 1.

[The remaining of the instructions was exactly the same as in Part I.]