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The Role of Morals in Three-Player Ultimatum Games

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The Role of Morals in Three-Player Ultimatum Games

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Abstract

We experimentally investigate the role of moral concerns in three-player ultimatum bargaining. In our experimental paradigm, proposers can increase the overall size of the pie at the expenses of an NGO that conducts humanitarian aid in emergency areas. In a first study, we find that responders are not willing to engage in ‘immoral’ transactions only when fully informed about proposers’ behavior toward the NGO. Under complete information, their willingness to reject offers increases with the strength of the harm to the NGO. Moreover, the possibility to compensate the NGO through rejection further increases their willingness to reject. In a second study aimed at gauging the importance of different motives behind rejections, we show that the two most prevalent motives are to compensate the NGO or to diminish inequality between responders and proposers. Punishing proposers’ unkind intentions towards the NGO or rejecting on the basis of pure deontological reasons constitute less important motives.

Keywords: mini ultimatum game, morals, experiment.

JEL code: C72, C91, D6

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1. Introduction

Under what conditions are people willing to sacrifice possible gains from trade to punish immoral behavior toward a third party? The investigation of this question has been at the heart of a flourishing and lively debate in economics. Falk and Szech (2013) provided evidence that market interactions tend to lower moral values compared to non-market transactions. In contrast, Bartling, Weber, and Yao (2015) find that socially responsible market behavior mitigates the potential damages of negative externalities: when facing multiple product offers, consumers are more inclined to buy ‘ethical’ products even if this entails paying higher prices. More recently, Kirchler, Huber, Stefan, and Sutter (2016) investigated which type of intervention reduces the extent of immoral behavior toward a third party in market and non-market transactions.

An open question, which we investigate in this paper, is which motives drive people to refuse to engage in ‘immoral’ transactions. In the market experiments cited above, several potential explanations could reconcile the observed evidence. First of all, subjects may be motivated by the willingness to punish the perpetrators of immoral actions; second, they could be driven by the intention of reducing or eliminating the negative externality on the third party; finally, they may be simply not willing to ‘get their hands dirty’ by engaging in transactions that involve immoral aspects.

These motives are difficult to tear apart in the experiments above mainly due to the dynamic nature of market setups. However, this distinction is important as it applies to virtually every situation where individuals fight unethical behavior. For example, consumers frequently engage in product boycotts in attempt to fight companies’ socially irresponsible behavior. These fights might be motivated by the desire to punish companies, to restore justice toward the victims pushing companies to produce in a more ethical way, or because it is a deontological imperative not to be part of an immoral transaction. These three mechanisms correspond to distinct domains of human morality. While the first two classes of motives, i.e., punishment and compensation, are related to consequentialist moral concerns, the third motive is related to deontological morality, as subjects may be willing to pursue what is morally right (not getting involved in such a transaction) independently of the consequences of theirs and others’ action (Sandel, 2010; White, MacDonnell and Ellard, 2012).

In this paper, we present two studies aimed at investigating and distinguishing these three classes of motives by analyzing subjects’ behavior in a modified version of the three-person ultimatum bargaining game proposed by Güth and van Damme (1998). In both studies

we use a general setup where the proposer can increase their initial endowment by *taking* an amount from a dummy player (see List, 2007 and Bardsley, 2008). Then, the proposer offers a fraction of their endowment to the responder. Finally, the responder decides whether to accept or reject the offer. The payoff consequences of a rejection vary across studies and treatments, allowing to isolate the mechanisms described above.

Our dummy player is the NGO *Doctors without borders* and its initial endowment is a donation provided by the experimenter to the NGO. We consider the act of taking from the NGO as an indication of the degree of morality of proposers for two main reasons: first, acts of taking are generally perceived as less socially appropriate than corresponding acts of giving (Leliveld, van Dijk, and van Beest 2008; Krupka and Weber, 2013); second and more important, since we chose an NGO that conducts humanitarian activities in emergency areas and sustains people in serious medical conditions, any amount not donated has a clear immoral connotation (see Kirchler et al., 2016 for a similar approach and Fiske and Tetlock, 1997 for a general discussion on relational schemata in moral domains).

In Study 1, we conduct three treatments. The first and second treatments mimic two of the information conditions of Güth and van Damme (1998), i.e., responders decide to accept or reject an offer having either no information or full information on the share of the other two players. In these two treatments, a rejection has payoff consequences only for the proposer and the responder. In case of rejection both proposer and responder get zero, while in case of acceptance the proposed offer is implemented. In our third treatment, a rejection has instead payoff consequences also for the NGO. This treatment mirrors the full information treatment except that rejecting an offer restores the initial donation to the NGO while still punishing the proposer by setting their payoff to zero.

Our findings from Study 1 reveal that uninformed responders behave as if they had no moral concerns for the NGO. However, they consider the negative externality on the NGO in the treatments where this information is revealed: the larger the amount taken from the NGO, the more likely the offer is rejected. Finally, in our last treatment we find evidence that the possibility to restore the initial donation makes responders more willing to reject a kind offer compared to situations where justice restoration is not possible. Hence, it establishes compensation as an important motive on top of punitive and deontological motivations. This indicates that consumers may be more willing to fight unethical behavior of firms if they can see consequential beneficial results of their actions on the third parties who are bearing the unethical consequences.

In Study 2 we go one step further and disentangle the relative importance of punishment, compensation and deontology as drivers of rejections. Moreover, we distinguish between two different determinants of punitive behavior. The first is the desire to punish proposers for their unkind intentions towards the NGO (indirect reciprocity) and the second is to punish them to reduce inequity between the proposer and the responder. While these two motives would yield observationally equivalent outcomes in Study 1, it is important to distinguish them as they refer to two clearly distinct psychological mechanisms. Our design of Study 2 achieves this allowing to observe the importance of each motive in isolation. We find that the two most prevalent motives for rejecting offers are to compensate the NGO or to diminish inequality between responders and proposers. Surprisingly, punishing proposers' unkind intentions towards the NGO constitutes a relatively less important motive along with deontological reasons.

Our paper connects to the growing literature on morals and markets (Falk and Szech, 2013; Bartling et al., 2015; Kirchler et al., 2016) and sheds light on the motives behind the decision not to engage in economically advantageous but morally questionable transactions. It is also connected to the literature on compensatory versus punitive justice (see, e.g., van Prooijen, 2010; Lotz, Okimoto, Schlosser, and Fetschenauer, 2011; Leliveld, van Dijk, and van Beest, 2012; FeldmanHall, Sokol-Hessner, van Bavel, and Phelps, 2014) with two important differences. While this literature looks at punishment or reward from uninvolved third parties, responders in our study have ‘skin in the game’ as they get a better deal if they accept an offer generated via immoral behavior of the proposer. Moreover, while these studies only contrast punitive versus compensatory motives, we (i) distinguish between punishment due to inequity aversion and to indirect reciprocity and (ii) introduce one additional reason for refusing immoral offers, deontological concerns, which is unlikely to play a role in third party justice restoration.

The remainder of the paper is structured as follows. Section 2 presents a conceptualization of the three relevant classes of moral concerns and describes potential theoretical representations. Section 3 and 4 present the design and results of Study 1 and Study 2, respectively. Section 5 concludes and discusses implications of our findings.

2. Conceptualization of Moral Concerns in Three-Player Ultimatum Games

In this section we conceptualize three classes of moral motives that can rationalize behavior of individuals who reject ‘immoral’ bargaining offers. We label these three classes punitive, compensatory and deontological.

Within the class of punitive motives we distinguish between two different psychological drivers. The first driver of punishment is the desire of the responder to get even with the proposer, that is, responder’s inequity aversion towards the proposer. In a standard theoretical formulation (Fehr and Schmidt, 1999) the responder bears a cost if the offer entails different amount for the proposer than for themselves and this cost is higher if inequity is disadvantageous. This motive is purely consequentialist as it considers payoff consequences for the proposer and responder.

The second possible driver is the desire to punish the unkind intentions of the perpetrators of immoral actions towards the NGO. This motive has been referred to in the literature as indirect reciprocity and it can be generally modelled using psychological game theory, that is, assuming agents’ utility depends not only on their and others’ strategies but also about agents’ beliefs about theirs and others’ strategies (see, e.g., Dufwenberg and Kirchsteiger, 2004; Falk and Fischbacher, 2006). Despite not being purely consequentialist, it can be still thought of as consequentialist as these models rely on payoff consequences to establish how kind or unkind players’ actions are.

From an empirical point of view, previous research on two-player ultimatum games has shown that rejections are motivated by the desire to punish unkind intentions of the proposer toward the responder (‘direct’ reciprocity) as well as by inequity concerns (see Falk, Fehr, and Fischbacher, 2003). Hence, it is important to take into account both drivers of punitive behavior.

The second class of concerns consists of alleviating or eliminating the negative externality on the NGO. This motive is also consequentialist as it considers the payoff consequences for the NGO. It can be generally modelled as a pure altruistic concern toward the NGO or as warm-glow that the individual derives from the action of donating (Andreoni, 1990 and Andreoni, 1998).¹ Previous evidence from three-player ultimatum games shows that

¹ These theories do not allow for different degrees of altruism depending on the relational schemata toward the third party and we believe that these would be different depending on such relational schemata. For example, subjects might have lower or no altruism at all if the money would be allocated to a commercial organization rather than to a charitable one. In that sense, a better theoretical description of the situation can be provided by models where the decision maker has a prior belief about the ‘types’ (altruistic or spiteful) of the other players and given their actions forms posterior beliefs about types (Levine, 1998). Given that we do not vary the third

both proposers and responders seem to have very limited concerns towards the third party (Güth and van Damme, 1998; Sääksvuori and Ramalingam, 2015). However, most of this literature used other participants as third parties for which subjects may feel less altruistically inclined compared to the NGO.

Finally, the third potential class of concerns may be related to the subjects' deontological imperative of not getting involved with something immoral. This is not related to the outcomes of the transaction but just to the action of accepting an immoral offer. In this sense, this is the only motive that we classify as deontological. This type of moral concern is akin to a Kantian categorical imperative; as Sandel (2010, p. 119) describes it: "...when we assess the moral worth of an action, we assess the motive for which it's done, not the consequences it produces". A rationalization in the economic literature of these types of concerns is offered by signaling models of moral behavior. If the detrimental effect to self or social image deriving from the acceptance of an immoral offer is high enough, subjects may not want to accept the offer no matter the monetary consequences. In this case, we would observe a deontological behavior similar to a Kantian imperative (see Tirole, Falk, and Bénabou, 2016, for a model that can rationalize this type of behavior).²

In the next section we describe Study 1 that investigates whether compensatory motives matter on top of the punishment and deontological motives in a three-player ultimatum game. This is an important first step as previous three-player ultimatum games showed very little altruistic concerns for other participants as third parties.

3. Study 1

3.1 Experimental design

In our design, the proposer (P) is initially endowed with €9 (E_P), the responder (R) with €0 (E_R) and an initial donation of €5 is allocated to the NGO (E_{NGO}). The experiment consists of three phases.

PHASE 1 - P takes a discrete sum t from the initial donation to the NGO, where $€0 \leq t \leq €5$.

party in our design simple altruism or warm-glow models would be sufficient to model altruistic concerns towards the NGO.

² Other formulations of Kantian morality have been proposed in the economics literature (Alger and Weibull, 2013; Roemer, 2010; Roemer, 2015). These formulation identify Kantian morality as the action an individual would do if everybody else would do the same. In this paper, we prefer an individual notion of Kantian morality rather than this conditional notion (see also Elster, 2017 for a comment).

PHASE 2 - P makes an offer o , of either €5 or €1, to R.

PHASE 3 - R chooses to accept or reject the offer. In case of acceptance the amounts are distributed as proposed; in case of rejection both P and R receive €0.

The three phases are common knowledge. We conduct three treatments. In the first, NO-INFO, the amount taken by P from the NGO is concealed. Hence, R decides whether to accept or reject an offer without knowing the outcome of PHASE 1. In our second treatment, INFO, responders are informed about the amount taken from the NGO before making a decision on the acceptance of the offer. Our third treatment, INFO-RESTORE, is like the INFO treatment except that the rejection of an offer implies different consequences for the NGO. While a rejection in INFO (and NO-INFO) sets the final payoff of P and R to zero and does not affect the NGO's payoff, in INFO-RESTORE a rejection restores the initial donation to the NGO to €5. Table 1 shows the consequences of responders' actions for our three treatments.

Table 1. Payoffs

		NO-INFO and INFO		INFO-RESTORE	
		R accepts	R rejects	R accepts	R rejects
P		$E_P + t - o$	0	$E_P + t - o$	0
R		$E_R + o$	0	$E_R + o$	0
NGO	$E_{NGO} - t$	$E_{NGO} - t$	E_{NGO}	$E_{NGO} - t$	E_{NGO}

The subgame-perfect Nash equilibrium of the game under standard preferences is the same in all treatments: R accepts all offers while P takes the maximum allowed amount from the NGO and offers the smallest possible amount to R. However, if subjects have moral concerns, they might behave differently across the three treatments.

In particular, in relation to the motives described in Section 2, Study 1 allows us to contrast the compensatory vs. the punitive and deontological motivations for a rejection. To derive behavioral predictions, as a starting point based on previous literature on ultimatum games (see, e.g., Fehr and Schmidt, 1999 and Güth and van Damme, 1998), we assume inequity aversion toward the proposer as the main punitive motive.³ According to inequity aversion we should observe rejections to be increasing in the amount taken in INFO and INFO-RESTORE both if €1 and if €5 is offered.⁴ In fact, the higher the amount taken the higher inequity between

³ We will disentangle the relative importance of inequity aversion and indirect reciprocity in Study 2.

⁴ We do not derive predictions for the NO-INFO as responders' reactions depend on beliefs about proposers' taking. Beliefs data (that we report in our results section) indicate that beliefs are not in line with actions and hence

the proposer and the responder and hence the higher the punishment. Moreover, inequity aversion predicts no differences across INFO and INFO-RESTORE because for a given amount taken and offered the payoff consequences and the inequity between the proposer and the responder are the same across the two treatments (see the theoretical analysis in Appendix C.1).

If subjects are altruistic towards the NGO but have no punitive concerns towards the proposer, we predict rejection rates to be zero and hence unaffected by the level of taking in INFO. This is because a rejection has no material consequences for the NGO. In contrast, we predict that in INFO-RESTORE due to the altruistic concerns and the possibility to compensate the NGO rejections will increase with the amount taken. Hence, we predict overall lower acceptance for INFO-RESTORE compared to INFO (see Appendix C.2).

A hybrid model where the responder cares both about inequity towards the proposer and is altruistic towards the NGO can allow for acceptance to decrease with taking both in INFO and INFO-RESTORE due to inequity aversion. Moreover, due to altruistic concerns we predict lower overall acceptance in INFO-RESTORE compared to INFO (see Appendix C.3).

Finally, according to deontological morality ('do not accept if $t > 0$ ') there should be full acceptance when $t = 0$ but lower and fixed acceptance rate for any level $t > 0$. We expect no difference between INFO and INFO-RESTORE as accepting entails in both cases a violation of the moral imperative if $t > 0$ (see Appendix C.4).

3.2 Procedures

The experiment was conducted at LabSi (University of Siena, Italy) using z-Tree (Fischbacher, 2007). A total of 174 subjects were recruited for 11 sessions (3 for the NO-INFO treatment, 4 for the INFO and INFO-RESTORE treatments). Upon their arrival to the lab subjects were seated in cubicles that separated them visually to protect anonymity. Instructions, that we report in Appendix A.1 (translated from Italian), were read aloud by the experimenter. After reading the instructions, the experimenter highlighted that the amount left to the NGO would be donated a few weeks after the experiment and that subjects would receive an email with the receipt of the total donation. Average payment for subjects was €6.85, including a €3 show-up fee, for an average session duration of 30 minutes. As NGO, we chose *Doctors without borders* because it is a well-known and esteemed organization and it does not have any strong

not in equilibrium. Since the mentioned models assume equilibrium behavior, we cannot apply them to the NO-INFO case that we only view as an empirical benchmark.

religious or political affiliation. Moreover, as mentioned above, the organization has a clear humanitarian mission and this gives to the act of taking from the NGO the moral connotation needed for our research question. The total donation to *Doctors without borders* was €220 (out of a potential maximum amount of €435).

In our experiment, in PHASE 1 and 2 proposers played the taking game and chose the amount to offer to responders, respectively. While proposers were making their choices, we elicited (non-incentivized) responders' beliefs about the modal amount that proposer would take from the NGO. In PHASE 3, we adopted a procedure that uses a variant of the Random Lottery incentive system (see, e.g., Cubitt, Starmer, and Sugden, 1998) to elicit responders' choices for different paths of play. In particular, all responders received the information about the offer made by each proposer in a sequence of screens, and made the choices knowing that only one would have been relevant for the final payoff. After PHASE 3 the computer randomly paired all subjects in the session and calculated the outcome of the game.

The advantage of this procedure is that it allows us to observe choices at different nodes of the game. The main reason for implementing this procedure rather than more standard methods as for example the strategy method (Selten, 1967) is that the number of choices taken by each responder would have been different across treatments had we used the strategy method. This is because in NO-INFO the information sets are less than in the other two treatments. Our method keeps the number of choices per responder similar across treatments by asking responders to make a choice for each proposers' action.⁵

3.3 Results

We divide our results section in two subsections. In Section 3.3.1 we investigate our main research question analyzing behavior of responders across our three treatments. In Section 3.3.2 we report results on proposers' behavior. In analyzing responders' behavior, given that they face a sequence of offers that is session-dependent we implement only regression analysis (mixed effects models) with clusters at individual and session level. With regard to proposers' behavior, we treat each offer and taking decision as independent.

⁵ One concern may be that seeing the distribution of amounts taken can affect responders' sense of what is the prevalent norm and hence induce more or less rejections. However, as we detail in Section 3.3.2, there are no significant differences in amount taken across INFO and INFO-RESTORE, the two treatments where responders are fully informed. Hence, any difference between these two treatments cannot be due to the fact that responders see different distributions.

3.3.1 Responders' behavior

Table 2 presents descriptive statistics on the acceptance rate for each treatment and each level of taking. Panel A presents data for offers of €1 and Panel B for offers of €5. Dots in the table denote cases where a certain combination of taking and offer did not occur in the experiment.

Table 2. Rate of acceptance for each treatment and each amount taken.

Amount taken	NO-INFO	INFO	RESTORE
<i>Panel A: €1 offers</i>			
€0	50%	56%	50%
€1	.	.	14%
€2	.	25%	25%
€3	44%	33%	.
€4	63%	.	19%
€5	50%	8%	0%
<i>Panel B: 5€ offers</i>			
€0	100%	88%	93%
€1	100%	100%	100%
€2	94%	100%	91%
€3	94%	100%	80%
€4	96%	81%	61%
€5	94%	53%	.

Next, we concentrate on the rate of acceptance across treatments, which leads us to our first result.

Result 1. *Acceptance is higher in NO-INFO compared to INFO and INFO-RESTORE. The effect is mainly driven by €1 offers.*

Responders in NO-INFO almost always accept a €5 offer (95% on average) while they accept a €1 offer 50% of the times. The average acceptance rate drops to 88% and 84% for €5 offers and to 28% and 26% for €1 offers in INFO and INFO-RESTORE, respectively. In Table 3, we report the estimates of mixed effect probit model where we regress the acceptance rate on treatment dummies (using NO-INFO as omitted category). Model (1) estimates the model for the entire sample while Models (2) and (3) report estimates for €1 and €5 offers, respectively. Model (1) shows that overall offers are less likely to be accepted in INFO compared to NO-INFO, but there is no difference between INFO-RESTORE and NO-INFO.

Models (2) and (3) show that this effect comes mainly from €1 offers while it is not significant for €5 offers.

Table 3. Comparison of acceptance across treatments

	All offers (1)	€1 offers (2)	€5 offers (3)
INFO	-0.27* (0.17)	-1.04* (0.58)	-0.10 (0.63)
INFO-RESTORE	-0.17 (0.17)	-1.18** (0.60)	-0.88 (0.58)
Constant	0.71 (0.13)	-0.08 (0.86)	2.22*** (0.50)
N	689	246	443

Notes: mixed-effects probit with random intercepts at the individual and session level. Dependent variable = 1 if the offer is accepted and = 0 otherwise. * significant at 10%, ** significant at 5%, *** significant at 1%.

The evidence that responders tend to accept offers more frequently in NO-INFO may be related to the existence of “moral-wiggle rooms” (see, e.g., Dana, Weber, and Kuang, 2007), that is, the evidence that people may behave more selfishly if the information structure allows them to avoid being confronted with the consequences of their actions. In relation to this, it is interesting to note that responders report significantly lower beliefs regarding the amount taken in NO-INFO compared to the two full information treatments. Beliefs about the modal amount taken are on average €2.50 in NO-INFO, €3.44 in INFO and €2.84 in INFO-RESTORE; a comparison of beliefs of the NO-INFO treatment versus the two full information treatments shows a statistically significant difference (MWU-test, $p = 0.037$).⁶ As subjects had no incentive to report ‘correct’ beliefs, this suggests that responders may have reported deflated beliefs in NO-INFO to justify their high acceptance rate.

Next, we analyze the effect of information on responders’ behavior restricting our attention to the INFO treatment.

Result 2. *When responders are fully informed, their willingness to punish increases with the amount taken from the NGO.*

⁶ If we conduct separately tests between NO-INFO and the two information treatments, we find beliefs to be significantly different between NO-INFO and INFO and INFO and INFO-RESTORE (MWU-test, $p = 0.037$ and $p = 0.074$, respectively), but not for the comparison between NO-INFO and INFO-RESTORE (MWU-test, $p = 0.421$).

In Table 4 we estimate the effects of disclosing the information about the amount taken on the acceptance rate using mixed effect probit models. Our dependent variable is a dummy that takes value one if the offer is accepted and zero otherwise. Our independent variable is the amount taken. We estimate the model both pooling all offers (Model (1)) and separating between €1 and €5 offers (Models (2) and (3), respectively). All three regressions show that as the amount taken increases subjects are less likely to accept offers. This decreasing pattern of acceptance in INFO is predicted by punitive motives, but not by compensatory or deontological ones. In particular, compensatory motives predict no rejection for any level of taking; this is clearly not borne out in the data. The deontological motive, instead, predicts a decline in acceptance moving from $t = 0$ to $t = 1$ and a flat acceptance rate for $t \geq 1$. To test the latter, we report an additional model (Model (4)) where we estimate the same specification of Model (1) restricting to $t > 0$. As the coefficient of “Amount taken” remains significant indicating that the acceptance rate decreases with the amount taken also for amounts greater than 0, we conclude that neither compensation alone nor deontological motives are good predictors of the rejection patterns. The only model that could reconcile a decreasing rejection pattern in INFO is the hybrid model where people care both about inequity towards the proposer and are altruistic towards the NGO.

Table 4. The effect of information on acceptance.

	All offers (1)	€1 offers (2)	€5 offers (3)	All offers ($t > 0$) (4)
Amount taken	-0.26*** (0.06)	-0.74*** (0.26)	-0.85*** (0.25)	-0.50*** (0.09)
Constant	1.19*** (0.22)	0.05 (0.68)	5.70*** (1.65)	2.01*** (0.37)
N	256	96	160	232

Notes: mixed-effects probit model with random intercepts at the individual and session level. Dependent variable takes value 1 if the offer is accepted and zero otherwise.

* significant at 10%, ** significant at 5%, *** significant at 1%.

Next, we analyze the effects of the opportunity to compensate the NGO. To do this, we focus on the comparison between INFO and INFO-RESTORE, where the only difference across treatments is the consequence of a rejection for the NGO.

Result 3. *For positive amounts taken from the NGO, responders reject a €5 offer more often when the rejection restores the initial donation.*

Support for this result comes from Table 5 where we report results of regression analyses that compare the two treatments. We restrict our estimates to the cases where the amount taken from the NGO is greater than zero as the restore option does not have an effect when the amount taken is equal to zero. We regress an acceptance dummy on the treatment dummy INFO-RESTORE and on the amount taken from the NGO. Model (1) is estimated for all offers, Model (2) for offers of €5.⁷ In Model (1), we find that acceptance decreases significantly with the amount taken, but is not different between the INFO and INFO-RESTORE. When we analyze €5 offers, we still find that the amount taken has a significant effect on the likelihood of acceptance but on top of that responders tend to accept significantly less when the restore option is available (Model (2)). Other specifications of this model, reported in Appendix B, which allow us to estimate also the effect on offers of €1, reveal that the restore option lowers significantly the acceptance rate for offers of €5 but not for offers of €1. Taken together, these results suggest that consequences for the NGO are important on top of punitive motives and that our data are best predicted by a model combining the punitive and compensation motives for rejection.

Table 5. The effect of the restore option.

	All offers (1)	€5 offers (2)
INFO-RESTORE	-0.12 (0.29)	-3.52** (1.40)
Amount taken	-0.47*** (0.07)	-1.85*** (0.42)
Constant	1.93*** (0.30)	10.87*** (2.57)
N	442	316

Notes: mixed-effects probit with random intercepts at the individual and session level. Dependent variable takes value 1 if the offer is accepted and zero otherwise. * significant at 10%, ** significant at 5%, *** significant at 1%.

⁷ We also estimated the same specification with the subset of offers of €1, but due to the low number of offers and the clusters at session and individual level, the log-likelihood estimation does not converge. Hence, we run two additional sets of estimations that we report in Appendix B. The first set uses a mixed effect probit model with clusters only at session level (Table B1). The second set of estimates uses linear mixed effect models instead of mixed effects probit models and maintains clusters both at the individual and at session level (Table B2). See discussion of the results of these additional estimations in the main text.

3.3.2 Proposers' behavior

Although the main research question of our paper regards responders' behavior and their moral motives for rejection, in this section we report for completeness results on proposers' behavior.

Result 4. *The distribution of amounts taken by proposers is different between the NO-INFO and the two full information treatments.*

Figure 1 shows the distribution of amounts taken from the NGO across treatments. The average amount taken in NO-INFO is €3.04, with €5 being the modal choice, although more than 20% of proposers do not take any positive amount from the NGO. In the two full information treatments, the amount taken is lower averaging €2.78 in INFO and €2.29 in INFO-RESTORE with modal choices of €2 and €3, respectively. A χ^2 -test rejects the null hypothesis of no differences between the three distributions ($p = 0.039$). Pairwise comparisons show no differences between the two full information treatments (χ^2 -test, $p = 0.191$) while both of them are significantly different compared to NO-INFO (INFO vs. NO-INFO χ^2 -test, $p = 0.081$; INFO-RESTORE vs. NO-INFO χ^2 -test, $p = 0.029$). This suggests that proposers modify significantly their behavior in response to the different information structure of NO-INFO and INFO strategically anticipating responders' reactions.

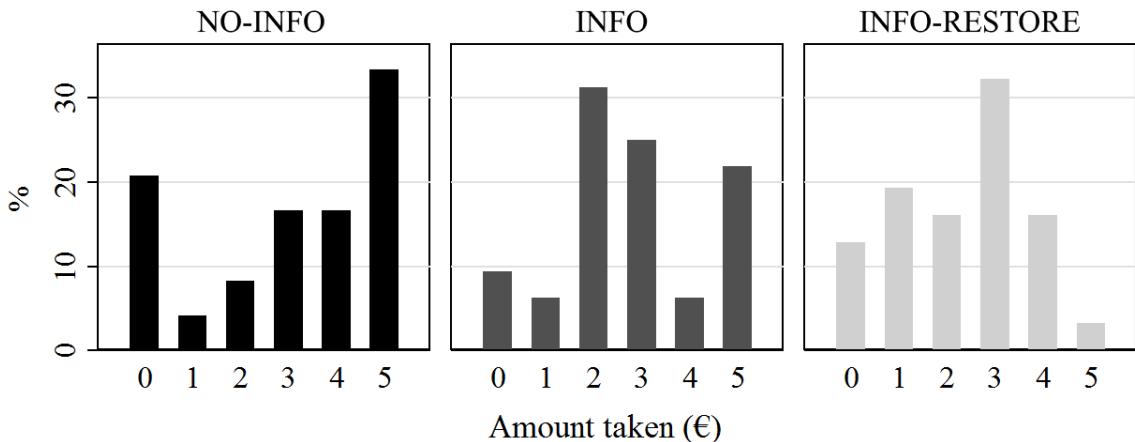


Figure 1. Distribution of amount taken (€) across treatments

Interestingly, the distribution in NO-INFO is bimodal with the majority of subjects taking nothing or everything. This could be reflective of proposers' moral concerns, that is,

some proposers may not want to engage in the immoral action if the responder is not also informed because they would feel fully responsible for it; this would be consistent with the evidence that diffusion of responsibility eases immoral actions (see Cappelen, Halvorsen, Sørensen, and Tungodden, 2017; Falk and Szech, 2017; Bartling and Özdemir, 2017; and Bartling, Valero and Weber, 2017). Other proposers, instead, would feel legitimate to take €5 given the responder would never know about it; this is in line with the existence of a moral wiggle room deriving from different informational structures (see, e.g., Dana et al., 2007). Another possible explanation is that the amounts taken reflect different strategies of the proposers in combination with their offers; that is, they might decide not to take from the NGO and make a low offer to the responder or vice-versa to take everything and make a high offer. To investigate this, as a next step, we link the amount taken to the realized offers. In Table 6, we report the percentage of €5 offers for each possible amount taken.

Table 6 Percent of €5 offers for each treatment and each amount taken.

Amount taken	NO-INFO	INFO	RESTORE
€0	20%	33%	50%
€1	100%	100%	83%
€2	100%	60%	60%
€3	50%	63%	100%
€4	75%	100%	60%
€5	50%	57%	0%

Result 5. *There is no correlation between offers and taking decisions.*

Spearman correlation coefficients confirm the visual impression from Table 6 both for the entire sample and for each treatment (Spearman's $\rho = 0.045, p = 0.680$ for the full sample; $\rho = 0.152, p = 0.479$ for NO-INFO; $\rho = 0.059, p = 0.750$ for INFO, and $\rho = 0.017, p = 0.926$ for INFO-RESTORE). This suggests that proposers see taking decisions and offers as two separate domains.

Result 6. *The average amount offered is not significantly different across the three treatments.*

Averaging across treatments, 36% of the proposers offer €1. Figure 2 shows the share of €1 offers across treatments. This share is highest in NO-INFO and lowest in INFO-

RESTORE. However, pairwise statistical comparisons do not reveal significant differences across treatments (χ^2 -tests, all $p > 0.121$).⁸

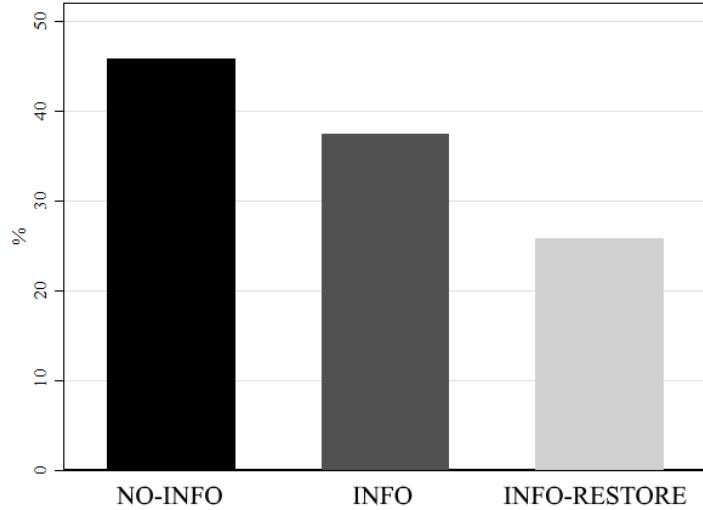


Figure 2. Shares of €1 offers across treatments

3.4 Discussion

Overall, in Study 1 we have shown that responders reject offers more frequently as the amount taken increases indicating that taking €5 is considered as the most immoral action (Result 2). This supports the punitive motive for rejections rather than deontological one as specified in Section 2. Moreover, the additional effect of the restoration option, increases further rejections (Result 3); this supports the presence of altruistic concerns towards the NGO on top of the punitive motives towards the proposer. With respect to proposers' behavior, we find that the NO-INFO treatment presents a bimodal distribution of amounts taken which is significantly different compared to the other two treatments where the distribution is instead unimodal. We further find, to our surprise, that the amount taken is uncorrelated with the amount offered.

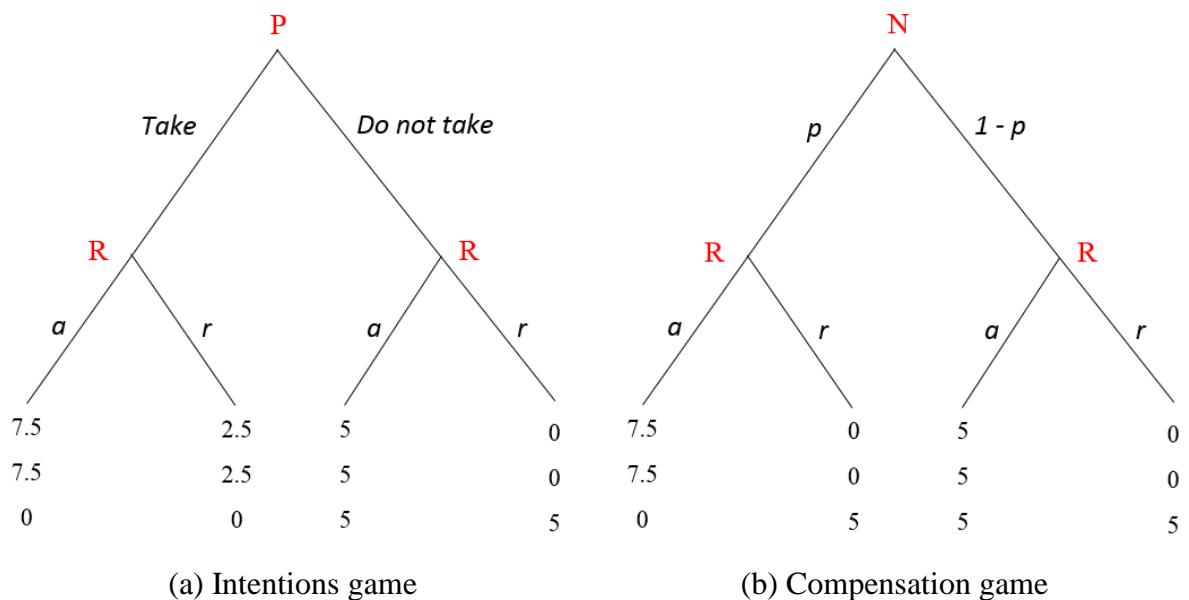
⁸ The sample size of our study was determined to have a sufficient number of observations to analyze responders' behavior. Given our design, this requires a small number of proposers as we elicit just one decision for each proposer and many for each responders (see Section 3.2). Hence, the statistical tests reported here for proposers must be taken cautiously as they might be the result of low power. To assess this we conducted ex-post power analyses. Given our sample sizes of $n = 24$, $n = 32$, and $n = 31$ for NO-INFO, INFO, and INFO-RESTORE, respectively, we have 80% power to detect effect sizes ($\varphi = \sqrt{\chi^2/n}$) at a 5% level of significance of at least 0.37, 0.37, and 0.35 for the binary comparisons NO-INFO vs. INFO, NO-INFO vs. INFO-RESTORE, and INFO vs. INFO-RESTORE, respectively. We find effect sizes of 0.17, 0.40, 0.24 for the three pairwise comparisons. Hence, the achieved power is 0.25, 0.84, and 0.48, respectively. If we accept our effect sizes as "true" despite the small sample, we would need a total sample size of $n = 283$ in the comparison NO-INFO vs. INFO and a total sample size of $n = 135$ for the comparison INFO vs. INFO-RESTORE in order to detect these effect sizes with 80% power. However, we would not need additional observations for the comparison NO-INFO vs. INFO-RESTORE.

One limitation of Study 1 is that it allowed us to assess the compensatory motive only on top of the punitive one. Hence, while we can conclude from Study 1, that consumers may be more willing to fight companies' unethical behavior if they can see beneficial consequential effects of their behavior on the offended party, we cannot disentangle the relative importance of the two motives. Moreover, as we detailed in Section 2 punishment may stem from two different motivations: to treat unkindly the proposer if they treated the NGO unkindly or to reduce the inequity between the proposer and the responder. While these two are psychologically different, they could lead to the same behavior in Study 1. Hence, in Study 2, we tackle these issues designing an experiment that isolates each possible moral motive for rejection to assess its relative frequency.

4. Study 2

4.1 Experimental design

The design is composed by four within-subjects conditions. As in Study 1, €5 are initially allocated to *Doctors without borders*. The proposer is endowed with €10 and he can, in some conditions, either take the whole €5 from the NGO or nothing. Given that behavior in Study 1 has revealed that taking €5 was the most immoral case, in Study 2 we limit our attention to the most and least immoral cases. This helps us designing four conditions, described in the game trees of Figure 3, where we can isolate each moral motive.



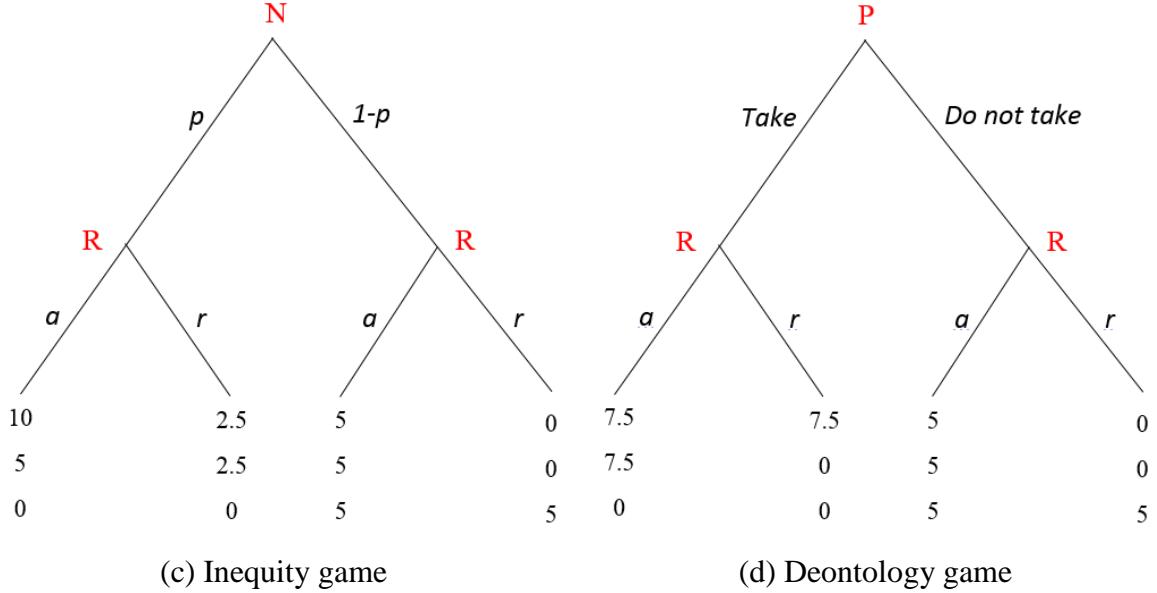


Figure 3. Experimental conditions in Study 2

P stands for the proposer, R for responder and N for nature. Each payoff triplet represents payoffs for the proposer, the responder, and the NGO going from top to bottom. The right-hand side of each game tree is the same in terms of consequences across all four conditions and it refers to the case in which the NGO initial endowment (€5) is not transferred to the proposer. In this case, the offer is, by construction, an equal split of the proposers' endowment (€10) to the responder, who can then accept or reject with standard payoff consequences of ultimatum games. A rejection has no consequences for the NGO.

All game trees differ regarding their left-hand side, i.e., the case where the €5 are transferred to the proposer. In game (a), the proposer actively decides whether to take the €5 from the NGO. If the proposer takes, the offer for the responder is an equal split of €15. If the responder rejects the offer, they both get €2.50. The only motive for a rejection in this case is punishing the proposer's intentions since there is no inequity between the proposer's and the responder's payoffs and no compensation for the NGO. We call this game *Intentions Game*.

In game (b), the proposer does not take any decisions and whether the €5 are transferred from the NGO to the proposer is decided by the Nature randomly with probability $p = 0.5$ (this probability was common knowledge during the experiment). If the transfer happens, the responder is offered an equal split of the resulting €15; if he rejects, both proposer and responder get €0 and the NGO gets back the original €5. In this case, neither indirect reciprocity nor inequity can be reasons for rejecting because there is no intentionality from the proposer

and there is no inequality between the proposer and responder. Hence, the only reason for rejecting must be the compensation to the NGO. We call this game *Compensation game*.

In game (c), the transfer between the NGO and the proposer is also decided randomly with probability $p = 0.5$. In case the money is transferred, an unequal split is offered to the responder, whereby the proposer gets €10 and the responder gets €5; a rejection entails both receiving €2.50. In this case, the only motive for a rejection is inequity aversion as the proposer's lack of intentionality rules out indirect reciprocity and there is no compensation for the NGO in case of rejection. We call this game *Inequity Game*.⁹

Finally, game (d) reintroduces intentional taking from the proposer and the equal split offer in case of taking. This time, however, a rejection entails €0 as payoff for both the responder and the NGO, while the proposer is unaffected and keeps their share of €7.50. Clearly, the only motive for a rejection in this case is deontological morality, i.e., ‘do not accept immoral offers’, as by rejecting responders would not be able to punish the proposer, they would create disadvantageous inequity, and they would not compensate the NGO. We call this game *Deontology game*.

In Study 2, given that we do not have asymmetry in the number of information sets across the treatments like in Study 1, we elicited responders' choices using the strategy method (Selten, 1967). Hence, responders had to make choices both for the case in which €5 were transferred from the NGO to the proposer and for the case in which €5 were not transferred.

4.2 Procedures

Upon their arrival to the lab subjects were seated in cubicles that separated them visually to protect anonymity. Instructions, that we report in Appendix A.2 (translated from Italian), were read aloud by the experimenter. The four games were all described before the decision making part of the experiment. Instructions specified that one of the games would randomly be selected at the end of each session to be payoff-relevant for that session. This avoids potential hedging or income effects and ensures incentive-compatibility (Cubitt et al., 1998). As in Study 1, at the end of the instructions the experimenter highlighted that the amount left to the NGO would be donated a few weeks after the experiment and that subjects would receive an email with the receipt of the total donation. Before each game, subjects had to go

⁹ Note that the design choice of payoffs in games (a), (b) and (c) controls for the possibility that people may value efficiency, that is, the sum of overall payoffs. Our implementation keeps constant the efficiency loss of a rejection across (a), (b), and (c).

through several control questions checking their understanding of the decision situations. Average payment for subjects was €10.30, including a €4 show-up fee, for an average session duration of 50 minutes. As Study 1, the experiment was conducted at LabSi (University of Siena, Italy) using z-Tree (Fischbacher, 2007) and we had in total 114 participants. The total donation to *Doctors without borders* was €140 (out of a potential maximum amount of €285).

4.3 Results

We start by looking at responders' behavior. Overall we find that 38.5% of the subjects reject in at least one of the games. The left panel of Figure 4 shows the frequency of rejections conditional on the €5 being transferred from the NGO to the proposer.¹⁰ The right panel shows a Venn diagram to visualize the frequencies of moral motivations among rejections.

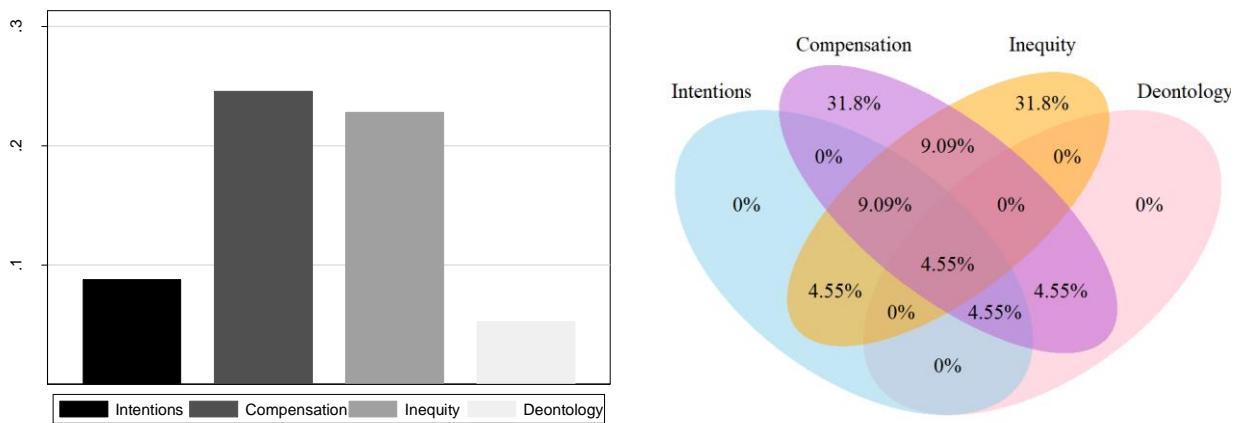


Figure 4. Left panel – rejection rate for each moral motive.
Right panel – Venn diagram on the frequency of each motive among rejections.

Result 7. *Responders reject more frequently due to inequity and compensatory motives compared to deontology or indirect reciprocity.*

Support for this result comes from signed-rank matched pairs tests. We find that rejections due to compensatory motives happen significantly more frequently than the ones for indirect reciprocity and deontology ($p = 0.007$ and $p < 0.001$, respectively). A similar result is obtained for rejections due to inequity compared to indirect reciprocity and deontology ($p = 0.012$ and $p = 0.008$, respectively). We find no statistical difference in rejections rates between the *Inequity game* and the *Compensation game* ($p = 0.808$). Likewise, we find no difference

¹⁰ The case in which the €5 are not transferred is relatively less interesting because, as expected, virtually in all cases the offers are accepted (100% in game (a) and 98% in (b), (c) and (d) games).

between the *Intentions game* and *Deontology game* ($p = 0.317$). Finally, the overall distribution of rejections differs significantly across the four games (Cochrane Q-test, $p < 0.001$).

For what concerns proposers' behavior, clearly, the only interesting case is to compare the two games where proposers have a choice, i.e., games (a) and (d). While in the *Intentions game* proposers may not take either because they have moral concerns toward the NGO or for the threat of being punished, in the *Deontology game* taking involves no threat and hence refraining from taking must be due to moral concerns towards the NGO. As expected, we find that proposers take €5 from the NGO significantly more frequently in the *Deontology game* rather than the *Intentions game* (67% vs. 53%; signed-rank matched pairs test, $p = 0.033$), but a sizeable 33% decides not to take in the *Deontology game*, indicating the presence of non-strategic moral concerns by proposers towards the NGO.

4.4 Discussion

Study 2 confirms the results of Study 1 showing that a mixture of punitive and compensatory concerns best explains the patterns of rejections. However, it allows to go beyond the conclusions of Study 1 as we can clearly distinguish two drivers of punishment. In particular, we find that inequity aversion is a stronger motive compared to indirect reciprocity. In this sense, responders seem to care about the NGO only insofar as they can compensate the NGO with their rejection. The results also confirm that deontology plays a minor role in determining rejections. Finally, one additional insight from Study 2 comes from exploiting the within subjects structure of the design to determine the structure of moral concerns in the population. While we have concluded from Study 1 that our *average* treatment differences could be predicted by a hybrid model, where responders are inequity averse towards proposers and are altruistic towards the NGO, an interesting question regards the potential heterogeneity behind these average effects. In other words, it could be that all agents have both inequity and altruistic concerns or that the average effects derive from a mixture of two types of individuals, one type who cares about inequity and one type who is altruistic towards the NGO. Study 2 supports the latter, showing that most rejections (around 64%) are due either to inequity or to compensation clearly highlighting the presence of two distinct types in the population.

5. Summary and Conclusion

In this paper, we have studied the role of moral concerns in three-player ultimatum bargaining. In particular, our main focus has been to study moral motivations for refusing to engage in a transaction when some of the gains are generated immorally at the expenses of an

NGO. Our results from responders' behavior shows that moral concerns play an important role in the rejection patterns. In Study 1 we have shown that responders are willing to punish, against their own personal interests, an immoral act toward the NGO, and they do so even more when the punishment restores justice. In Study 2 we have shown that the two most frequent motivations for rejections are inequity aversion toward the proposer and altruism toward the NGO, although these occur mostly from different individuals suggesting the presence of two different moral types. Surprisingly, additional motives, such as indirect reciprocity or deontological concerns seem to play a minor role. One important question for future research is to investigate the role played by the sense of responsibility that responders feel for the consequences of their action for the NGO. In both our studies, when a responder decides to compensate the NGO by rejecting the offer, they are fully responsible for the NGO and certain that the situation of the NGO would improve due to their action. In reality, justice restoration may not be such an easy process. For this reason, one interesting direction might be to look at intermediate situations where the remedy to the immoral actions depends on reaching a critical mass of rejections among responders.

Our results from both studies show that a mixture of strategic and moral concerns can characterize proposers' behavior. In Study 1, in particular, we find that they tend to take more from the NGO when this action is not revealed to responders. This suggests that some proposers anticipate responders' reactions and take strategically less from the NGO under full information to avoid rejections. In Study 2, we show, nevertheless, that 33% of proposers have moral concerns which prevents them from taking even without threats of being punished.

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APPENDIX A.1 – Experimental Instructions for Study 1 (translated from Italian).

Instructions

Welcome! Thank you for participating in this experiment.

For your participation you will receive €3. On top of this an additional sum may be paid to you depending on the decisions made – by you and the other participants – during the experiment.

During the experiment it is prohibited to talk with other participants: if you have any question at any time please raise your hand and wait for an experimenter to come to your desk and answer it in private. We kindly ask you to turn off the cell phone. In case you violate these rules, you will be asked to leave the experiment and you will lose the right to be paid.

After reading the instructions, to ensure the full comprehension of the experiment, we will ask you to complete a questionnaire through the computer that has been assigned to you. The experiment will begin after all participants answered correctly all questions.

During the experiment, all information and decisions made will be anonymous and confidential. At the end of the experiment each of you will be paid in private and in cash.

Experimental instructions

In this experiment there are two roles. Each participant will be identified either as Player A or Player B. Roles are assigned randomly and will remain the same for the whole experiment.

Each participant has an initial endowment in Euro that varies based on the role:

- **Player A** has an initial endowment of €9.
- **Player B** has an initial endowment of €0.

You will be informed if you are Player A or B at the beginning of the experiment.

For each pair of players (formed by one Player A and one Player B), an initial donation of €5 has been allocated to the organization *Doctors without borders*. The final amount of the donation depends on the decisions made in the experiment. For those who don't know it, *Doctors without borders* is described on Wikipedia as follows:

“Doctors Without Borders is a private international organization whose purpose is to bring emergency aid and health care assistance in areas of the world where the right to health care is not yet guaranteed.”

Doctors without borders asks to support, through voluntary donations, the independent and effective intervention in over 70 countries around the world, to fight diseases such as malnutrition and malaria, to fulfill vaccination programs and to guarantee health care assistance saving every day human lives.

See below a screenshot of the webpage through which the organization asks for donations.



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NOTIZIE

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DONA ORA >

HOME:

Dona ora

Il tuo contributo ci permette di intervenire in modo indipendente ed efficace in oltre 60 paesi del mondo. Insieme combattiamo malattie come la malnutrizione e la malaria, realizziamo programmi di vaccinazione e garantiamo cure sanitarie salvando ogni giorno vite umane.

Scegli il tipo di sostegno che vuoi dare a Medici Senza Frontiere:

ATTIVA UNA DONAZIONE MENSILE



Fai una donazione singola



DONAZIONI IN MEMORIA

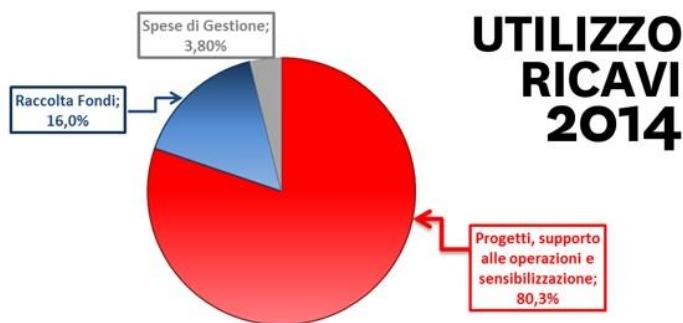


Tutte le donazioni fatte a MSF sono deducibili e detraibili. [Maggiori informazioni >](#)

La tua donazione fa la differenza. Oltre il 99% dei fondi che raccogliamo proviene da donazioni private.

L'80,3% delle vostre donazioni viene speso direttamente sul campo per aiutare chi ne ha più bisogno:

- Disastri naturali - Aiutiamo le vittime di calamità naturali
- Guerre e conflitti - Forniamo assistenza medica e chirurgica alle persone nelle zone di guerra
- Crisi umanitarie - Curiamo chi affronta malattie endemiche o epidemie o è escluso dall'assistenza sanitaria.



Interaction rules between Player A and Player B

The experiment is divided in three phases.

PHASE 1

In this phase, each Player A has the opportunity to increase their own endowment by taking money from the donation to *Doctors without borders*. Each Player A can take between 0 and 5 Euros in intervals of 1 Euro. Thus, they can take 0, 1, 2, 3, 4 or 5 Euros. What is not taken by Player A (remaining donation) will be donated to *Doctors without borders*.

At the end of PHASE 1 each Player A will have their initial endowment of €9 plus the amount taken from *Doctors without borders* (if any).

PHASE 2

In this phase, each Player A has to make an offer on how to split the amount they have to the Player B they will be matched with. Player A can choose between two alternatives:

- Offer €5.
- Offer €1.

PHASE 3

In this phase, each Player B will have to make a sequence of decisions regarding the offers made by Players A in PHASE 2.

[NO-INFO]: For every Player A, Player B will be informed of:

- The amount offered (€5 or €1) in PHASE 2.

Note: Player B will never know (even at the end of today's experiment), how much each Player A has taken from *Doctors without borders*.]

[INFO & INFO-RESTORE]: For every Player A, Player B will be informed of:

- The amount taken from *Doctors without borders* in PHASE 1.
- The amount offered (€5 or €1) in PHASE 2.]

For every offer, Player B has to decide whether to **accept** or **reject** it:

- If Player B **accepts**, the offer proposed is implemented.
- If Player B **rejects**, both Player A and Player B receive €0.

[INFO-RESTORE]: If Player B **rejects**, both Player A and Player B receive €0, while *Doctors without Borders* receives the initial donation of €5].

Matching process

Each Player B is actually matched with only **one** Player A.

However, Player B will not know, until the end of the experiment, which Player A they are assigned to. Thus, they will not know which of the decisions described above will be relevant for their earnings.

Therefore, the best strategy is to treat all the decisions as relevant as any of them could be relevant.

If you have any question about the experiment, please raise your hand and wait for an experimenter to come to your desk and answer it in private. If there are no questions we now proceed with the questionnaire and, later, with the experiment.

APPENDIX A.2 – Experimental Instructions for Study 2 (translated from Italian).

Welcome! Thank you for participating in this experiment.

For your participation you will receive €3. On top of this an additional sum may be paid to you depending on the decisions made – by you and the other participants – during the experiment.

During the experiment it is prohibited to talk with other participants: if you have any question at any time please raise your hand and wait for an experimenter to come to your desk and answer it in private. We kindly ask you to turn off the cell phone. In case you violate these rules, you will be asked to leave the experiment and you will lose the right to be paid.

After reading the instructions, to ensure the full comprehension of the experiment, we will ask you to complete a questionnaire through the computer that has been assigned to you. The experiment will begin after all participants answered correctly all questions.

During the experiment, all information and decisions made will be anonymous and confidential. At the end of the experiment each of you will be paid in private and in cash.

Experimental instructions

In this experiment there are two roles. Each participant will be identified either as Player A or Player B. Roles are assigned randomly and will remain the same for the whole experiment.

You will learn whether your role is A or B at the beginning of the experiment.

The decisions taken by each couple of players (formed by one Player A and one Player B) will also have influence on a final donation for the organization Doctors Without Borders. For those who don't know it, *Doctors without borders* is described on Wikipedia as follows:

“Doctors Without Borders is a private international organization whose purpose is to bring emergency aid and health care assistance in areas of the world where the right to health care is not yet guaranteed.”

Doctors without borders asks to support, through voluntary donations, the independent and effective intervention in over 70 countries around the world, to fight diseases such as malnutrition and malaria, to fulfill vaccination programs and to guarantee health care assistance saving every day human lives.

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Scegli il tipo di sostegno che vuoi dare a Medici Senza Frontiere:

ATTIVA UNA DONAZIONE MENSILE



Fai una donazione singola



DONAZIONI IN MEMORIA

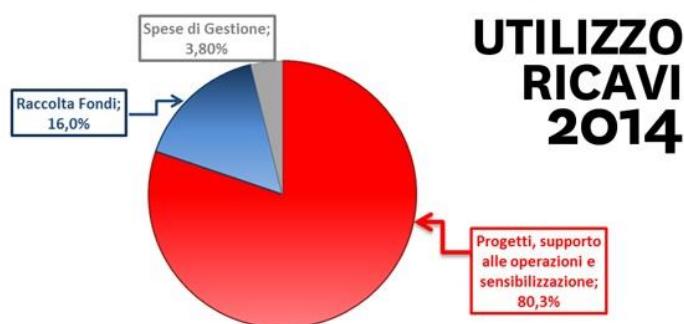


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Interaction rules between Player A and Player B

The experiment is composed of four scenarios. In each scenario, participants have an initial endowment that varies depending on the role:

- Player A has an initial endowment of €10.
- Player B has an initial endowment of €0.
- For each couple of players (composed by one Player A and one Player B), €5 have been allocated initially as a donation to *Doctors Without Borders*.

In each scenario, one or both players, will have to make decisions. These decisions will determine the final earnings of both players and the final amount to donate to *Doctors Without Borders*.

Each scenario is composed by three phases.

PHASE 1

In this phase, it will be determined whether €5 allocated to *Doctors Without Borders* will be transferred to Player A. Would this be the case, the endowment of Player A would grow to €15, while if there would be no transfer the total for Player A would remain €10 and €5 would be donated to *Doctors Without Borders*. The rules regarding who can transfer the €5 from *Doctors Without Borders* to Player A vary across scenarios and will be specified in the instructions for each scenarios (see below).

PHASE 2

In this phase, Player B will be offered a split of the amount accumulated by Player A (which could be either €10 or €15 depending on the result of PHASE 1). The rules for the division of the amount between the two players will be specified in the instructions of each scenario.

PHASE 3

In this phase, Player B will decided whether to accept or reject the offer proposed in PHASE 2. The choice of accepting or rejecting the proposed split will have consequences on the final earnings of the two players and on the donation to *Doctors Without Borders*. These consequences vary across scenarios and will be specified in the instructions of each scenario.

Find below the instructions of the 4 scenarios.

Instructions – Scenario 1

PHASE 1

Player A has the possibility of increasing their endowment to €15 taking the €5 donation allocated to *Doctors Without Borders*. They need to choose between *Take* and *Do not take* the 5€ from *Doctors Without Borders*.

PHASE 2

Player B will be offered an equal split of the total accumulated by Player A.

PHASE 3

Player B will decide to accept or reject the offer.

If Player A chooses *Do not take*, Player B will decide whether to accept an equal split of €10 between them and Player A (€5 each), or to reject the proposal and reduce earnings of both players to €0:

<u>Accepts the offer:</u>	<u>Rejects the offer:</u>
Final earnings <ul style="list-style-type: none">• <u>Player A: €5</u>• <u>Player B: €5</u>• <u>Doctors without Borders: €5</u>	Final earnings <ul style="list-style-type: none">• <u>Player A: €0</u>• <u>Player B: €0</u>• <u>Doctors without Borders: €5</u>

If Player A chooses *Take*, Player B will decide whether to accept an equal split of €15 between them and Player A (€7.5 each), or to reject the proposal and reduce earnings of both players to €2.5.

<u>Accepts the offer:</u>	<u>Rejects the offer:</u>
Final earnings <ul style="list-style-type: none">• <u>Player A: €7.5</u>• <u>Player B: €7.5</u>• <u>Doctors without Borders: €0</u>	Final earnings <ul style="list-style-type: none">• <u>Player A: €2.5</u>• <u>Player B: €2.5</u>• <u>Doctors without Borders: €0</u>

Instructions – Scenario 2

PHASE 1

In this scenario, Player A will not take decisions. With 50% probability the €5 of the initial donation to *Doctors without Borders* will be transferred to Player A and with 50% probability they will not be transferred. This will be determined randomly during the experiment.

PHASE 2

Player B will be offered an equal split of the total accumulated by Player A.

PHASE 3

Player B will decide to accept or reject the offer.

If the €5 will not be transferred to Player A, Player B will decide whether to accept an equal split of €10 between them and Player A (€5 each), or to reject the proposal and reduce earnings of both players to €0:

<u>Accepts the offer:</u>	<u>Rejects the offer:</u>
<p>Final earnings</p> <ul style="list-style-type: none">• <u>Player A: €5</u>• <u>Player B: €5</u>• <u>Doctors without Borders: €5</u>	<p>Final earnings</p> <ul style="list-style-type: none">• <u>Player A: €0</u>• <u>Player B: €0</u>• <u>Doctors without Borders: €5</u>

If the €5 will be transferred to Player A, Player B will decide whether to accept an equal split of €15 between them and Player A (€7.5 each), or to reject the proposal and reduce earnings of both players to €0 and give back the €5 to *Doctors without Borders*:

<u>Accepts the offer:</u>	<u>Rejects the offer:</u>
<p>Final earnings</p> <ul style="list-style-type: none">• <u>Player A: €7.5</u>• <u>Player B: €7.5</u>• <u>Doctors without Borders: €0</u>	<p>Final earnings</p> <ul style="list-style-type: none">• <u>Player A: €0</u>• <u>Player B: €0</u>• <u>Doctors without Borders: €5</u>

Instructions – Scenario 3

PHASE 1

In this scenario, Player A will not take decisions. With 50% probability the €5 of the initial donation to *Doctors without Borders* will be transferred to Player A and with 50% probability they will not be transferred. This will be determined randomly during the experiment.

PHASE 2

Player B will be offered €5 of the total accumulated by Player A.

PHASE 3

Player B will decide to accept or reject the offer.

If the €5 will not be transferred to Player A, Player B will decide whether to accept the €5 offered (Player A will also earn €5 in this case), or to reject the proposal and reduce earnings of both players to €0:

<u>Accepts the offer:</u>	<u>Rejects the offer:</u>
<p>Final earnings</p> <ul style="list-style-type: none">• <u>Player A: €5</u>• <u>Player B: €5</u>• <u>Doctors without Borders: €5</u>	<p>Final earnings</p> <ul style="list-style-type: none">• <u>Player A: €0</u>• <u>Player B: €0</u>• <u>Doctors without Borders: €5</u>

If the €5 will be transferred to Player A, Player B will decide whether to accept the €5 offered (Player A will earn €10 in this case), or to reject the proposal and reduce earnings of both players to €2.5:

<u>Accepts the offer:</u>	<u>Rejects the offer:</u>
<p>Final earnings</p> <ul style="list-style-type: none">• <u>Player A: €10</u>• <u>Player B: €5</u>• <u>Doctors without Borders: €0</u>	<p>Final earnings</p> <ul style="list-style-type: none">• <u>Player A: €2.5</u>• <u>Player B: €2.5</u>• <u>Doctors without Borders: €0</u>

Instructions – Scenario 4

PHASE 1

Player A has the possibility of increasing their endowment to €15 taking the €5 donation allocated to *Doctors Without Borders*. They need to choose between *Take* and *Do not take* the 5€ from *Doctors Without Borders*.

PHASE 2

Player B will be offered an equal split of the total accumulated by Player A.

PHASE 3

Player B will decide to accept or reject the offer.

If Player A chooses *Do not take*, Player B will decide whether to accept an equal split of €10 between them and Player A (€5 each), or to reject the proposal and reduce earnings of both players to €0:

<u>Accepts the offer:</u>	<u>Rejects the offer:</u>
Final earnings <ul style="list-style-type: none">• <u>Player A: €5</u>• <u>Player B: €5</u>• <u>Doctors without Borders: €5</u>	Final earnings <ul style="list-style-type: none">• <u>Player A: €0</u>• <u>Player B: €0</u>• <u>Doctors without Borders: €5</u>

If Player A chooses *Take*, Player B will decide whether to accept an equal split of €15 between them and Player A (€7.5 each), or to reject the proposal and renounce to their part of earnings.

<u>Accepts the offer:</u>	<u>Rejects the offer:</u>
Final earnings <ul style="list-style-type: none">• <u>Player A: €7.5</u>• <u>Player B: €7.5</u>• <u>Doctors without Borders: €0</u>	Final earnings <ul style="list-style-type: none">• <u>Player A: €7.5</u>• <u>Player B: €0</u>• <u>Doctors without Borders: €0</u>

EARNINGS CALCULATION

Each Player B is matched with only one Player A, with whom they will interact in each scenario. Player B will be asked to take a decision (accept or reject) for every possible decision of their matched Player A in each scenario.

Hence, in each scenario Player B will decide whether to accept or reject the offer both in the hypothetical case in which the €5 are transferred and in the one in which the €5 are not transferred.

At the end of the decision making part of the experiment, Player A and B in each couple will get to know their respective choices. Moreover, we will use 4 playing cards (from 1 to 4 of Hearts) to select randomly one of the four scenarios: the selected scenario will be the only one relevant for the calculation of earnings. Given that it will be unknown to participants which scenario will be relevant for earnings, the best strategy is to treat all the decisions as relevant as any of them could be relevant.

If you have any question about the experiment, please raise your hand and wait for an experimenter to come to your desk and answer it in private. If there are no questions we now proceed with the questionnaire and, later, with the experiment.

APPENDIX B – Alternative estimations to Table 5

Table B1. Mixed-effects probit.

	All offers (1)	€1 offers (2)	€5 offers (3)
INFO-RESTORE	-0.10 (0.27)	-0.23 (0.27)	-1.71** (0.68)
Amount taken	-0.43*** (0.29)	-0.19* (0.11)	-0.95*** (0.18)
Constant	1.77*** (0.27)	-0.16 (0.35)	5.45*** (0.97)
N	442	126	316

Notes: mixed-effects probit with random intercepts only at session level. Dependent variable takes value 1 if the offer is accepted and zero otherwise. * significant at 10%, ** significant at 5%, *** significant at 1%.

Table B2. Mixed-effects linear model.

	All offers (1)	€1 offers (2)	€5 offers (3)
INFO-RESTORE	-0.03 (0.09)	-0.03 (0.09)	-0.13* (0.07)
Amount taken	-0.14*** (0.02)	-0.04** (0.02)	-0.12*** (0.02)
Constant	1.09*** (0.08)	0.35*** (0.09)	1.26*** (0.06)
N	442	126	316

Notes: mixed-effects linear model with random intercepts at individual and session level. Dependent variable takes value 1 if the offer is accepted and zero otherwise. * significant at 10%, ** significant at 5%, *** significant at 1%.

APPENDIX C – Behavioral predictions

C.1 Inequity aversion toward the Proposer

The responder (R henceforth) cares about inequity toward the proposer (P). Their utility has the following functional form

$$U_R(\pi_P, \pi_R) = \pi_R - \alpha[\max(\pi_P - \pi_R, 0)] - \beta[\max(\pi_R - \pi_P, 0)]$$

where,

- $\pi_P = E_P + t - o$, if R accepts ($\pi_P = 0$ otherwise)
- $\pi_R = E_R + o$, if R accepts ($\pi_R = 0$ otherwise)
- $E_P = 9, E_R = 0$

and by assumption from Fehr and Schmidt (1999),

- $0 \leq \beta < 1$
- $\alpha \geq \beta$.

C.1.a. Proposer offers 5 ($o = 5$)

If R accepts their utility is equal to

$$U_R(t) = 5 - \alpha[\max(t - 1, 0)] - \beta[\max(1 - t, 0)].$$

Given the discontinuity of the utility function conditional on t , we can rewrite it as

$$U_R(t) = \begin{cases} 5 - \beta & \text{if } t = 0 \\ 5 & \text{if } t = 1 \\ 5 - \alpha(t - 1) & \text{if } t > 1 \end{cases}$$

When R rejects, both in INFO and INFO-RESTORE her utility is equal to zero.

It follows that, in both conditions (INFO and INFO-RESTORE), R always accepts an offer of 5 for $t \leq 1$ and, for $t > 1$, she accepts the offer if and only if $\alpha < \frac{5}{t-1}$.

C.1.b. Proposer offers 1 ($o = 1$)

If R accepts their utility is equal to

$$U_R(t) = 1 - \alpha(t + 7).$$

When R rejects, both in INFO and INFO-RESTORE her utility is equal to zero.

It follows that, in both conditions (INFO and INFO-RESTORE), R accepts an offer of 1 if and only if $\alpha < \frac{1}{t+7}$.

C.1.c Summary of predictions according to inequity aversion toward the Proposer

Table C1 summarizes predicted differences in acceptance between INFO and INFO-RESTORE for all possible levels of taking. Given these predicted difference, we expect the same acceptance rates in INFO than in INFO-RESTORE.

Table C1. Difference in acceptance between INFO and INFO-RESTORE.

Offer	Amount taken					
	0	1	2	3	4	5
$o = 5$	=	=	=	=	=	=
$o = 1$	=	=	=	=	=	=

Notes: = means that acceptance in INFO-RESTORE is as likely as it is in INFO. + means that acceptance in INFO is more likely than in INFO-RESTORE. - means that acceptance in INFO-RESTORE is more likely than in INFO.

C.2 Altruism toward the NGO

R suffers disutility if the NGO receives less than the maximal donation. Their utility has the following functional form

$$U_R(\pi_R, \pi_{NGO}) = \pi_R - \gamma(5 - \pi_{NGO})$$

where,

- $\pi_R = E_R + o$, if R accepts ($\pi_R = 0$ otherwise)
- $\pi_{NGO} = E_{NGO} - t$, if R accepts;
 $\pi_{NGO} = E_{NGO} - t$, if R rejects in INFO;
 $\pi_{NGO} = E_{NGO}$, if R rejects in INFO-RESTORE.
- $E_R = 0$, and $E_{NGO} = 5$

and by assumption,

- $\gamma > 0$.

C.2.a. Proposer offers 5 ($o = 5$)

If R accepts their utility is equal to

$$U_R(t) = 5 - \gamma t.$$

If R rejects, in INFO their utility is equal to

$$U_R(t) = -\gamma t,$$

while in INFO-RESTORE is equal to zero.

It follows that in INFO, R always accepts an offer of 5. In INFO-RESTORE she accepts the offer if $t = 0$ and for $t > 1$ she accepts if $\gamma < \frac{5}{t}$. It derives that acceptance rate is lower in INFO-RESTORE than the one in INFO.

C.2.b. Proposer offers 1 ($o = 1$)

If R accepts their utility is equal to

$$U_R(t) = 1 - \gamma t.$$

If R rejects, in INFO their utility is equal to

$$U_R(t) = -\gamma t,$$

while in INFO-RESTORE is equal to zero.

It follows that in INFO, R always accepts an offer of 1 while in INFO-RESTORE she accepts if $t = 0$ and for $t > 1$ she accepts if $\gamma < \frac{1}{t}$. It derives that acceptance rate is lower in INFO-RESTORE than the one in INFO.

C.2.c Summary of predictions according to altruism toward the NGO

Table C2 summarizes predicted differences in acceptance between INFO and INFO-RESTORE for all possible levels of taking. Given these predicted difference, we expect the same acceptance rates in INFO than in INFO-RESTORE for $t = 0$, and higher acceptance rates in INFO than in INFO-RESTORE for $t > 0$.

Table C2. Difference in acceptance between INFO and INFO-RESTORE.

Offer	Amount taken					
	0	1	2	3	4	5
$o = 5$	=	+	+	+	+	+
$o = 1$	=	+	+	+	+	+

Notes: = means that acceptance in INFO-RESTORE is as likely as it is in INFO. + means that acceptance in INFO is more likely than in INFO-RESTORE. - means that acceptance in INFO-RESTORE is more likely than in INFO.

C.3 Inequity aversion toward the Proposer and altruism toward the NGO (Hybrid model)

We assume that R cares about inequity toward P but they suffer disutility if the NGO receives less than the maximal donation. Their utility has the following functional form:

$$U_R(\pi_P, \pi_R, \pi_{NGO}) = \pi_R - \alpha[\max(\pi_P - \pi_R, 0)] - \beta[\max(\pi_R - \pi_P, 0)] - \gamma(5 - \pi_{NGO})$$

where,

- $\pi_P = E_P + t - o$, if R accepts ($\pi_P = 0$ otherwise)
- $\pi_R = E_R + o$, if R accepts ($\pi_R = 0$ otherwise)
- $\pi_{NGO} = E_{NGO} - t$, if R accepts;
 $\pi_{NGO} = E_{NGO} - t$, if R rejects in INFO;
 $\pi_{NGO} = E_{NGO}$, if R rejects in INFO-RESTORE.
- $E_P = 9, E_R = 0$, and $E_{NGO} = 5$.

and by assumption,

- $0 \leq \beta < 1$
- $\alpha \geq \beta$
- $\gamma > 0$.

C.3.a. Proposer offers 5 ($o = 5$)

When P offers 5 and R accepts the offer, their utility is equal to

$$U_R(t) = 5 - \alpha[\max(t - 1, 0)] - \beta[\max(1 - t, 0)] - \gamma t.$$

Given restrictions on t, α, β , and γ we can re-write the utility of acceptance as:

$$U_R(t) = \begin{cases} 5 - \beta & \text{if } t = 0 \\ 5 - \gamma & \text{if } t = 1 \\ 5 - \alpha(t - 1) - \gamma t & \text{if } t > 1. \end{cases}$$

In INFO, when R rejects, her utility as a function of the amount taken (t) has the following form

$$U_R(t) = \begin{cases} 0 & \text{if } t = 0 \\ -\gamma t & \text{if } t > 0, \end{cases}$$

while in INFO-RESTORE, when R rejects her utility becomes constant and equal to zero.

It follows that, in INFO, R always accepts P's offer if $t \leq 1$. If $t > 1$, R accepts P's offer if and only if

$$t < \frac{5 + \alpha}{\alpha}.$$

The above inequality holds, according to the amount taken, only for specific values of α , which represent the threshold for R's acceptance. These values are summarized in Table C3.

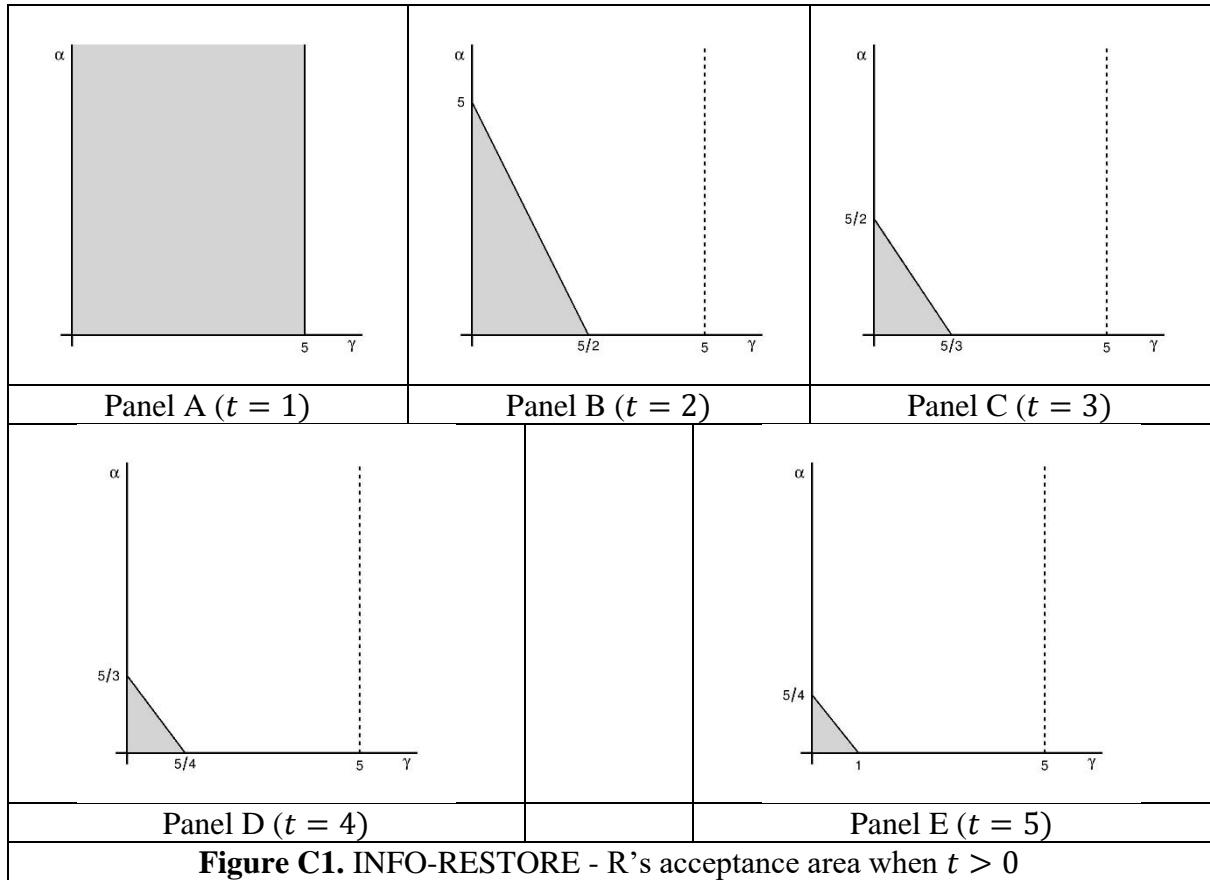
Table C3. INFO - R's acceptance thresholds when $t > 1$ and $o = 5$

Amount taken by P	Condition for R's acceptance
2	$0 \leq \beta \leq \alpha < 5$
3	$0 \leq \beta \leq \alpha < \frac{5}{2}$
4	$0 \leq \beta \leq \alpha < \frac{5}{3}$
5	$0 \leq \beta \leq \alpha < \frac{5}{4}$

Thus it follows that, the less P takes the higher is R's acceptance threshold. Hence, in this respect this model offers similar predictions to the standard Fehr and Schmidt (1999) model as acceptance is predicted to decrease as t increases.

In INFO-RESTORE, R accepts P's offer if $t = 0$. If $t > 0$, R accepts P's offer if and only if $t < \frac{5+\alpha}{\alpha+\gamma}$.

Given our assumptions on α and γ , the above inequality holds only for specific combinations of the two parameters. Figure C1 summarizes the possible combinations of α and γ that lead to R's acceptance for different values of t . As it is clear from Figure C1, we should expect less acceptance as t increases as in the INFO case.



Finally, given that $\frac{5+\alpha}{\alpha+\gamma} < \frac{5+\alpha}{\alpha}$ always holds for positive values of γ , it follows that the area of acceptance for a given t is always greater in INFO than in INFO-RESTORE. Notice that this effect goes in opposite direction compared to inequity aversion.

C.3.b. Proposer offers 1 ($o = 1$)

When P offers 1, if R accepts their utility is equal to

$$U_R(t) = 1 - \alpha(7 + t) - \gamma t$$

Nothing changes, in case of rejections, from the case of $o = 5$.

It follows that, in INFO, R accepts an offer of 1 when $t = 0$ only if $\alpha < \frac{1}{7}$. For $t > 0$, R accepts the offer if and only if $t < \frac{1-7\alpha}{\alpha}$.

The above inequality holds, according to the amount taken, only for specific values of α , which represent the threshold for R's acceptance. These values are summarized in Table C4.

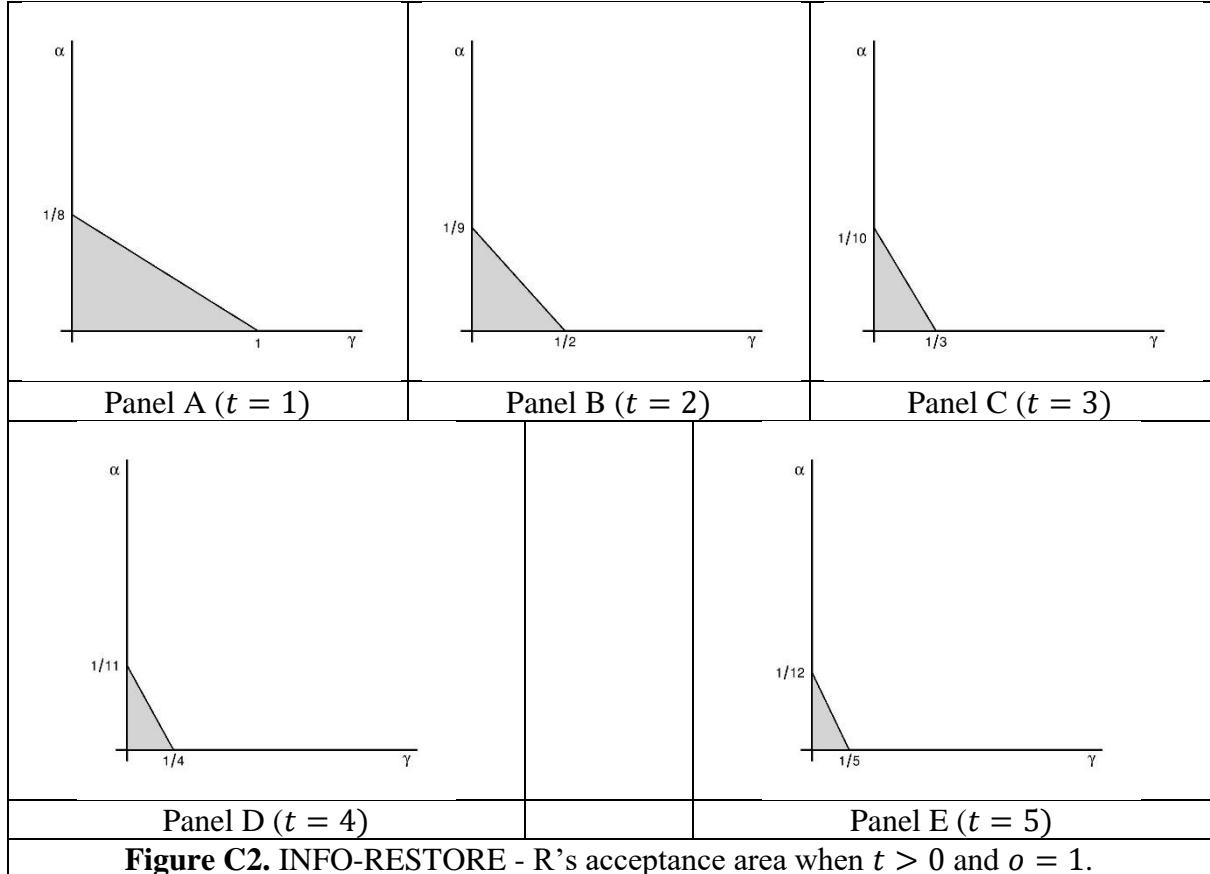
Table C4. INFO - R's acceptance thresholds when $t > 0$ and $o = 1$.

Amount taken by P	Condition for R's acceptance
1	$0 \leq \beta \leq \alpha < \frac{1}{8}$
2	$0 \leq \beta \leq \alpha < \frac{1}{9}$
3	$0 \leq \beta \leq \alpha < \frac{1}{10}$
4	$0 \leq \beta \leq \alpha < \frac{1}{11}$
5	$0 \leq \beta \leq \alpha < \frac{1}{12}$

Thus, it follows that, the less P takes the higher is R's acceptance threshold: acceptance happens for very low levels of α and it is less likely when t increases.

In INFO-RESTORE R accepts the offer when $t = 0$ only if $\alpha < \frac{1}{7}$. If $t > 0$, R accepts P's offer if and only if $t < \frac{1-7\alpha}{\alpha+\gamma}$.

Given our assumptions on α and γ , the above inequality holds only for specific combinations of the two parameters. Figure C2 summarizes the possible combinations of α and γ that lead to R's acceptance for different values of t . As it is clear from Figure C2, also for offers of 1€ we should expect less acceptance as t increases.



Similar to the case of offers of 5€, to compare acceptance across the two treatments we compare the acceptance thresholds and since $\frac{1-7\alpha}{\alpha+\gamma} < \frac{1-7\alpha}{\alpha}$, we conclude that acceptance areas are larger in INFO than in INFO-RESTORE.

C.3.c Summary of predictions according to the Hybrid model

Table C5 summarizes predicted differences in acceptance between INFO and INFO-RESTORE for all possible levels of taking. Given these predicted difference, we expect higher acceptance rates in INFO than in INFO-RESTORE.

Table C5. Difference in acceptance between INFO and INFO-RESTORE.

Offer	Amount taken					
	0	1	2	3	4	5
$o = 5$	=	+	+	+	+	+
$o = 1$	=	+	+	+	+	+

Notes: = means that acceptance in INFO-RESTORE is as likely as it is in INFO. + means that acceptance in INFO is more likely than in INFO-RESTORE. - means that acceptance in INFO-RESTORE is more likely than in INFO.

C.4 Deontological morality toward the NGO

We assume that R suffers a cost (K) whenever they accept an offer from the proposer and a positive amount has been taken from the NGO. Their utility has the following functional form:

$$U_R(\pi_R) = \pi_R - \mathbb{1}_{t>0} \mathbb{1}_{Accept} K$$

where,

- $\pi_R = E_R + o$, if R accepts ($\pi_R = 0$ otherwise)
- $E_R = 0$

and by assumption,

- $K > 0$.

C.4.a. Proposer offers 5 ($o = 5$)

When R accepts the offer, their utility is equal to

$$U_R(t) = 5 - \mathbb{1}_{t>0} K.$$

We can re-write the utility of acceptance as:

$$U_R(t) = \begin{cases} 5 & \text{if } t = 0 \\ 5 - K & \text{if } t > 0. \end{cases}$$

In both INFO and in INFO-RESTORE, when R rejects, her utility is equal to zero, given that the responder only suffers a moral cost only if they accept the offer (and the offer is ‘immoral’).

It follows that, in both conditions (INFO and INFO-RESTORE), R always accepts the offer when $t = 0$ and they accept the offer, when $t > 0$, if and only if $K < 5$.

C.4.b. Proposer offers 1 ($o = 1$)

When if R accepts the offer, their utility is equal to

$$U_R(t) = 1 - \mathbb{1}_{t>0} K.$$

We can re-write the utility of acceptance as:

$$U_R(t) = \begin{cases} 1 & \text{if } t = 0 \\ 1 - K & \text{if } t > 0. \end{cases}$$

As for the case of $o = 5$, in both INFO and in INFO-RESTORE, when R rejects, her utility is equal to zero, given that the responder only suffers a moral cost only if they accept the offer (and the offer is ‘immoral’).

It follows that, in both conditions (INFO and INFO-RESTORE), R always accepts the offer when $t = 0$ and they accept the offer, when $t > 0$, if and only if $K < 1$.

C.4.c Summary of predictions according to deontological morality toward the NGO

Table C6 summarizes predicted differences in acceptance between INFO and INFO-RESTORE for all possible levels of taking. Given these predicted difference, we expect the same acceptance rates in INFO than in INFO-RESTORE.

Table C6. Difference in acceptance between INFO and INFO-RESTORE.

Offer	Amount taken					
	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
$o = 5$	=	=	=	=	=	=
$o = 1$	=	=	=	=	=	=

Notes: = means that acceptance in INFO-RESTORE is as likely as it is in INFO. + means that acceptance in INFO is more likely than in INFO-RESTORE. – means that acceptance in INFO-RESTORE is more likely than in INFO.

Appendix References

Fehr, E., Schmidt, K. M. (1999). A theory of fairness, competition, and cooperation. *The Quarterly Journal of Economics*, 114(3), 817-868.

