Behavioral Patterns in Conditional Generosity Experiments*

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Abstract

Conditional generosity is explored experimentally by confronting two participants with the same allocation task and allowing only one of them to adjust the own generosity level via conditioning on whether the other intends to be more, respectively less generous. Only one of two allocator candidates can actually give conditioning on the other's intended generosity to the respective responder. We employ the strategy vector method but restrict conditioning to qualitative information only. The focus is on how generosity inclinations, largely responsible for fair(er) allocation results and charitable giving, are affected by information that one anonymous other just intended to be more, respectively less generous. Participants play three successive games in the order ultimatum, yes−no and impunity game or (between subjects) in the reversed order. Although only impunity appeals to intrinsic generosity intentions, we test whether conditioning persists when sanctioning is possible. Based on our data, we distinguish two major types of participants, one yielding to weakest social influence and another immune to it. The latter type offers much less: it is greed which, as expected, weakens social influence.

Keywords: (Conditional) Generosity, Ultimatum Game, Yes-No Game, Impunity Game, Experiments.
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1 Introduction

Generosity is an important aspect of human social interaction usually attributed to intrinsic individual motivations such as impure or warm glow altruism (see e.g. Andreoni 1989). However, generosity intentions are also subject to social influence, i.e. to others' views and choices. It is well documented via path dependence of choice making in sequential or recursive experiments (see Vesterlund, 2016) that sanctioning, reciprocity, peer pressure, conformity, reputation formation and competition in helping can in fact affect generosity.[1]

Our study experimentally explores the effects of social influence on generosity when subjects can condition own choices on those by others. Participants play three successive games in the order ultimatum, yes−no and impunity game or (between subjects) in the reversed order. To not confound conditional generosity with conditional cooperation,[2] signaling (e.g. when interacting repeatedly with the same partner) and learning, we focus on the weakest form of social influence by allowing only for qualitative conditioning of own generosity on purely counterfactual generosity intentions of an unknown other.

In particular, we form pairs of allocator candidates who both state their generosity intention although only one is randomly selected as solely responsible for the needy. Before knowing which of the two candidates will be selected as actual allocator, each of them can adjust how much help to provide to the needy via conditioning the own offer on whether the other's intended offer is larger or smaller than the own one.

This excludes any competition in generosity by focussing on situations in which help can be only provided by one individual who is solely responsible for improving the lot of the needy. This appeals to field situations where essentially only one person recognizes that someone is needy and can actually help, as in cases of job loss or health problems, about which only somebody living nearby may become accidentally informed. Since individual victims of bad luck or circumstances

[1]For conformity seeking behavior, see e.g. Carpenter (2004), Bardsley and Sausgruber (2005). For peer effects, see e.g. Smith, Windmeijer and Wright (2015). For reputation formation see, among the others, Bateson et al. (2006) and Rigdon et al. (2009).

[2]As in Fischbacher et al. (2001) and Fischbacher and Gächter (2010).

often are ashamed and hide their neediness, being individually informed about their bad luck and solely responsible for helping them could be rather typical.

Qualitative comparability of generosity intentions appeals to social environments providing only vague signals about the generosity of the other(s). Especially when neediness and required help differ across situations,[3] often only qualitative comparability of generosity levels and conclusions like "other(s) would help more, respectively less" seem typical and realistic.[4] Typical examples are situations when only little help is needed, e.g. to pay the fare of a cab or tram ride when somebody has been robbed. Actually helping in such cases would be very much in line with what is at stake in our experiment.

What distinguishes conditional generosity from other forms of social interaction affecting individual generosity, e.g. conditional cooperation in collective action, reciprocity, conformity seeking or peer effects? One crucial difference is obviously that when voluntarily contributing to a public good, one may induce the other(s) to do the same whereas in case of conditional generosity one does not help in order to be helped. Our design furthermore excludes joint generosity:[5] one of two allocator candidates is randomly selected to actually help. When deciding how much the needy deserves and receives, this rules out help by others. Will one nevertheless condition on an anonymous other's intended, however counterfactual, generosity intention about which one is, furthermore, only qualitatively informed? It is this very weak social influence on which we focus. Moreover, in our experiment participants play different games with feedback information only on own outcomes, i.e. with very little information on others' past choices, so that peer effects and conformity seeking are excluded since they rely usually on what one's peers actually do. Finally, conformity seeking is appealing to social influence when embedded in a larger group and hardly ever connected to conditioning on reaction to just one anonymous other.

[3] When having lost the job, one can possibly help to find a new one; when the needy is ill, one may provide medication or care.

[4] Although equal intentions often are maintained (see Di Cagno et al., 2016), we opted against eliciting reaction to equality of intentions since this questions qualitative comparability.

[5] Joint generosity is explored by running charitable donation experiments in which conditioning is investigated via providing information about other earlier donations, e.g. by distinguishing larger (smaller) earlier donations (see Bereby-Meyer and Niederle, 2005).

Viewing the impunity game[6] as most suitable for eliciting intrinsic generosity intentions, we investigate conditional generosity in case of impunity but also allow for sanctioning power as in ultimatum game and a yes-no games.[7] Based on the strategy vector method, we elicit intended and conditional offers as allocator and acceptance behavior as needy recipient, resp. responder. Whereas the impunity game (IG) is the obvious experimental paradigm[8] for investigating intrinsic generosity,[9] the yes-no (YN) and ultimatum game (UG) both grant sanctioning power to the responder but differ in information when possibly sanctioning.[10] Will conditioning in generosity even prevail when disciplined by veto power with or without being able to monitor the offer? And how do actual offers compare to usual ultimatum offers (more than minimally, often half of the pie)?[11] All three games allow intrinsically motivated allocator candidates to display generosity but vary in how offers are confounded by strategic considerations.

We confirm conditional generosity as well as opportunistic behavior. So, we not only shed light on what motivates individual generosity but also question the stability of "social preferences" (see the survey by Cooper and Kagel, 2016). In our setting "social preferences" would allow conditioning on an other's intended offer which is purely counterfactual and therefore, for instance, irrelevant in view of payoff-based preferences like inequity aversion. Moreover, belief-based other regarding concerns like let-down aversion would have to explain how counterfactual intentions can indicate what responders expect to be offered. Although as-if-(pursuing social preferences) explanations, based on rationality, can be very informative, especially when one such idea can account for many findings across games[12] (see, for example, Bolton and Ockenfels, 1998 and 2000 and Fehr and

[6]See, e.g., Güth and Huck (1997) and Bolton et al. (1998).

[7]Our companion paper (Di Cagno et al., 2017) studies conditional generosity via impunity game when unaffected by other experiences.

[8]Dictator game experiments – except when especially interested in the "moral wriggle room" (see Dana et al., 2006) - unnecessarily deprive the recipient of voice and choice in addition to excluding sanctioning power, for example, when comparing them with those of ultimatum game experiments.

[9]In principle, allocator candidates may also be influenced by expectations of the receiving party even when it has no sanctioning power, e.g. due to belief dependent let-down aversion (see Cooper and Kagel, 2016, for a review of other regarding concerns). Here we focus on conditioning one's choice on another's (purely counterfactual) one and not on beliefs.

[10]Compared to YN one can view UG as an institution allowing for auditing (see Angelovski et al., 2017)

[11]Note that UG-equilibrium multiplicity is avoided by YN as well as by IG.

[12]The literature on "social preferences" does not deny heterogeneity of other regarding concerns across individuals but suggests their individual stability, e.g. via calibrating individual social preference parameters via ultimatum and

Schmidt, 1999), they seem less applicable to our setup.

Section 2 formally describes the social environment based on the three game types with the impunity game as the main condition. The experimental protocols and research questions are described in section 3. The main findings are reported and statistically confirmed in sections 4, mainly devoted to evidence for conditional generosity. Section 5 reports on acceptance rates and payoffs, while section 6 distinguishes behavioral patterns. Section 7 concludes. In Appendix A, the translated version of the Instructions is reported only for one treatment (since the other treatment differs only in the order in which games are played). In Appendix B, additional tables and figures are reported.

2 The social environment

Participants are matched in pairs of allocator candidates. Each pair consists of one allocator candidate (e), whose offers y_e are even integers ranging from 0€ to $P_e = 22$€ and one allocator candidate (o) whose offers y_o are odd integers ranging from 1€ to $P_o = 23$€. Being even, respectively odd, is randomly selected by the computer before choosing and privately communicated to participants. Not knowing yet whether actually endowed or not, each candidate $i = e, o$ chooses an intended offer, y_i, and two adjusted offers, y_i^+ and y_i^-, higher than or equal to, respectively lower than or equal to, the own intended offer y_i if the other candidate's intended offer y_j (with $j \neq i$) is higher ($y_j > y_i$) or lower ($y_j < y_i$) than the own one, i.e. $y_i^+ \geqslant y_i \geqslant y_i^-$. In addition allocator candidates' choose their response which depends on the game type:

1. in IG and UG, each $i = e, o$ sets an acceptance threshold $\underline{y}_i^I$, respectively $\underline{y}_i^U$, based on the same integer restrictions for $i = e, o$;

2. in YN, each $i = e, o$ decides between unconditional acceptance ($\delta_i = 1$) and rejection ($\delta_i = 0$).

dictator experiments.

Thereafter, one allocator candidate i in a pair is randomly selected, with probability $1/2$, to be a proposer endowed either with P_e or P_o depending on $i = e$, respectively o. This endowed proposer (e or o) confronts an opposite (o or e) non-endowed candidate of another pair so that an even (odd) offer is accepted or rejected according to an odd (even) acceptance threshold in IG and UG. Since intended offers are never equal within a pair of allocator candidates, the factual offer y^i of actual proposer $i = e, o$ is either the downward adjusted offer y_i^- or the upward adjusted offer y_i^+, with j denoting the non-endowed candidate in i's pair.[13] Participants' payoffs depend on game type as follows:

- in IG, proposer i, with either $i = e$ or $i = o$, earns $P_i - y^i$ irrespective of responder's acceptance threshold and responder j, with $j \neq i$, earns y^i when $\underline{y}_j^I < y^i$ and zero otherwise;
- in UG, proposer i, with either $i = e$ or $i = o$, earns $P_i - y^i$ and payoff of responder j, with $j \neq i$, is y^i when the offer is accepted, i.e. when $\underline{y}_j^U < y^i$; payoff of both, proposer and responder is zero when the offer is rejected, i.e. when $\underline{y}_j^U > y^i$;
- in YN, proposer i, with either $i = e$ or $i = o$, earns $P_i - y^i$ and responder j, with $j \neq i$, earns y^i when the offer is unconditionally accepted, i.e. when $\delta_j = 1$; both, proposer and responder, earn zero when the offer is unconditionally rejected, i.e. when $\delta_j = 0$.

Compared to UG and YN, the responder in IG has no material punishment power but still choice in determining $\underline{y}^I$ and "voice", which is granted by informing the allocator whether $y^i > \underline{y}_j^I$ or $y^i < \underline{y}_j^I$ applies.[14] The benchmark solutions, based on common monetary opportunism and (at most) once repeated elimination of weakly dominated strategies, are:

- in IG and UG, responder i sets $\underline{y}_i^I = \underline{y}_i^U = 0$ when $i = e$ and $\underline{y}_i^I = \underline{y}_i^U = 1$ when $i = o$, while in YN responder i, with $i = e, o$, sets $\delta_i = 1$, and
- in each game type, proposer i, with $i = e, o$, sets $y_i^+ = y_i$ and $y_i^- = 0$ if $i = e$ and $y_i^- = 1$ if $i = o$.

[13] Due to $P_o = €23 > P_e = €22$ the available €-amount differs between o and e as to allow, both, o and e, to offer the whole endowment.

[14] In the terminology of Yamagishi et al. (2009) we have implemented a non-private IG.

Therefore, for all games the outcome prediction is the lowest positive offer (in YN, also the second lowest)[15], hence no generosity of proposers.[16] Regarding the y_i-choices, the prediction is unclear: if not actually offering, one's choice of y_i is payoff irrelevant. If selected as actual proposer, one can implement any final offer y^i via $y_i = y^i$ and not adapting. However, one can also adapt to whatever final offer y^i via y_i^+ and y_i^- by extreme ($y_e = 0$ when $i = e$ or $y_o = 23$ when $i = o$) y_i-choices.

3 The Experimental Protocol

Each subject is confronted with all game types whose sequences monotonically vary (between-subjects) in veto power: in treatment T1, veto power is decreasing due to UG−YN−IG order, and in treatment T2 with the reverse order veto power is increasing. Games with strongest (UG), respectively no (IG) sanctioning power of responders are played either first, to allow for their comparison without path dependence, or last to assess the experience effects with the two other game types. To distinguish spillover effects from experiences with related games from learning to play the same game repeatedly, each game type is played three times before switching to another game or having reached the last (ninth) round.[17]Only one randomly selected round of one randomly selected game, i.e. one of altogether nine successive rounds is paid (to avoid experimental house-money effects).

To guarantee newly formed pairs of allocator candidates, in each round two pairs A and B of participant pairs whose members are subject to a different integer restriction are matched.[18] The randomly endowed candidate and actual proposer i, with $i = e, o$, in one pair is matched with the non-endowed candidate and actual responder j, with $j \neq i$, in the other pair. Therefore the factual offer by i-proposer in pair A (denoted y_A^i in Figure 1) is accepted or rejected by j-responder in pair B and the factual offer by i-proposer in pair B (denoted y_B^i in Figure 1) is accepted or rejected by

[15]For $y_e = 0$ in YN both, acceptance and rejection, are best responses, i.e. there exist two (pure strategy) equilibria.

[16]UG has other equilibria with other, also fair, outcomes. These, however, rely on weakly dominated response strategies which would not survive once repeated elimination.

[17]All three sharing games were easily understood by participants and three rounds seemed sufficient to indicate learning.

[18]Participants were informed about random rematching in each round.

j-responder in pair A. Thus conditioning is based on comparing intended offers within a pair (the dashed bi-directed arrows in Figure 1) whereas offers are made across pairs (the one-direction bold arrows in Figure 1)

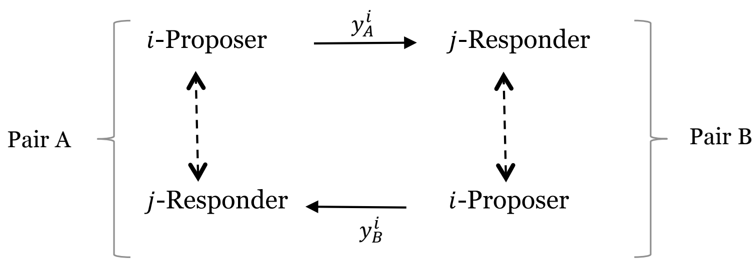


Figure 1: The matching within and between pairs.

In each round, participants are privately informed about their (odd or even) integer restriction for their choices. Then their offers (y_i, y_i^+, y_i^-) and acceptance behavior $(\underline{y}_i^I, \underline{y}_i^U$, or $\delta_i)$ are elicited via the strategy vector method. Finally, participants are informed about their role in the current round (endowed proposer or needy responder).

As for feedback information, responders learns the actual offer y when accepting it; when rejecting only their payoff (zero) is communicated. Proposers learns about own payoff and about acceptance or rejection, which is explicitly communicated in the (non-private) IG, and can be usually (for $y^i < P_i$) inferred from their 0-payoff in UG and YN. Proposers remain unaware of the acceptance threshold $\underline{y}_2^U$ and $\underline{y}_1^I$, respectively. Both actual players know after playing how much each of them has earned and in which role. (see Table 1)

Table 1: Feedback by treatments

	Endowed Proposer	Needy Responder
IG game	Role, Final payoff and Responder's payoff	Role and Final payoff
UG game	Role and Final payoff	Role and Final payoff
YN game	Role and Final Payoff	Role and Final payoff

In total 144 participants were recruited from a pool of (under)graduate students in Economics, Law and Political Science at Luiss Guido Carli University in Rome using Orsee (Greiner, 2015).

No subject participated in more than one session. Between-subject sessions T1 and T2 used the same protocol in the reverse order. The software is based on z-Tree (Fischbacher, 2007). The experimenter read aloud the written instructions (see the translated instructions in Appendix A) before subjects could privately ask questions and starting the experiment.

4 Evidence of conditioning

We confirm that participants condition own offers on purely counterfactual intended generosity: offer profiles (y_i, y_i^+, y_i^-) with $y_i^+ > y_i^-$ amount to 831 out of 1296 (64.12%),[19] and, in those cases, the average difference $y^+ - y^-$ is quite substantial (4.628).[20] Thus reacting to another's generosity intention can considerably increase the own sacrifice (see Table 2, All Games).

Result 1 *Nearly two thirds of all offer profiles (y_i, y_i^-, y_i^+) leave substantial room for reacting to another's generosity intention via $y^+ - y^-$ being positive.*

Looking at offer profiles by type of game, we find that, in addition to the influence of an anonymous other, participants care also for own material self-interest, which is enhanced when adjusting downward but harmed when adjusting upward (see Table 2, last column).

Result 2 *Most offer profiles allowing for conditioning adjust in a self-serving way more down- than upward. In fact, $y_i - y_i^- > y_i^+ - y_i$ is significant for all three games and both treatments.*

We expected a majority of reacting participants but less reactivity (at least in adjustment size) in case of sanctioning power when strategic concerns might question weak social influence. In IG down- and upward adjustments do not systematically and significantly differ from those in the two control games UG and YN (except for upward adjustments in UG, treatment T1).

Figure 2 illustrates the evolution of offer profiles across rounds in the three games for both treatments. It reveals no significant treatment effect on offers in IG but it shows that average offers

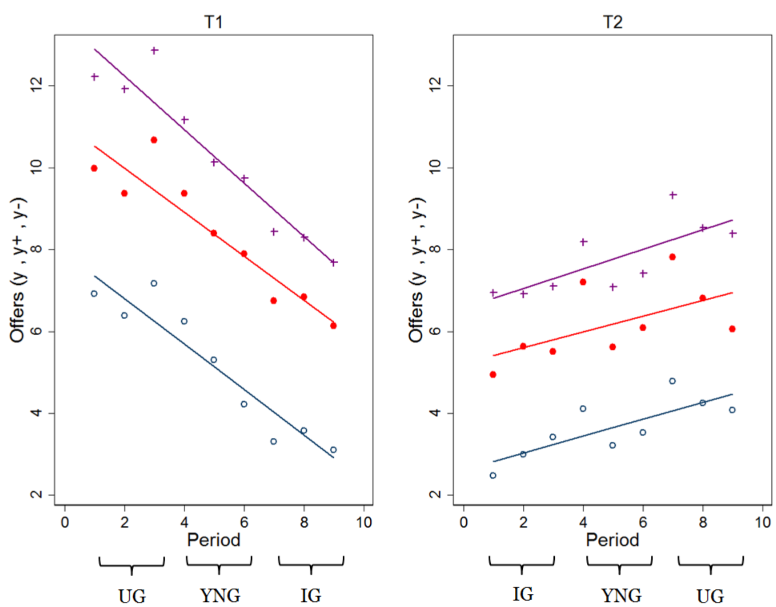
[19]Since $y_i^+ \geqslant y_i \geqslant y_i^-$ by assumption, there are no offer profiles with $y_i^+ < y_i^-$.
[20]In what follows, y^+, y^- will denote average values.

y, y^+ and y^- in the two control games are lower in treatment T2 than in treatment T1 (see Table 2 for associated statistical tests): fairness concerns in UG are weaker when played after other games. All offer types display an essentially low single peak only for YN and IG whereas for UG this applies only to offers y^- (see Figure 6 in Appendix B).[21]

As far as response behavior is concerned, responders in IG (with no veto power) set systematically lower acceptance thresholds than UG responders who claim nearly twice as much in treatment T1 (see Table 2). There is no treatment effect on response behavior in IG (acceptance thresholds in T1 and T2 do not significantly differ) whereas UG acceptance thresholds are higher in treatment T1. Such anticipating and more opportunistic response when playing UG later is in line with the much lower average acceptance thresholds, $\underline{y}^G$ in treatment T2.[22]

The acceptance share in YN is close to 100%, in line with earlier YN-experiments (see Güth and Kocher, 2014).

Figure 2: Independent offer and adjustments by treatment



Notes: Average values per period are indicated by $+$ for y^+, $\bullet$ for y, and $\circ$ for y^-.

[21]This is in line with previous experiments without conditioning (see Güth and Kocher, 2014, for references).

[22]Whether $y \geqslant \underline{y}^G$ or $y \geqslant \underline{y}^I$ holds allows to verify participants' consistency in that otherwise they would not accept their own offer. Such consistency is higher in UG (71% of adjusted offers satisfy $y^+, y^- \geqslant \underline{y}^G$) than in IG (43% of adjusted offers satisfy $y^+, y^- \geqslant \underline{y}^I$).

Table 2: Average offers y, y^+, y^-, acceptance thresholds $\underline{y}^G, \delta, \underline{y}^I$ and differences $y^+ - y$, $y - y^-$

All Games						
	y	y^+	y^-		$y^+ - y$	$y - y^-$
T1 and T2 (1296)	7.278	9.023	4.395		1.745	2.883
T1(648)	8.373	10.278	5.139		1.904	3.235
T2(648)	6.182	7.769	3.651		1.586	2.531
WRST	0.000	0.000	0.000		0.000	0.000
	UG					
	y	y^+	y^-	$\underline{y}^G$	$y^+ - y$	$y - y^-$
T1 and T2 (432)	8.444	10.542	5.597	3.639	2.097	2.847
T1(216)	10.000	12.333	6.824	4.685	2.333	3.176
T2(216)	6.889	8.750	4.370	2.593	1.861	2.519
WRST	0.000	0.000	0.000	0.000	0.001	0.023
	YN					
	y	y^+	y^-	$\delta(\%)$	$y^+ - y$	$y - y^-$
T1 and T2 (432)	7.421	8.958	4.440	0.986	1.537	2.981
T1(216)	8.546	10.352	5.259	0.991	1.806	3.287
T2(216)	6.296	7.565	3.620	0.981	1.269	2.676
WRST	0.000	0.000	0.000	0.412	0.004	0.023
	IG					
	y	y^+	y^-	$\underline{y}^I$	$y^+ - y$	$y - y^-$
T1 and T2 (432)	5.968	7.569	3.148	2.315	1.602	2.819
T1(216)	6.574	8.148	3.333	2.454	1.574	3.241
T2(216)	5.361	6.991	2.963	2.176	1.630	2.398
WRST	0.059	0.146	0.422	0.162	0.844	0.309

Notes: In parenthesis the number of observations. Average treatment effects are compared using Wilcoxon Rank-Sum Test (p-values are reported for both average proposals and their differences).

Result 3 *The treatment effect is game dependent:*

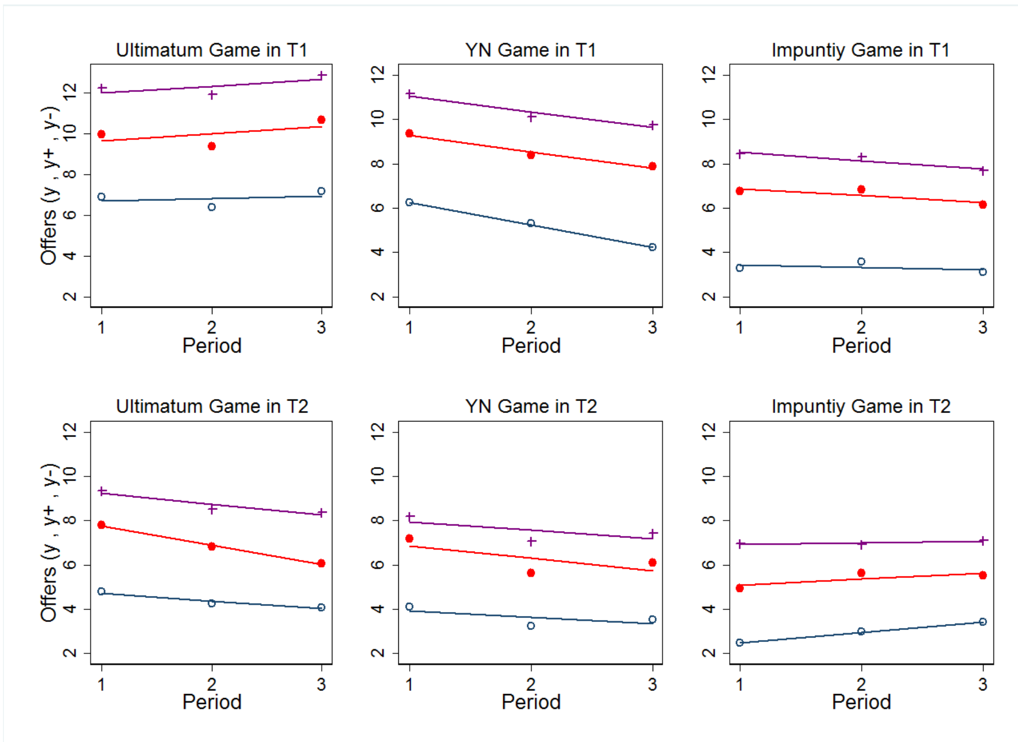
(i) for IG differences in offers and acceptance thresholds when played first or last are minor and mostly insignificant,

(ii) for UG average offers and acceptance thresholds are much and significantly smaller when UG is played last,

(iii) for YN it does not matter for response behavior whether it is preceded by UG or IG but average offers are significantly smaller when YN is preceded by IG rather than by UG.

The treatment effects across game types reported in Results 3, and visualized also in Figure 3, substantiate that conditioning in IG is a stable inclination but partly, in UG and YN, context dependent. The latter justifies our more systematic attempt to assess conditioning not only in case of impunity but also when sanctioning is possible. Overall most context dependent participants allow themselves to be influenced by whether another intends to help more, respectively less. In our view, this suggests that (intrinsic) generosity concerns are not given but have to be cognitively generated, depending on the type of game played presently as well as before.

Figure 3: Independent offer and adjustments by game and treatment



Notes: Average values per period are indicated by $+$ for y^+, $\bullet$ for y, and $\circ$ for y^-.

The offer profiles dynamics are further investigated in the regression analysis of Table 3, based on 12 normalized offer levels $n_i, n_i^+, n_i^- = 0, 1, 2, 3, ..., 11$,[23] which are explained by profits and role in the previous round.[24] In IG, being a proposer has a positive effect on offers in the following round, implying that people are willing to help more when having been endowed before. In UG, this is true only when one's proposal had been accepted (see Appendix B, Table 7); when proposals were rejected offers in the following round are lower. Past profit has a negative effect on offers in IG and YN: people become greedier after higher payoffs in the previous period. Checking whether

[23]The offers are rescaled via $n_i = \frac{y_i - 1}{2}$ when $i = o$ and $n_i = \frac{y_i}{2}$ when $i = e$. In this way, each offer is associated with a value between 1 and 11, consistent with the choices ranging either from 0 to 22 or from 1 to 23.

[24]We estimated all models with panel data regression. The analysis is consistent when we consider the 12 possible allocations or the full offer profiles for even and odd participants; nevertheless censored regression model was more accurate for the current analysis. We ran also a multilevel analysis to account for different groups: the likelihood ratio test, testing for the multilevel model, rejects the between-group variations.

being an odd allocator candidate has an impact on offers reveals that when odd, there are more negative adjustments to the minimum level.

Table 3: Choice dynamic by Game

	(1) UG	(2) YN	(3) IG	(4) UG	(5) YN	(6) IG	(7) UG	(8) YN	(9) IG
		n			n^+			n^-	
L.Proposer	0.61	1.37*	4.97***	0.40	1.47*	6.21***	0.52	1.35**	4.48***
	(0.40)	(0.79)	(1.42)	(0.41)	(0.85)	(1.50)	(0.33)	(0.67)	(1.32)
L.Profit	-0.02	-0.13**	-0.30***	-0.04	-0.15**	-0.39***	-0.04*	-0.14***	-0.30***
	(0.03)	(0.06)	(0.08)	(0.03)	(0.06)	(0.09)	(0.02)	(0.05)	(0.07)
Odd	-0.12	0.00	-0.94	0.12	-0.27	-1.34**	-1.03***	-0.40	-1.15**
	(0.41)	(0.54)	(0.61)	(0.38)	(0.55)	(0.63)	(0.31)	(0.44)	(0.50)
Treatment	-2.07***	-2.00**	-0.89	-2.10***	-2.01**	-0.76	-1.61***	-1.36**	-0.18
	(0.49)	(0.80)	(0.81)	(0.51)	(0.81)	(0.87)	(0.37)	(0.62)	(0.60)
Cons	6.63***	5.87***	3.97***	8.04***	7.20***	5.20***	5.15***	3.57***	1.54
	(0.81)	(1.32)	(1.32)	(0.84)	(1.37)	(1.45)	(0.59)	(1.06)	(1.02)
σ cons	3.27***	4.79***	4.77***	3.29***	4.90***	5.14***	2.56***	3.67***	3.60***
	(0.20)	(0.31)	(0.35)	(0.17)	(0.29)	(0.32)	(0.15)	(0.29)	(0.31)
N	288	288	288	288	288	288	288	288	288
LL	-708.49	-652.48	-608.18	-736.86	-698.38	-666.38	-611.11	-529.90	-466.66
pseudo R^2	0.02	0.01	0.02	0.02	0.01	0.02	0.03	0.02	0.04
F	5.27	3.30	4.94	4.86	3.30	6.81	7.86	4.43	6.31

Notes: Tobit estimation with robust errors (clustered on individuals).
$n_i = \frac{y_i - 1}{2}$ when $i = o$ and $n_i = \frac{y_i}{2}$ when $i = e$
$n_i^+ = \frac{y_i^+ - 1}{2}$ when $i = o$ and $n_i = \frac{y_i^+}{2}$ when $i = e$
$n_i = \frac{y_i^- - 1}{2}$ when $i = o$ and $n_i = \frac{y_i^-}{2}$ when $i = e$

5 Efficiency analysis

We assess the average acceptance rate across games and the associated efficiency: in IG the only efficiency loss are the rejected offers, while in YN and UG the whole pie $P_i, i = e, o,$ is lost when the offer is not accepted. Table 4 lists the average payoff by acceptance rate in the three games (where 'Total' refers to both, accepted and rejected offers). There is less acceptance in IG than in UG and in UG than in YN. The average payoff in IG is not significantly lower than in YN (WRST, p-value $= 0.8$)[25] and significantly higher than in UG (WRT, p-value < 0.001). The latter result is clearly due to the rejected offers in UG, accounting almost for 30% of all offers: although the rejection rate in IG is higher (36%), its average payoff loss is smaller as its proposer is not harmed and offers on average less. Therefore, as expected, the average proposer payoff in case of acceptance

[25] All tests reported are two-sided, when not specified. WRST stands for Wilcoxon Rank Sum Test.

is higher in IG (17.478 versus 13.66 in UG and 16.95 in YN) while responder payoffs are higher when accepting in UG (8.77 versus 5.21 in IG and 5.5 in YN).

To analyze efficiency independently of random selection we also compared the average payoffs of actual plays (Table 4) with those of simulated plays[26] (Table 5) when either of them is selected and confronted with the acceptance threshold $\underline{y}^G$, respectively $\underline{y}^I$ of the respective responder.[27] The simulated results, relying only on first round and thus independent choices include all possible pairs of participants, allow for a robustness check of our efficiency analysis.

Table 4: Payoff analysis by acceptance rate (actual plays)

			Proposer Payoff (UG)		Responder Payoff (UG)	
	Freq.	%	Mean	Std. Dev	Mean	Std. Dev
Rejected deals	126	29.167	0.000	0.000	0.000	0.000
Accepted deals	306	70.833	13.660	5.149	8.771	5.091
Total	432	100	9.676	7.581	6.213	5.856
			Proposer Payoff (YN)		Responder Payoff (YN)	
	Freq.	%	Mean	Std. Dev	Mean	Std. Dev
Rejected deals	6	1.389	0.000	0.000	0.000	0.000
Accepted deals	426	98.611	16.958	5.218	5.521	5.195
Total	432	100	16.722	5.550	5.444	5.199
			Proposer Payoff (IG)		Responder Payoff (IG)	
	Freq.	%	Mean	Std. Dev	Mean	Std. Dev
Rejected deals	156	36.111	21.128	2.054	0.000	0.000
Accepted deals	276	63.889	17.478	5.071	5.210	4.867
Total	432	100	18.796	4.581	3.329	4.624

Notes: Profit average, standard deviations by offers acceptance.

Table 5: Payoff analysis by acceptance rate (simulated data)

			Proposer Payoff (UG)		Responder Payoff (UG)	
	Freq.	%	Mean	Std. Dev	Mean	Std. Dev
Rejected deals	22528	24.832	0	.	0	.
Accepted deals	68192	75.168	12.024	4.680	10.531	4.592
Total	90720	100	9.038	6.592	7.916	6.046
			Proposer Payoff (IG)		Responder Payoff (IG)	
	Freq.	%	Mean	Std. Dev	Mean	Std. Dev
Rejected deals	39725	43.789	21.292	1.584	0	.
Accepted deals	50995	56.211	16.815	4.601	5.675	4.609
Total	90720	100	18.775	4.235	3.190	4.457

Notes: Profit average, standard deviations by offers acceptance (simulated results).

[26] We rely on $N = 72$ participants for UG and $N = 72$ participants for IG. A participant is paired with half ($\frac{N}{2}$) of the other allocator candidates, namely those of the other type (o and e) which determines the adjusted offers of this participant and for each of them is paired with the remaining other allocator candidates ($\frac{N}{2} - 1$) which determines the acceptance threshold of responders. This yields in total 1260 combinations for each individual in the first round.

[27] Recall that randomly selecting a proposer candidate in one pair also selects the proposer candidate of the other pair since each interacting pair involves an $e-$and an $o-$player.

The results of the simulated plays essentially confirm those for actual plays (see Table 5): the rejection rate is higher in IG (44%) than in UG (25%); proposer payoffs in case of acceptance are higher in IG (16.8) than in UG (12.0) whereas responder payoffs are higher in UG (10.5) than in IG (5.7).[28]

6 Categorization of offer profiles and individuals

Our data support other-regarding concerns as established in the literature (see especially Bolton and Ockenfels, 2000 and Fehr and Schmidt, 1999), but also show that there is considerable heterogeneity. In our setting, heterogeneity in conditioning can be explored via individual offer profiles by distinguishing the following mutually exclusive patterns:

- *Reactive*: if $y^+ - y > 0$ and $y - y^- > 0$, one both increases and decreases the initial offer in response to the intended offer of the other allocator candidate.

Reactive offer profiles can be further differentiated via:

- *Reactive selfserving* (R.s): $y^+ - y < y - y^-$, i.e. one reduces one's initial offer more than one increases it;

- *Reactive non-selfserving*: (R.ns) if $y - y^+ \geqslant y - y^-$, i.e. one is reactive but not selfserving.

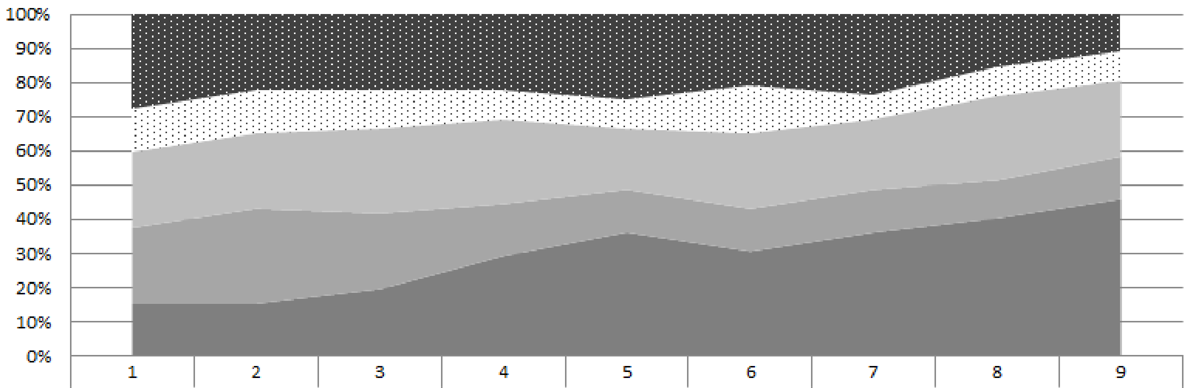
A participant, who is not reactive, may still adjust the intended offer, however only in one direction. We refer by pattern to adapting only in one way and distinguish:

- *Adapting Downward* (D) if $y - y^- > y^+ - y = 0$ and, more rarely

- *Adapting Upward* (U) if $y - y^- = 0 < y^+ - y$.

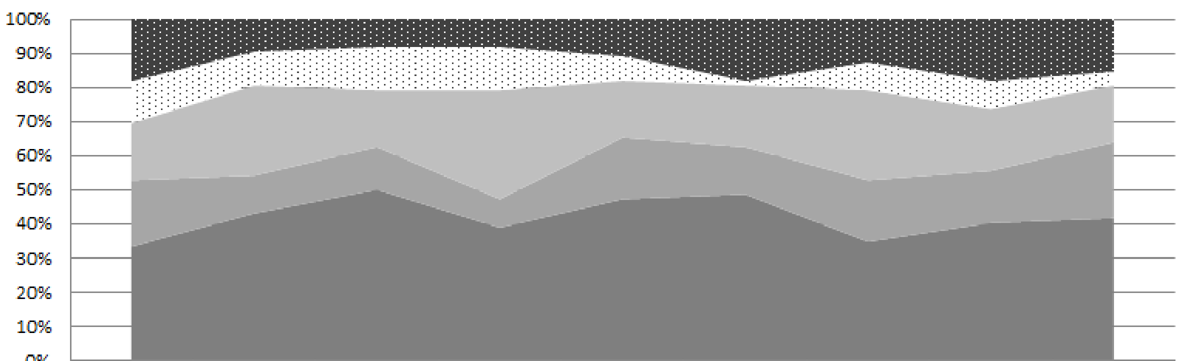
Finally immune pattern (I) means not adapt at all:

- *Immune* (I) if $y^- = y = y^+$.



	1	2	3	4	5	6	7	8	9
	UG			YN			IG		
Rns	0.28	0.22	0.22	0.22	0.25	0.21	0.24	0.15	0.11
Rs	0.13	0.13	0.11	0.08	0.08	0.14	0.07	0.08	0.08
D	0.22	0.22	0.25	0.25	0.18	0.22	0.21	0.25	0.22
U	0.22	0.28	0.22	0.15	0.13	0.13	0.13	0.11	0.13
I	0.15	0.15	0.19	0.29	0.36	0.31	0.36	0.40	0.46

Figure 4: Types distribution by period in treatment T1



	1	2	3	4	5	6	7	8	9
	IG			YN			UG		
Rns	0.18	0.10	0.08	0.08	0.11	0.18	0.13	0.18	0.15
Rs	0.13	0.10	0.13	0.13	0.07	0.01	0.08	0.08	0.04
D	0.17	0.26	0.17	0.32	0.17	0.18	0.26	0.18	0.17
U	0.19	0.11	0.13	0.08	0.18	0.14	0.18	0.15	0.22
I	0.33	0.43	0.50	0.39	0.47	0.49	0.35	0.40	0.42

Figure 5: Types distribution by period in treatment T2

Figures 4 and 5 visualize the distribution of types across the nine rounds by games, separately for treatment T1 and T2. In IG, as expected, the share of immune patterns is larger than in the other games, both in treatment T1 (46% in the last round) and T2 (50% in the last round). Furthermore,

[28] One may ask whether odd and even participants differ in average and/or role dependent earnings: the average profit is significantly higher for odd proposers and even responders according to the simulated and actual plays (see Table 8 in Appendix B).

the immune share is rather stable in IG so that the reacting and adapting pattern together account for at most 50% in IG. In UG, on the other hand, the share of the immune pattern is larger in T2 (49% in the last round) than in T1 (19% in the last round). Overall, we observe that conditioning survives repeated play of different games, irrespective of their sequence.

On the individual level,[29] we distinguish participants who consistently are either of the $I-$ or $R-$type in all three rounds of a given game. As expected, the average offer of I-types is particularly low in IG and increases when the game becomes more strategic in the sense of not monitoring offers, YN, and monitoring offers and possibly sanctioning only low ones, UG (see Table 6). Always reacting participants have a similar frequency in IG and UG. Moreover, their initial offers are similar in the two game types. However, one adjusts average offers in IG more than in UG, both upward and downward.

Table 6: Immune and reacting participants average offers and acceptance behavior

	UG			
	y	y^+	y^-	$\underline{y}^G$
Always Immune (72)	4.639	4.639	4.639	2.000
Always Reacting (48)	10.604	14.271	6.938	4.979
WRST	0.000	0.000	0.000	0.000
	YN			
	y	y^+	y^-	$\delta(\%)$
Always Immune (117)	3.103	3.103	3.103	1.000
Always Reacting (66)	10.212	13.606	6.455	0.955
WRST	0.000	0.000	0.000	0.020
	IG			
	y	y^+	y^-	$\underline{y}^I$
Always Immune (129)	0.899	0.899	0.899	1.039
Always Reacting (57)	10.263	15.281	5.526	3.947
WRST	0.000	0.000	0.000	0.000

Notes: The two groups are consistently adopting the same strategy all three periods of UG, YN and IG respectively. Average offers between groups are compared using Wilcoxon Rank-Sum Test (p-values are reported for both average proposals and their differences).

[29]Figure 7 (in Appendix B) visualizes how often individual participants adhere to two of the four possible categories I, R, D and U, separately for UG and IG and treatments T1 and T2. In each of the four diagrams the upper left square provides the frequency scatter plots of the $I, R-$ frequencies, below first the $I, D-$ and then the $I, U-$ frequencies, etc. Belonging often to both categories is more systematic when combining R, D and U and more markedly so for UG, T1and T2 and IG, T2.

7 Conclusions

Our setup explores the weakest social influence by restricting it to qualitative information about the intention of just one anonymous other which, furthermore, is purely counterfactual: we excluded any competition in helping by endowing only one of two candidates. Although only the impunity game IG elicits reliably purely intrinsic generosity, we controlled for sanctioning power via the yes-no game YN and the ultimatum game UG with the same benchmark outcome. This has been done to test whether sanctioning power per se and, via sequence treatments, T1 and T2, also experience with sanctioning power question social influence.

The evidence of conditional generosity, as revealed by $y^+ - y$, $y - y^-$ and $y^+ - y^-$ across all three games and both sequence treatments is surprisingly strong although there exists also significant immunity, i.e not reacting to social influence: a non-negligible share of participants maintains their independent offers but adjusting dominates.

It is interesting that being socially influenced is correlated with fairness concerns in the sense of offering considerably more whereas immunity is more guided by strategic considerations. The likely explanation is that "greed" renders one immune to social influence[30] whereas fairness concerns, for instance, based on social norms, let one respond to what others, in our setup just one anonymous other, might do. Altogether our results (and especially IG-conditioning) confirm our main intuition that (intrinsic) generosity is mostly prone to social influence, even very weak one.

In our view, this questions rational choice explanations of empirical findings by "social preferences". Trying to estimate or calibrate social preference parameters via dictator, IG or UG-data (e.g. like Bolton and Ockenfels, 2000 and Fehr and Schmidt, 1999) may not assess reliable fairness or generosity concerns, except for immune, (I-type) participants.

[30] In view of the (dictator) taking, observed in Bardsley (2007) and List (2007), even small positive offers may be judged as generous by greedy participants.

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8 Appendix A

Translated instruction for treatment T1.

INSTRUCTIONS TO PARTICIPANTS

Introduction

Welcome to our experiment!

During this experiment, you as well as the other participants will have to take several decisions.

Please read the instructions carefully. Your decisions, as well as the decisions of the other participants will determine your payoff according to rules, which will be explained shortly. The earnings during the experiment are expressed in euros (€). In addition to the earnings obtained over the course of the experiment, you will receive a show-up fee of €3.00.

Please note that hereafter any form of communication between the participants is strictly prohibited. If you violate this rule, you will be excluded from the experiment with no payment. If you have any questions, please raise your hand. The experimenter will come to you and answer your questions individually.

Description of the Experiment

This experiment is fully computerized. After reading the instructions, before starting the experimental task, you will have to answer to few control questions; these questions are going to help you to understand the experimental task, and they have no effect on your final earnings.

The experiment is composed by 5 control questions (to help you understanding the experiment), three phases (Phase I, Phase II and Phase III) and a final questionnaire. Each phase lasts 3 rounds and in each round you can be a proposer or a responder. Your role will be randomly selected by the computer with probability equal to ½ and communicated at the end of each round.

The proposer will be endowed with an initial amount of euros which can be shared with a responder in the experiment. A responder will have no endowment and can accept or reject the offer of the proposer.

Note: Your task in each round is to make choices that pertain your role as a proposer and your role as a responder. Beware that you will have to take your decisions <u>before knowing if you will be a proposer or a responder</u>.

Phase I

At the beginning of each round in Phase I, you will be selected either as *O*(dd) participant or as an *E*(ven) participant with probability 1/2. If you are *E* your initial endowment is €22 and you can allocate only even values. If you are *O* your initial endowment is €23 and you can allocate only odd values.

After that, you will be randomly paired with another participant, whose identity will not be disclosed to you. If you are an *O*(dd) participant, you will be paired with an *E*(ven) participant; similarly, if you are an *E*(ven) participant, you will be paired with an *O*(dd) participant. The paired participant will always be different from the one in the previous round.

Both you and your paired participant are asked to take the following decisions:

1. first, you have to decide, individually and independently, how much of your endowment you to want to give to a responder (different from your paired participant) if you will be selected as a proposer. If you are an *O*(dd) participant, you can choose one between these numbers $\{1,3,\ldots,21,23\}$. If you are an *E*(ven) participant, you can choose one of the numbers $\{0,2,4,\ldots,20,22\}$.

   Observe that both types of participants have the same number of possible choices, i.e. twelve, and that the difference between the minimum and the maximum choice, i.e. 22€, is the same for both types of participant.

2. Second, you have to decide, individually and independently, how much you want to update your initial proposal if you will be selected as a proposer in the two following situations:

   - <u>the proposal of your paired participant is larger than yours</u>; in this case you can either confirm or increase your initial proposal;
   - <u>the proposal of your paired participant is smaller than your</u>; in this case you can either confirm or decrease your initial proposal.

   Remember that in each of the two cases, your updated proposal can only be an odd number or even number depending on whether you are an O or an E candidate.

   Note: Beware that you will be asked to update your initial proposal before knowing if the other has decided to propose more than you or less than you.

3. Third, you have to decide, individually and independently, what proposals you will accept if you will be selected as a responder. In particular, you have to decide an acceptance threshold such that all proposals larger than the threshold will be accepted and all proposals lower than the threshold will be rejected.

Remember that the acceptance threshold can only be an odd number or even number depending on whether you are an O or an E candidate.

After all participants have taken their decisions regarding the initial proposal, the updated proposals and the acceptance threshold, the computer will

- adjust the proposals of each participant depending on whether the initial proposal of the paired participant is larger or smaller than the own one;
- select, for each pair of participant, who is the proposer and who is the responder;
- randomly match each proposer with a responder from a *different* pair than the initial one and, similarly, randomly match each responder with a proposer from a *different* pair than the initial one.

Observe that:

- *O*(dd) proposers will be matched with *E*(ven) receivers and that *E*(ven) proposers will be matched with *O*(dd) receivers;
- the proposal communicated to the receiver will be the adjusted one (and not the initial one).

Your payoff in each round of Phase I will be calculated as follows:

- if you are a proposer, your payoff will be equal to
    - your endowment minus your offer when your offer is above the responder's acceptance threshold;
    - zero, when you offer is below the responder's acceptance threshold;
- if you are a receiver, your payoff will be equal to
    - the proposer's proposal if this is larger than your acceptance threshold;
    - zero if the proposal is smaller than your acceptance threshold.

At the end of each round the computer communicates:

- if you are proposer or responder;
- your payoff.

NOTE: The computer <u>will not inform</u> you about the initial proposal of the paired participant with whom you interact at the beginning of each round.

Phase II

In Phase II, proposers are asked to take the same type of decisions described in Phase I, therefore, the same instructions apply in this case.

The decision that you have to take for the case in which you will be selected as receiver is different in this Phase. In particular, in Phase II you have to state, individually and independently, if you want to accept or refuse the proposal you will receive by selecting one of the two options {Yes, No}.

Remember that you have to state your decision without knowing the proposal you will receive.

Your payoff in each round of Phase II will be calculated as follows:

- if you are a proposer, your payoff will be equal to
    - the initial endowment minus your proposal if the receiver selected the Yes option;
    - zero if the receiver selected the No option;
- if you are a receiver, your payoff will be equal to
    - the proposer's proposal if you selected the Yes option;
    - zero if you selected the No option.

At the end of each round the computer communicates:

- if you are proposer or responder;
- your payoff.

Phase III

In Phase III, proposers are asked to take the same type of decisions described in Phase I and Phase II, therefore, the same instructions apply in this case.

The decision that you have to take for the case in which you will be selected as receiver is different in this Phase. In particular, in Phase III you have to state, individually and independently, what proposals you will accept if you will be selected as a responder. In particular, you have to decide an acceptance threshold such that all proposals larger than the threshold will be accepted and all proposals lower than the threshold will be rejected.

Your payoff in in each round of Phase III will be calculated as follows:

- if you are a proposer, your payoff will be equal to your endowment minus your offer both in case the offer is above or below the responder's acceptance threshold;

- if you are a receiver, your payoff will be equal to
  - the proposer's proposal if this is larger than your acceptance threshold;
  - equal to zero if the proposal is smaller than your acceptance threshold.

At the end of each round the computer communicates:

- if you are proposer or responder;
- if your are a proposer, your payoff and the payoff of the responder who received your proposal;
- if you are a receiver, your payoff.

Your final earning for this Experiment

After completing the experiment, a lottery administrated by the computer will randomly select one round to be considered for payment. Each round has the same probability to be selected (1/9). The result lottery will be displayed on your screen with the corresponding payoff you made in that round.

Your total payoff from the experiment will be equal to the sum of:

- the payoff that you realised in the selected round;
- the participation fee of €3.

At the end of the experiment, but before receiving your payoff, you will be asked also to fill up a short questionnaire about your demographics and other few questions. Please remain at your cubicle until asked to come forward and receive the payment for the experiment.

9 Appendix B

Figure 6: Frequency for offers allocation y, y^+, y^- (from 0 to 23)

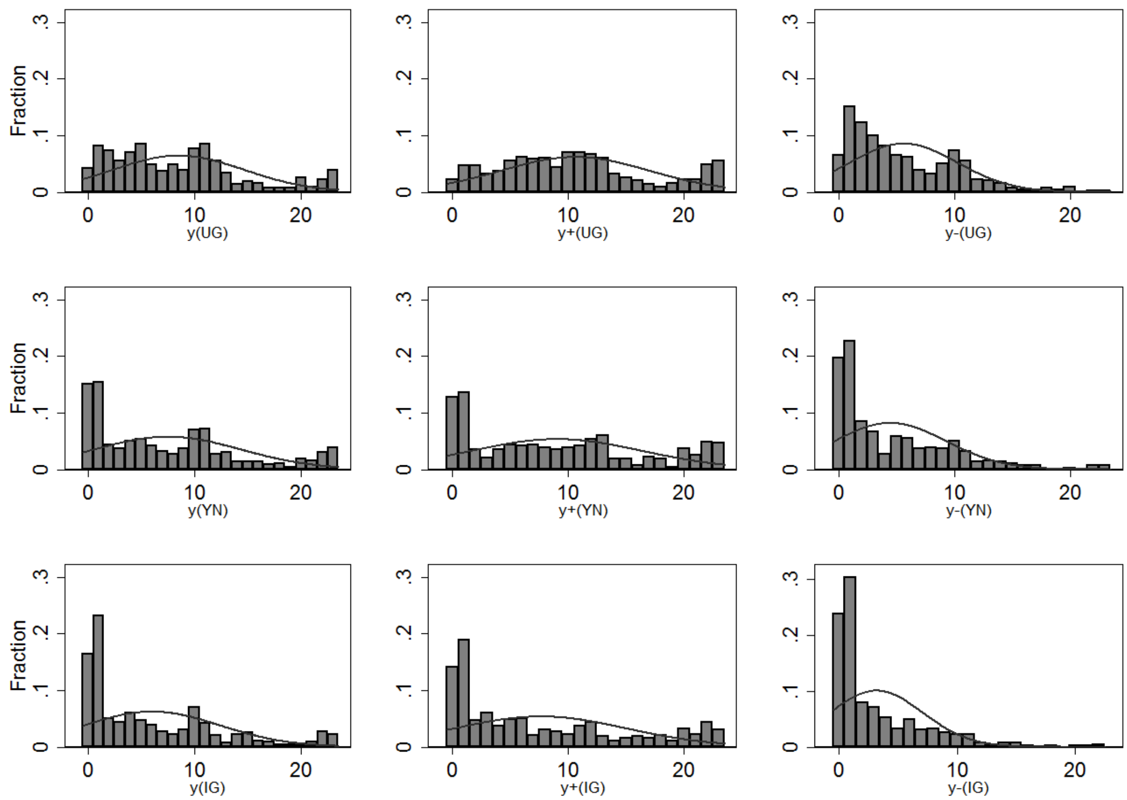

Table 7: Choice dynamic by Game

	(1) UG	(2) YN	(3) IG	(4) UG	(5) YN	(6) IG	(7) UG	(8) IG
		n			n^{+}		n^{-}	
L.Proposer	-1.31	3.11	4.63**	-1.75**	-2.10	5.63**	-1.33**	2.85
	(0.80)	(5.96)	(2.19)	(0.76)	(5.84)	(2.40)	(0.63)	(1.84)
L.Success	-0.94	4.79	1.13	-0.68	0.81	1.59	-1.11*	0.81
	(0.78)	(3.35)	(0.95)	(0.80)	(2.95)	(1.05)	(0.61)	(0.74)
L.Proposer$times$ Success	2.95***	-1.53	0.50	3.42***	3.89	0.73	2.82***	1.66
	(0.97)	(6.04)	(1.56)	(0.94)	(5.93)	(1.71)	(0.76)	(1.22)
L.Profit	-0.07	-0.15**	-0.30***	-0.12***	-0.17**	-0.38***	-0.08**	-0.27***
	(0.05)	(0.06)	(0.09)	(0.04)	(0.07)	(0.10)	(0.04)	(0.08)
Odd	-0.19	0.02	-0.77	0.03	-0.30	-1.10*	-1.10***	-0.96*
	(0.42)	(0.56)	(0.60)	(0.39)	(0.56)	(0.62)	(0.32)	(0.49)
Cons	4.54***	-1.72	1.86**	5.90***	3.53	2.96***	3.77***	0.63
	(0.55)	(3.37)	(0.77)	(0.57)	(2.93)	(0.78)	(0.45)	(0.58)
σ cons	3.37***	4.86***	4.75***	3.37***	4.99***	5.07***	2.62***	3.52***
	(0.21)	(0.32)	(0.36)	(0.17)	(0.29)	(0.32)	(0.16)	(0.30)
N	288	288	288	288	288	288	288	288
LL	-708.49	-652.48	-608.18	-736.86	-698.38	-666.38	-611.11	-466.66
pR^2	0.01	0.01	0.02	0.01	0.01	0.03	0.02	0.05
F	2.57	1.55	5.61	3.78	1.36	8.62	5.99	8.49

Notes: Tobit estimation with robust errors (clustered on individuals). "Success" is a variable equal to 1 every time the offer has been accepted, both for proposer and responder. Success is 0 for proposer in IG when the offer was refused even though this does not have an effect on the proposer payoffs.

Table 8: Profit analysis by role and type (even or odd), simulated results

	Proposer Profit				Responder Profit			
	Obs	Mean	Std.Error	Std. Dev.	Obs	Mean	Std.Error	Std. Dev.
Even Proposer/Odd Responder	90720	12.884	0.026	7.905	90720	5.274	0.020	6.063
Odd Proposer/Even Responder	90720	14.929	0.022	6.649	90720	5.832	0.018	5.539
P-Value		0.000				0.000		
UG								
Even Proposer/Odd Responder	45360	7.248	0.032	6.731	45360	7.474	0.032	6.852
Odd Proposer/Even Responder	45360	10.828	0.028	5.932	45360	8.357	0.024	5.076
P-Value		0.000				0.000		
IG								
Even Proposer/Odd Responder	45360	18.520	0.019	4.018	45360	3.073	0.019	4.108
Odd Proposer/Even Responder	45360	19.031	0.021	4.426	45360	3.306	0.022	4.778
P-Value		0.000				0.000		

Notes: Simulated results, P-values refer to independent samples t-tests.

Figure 7: Individual types frequency across periods