Trusting versus Monitoring

An Institutional Choice Experiment

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Abstract

To shed light on the choice between trusting a partner or monitoring her, we let one party decide between two stylized game paradigms, the Ultimatum and the Yes-No Game. Whereas in Ultimatum Games responders monitor the allocation proposal, in Yes-No games responders react without monitoring. Since monitoring can be costly, we allow the shared amount in Yes-No Games to be larger than in Ultimatum Games. Experimental conditions vary the cost of monitoring, who (proposer or responder) decides between trusting and monitoring, and whether the responder's conflict payoff is negative or positive. The latter renders Yes-No Games (trusting) social dilemma situations. We question whether some responders opt for trusting and predominantly accept an unknown offer, especially when justified by efficiency concerns, and whether some proposers, due to behavioral concerns, are more inclined to suggest monitoring.

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1. Introduction

Monitoring aims at controlling performance and compliance of partners in joint venture firms, or of employees *via* hired overseers (managers, inspectors, or auditing agencies). It thus represents an important aspect of corporate governance. Monitoring often implies suspicion and mistrust and is usually rather costly, both materially and emotionally. If trusting each other would be the norm, embarrassing practices like checking employee email and internet use, examining business expenditures, inspecting private belongings upon exit, administering unannounced performance evaluations etc. could be avoided, which would lower overall costs and make professional interaction more enjoyable[1]. However, the presumption is that we can behave "badly" and thus have to be prevented from it *via* anticipated monitoring and sanctioning. Being aware of this, even trustees themselves, for instance employees, might prefer to be monitored. On the other hand, being monitored can crowding intrinsic motivation out since it questions individual loyalty and honesty in fulfilling a given task.[2]

Moreover, given the potentially high monetary costs related to monitoring, like the ones of acquiring and maintaining monitoring systems and of hiring additional supervisors, the debate on whether to trust or to monitor is likely to continue. Given that a conclusive answer seems impossible, at best we can discern among the determinants of this decision. In light of this, trusting might, for example, be better in a small firm whose members interact personally and repeatedly. On the contrary, monitoring is likely to be preferred when interpersonal distance is high or when interaction is anonymous. An example of the latter case is represented by the International Atomic Energy Agency (IAEA), in Vienna, which monitors the compliance of its member countries with the Non-Proliferation Treaty for Nuclear Weapons (NTP). Since nuclear energy provision produces uranium in random amounts, underreporting of uranium is discouraged by randomly inspecting nuclear power plants. Obviously, in this case, the enormous costs of monitoring seem justified by the risk of setting aside uranium to produce nuclear weapons.[3]

Experimental research has recently started looking at how monitoring and trust interact (Dickinson and Villeval, 2008; Schweitzer et al., 2016), since laboratory methods allow to generate more controlled data. However for the most part the relationship remains to be disentangled. Using a real effort task where the trustor can set different monitoring intensities, Dickinson and Villeval (2008)

[1] Frey (1993) stresses the rivalry between trust and loyalty in shaping work effort.

[2] Crowding-out of intrinsic motivation induced by extrinsic incentives has been extensively studied experimentally (e.g. Falk et al., 1999; Nagin et al., 2002; Falk and Kosfeld, 2006) and theoretically (Benabou and Tirole, 2003; Bowles and Polania-Reyes, 2012).

[3] How to randomly inspect and prevent underreporting of uranium amounts is far from obvious (see Avenhaus et al. 1996).

experimentally test in a principal/agent setting the traditional prediction that more monitoring should increase performance since individuals want to avoid penalties (e.g. Calvo and Wellisz, 1978; Fama and Jensen, 1983; Prendergast, 1999) Their results show that trustors (principals) tend to monitor more than trust and that such a behavior increases the performance of most of the trustees (agents); however, crowding-out does happen above a certain level of monitoring. The dynamics of monitoring or trusting has been also analyzed by Schweitzer et al. (2016) through a repeated trust game with different monitoring conditions. The results show that trustees returnes more money when they knew they would be monitored, but returned smaller amounts or even nothing when they anticipated not to be monitored.Trustors, however, failed to appreciate the strategic behavior of their counterparts and continued to send money to their counterparts even when they were unable to monitor them.

While there are many examples in private and economic environments where one of the interacting parties decides between monitoring or trusting others' performance, there are very few studies that focus on the choice between trusting and monitoring by one of the involved parties. Although the effect of trust on organizations and groups performance has been widely studied[4], yet the conditions conditions shaping such decision are underexplored. Additionally, the effect of having one of the interacting parties (trustor or trustee) make the decision remains fully unanswered[5].

Our focus in this paper is filling this gap by shedding light on the endogenous selection by one of the involved parties (either proposer or responder) of the initial institutional choice between trusting or monitoring without prior experience, and on investigating how the choice mechanism affects individual behavior of those (non) monitored and those (not) monitoring depending on crucial determinants such as: who has made the decision to monitor (trust), the size of the monitoring costs, and the conflict payoff of trustors.

To capture the basic features of the dilemma, we capture the decision between trusting and monitoring as the choice between two stylized game paradigms: the Ultimatum and the Yes-No Game. Whereas in Ultimatum Games (henceforth, UG) responders monitor the allocation proposal, in Yes-No games (henceforth, YNG) responders react without the possibility to monitor offers while still maintaining veto power. The advantages of employing these two games are that they are easily understood by participants, avoid demand effects on the observed relationship and allow the

[4] Some determinants that have been looked at are: individual autonomy (Langrfred, 2004), view of one's vs. other's trustworthiness (Ferrin et al., 2007), ongoing (long-term) teams (De Jong and Elfring, 2010), trust in team members vs. trust in supervisors (Bijlsma-Frankema et al., 2008), the role of trust in organizational setting (Dirk and Ferrin, 2001 and Gätcher and Falk (2002).

[5] See Malhotra (2004) for a general discussion of differing perspectives of trustors and trusted parties in traditional trust games.

comparison of choice data for either institution with the standard variations of the game which are not preceded by institutional selection, frequently employed in experimental game theory. Most importantly, choosing between the two games captures the essence of the decision between trusting and monitoring.

Responders are typically the trustors, who choose between trusting or monitoring employees[6]. However, there may be instances where trustees make this decision. We therefore explore the cases in which either proposers or responders choose the game type and analyze the differences in behavior dependent on who has chosen the game.

The main specifications of our design are the following: trusting or monitoring is a choice taken either by the trustor (responder) or by the trustee (proposer), and consequently the efficiency of the interaction is endogenously determined in it; we restrict efficiency aspects to monitoring costs and acceptance of the known or unknown offer; partners interact repeatedly but receive only the feedback of the game that has been chosen (and no feedback on acceptance or on monitoring until all rounds have been played)[7].

Both UG and YNG are altruistic punishment games. In particular, YNG captures trust albeit differently from impunity games like the standard "trust game" à la Berg et al. (1995). Only UG offers can be monitored before accepting or rejecting them. Due to monitoring cost, the amount to be shared in YNG is usually higher than in UG. Game-theoretically, both games predict exploitation for non-positive conflict payoffs of responders, although UG has a multiplicity of equilibria in weakly dominated strategies. When the responder's conflict payoff exceeds the lowest possible offer, YNG becomes a social dilemma game since the responder should reject the unknown offer.

UG is experimentally implemented by responders choosing an acceptance threshold[8]: below this threshold, all offers are rejected. In YNG, responders accept or reject without knowing and thus monitoring the offer. In either game the responder's conflict payoff can be negative or positive and monitoring costs vary the efficiency of trusting (Lewicki et al., 2006). Contrary to benchmark predictions, we expect YNG rather than UG to be chosen even when the responder's conflict payoff is positive.

[6] In corporate governance employers are usually responsible for institutional rules, and are represented by responders in our setup. Proposers, in our setup, represent employees, who may steal, accept bribes etc. and thereby lower the amount to be shared.

[7] In repeated interaction with more feedback it can make sense to study whether and how trust can be repaired after some violation of it, for example, by an apology or by attribution the violation to some external cause (see, for instance, Kim et al., 2006).

[8] What is rules out is, for instance, rejecting meager as well as overgenerous offers (see Gueth and Kocher, 2014).

Although game-theoretically game selection by neither party, proposer or responder, depends on who makes that choice, but only on whether the responder's conflict payoff is positive or negative, we behaviorally predict a significant effect of having one party making the game choice, and a much weaker effect of the responder's conflict payoff. If the costs of monitoring are high, what can be shared in YNG is considerably larger than in UG. When responder selects YNG rather than UG, it appears like a trust choice by the responder in the hope that they will be rewarded by a (more than in UG) generous offer. Although the total reward also increases when the proposer has opted for YNG rather than UG, this does not invite an interpretation of trust by the proposer but rather appears like a self-serving game-choice which rules-out the possibility of being monitored.

Our findings, however, suggest that even in case of large monitoring cost, responder participants who opt for YNG are not rewarded by offer that are larger than in UG. In retrospective analysis of their game choice, responder participants would, on average, have earned considerably more by monitoring instead of trusting. This is partly due to another important finding, namely that the outcomes of YNG-and UG- plays are only weakly affected by who, proposer or responder, has chosen the game type.

The paper is organized as follows. Section 2 introduces the games and how to endogenously select one of them. Section 3 describes the experimental design and protocols. Results are presented in Section 4. Section 5 concludes. An Appendix contains translated Instructions and some additional tables.

2. Game-choice and behavioral predictions

Both YNG and UG involve a proposer (X) and a responder (Y) and, in both games, X and Y can share at least the positive integer amount ("pie") p of money. The integer offer by proposer X, called y, is restricted to non-negative integers not exceeding p. Denoting by c (≥ 0) the cost of monitoring, which is faced in UG but not in YNG, and by d the negative or positive conflict (or disagreement) payoff of responder Y, the agreement surplus is $p - d$ in YNG and $p - c - d$ in UG. When d is positive, it is assumed to exceed the smallest positive (integer) offer.

In YNG, responder Y chooses between acceptance ($\delta = 1$) and rejection ($\delta = 0$) of the unknown offer y with $0 \leq y \leq p$. Proposer X is the residual claimant whose conflict payoff is 0. Given X's offer, X earns $\delta(p + c - y)$ and Y receives $\delta y + (1 - \delta)d$. If $d < 0$ the optimal choice of Y is $\delta^* = 1$ and an opportunistic proposer X will offer $y^* = 0$. For $\delta = 1$ in case of $d > 0$ proposer X

would also offer $y = 0$ what makes δ* = 0 optimal for *Y*; so y*= 0 and δ* = 0 is the only (perfect) equilibrium.[9] Thus YNG with $p + c > d > 0$ is a social dilemma game whose agreement surplus $p + c - d$ is predicted to be lost.

In UG responder *Y* chooses (experimentally) a monotonic acceptance strategy *Y via* a non-negative (integer) acceptance-threshold $\underline{y}$ with $0 \leq \underline{y} \leq p$ such that *Y* accepts, $\delta(y) = 1$, when $y \geq \underline{y}$, and *Y* rejects $\delta(y) = 0$ when $y < \underline{y}$. Proceeding by backward induction, *Y*'s optimal choice is $\underline{y}^* = 0$ when $d < 0$ but $\underline{y}^* = d$ or $d + 1$ when $d > 0$. Anticipating this, an opportunistic proposer *X* will choose $y^* = 0$ when $d < 0$ and $y^* = d$ or $d + 1$ when $d > 0$.

Behaviorally, we expect to observe:

(I) for $d < 0$ nearly all responders opt for YNG; the larger c, the higher percentage of proposers opt for YNG

(II) even for $d > 0$, i.e. when the social dilemma aspect of YNG seems like that *Y* is betting on reciprocal gift exchange[10], responders may opt for YNG as a trust signal hoping to be rewarded by offer $y > d$; proposers might doubt that they will be trusted *via* $\delta = 1$ and therefore opt for UG but - the larger c - an increasing percentage of proposers will opt for YNG.

Less related to our specific focus on "Monitoring vs. Trusting" we predict:

(III) less than usual altruistic punishment (i.e. no agreement) by responders *Y*, especially for $d < 0$ and when *Y* has selected UG, i.e. responders might accept low offers more often than in other UG-experiments.

By opting for UG in spite of $c > 0$ responders reveal their fear of exploitation. In the spirit of social preferences (see Cooper and Kagel, 2016) revealing suspicion and mistrust could induce (let-down averse) proposers to offer less and (fearful) responders to expect and accept less than usual in UG experiments without preceding endogenous game selection (see the review by Gueth and Kocher, 2014).

3. Treatment design and experimental protocols

[9] There may exist other equilibrium outcomes with $\delta^* = 0$ and offers y in the range $0 \leq y < d$ for $d > 0$.
[10] Y's gift would be acceptance, $\delta = 1$, and X's gift a decent offer

In each treatment participants are randomly assigned a role (proposer *X*, or responder *Y)* that will remain the same during the treatment, and are randomly matched in pairs which interact together across six rounds (or scenarios) characterized by different parameters *p*, *c* and *d*. Participants do not receive feedback on offers and acceptances/acceptance thresholds between rounds. Four between-subject treatments (denoted 1, 2, 3 and 4) result from combining: (a) the sequence of monitoring cost difference *c* across rounds (increasing or decreasing) and (b) who makes the choice between UG or YNG (proposer *X* or responder *Y).*

Table 1 provides the key aspects of the four between-subjects treatments.

Table 1. Treatments description

Treatment	**Game choice by**	**Round 1**			**Round 2**			**Round 3**			**Round 4**			**Round 5**			**Round 6**		
		p	*c*	*d*	*p*	*c*	*d*	*p*	*c*	*d*	*p*	*c*	*d*	*p*	*c*	*d*	*p*	*c*	*d*
1	*X*	19	0	-2	19	0	2	21	4	-2	21	4	2	23	8	-2	23	8	2
2	*X*	23	8	-2	23	8	2	21	4	-2	21	4	2	19	0	-2	19	0	2
3	*Y*	19	0	-2	19	0	2	21	4	-2	21	4	2	23	8	-2	23	8	2
4	*Y*	23	8	-2	23	8	2	21	4	-2	21	4	2	19	0	-2	19	0	2

To balance the total stakes across the three cost levels, respectively c = 0, 4, 8, we vary p having p = 19 for c = 0; p = 21 for c = 4; p = 23 for c = 8. So what can be shared in YNG varies from 19, 21 to 23 whereas in UG only p-c = 19, 17 or 15 is available. The total rewards of both games, p for YNG and p-c for UG, always add up to 38 but the difference between games vary *via* the monitoring cost c. These total rewards have to be distinguished from the agreement surplus which is $p - d$ in YNG and $p - (c + d)$ in UG: in either game the agreement surplus for d = -2 exceeds by 4 the agreement surplus for d = +2.

Our experimental subjects are 180 (under)graduate students from Law, Political Science and Economics, recruited through Orsée (Greiner, 2015). No subject participated in more than one session. The software is based on z-Tree (Fischbacher, 2007). An experimenter read aloud the instructions sheet. Before the start of the experiment, participants could privately ask clarification questions if needed. The average earning was 9.48 euro (plus 5 euro show up fee). The experiment lasted approximately one hour.

4. Results

Due to our focus on the institutional choice between trusting and monitoring, we first report results on proposers' and responders' choices between the two games. Then, we will present findings on offers in both games and response behavior (acceptance rate in YNG, acceptance thresholds in UG).

4.1 Endogenous game choice

Viewing YNG as a trust interaction features responder *Y* as trustor and proposer *X* as trustee. While trustors - for instance employers deciding on corporate governance - are typically responsible whether to trust or monitor, in some situations trustees may also be responsible for this choice[11]. Thus depending on treatment either trustor *Y* or trustee *X* is responsible for the institutional choice between monitoring and trusting.

Overall, trust is preferred to monitoring: participants choose YNG (UG) in 58.15% (41.85%) of all cases. Proposers self-servingly suggest trusting: when proposers make the game choice, YNG is selected in 73.11% of all cases; when responders choose, this occurs in 43.84% of all cases ($Z=-9.741$, $p = 0.000$, one-tailed test) using the Wilcoxon rank-sum test (henceforth WRST); see Figure 1 for a graphical illustration.

Result 1. *Proposer X (Responder Y) participants, when responsible for the game choice, opt for YNG significantly more (less) often than for UG.*

[11] A seller may, for example, offer a customer to withdraw from a deal if the quality of the delivery is below the threshold standard.

Figure 1: Game Choice: Shares of participants choosing YNG

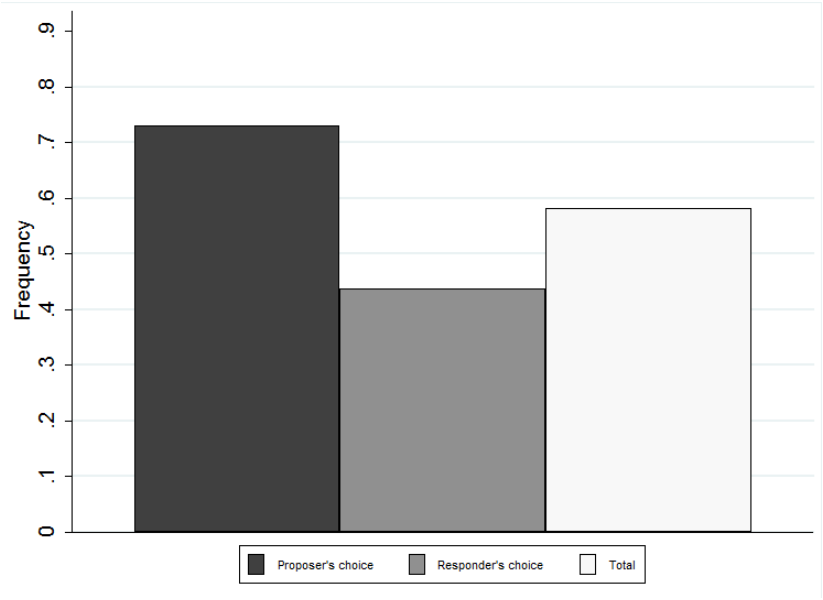


Table 2 presents the YNG shares of participants who "predominantly" (in at least 5 of the 6 rounds) choose YNG: 52.3% of proposers predominantly choose YNG but only 6.5% of responders. On the other hand, 23.9% of responders predominantly choose UG but only 2.3% of proposers. The vast majority (69.6%) of responders and a substantial percentage (45.5%) of proposers are "mixed" in the sense of not predominantly opting for either game.

Table 2: (Relative) Frequency of participants who predominantly choose one game type

	Proposer (X)		Responder (Y)		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Predominant UG	1	2.3%	11	23.9%	12	13.3%
Mixed	20	45.5%	32	69.6%	52	57.8%
Predominant YNG	23	52.3%	3	6.5%	26	28.9%
Total	44	100%	46	100%	90	100%

Note: Predominant = at least five of the six rounds.

The high general frequency of YNG choices is far from obvious. Common sense suggest that proposers prefer not to be monitored, and that responders prefer to monitor. However, suspicious proposer participants might fear YNG-rejection when self-servingly opting for it and one might opt for the game type yielding the larger expected payoff. The latter suggests that first-order action

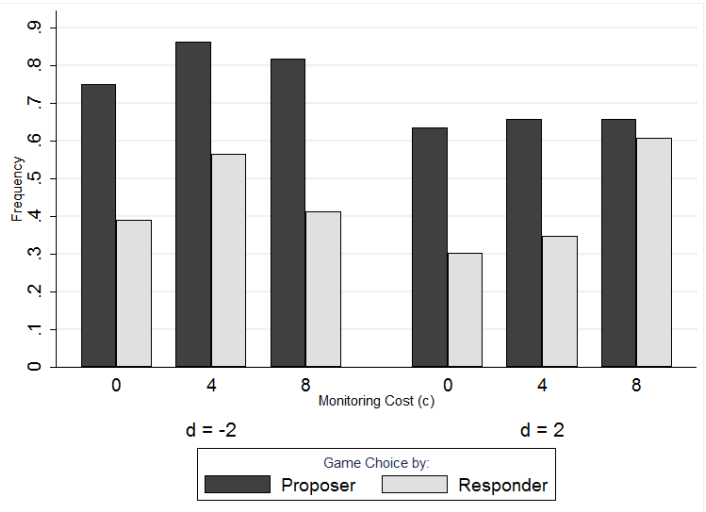
beliefs for UG and YNG could matter. Specifically, proposers should avoid rejection, and responders low offers.

Role of monitoring cost c

Since the amount to share becomes smaller when the monitoring cost *c* increases, we expected participants to choose UG more frequently when *c = 0*: zero monitoring costs do not allow proposers to justify their YNG choice by an efficiency motive. We indeed observe a significantly lower general frequency of YNG choices when *c* = 0 vs. *c > 0* (51.66% vs. 61.38%, Z = -3.052, p = 0.002, WRST one-tailed test). However, this difference is driven by responders, who reduce their YNG percentage (from 48.37% for *c*>0 to 34.78% for *c*=0, Z = -3.030, p = 0.002, WRST one-tailed test): and thereby reveal their efficiency concerns. For proposers, no significant difference emerges: their YNG percentage decreases when *c* = 0 instead of *c > 0* (69.32% vs. 75%, Z = -1.387, p = 0.165 WRST one-tailed test).

Treatments 1 and 3 differ from treatments 2 and 4 by presenting increasing vs. decreasing monitoring costs. There is no significant difference in game choices between increasing and decreasing costs *c* (for proposer: 70.63% vs. 75.36%, WRST with Z=1.222, p=0.222, one-tailed test; for responders 42.75% vs. 44.93%, WRST Z=0.514, p = 0.607, one-tailed test). Results by round and by increasing or decreasing costs *c* are reported in Table B1 in Appendix B. What apparently matters is not the sequence of cost levels but the cost level *per se*: the correlation between YNG shares and monitoring cost level *c* is positive and highly significant (coeff.= 0.087, p=0.004, Pearson correlation test).

Figure 2: Detailed Game Choice – Relative Frequencies of selecting YNG



Role of Y's conflict payoff d

Comparing YNG-choices for $d = -2$ and $d = +2$ reveals (see Figure 2) that d does not significantly affect responders game choices (54.35% vs. 57.97%, WRST with Z=0.857, p = 0.391, one-tailed test) but significantly enhances proposers' ones (81.06% vs. 65.15%, WRST with Z=4.118, p = 0.000, one-tailed test). This result is rather surprising: responders apparently neglect the social dilemma aspect of YNG for d = +2 and the possibility of receiving lower offers than d = +2.

Table 3 presents a set of Probit regressions summarizing how experimental conditions affect the binary game choice between UG and YNG ("game decision"). It shows that the preference for YNG significantly increases across all specifications with (a) the proposer making the game choice, and (b) higher monitoring costs c. Both results are consistent with our previous non-parametric test results. In particular, column (3) of Table 3 controls for the interaction between "Proposer's choice" and "Monitoring Cost (c)", named "Proposer's choice_c", which is not significant.

Table 3: Determinants of game decision (YNG=1, UG=0)

VARIABLES	(1) basics	(2) interaction 1	(3) interaction 2	(4) round
Proposer_choice	0.785***	0.795***	0.924***	0.800***
	[0.161]	[0.162]	[0.162]	[0.164]
Conflict Payoff (*d*)	-0.069**	-0.023	-0.069**	-0.097***
	[0.029]	[0.047]	[0.029]	[0.030]
Monitoring Cost (*c*)	0.037***	0.037***	0.053***	0.038***
	[0.010]	[0.010]	[0.009]	[0.010]
Proposer's choice _*d*		-0.100*		
		[0.060]		
Proposer's choice _*c*			-0.035	
			[0.021]	
Round				0.109***
				[0.021]
Constant	-0.304***	-0.304***	-0.369***	-0.695***
	[0.109]	[0.108]	[0.105]	[0.097]
Observations	1,080	1,080	1,080	1,080

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

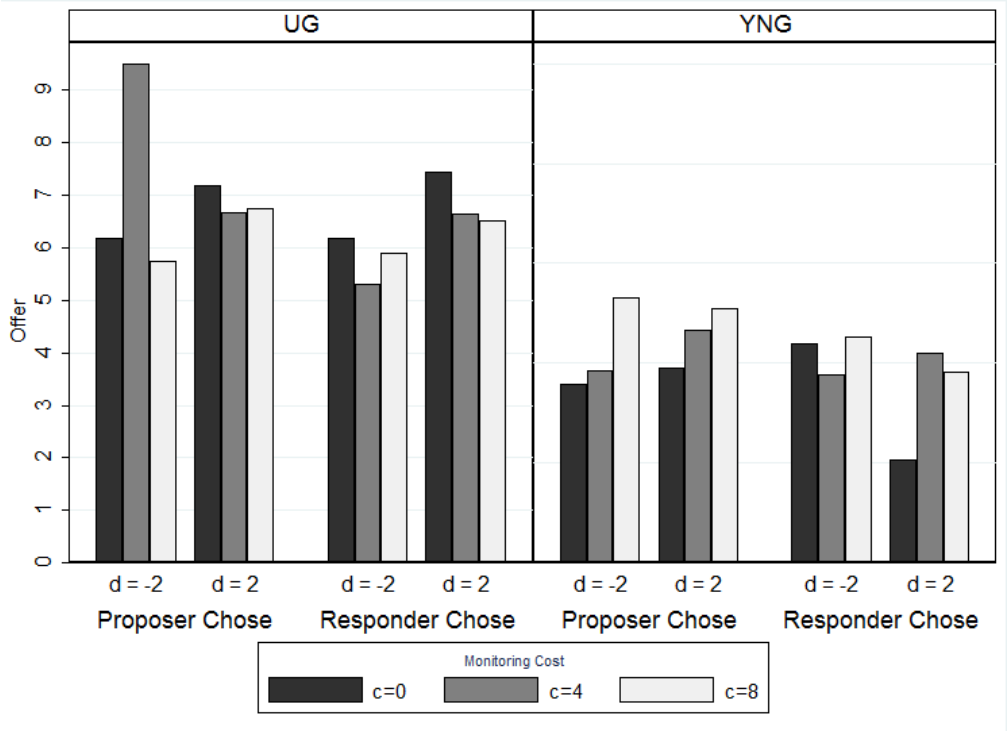
The non-parametric evidence suggests a significant role for (positive or negative) conflict payoff *d* only when the proposer chooses between games: this effect is confirmed by the regression analysis in Table 3 (column 2). It reveals a significant and decreasing relationship between YNG-choices and conflict payoff *d* which vanishes when controlling for the interaction between "Proposer's choice" and "Conflict Payoff (*d*)", named "Proposer's choice _*d*". This interaction term is significant and negative, suggesting that participants choose trusting more frequently in the proposer role and when the conflict payoff is negative. Column 4 controls for the round of interaction: the significant and positive effect suggests an increase in trusting of paired participants (in spite of not receiving any feedback information on previous rounds) as time passes by.

4.2 Proposer behavior

Do offers depend on the game, YNG or UG, and on who, *X* or *Y*, has chosen it? In the light of previous UG and YNG experiments, mostly based on $d = 0 = c$, we expected substantially and significantly larger UG than YNG offers, and both being larger for *d* = +2 than for *d* = -2 due to sharing the agreement surplus rather than the pie *p* (see Gueth and Kocher, 2014). Our main results regarding offers confirm these expectations.

The average offer across all conditions is 5.17 corresponding to a 27.52% share of *p*. Proposers, in general, offer significantly more in UG than in YNG (6.54 vs. 4.18, WRST with Z=11.776, p = 0.000, two-tailed test). If we account for monitoring costs in UG, the difference in the percentage shares offered is even more striking: average offers amount to 38.34% of *p-c* in UG and 19.75% of *p* in YNG. Whether proposer or responder has opted for the game type does not significantly affect the offer level. Both when the proposer or the responder decides between games, we observe lower offers in YNG compared to UG. The difference is significant and substantial (proposers: 3.85 vs. 6.49, WRST with Z=7.759, p=0.000, two tailed test; responders: 4.39 vs. 6.85, WRST with z=9.026, p=0.000, two-tailed test). These results are summarized in Figure 3.

Figure 3: Offers in UG vs. YNG



As in the special case $d = 0 = c$, on which earlier experiments are concentrated, UG offers are substantially and significantly larger than YNG ones (6.54 vs. 3.60, WRST with Z = 9.379, p = 0.000, two-tailed test).

As expected, the average offer is significantly higher for d = + 2 than for d = - 2 (5.43 vs. 4.91, WRST with Z=-2.573, p = 0.010, two-tailed test. The correlation between offers in both games and monitoring costs is insignificant (coeff.= 0.015, p=0.633, Pearson correlation test); restricted to UG-offers, we observe a negative and slightly significant correlation (coeff.= -0.087, p=0.064, Pearson correlation test). The larger c the more UG-interaction appears like a loss (due to not having opted for YNG) to which proposer participants apparently react by lowering offers in order to recover such "loss".

Do proposers reward responders who chose YNG by making them higher offers? Our results question this. When restricting the sample to responders opting for trust, UG-offers are still significantly higher (6.12 vs. 4.02 in YNG, WRST with Z = 6.524, p = 0.000, two-tailed test): responders who opted for YNG receive lower offers than those who have decided for UG, i.e. a responder favoring monitoring is, on average, better off than one favoring trust. Even worse, YNG-

offers when the responder has made the game choice are significantly lower than when the proposer has made it (6.12 vs. 6.90, WRST with Z = 3.211, p = 0.001, two-tailed test). A possible interpretation is that, instead of reciprocating responders' trust, proposers compensate responders for self-servingly opting for trust.

Table 4 presents OLS regressions aimed at investigating the determinants of offer levels in both games.

Table 4: Offers in both games

VARIABLES	(1) basics	(2) interaction	(3) time	(4) offer in the previous round
YNG chosen	-2.518***	-2.496***	-2.452***	-1.817***
	[0.422]	[0.426]	[0.428]	[0.357]
Proposer's choice	0.507	0.474	0.488	0.428
	[0.666]	[0.664]	[0.668]	[0.538]
Conflict Payoff (*d*)	0.067	0.194**	0.104	0.048
	[0.063]	[0.068]	[0.072]	[0.060]
Monitoring Cost (*c*)	0.051	0.054*	0.049	0.035
	[0.030]	[0.029]	[0.030]	[0.023]
YNG_d		-0.218		
		[0.131]		
Round			-0.142**	-0.051
			[0.054]	[0.044]
Offer_Lag				0.481***
				[0.078]
Constant	6.182***	6.152***	6.659***	3.571***
	[0.443]	[0.440]	[0.394]	[0.524]
Observations	1,080	1,080	1,080	1,079
R-squared	0.089	0.091	0.092	0.314

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

The main determinant of offers magnitude is having participants playing the YNG or the UG: if YNG has been chosen, offers are significantly lower, no matter the specification we use. Having the proposer or the responder choosing the game does not matter.

The regression results generally confirm also the other non-parametric test results. In particular, offers are higher for $d = +2$ than for $d = -2$ with the latter effect being weak and not robust across all conditions what also applies to monitoring costs (see column 2 of Table 4). Offers significantly decrease as interaction proceeds (column 3) in spite of no information feedback and offers in *t* are also positively and significantly related to those in the previous round *t-1* (column 4)[12].

Result 2. *Average UG-offers are significantly higher than YNG-ones, irrespective of whether proposers or responders have chosen the game. In both games, average offers are higher for d =+2 than for d =- 2 with this effect being not robust; average offers do not depend significantly on monitoring cost c and on who has chosen the game type.*

4.3 **Responder' behavior**

We now analyze response behavior, i.e. the acceptance rate in YNG, and the acceptance thresholds in UG. As anticipated, acceptance rates in YNG are generally high (85.35%); participants always accept in the first round, but acceptance decreases as the interaction proceeds (Spearman corr. test with coef.=-0.145, p=0.001) with 17% of rejections in rounds 2-6. Consistently with the fact that responders do not want to end up with a negative payoff, the acceptance rate increases significantly from $d = +2$ to $d = -2$ (72.22% vs. 96.47%: WRST with Z=8.556, p =0.000, one-tailed test). Interestingly, the acceptance rate is not significantly affected by who has chosen YNG (84.97% vs. 85.95%: WRST with Z=0.336, p = 0.737, one-tailed test) or by the monitoring cost (85.52% vs. 84.94%: WRST with Z= -0.186, p = 0.852, one-tailed test). Our non-parametric results are confirmed by the regression analysis presented in Table 5[13].

[12] Table B2 (in Appendix B) provides more details about offers, separately for treatments and rounds.

[13] Table B3 (in Appendix B) presents more detailed information on YNG acceptance rates.

Table 5: Acceptance rate in the YNG

VARIABLES	(1) basics	(2) time
Proposer_choice	-0.072	-0.068
	[0.247]	[0.245]
Conflict payoff *d*	-0.308***	-0.296***
	[0.051]	[0.053]
Monitoring cost *c*	0.024	0.022
	[0.021]	[0.020]
Round		-0.060
		[0.074]
Constant	1.144***	1.375***
	[0.203]	[0.338]
Observations	628	628

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

Result 3. Overall YNG acceptance rate is 85.35% and decreases significantly from d =-2 to d =+2 without being significantly affected by who, X or Y, has chosen YNG.

UG-acceptance thresholds are also not affected by who has chosen UG. The average threshold is 5.97 and becomes significantly smaller when *Y*'s outside option decreases (from 6.79 when *d* = +2 to 4.93 when *d* = -2: WRST with Z=-6.407, p = 0.000, two-tailed test). The average threshold is 6.68 in treatments when *c* increases and only 5.22 when *c* decreases (WRST with Z=-4.869, p = 0.000, two-tailed test). In particular, *c > 0* triggers a significantly lower average acceptance threshold, (5.50), than for c= 0, (6.71), (WRST with Z=-4.869, p = 0.000, two-tailed test).

The regressions in Table 6 confirm the role of outside option and monitoring costs, that hold also when controlling for the round of interaction (see column 2). Column 3 shows a positive and significant relation between the acceptance threshold and the threshold set by the same participant in the previous round.

Table 6: Acceptance threshold in the UG

VARIABLES	(1) Basics	(2) time	(3) threshold in the previous round
Proposer_choice	-0.995	-1.034	-0.014
	[0.820]	[0.819]	[0.451]
Conflict Payoff (*d*)	0.478***	0.493***	0.130***
	[0.066]	[0.075]	[0.042]
Monitoring Cost (*c*)	-0.207**		
	[0.055]		
Decision Maker_*d*			
Decision Maker_*c*			
Round		0.008	-0.086
		[0.091]	[0.061]
AcceptanceThreshold_Lag			0.741***
			[0.049]
Constant	6.931***	6.155***	1.872***
	[0.476]	[0.388]	[0.354]
Observations	452	452	339
R-squared	0.139	0.097	0.588

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

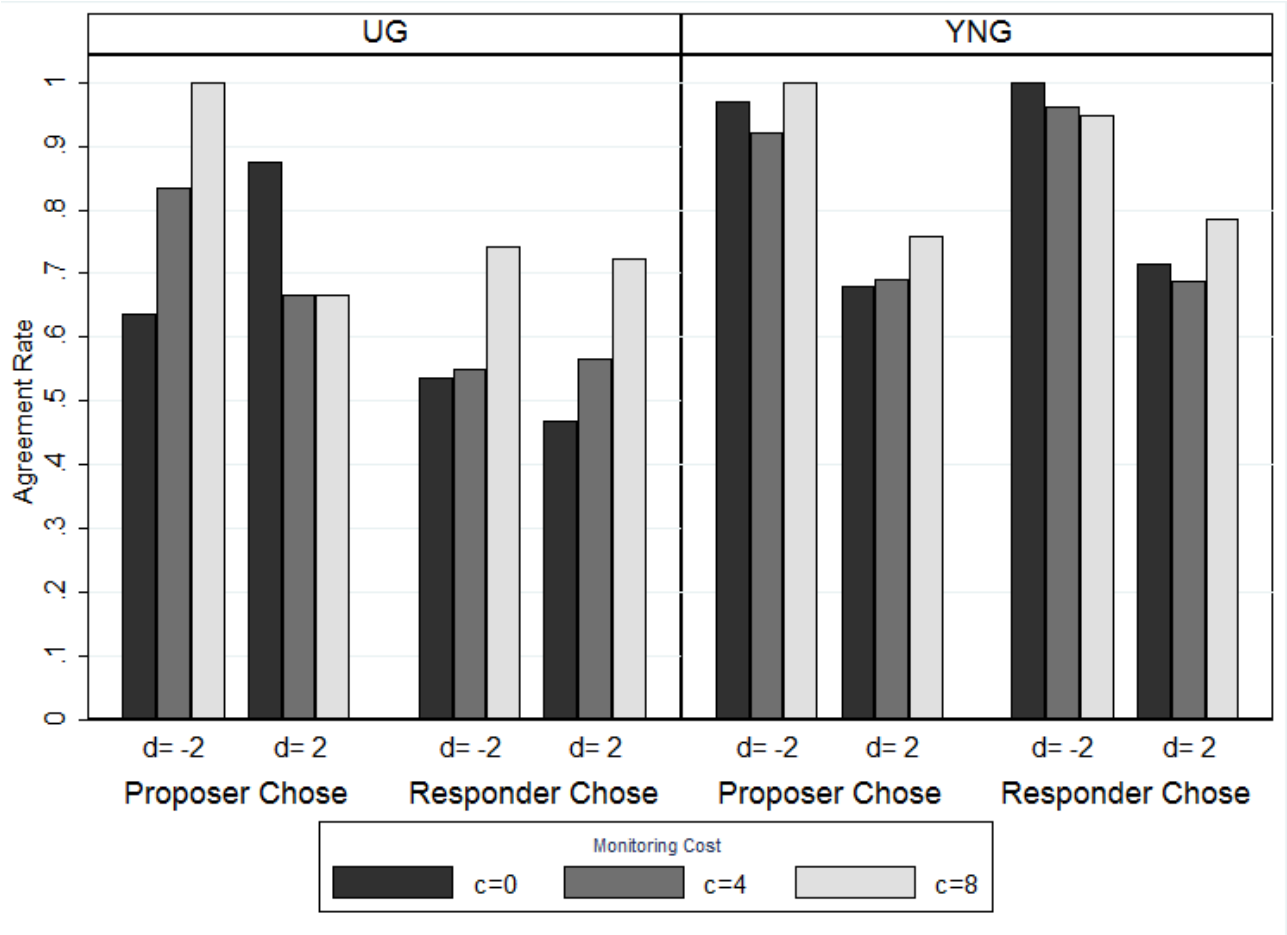
Altogether YNG acceptance rates are generally very high and average UG-acceptance thresholds are smaller when the responder's conflict payoff is negative but exceed for $d = -2$ and $d = +2$ Y's conflict payoff considerably. Neither YNG- and UG- response behavior depends significantly on who, *X* or Y, has selected the game type, YNG or UG.

In the light of our conclusions on UG-offers and acceptance thresholds we now can compare YNG and UG interaction outcomes. In UG, acceptance is significantly less frequent than YNG but significantly more likely when the proposer has made the game choice (76.1% vs. 57.8%, WRST with Z=3.566, p = 0.000, two-tailed test). The conflict payoff plays no role with the exception of thresholds being significantly lower when *d* is negative.

Result 4. *The average acceptance threshold in UG is significantly smaller for d = -2 than d = +2 and decreases with increasing cost of monitoring c. It does not depend on who has opted for UG. Agreement in UG is more likely for lower monitoring costs and when proposers choose the game but significantly less likely than in YNG.*

We conclude by discussing results on agreement rates for the two games. Figure 4 reports agreement rates by distinguishing between game types, who has selected them, the conflict payoff, and their difference in pie size (monitoring cost). Agreements are significantly more frequent in YNG than UG (85.35% vs. 64.15%: WRST with Z=-8.907, p =0.000, one-tailed test), for strictly positive monitoring costs (78.61% vs. 72.22%: WRST with Z=2.333, p=0.019, one-tailed test), and when proposers have chosen the game (82.58% vs. 70.65%, WRST with Z=4.616 and p=0.000, two-tailed test). Responders' conflict payoff plays an important role as well: negative conflict payoff, *d = -2*, leads to significantly more agreements (85.18% vs. 67.78%, WRST with Z= 6.741, p=0.000, one-tailed test).

Figure 4: Agreement rates



Result 5. *Agreement is significantly more frequent in YNG than in UG and more likely when proposers have chosen the game, when the monitoring is costly, and when Y's conflict payoff is negative.*

Table B3 in Appendix B presents agreement rates for all the rounds and treatments in YNG, and Tables B4 and B5 present acceptance thresholds and agreement rates for all rounds and treatments in UG.

4.4 Payoffs

In terms of acceptance rates, YNG outperforms UG. But in YNG-offers are smaller: responders might be worse off in YNG than in UG, which seems to favor proposers. Table 7 looks at the average payoffs of both games for either proposers and responders by who has decided on the game type.

Table 7: Average Payoff by Game Type and Game Decider

Average Payoff							
		Proposer (X)		Responder (Y)		Sum (X + Y)	
		UG	YNG	UG	YNG	UG	YNG
Game Decided by	X	7.52	13.99	5.69	4.14	13.21	18.13
	Y	5.47	14.80	4.55	3.66	10.02	18.46

The loss of responders making the "wrong" game choice (i.e. the game that entails the worst outcome for them) is 0.89 euros (4.55-3.66) and lower than the corresponding loss of 6.47 euros (13.99 - 7.52) for proposers. Both differences are significant (Z=-14.138 and p=0.000 for proposers, and Z=5.232 and p=0.000, two tailed WRST). For what concerns "true" (so-called "rational") expectations, proposers opting for UG and responders opting for YNG choose the worse game. The loss for proposers in choosing monitoring decreases when monitoring costs are 0 but remains highly significant (see Table B6 in Appendix B).

Result 6. *According to average payoffs responders should avoid YNG (trust) whereas proposer participants should prefer it.*

Table 7 further indicates that responders are significantly better off when the proposer is the one who has chosen the game rather than if they had made the choice themselves (Z= -1.961 and p=0.049, two tailed WRST), regardless the game that was chosen (significant also for each game separately (p<0.05, two tailed WRST). Proposers earn a higher payoff when they are the ones who choose UG (Z= 4.042 and p=0.000, two tailed WRST) and a lower one when they are the ones choosing YNG (Z= -2.258 and p=0.024, two tailed WRST).

The regressions in Table 8 illustrate the determinants of proposers' payoff (columns 1 and 2) and responders' (columns 3 and 4) payoffs.

Table 8: Proposers' and Responders' Payoffs

	(1)	(2)	(3)	(4)
VARIABLES	Proposers 1	Proposers 2	Responders 1	Responders 2

YNG chosen	7.674***	2.679	-1.172*	-2.025
	[0.564]	[1.944]	[0.547]	[1.608]
Proposer_choice	-0.446	-5.556***	-0.740	-1.613
	[0.735]	[1.659]	[0.521]	[1.528]
YNG_proposer		3.183***		0.544
		[1.030]		[1.164]
Conflict payoff	-0.647***	-0.676***	0.119	0.114
	[0.174]	[0.181]	[0.083]	[0.083]
Monitoring cost	0.220**	0.210**	0.077***	0.076***
	[0.076]	[0.075]	[0.022]	[0.024]
Constant	-1.462	6.820*	7.016***	8.432***
	[1.612]	[3.218]	[1.373]	[2.002]
Observations	1,080	1,080	1,080	1,080
R-squared	0.317	0.326	0.025	0.026

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

We observe that proposers have a significantly higher payoff in case of YNG than in case of UG (column1); however, when controlling for the interacted variable "YNG_proposer" (obtained by interacting the variables "YNG chosen" and "Proposer_choice") (see column 2), we learn that the proposer's payoff decreases when the game choice has been made by the proposer herself, and increases in presence of a YNG that has been chosen by the proposer. The responder has a slightly significantly lower payoff in presence of YNG (column 3), but this effect does not hold any more when controlling for who has made the game choice and for the interaction term "YNG_proposer" (column 4). The conflict payoff has a significant and negative effect only on the proposer's payoff (see also Table B7 in Appendix B), but no significant effect on responder's payoff, whereas higher monitoring costs always entail higher payoffs.

5. Conclusion

Deciding what is best between trusting and monitoring is crucial in many private relationships (e.g. husband and wife or child and parent ones) as well as in economic interactions like markets and intra-firms exchanges. In the case of market deliveries customers have to check goods quality or trust the seller; in corporate governance monitoring is an critical aspect of corporate governance. Addressing this issue is thus of primary importance.

Our experiment allows for participants'answer through an endogenous decision between two institutions - "Trusting" vs. "Monitoring" - captured by the Yes-No-Game and the Ultimatum Game

respectively. Our findings show that only 23.9% of responders predominantly choose to monitor, i.e. opts for the game that, on average, leads to a significantly higher pay for them. One might argue that it is hardly possible that agents persistently prefer the costlier option. However, our result only refers to the situation where agents do not receive any feedback on previous outcomes, and thus cannot modify their choices in the light of past experiences. We only shed light on initial inclinations on how to decide between trusting and monitoring in either role. In our view, the predominant preference for YNG, i.e. for trusting, will typically apply to small, newly-born dyads where one of the two agents might at some point opt for a more profitable mechanism depending on her role. In the terminology of our experiment this predicts that, over time, responders should learn to prefer UG over YNG, i.e. substitute trusting by monitoring. If true, it will be interesting to explore whether this will induce proposers to offer more in YNG than in UG in presence of positive monitoring costs, i.e. the exploitation of responders' trust will decrease.

Our results are partly surprising. *P*roposers self-servingly select trusting (YNG) even when the cost of monitoring is zero. And initially they are perfectly right: no single YNG-offer has been rejected in the first round. Only with more experience, a significantly positive tendency to reject in YNG evolved, i.e. after more familiarity and better understanding responders became more suspicious. Average offers, acceptance rates (in YNG) and acceptance thresholds (in UG) are qualitatively in line with existing results, albeit tending to the meager side. Monitored UG-offers, on average, significantly exceed YNG-ones without preventing a significantly positive and surprisingly large UG rejection rate. What surprises is that game offers and acceptance rates are hardly influenced by who, *X* or *Y*, has opted for the game (YNG or UG).

The predominance of trusting should erode when providing feedback information which, in turn, might trigger more generous YNG-offers especially for positive cost of monitoring ($c > 0$). We expect it to occur in large commercial enterprises and public administrations, where monitoring prevails. Nevertheless, in small startup firms, to which our dyadic stylized interaction seems more applicable, one still observes persistent trusting. Our conclusions can thus inform on initial and intuitive tendencies on how to resolve the conflict between trusting, when doubting trustworthiness, and, costly monitoring.