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Institutions and Opportunistic Behavior: Experimental Evidence

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Comments

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Experimental Evidence.

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Abstract: Risk mitigating institutions have long been used by societies to protect against opportunistic behavior. We know little about how they are demanded, who demands them or how they impact subsequent behavior. To study these questions, we run a large-scale online experiment where insurance can be purchased to safeguard against opportunistic behavior. We compare two different selection mechanisms for risk mitigation, the individual and the collective (voting). We find that, whether individual or collective, there is demand for risk-mitigating institutions amongst high-opportunism individuals, while low-opportunism individuals demand lesser levels of insurance. However, high-opportunism individuals strategically demand lower insurance institutions when they are chosen collectively through voting. We also find that the presence of risk mitigating institutions crowds out reciprocity. Reciprocity is lower when the no-insurance option is chosen among other insurance options than when it is not available. Finally, we also observe higher gains from exchange in low-opportunism groups than in more opportunistic ones.

Keywords: institutions; trust; trustworthiness; voting; insurance

JEL classification: C92, D02, D64.

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Arrow (1972, p.357): "Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a certain period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence".

1. Introduction

For long society has responded by developing institutions to mitigate opportunistic behavior and minimize losses in profitable exchanges. Certifying agencies, enforcers, public notaries, courts, police forces, are all examples of (costly) risk mitigating institutions put in place by society to help minimize the risk of default in economic transactions. In this paper we try to understand the causes and consequences of an (risk-mitigating) institution that is chosen by individuals to protect themselves against the opportunistic behaviors of others. We focus on how the presence of opportunistic behavior affects the choice of insurance levels and future actions.

We pay special attention to the role of mechanisms adopted in choosing such institutions. Keeping this goal in mind, we set up risk-mitigating institutions that can be chosen individually or collectively (i.e., voted upon). It is important to explore this dimension, because the mechanisms for choosing the level of protection may affect the outcome and thereby social welfare. In terms of consequences, we focus on the impact of the presence of insurance providing institutions on individual pro-sociality.

Although, there is some research on the relation between trust and regulation (see the literature review), the likely co-determination of trust and regulation implies that there are serious difficulties in clearly establishing causality. Actions, in the present or future, may be an important determinant of the choice of institutions, a feature that is hard to measure with secondary data. It is also difficult to shed light on exactly who demands these institutions, and their subsequent actions, from real world data where individual actions are mostly unobservable. In our experimental design we can trace this link, i.e. we can map demands for institutions into subsequent actions. The advantage of the experimental methodology is that it allows us both to suppress institutional and environmental confounding factors that characterize field data, and to understand what principles are in operation (Plott, 2001).

We conduct a large-scale online experiment with 1564 participants using Amazon Mechanical Turk. A modified version of the standard trust game (Berg, Dickhaut, & McCabe, 1995) in the first part of the experiment is used to determine (through strategy method) the level of trust and trustworthiness of the participants. Trustworthiness is used as it is based on social preferences and may reveal the trustee's intentions such as reciprocity (Bohnet, 2010; Rabin, 1993). The first part of the experiment is the same across all treatments.

Given their choices in the first part of the experiment, individuals are allocated to a low-, or high-, trustworthiness groups in the second part. We classify low (high) -trustworthiness individuals as high (low) -opportunism. Individuals are informed about the group they have been assigned to and then get to choose, individually or collectively (through voting), between different levels of insurance which protects them against future opportunistic behavior. Insurance is costly and ensures that at least a part of the money sent will be returned to the sender. Higher levels of insurance imply higher guaranteed returned amounts and are costlier to society resulting in reduced rents from exchange.

We introduce two treatment variations in the second part. This allows us to study different mechanisms used in the choice of risk-mitigating institutions. In the first, the *individual choice* treatment, senders individually decide amongst four possible insurance levels (with 'no insurance' also being one of the options). In the second, the *collective choice (voting)* treatment, all players in the group vote for their preferred insurance level. The most voted insurance level is then implemented for the group. The two treatments are designed to mimic the role of (costly) risk-mitigating institutions as a substitute for mutual lack of confidence and their impact on opportunistic behavior.

We now briefly summarize the main results. First, there is a *significant demand* for insurance in both treatments and this depends on the level of opportunism of the group. When *individually chosen*, those in the high-opportunism group demand greater insurance than those in the low-opportunism group. When *collectively chosen*, the demand for insurance does not differ across groups. This is quite an intriguing result that is explained by the strategic behavior of high-opportunism individuals and the manner in which insurance levels are chosen. In the individual-choice treatment the insurance level is chosen by the sender, whereas in the collective-choice treatment both senders and receivers vote for the level of the insurance. This is important, as voting upon an insurance level can have its consequences in that high-opportunism, i.e. non-reciprocating, individuals can vote strategically to take advantage of future interactions by voting for a lower level of insurance. We conduct an additional treatment where only senders can vote for the level of institutions. In this treatment, high-opportunism senders vote for higher levels of insurance, behaving exactly as those in the individual choice treatment, which supports the hypothesis of strategic (opportunistic) voting. This result is consistent with the fact that countries with higher levels of opportunistic behavior have more bureaucratic procedures and controls in place (Pinotti, 2012; Aghion, Algan, & Cahuc, 2011). This higher level of institutional control could possibly be due to a higher demand for protection. Actually, in societies with high levels of opportunism, where institutions are selected collectively, the level of protection demanded by citizens is likely to be high[1].

Second, low-opportunism individuals return less as higher levels of insurance are selected, showing that risk mitigating institutions crowds out reciprocity. On the contrary, high-opportunism individuals return more with higher levels of insurance as they are forced by the higher minima of the insurance.

Finally, we find that opportunism in the first part of the experiment is lower than in the second. This suggests that the possibility of individually choosing, or collectively voting for institutions can crowd out civic behavior. There are, however, four changes that could affect opportunistic behavior in the second part. First, insurance options are introduced in the second part, and the possibility of demanding institutions can crowd out civic behavior. Second, in the second part the participants are assigned and then informed about the group to which they belong, and this could also affect their choices. Third, the level of insurance in the second part is chosen/voted by other players, and fourth, senders were not allowed to send nothing in the second part.

We introduce four additional treatments to disentangle which mechanism is at play. In a first *additional* treatment, the players were divided into groups, and the receiver had the same set of choices as in the first part. The only innovation between the first and the second part was that participants knew whether they were in a high or a low-opportunism group. The

[1] Unless there is an extremely high fraction of opportunistic individuals voting strategically.

second *additional* treatment introduced different levels of insurance, but the level was chosen by nature and not by the group members. In the third and fourth *additional* treatments we added the possibility for the sender not to send anything and avoid opportunistic behavior by avoiding exposure. We still observe crowding out.

Having the possibility of choosing risk-mitigating institutions significantly increases the difference in the amount returned between the first and second part of the experiment for the low-opportunism group. With these additional treatments we can show that the crowding out of reciprocity for the low-opportunism group is in-fact due to the presence of risk-mitigating institutions and is not an outcome of whether insurance levels are individually, or collectively, chosen. Being informed about their respective groups, i.e. low or high opportunism group, also affects the amount returned in the second part, but the effect of the *ability to choose* insurance levels is greater. Importantly, the presence of risk-mitigating institutions, or the release of information about the group they are in, does not result in any significant difference for the low-opportunism group. This could suggest that in countries that choose institutions that provide high protection levels, the institutions themselves affect the opportunistic behavior of individuals (Lowes et al 2017).

Results in our paper are consistent with the fact that more trustworthy societies demand less institutions and are more efficient (see Pinotti, 2012; Aghion, Algan, & Cahuc, 2011). We also observe higher gains from exchange in low-opportunism groups than in high-opportunism ones. From a policy perspective, one important lesson is that protection against opportunism cannot be the exclusive remit of the public sector. Voters will be concerned about the times when they are the opportunists themselves. The second big message from this perspective is that institutions against opportunism can crowd out part of the civic spirit that sustains cooperation, so when initiated, they should be sufficiently robust so that the situation does not end up being worse than without them.

We show that many of our results can be rationalized using a very simple theoretical framework based on standard models from the literature. First, to understand sender behavior all that is needed is some heterogeneity in preferences and expectations, and that on average they are correct in that receivers in the high-opportunism group are indeed more opportunistic. This leads to a higher frequency of more protective contracts in that group and, mechanically, to lower total efficiency, in accordance with our experimental observation. Second, for receivers, a model with social preferences and reciprocity as in Charness and Rabin (2002) does a good job at rationalizing behavior. For example, the crowding out phenomenon we observe can be explained if the presence of contracts leads to a lower weight of the payoff of the sender. This could happen because contracts can be seen as a form to dilute responsibility for the others' welfare.

The structure of the rest of the paper is as follows. Section 2 discusses some related literature. Section 3 is devoted to the experimental design. Section 4 proposes a theoretical framework. Section 5 reports the results. Section 6 concludes.

2. Related literature

The majority of the related literature has focused on using trust[2] measures from surveys to study the impact on economic growth (Knack and Keefer, 1997), the impact of lack of trust on demand for regulation (Aghion and Giuliano, 2011) or differences in regulation captured y differences in trust (Pinotti, 2012). Knack and Keefer (1997) show a strong relationship between trust and economic growth.[3] After the correlational work of Knack & Keefer (1997), a growing literature has analyzed the causality path between trust and economic growth. For example, Tabellini (2010) or Algan and Cahuc (2010).[4]

[2] Trust has been defined in a variety of ways, but a common element (see e.g. Doney, Cannon, & Mullen, 1998) is the disposition of individuals (or collective decision makers) to be placed in a situation where others can take advantage of them, *in the expectation* that such a situation leads instead to mutual benefit.

[3] Trust has also been positively associated with better public education (Galor & Zeira, 1993; Putnam, Leonardi, & Nanetti, 1993; La Porta et al., 1997), the organizations of firms (Fukuyama, 1995; La Porta et al., 1997; Bertrand & Schoar, 2006), the labor market (Algan & Cahuc, 2009, Aghion et al., 2011), public service (Putnam, Leonardi, & Nanetti, 1993), regulation (Aghion et al., 2011), financial outcomes (Guiso, Sapienza, & Zingales, 2004, 2008, 2009), insurance (Cole et al., 2013) and research and development (Akcomak & ter Weel, 2009).

[4] Tabellini (2010) analyzes the effect of culture on economic performance using regional data from 8 European countries. Culture is measured by individual values and beliefs such as trust, respect for others or confidence in the link between effort and economic success. To avoid reverse causality, Tabellini (2010) uses past literacy rates and restraints on executive power as instruments for contemporaneous trust. He finds that regions with higher levels of trust present significantly higher income per capita and higher growth rates. Algan & Cahuc (2010) follow a different strategy. They use a time-varying instruments for contemporaneous trust: inherited trust of immigrants. In order to exclude reverse causality, they use the trust of immigrants inherited from their home countries as a proxy for contemporaneous trust, assuming that their level of trust is not gradually modified by their country of residence. They find a substantial impact of inherited trust on changes in income per capita.

There are two closely related papers to ours that argue that trust plays an important role in the choice of institutions. Aghion et al. (2011) propose a theoretical model where they show that lack of trust increases the demand for regulation. They also provide correlational survey evidence linking trust levels in various countries with support for regulation. Using data from several countries, Pinotti (2012) argues that differences in regulation reflects concern for market failures and shows that the variation in entry regulations around the world mostly reflect demand pressures from individuals at large, as captured by differences in trust.

We add to this literature by providing controlled experiments where causality can be more tightly established. More importantly, we add by showing that the method by which the demand is expressed, individual, or collective through voting, can lead to different amounts of insurance. Although we focus on the relationship from culture to the demand for institutions[5], Lowes et al. (2017) offer evidence of the other direction of causality: centralized formal institutions are associated with weaker norms of rule-following and a greater propensity to cheat for material gain. In this paper we show that the mere possibility of being able to choose insurance against opportunism crowds out civic behavior. We focus on trustworthiness, and not trust, as it can be interpreted as a measure of reciprocity (Rabin, 1993). Additionally, trustworthiness implies trust, while the converse is not true (Chaudhuri and Gangahdharan, 2007). In addition, trust is based on expectations on the belief about someone else's trustworthiness (Bohnet, 2010). It also depends on a person's willingness to be vulnerable to someone else, and hence it may be related to her attitudes to risk (Eckel and Wilson, 2004), her social preferences (Cox, 2004) or her willingness to accept the risk of betrayal (Bohnet and Zeckhauser, 2004).

We study strategic voting in the demand for risk mitigating institutions and its subsequent impact on behavior. Bénabou & Tirole (2006) theoretically, and Cárdenas, Stranlund, & Willis (2000), Falk & Kosfeld (2006) experimentally study how incentives may crowd out prosocial behaviour. They find that the participants behave more selfishly when the principal becomes more controlling. Bohnet & Beytelman (2007) find that control affects trust but not trustworthiness. In contrast, we find that the possibility of having institutions, even if they do not constrain participants, is enough to affect trustworthiness. We also contribute to this

[5] See Alesina & Giuliano (2015), for survey of the theoretical and empirical literature on the relationship between culture and institutions.

literature by adding that the level of trustworthiness in the environment matters for the crowding out.

3. Experimental Design

3.1 The structure

Our design is motivated by our research question, i.e. given the levels of opportunism, we are interested in how it determines the demand for risk-mitigating institutions and subsequent behavior. The experiments were run on Amazon M-Turk on a very large sample of 1564 individuals.[6]

The experimental design consisted of two parts. In the first, subjects participated in a variation of the trust game (Berg, Dickhaut, & McCabe, 1995) where player A had to decide whether to invest her *entire* initial endowment of 100 points or not. If she chose to invest, the endowment was tripled to 300. The other player, B, decided how to split the 300 points received from player A. She could choose to return any integer amount between 0 and 300 and keep the rest for herself (in addition to her initial endowment). We used the strategy method (Selten, 1967) and asked subjects to make decisions on both roles simultaneously. A binary decision for player A was chosen to simplify the decision problem and obtain a unique measure of trustworthiness.

In the second part, individuals were classified according to their level of trustworthiness in the first part, i.e., the amount they (as Player B) returned to player A in the first part of the game. *High* trustworthiness individuals who returned 150 points[7] or more in the first part of the experiment were classified as *low-opportunism*, whereas individuals who returned less than 150 points were classified as having *high-opportunism*. Individuals in each category were then randomly matched in groups of four and were informed whether they were in a group whose members transferred less, or more, than 150, no other wording was used. All participants were also informed that the criteria by which they were allocated into either group was common knowledge.

[6] All experimental procedures were approved by the ethics committee at Middlesex University.
[7] The average amount returned in the first part was 155, very close to 150.

In the second part, subjects then made decisions in another variation of the trust game (see Table 1) where Player S had to select amongst four different insurance options (S1, S2, S3 and S4). Each option guaranteed a minimum amount returned by player R. S1 represented the lowest level of insurance, where Player R would have the option to return to Player S any amount between 0 and 300. Thus, S1 provided no insurance against an opportunistic receiver. In contrast, S4 represented a situation in which Player S had the maximum coverage (her earnings were between 100 and 150) and hence provided the highest level of insurance. Note that, higher levels of insurance (moving from S1 to S4) imply lower overall theoretical surplus. For example, S1 (or no insurance) generated 300 points to be distributed by player R, whereas S4 generated only 150 points. Lower overall surplus at higher levels of insurance reflects the costs for setting up such institutions.

Table 1. Game in Part II.

Players' decision		Payoffs	
Player S: **selected option:**	Player R: **amount allocated to player S:**	Player S's payoff	Player R's payoff
S1	$X \in [0,300]$	X	$400 - X$
S2	$X \in [25,270]$	X	$370 - X$
S3	$X \in [65,210]$	X	310 – X
S4	$X \in [100,150]$	X	$250 - X$

3.2 Treatments

We conducted three main treatments, *Purchase* (n=214), *All-Voting* (n=207), and *S-Voting* (n=320), in which we modified how the different insurance levels (S1 to S4) were selected. We describe the three main treatments below.

Individual choice treatment. Player S chose from one of the four possible levels, S1 to S4, of insurance.

All-Voting treatment. Here, players first had to collectively vote in groups of four regarding the insurance level they preferred. In particular, subjects were presented with all possible pairs of insurance levels in random order and had to decide which one they preferred for each pair. The most popular option was then chosen.

S-Voting treatment. This treatment is identical to the *All-Voting* treatment except that only the vote of players S would count for choosing the insurance level. In order to be able to compare the results with the voting treatment, we formed groups of 8 subjects in which 4 of them would be randomly selected as players S and the remaining four players would be players R.

Clearly, the All-Voting treatment is more realistic than the S-Voting one. As we will see, there is a significant difference in demand for insurance between the Individual-Choice and All-Voting treatments. We conjectured that the main reason is that participants in All-Voting anticipate that they could be Receivers (player R) with 50% probability and may thus be negatively affected by the protection. Hence, we introduced S-Voting as an artificial treatment that allows to directly test the conjecture that being both senders and receivers reduces the demand for insurance.

In the voting treatments, we used an extension of Condorcet's voting rule proposed by (Young, 1986, 1988, 1995; Young & Levenglick, 1978) to select the most preferred insurance level in each group. This mechanism has been shown to be incentive-compatible and difficult to manipulate (Harrison & McDaniel, 2008).[8][9]

We also conducted a series of additional treatments which allowed us to better analyze subject behavior, the mechanisms behind our results, and to disentangle possible confounding explanations.

No Investment+Individual-Choice treatment (*NI+Individual-Chocie*). In this treatment player S had the option "not to invest" or select one of the four insurance levels (S1, S2, S3, S4). The "not to invest" option guaranteed 100 points to both players S and R.

No investment+S-Voting treatment (*NI+S-Voting*). In this treatment player S had the option whether to invest when the insurance levels (S1, S2, S3, S4) are voted by the group or to opt out, i.e. "not to invest". The decision whether to invest or not was presented after the voting decision.

Repeated trust treatment (*Repeated*). In this treatment, player S had only two options, either insurance level S1 or "not to invest".

[8] We run additional treatments for robustness checks which we explain later.

[9] Harrison & McDaniel (2008) argue that (sic) *"it is a natural and intuitive extension of the idea of simple majority rule, to allow for the possibility of Condorcet cycles forming. These cycles are avoided by searching over all non-cyclic group rankings to find the one receiving greatest support in terms of pairwise comparisons."* They refer to this as the 'Condorcet-Consistent' voting rule.

Random insurance level treatment (*Random*). In this treatment, player S had the option "not to invest". If she did not choose this option then one insurance level from (S1, S2, S3, S4) was randomly chosen by the computer.

All these treatments only differ from the previous treatments in one dimension of the second part of the modified trust game. The *NI+Individual-Choice* and *NI+S-Voting* treatments are identical to the *Individual-Choice* and *S-Voting* treatments except that they include the *No Investment* option which allows Player S to opt out and not invest in the second part of the game. Under this option both players S and R obtain 100 points, as in the first part of the game. Note that, "not to invest" is dominated by S4 which guarantees 100 points to both players and 50 additional points to be distributed by player R. The *Random* treatment has the same levels of insurance providing institutions as the *NI+ Individual-Choice* treatment, the only difference being that the one implemented is determined by a random computer draw. In the *Repeated* treatment, the first, and second part, subgames are identical. The only difference is that in the second part participants know that they belong to high or opportunism groups and are matched with somebody in their own group.

3.3 Procedures

We conducted our experiments on the Amazon Mechanical Turk online platform. A total of 1564 subjects (52% female; Age, M=38.46, SD=11.61) participated and the task took approximately 20 minutes to complete.

Subjects were informed that the experiment would consist of a series of decision tasks divided into three parts and that their earnings in each part would be determined separately. The first two parts corresponded to the trust game described in section 3.1. In the third part of the experiment, subjects undertook a series of tasks measuring their risk attitudes a la Holt & Laury (2002), distributional social preferences (Bartling et al., 2009; Corgnet, Espín, & Hernán-González, 2015), numeracy (Schwartz et al., 1997; Cokely et al., 2012), cognitive reflection test (Frederick, 2005; Toplak, West, & Stanovich, 2014) and some socio-demographic characteristics. Instructions (see the Appendix) were provided at the beginning of each part describing only the task in that part. No feedback was provided at any time during the experiment.

The maximum time taken was approximately 20 minutes, subject payment varies between a minimum of $0.01 and a maximum of $8.87, and on average subjects earned $2.43 plus a fixed payment of $0.90. Earnings were presented in points and converted to dollars according to the exchange rate of 100 points = $1. At the end of the experiment, subjects were randomly matched and assigned roles that determined their payments.

In Table 2 we show summary statistics by treatment for the baseline characteristics we elicited prior to the online experiment. Balance tests using a join test of orthogonality on all these baseline characteristics also indicate that assignment to different treatments can be considered random.

Table 2. Descriptive statistics by treatments and balance tests.

Treatment	**Female**	**Age**	**Attended college**	**Finished College**
Individual-Choice (n=214)	56.54%	38.42	79.91%	52.34%
	(49.69%)	(11.61)	(40.16%)	(50.06%)
S-Voting (n=320)	45.94%	37.33	81.88%	50.94%
	(49.91%)	(11.77)	(38.58%)	(50.07%)
All-Voting (n=207)	48.31%	37.98	79.23%	52.17%
	(50.09%)	(11.76)	(40.67%)	(50.07%)
Repeated (n=200)	51.50%	39.06	84.00%	55.50%
	(50.10%)	(11.21)	(36.75%)	(49.82%)
NI+Random (n=204)	53.43%	39.37	90.69%	64.22%
	(50.00%)	(11.81)	(29.13%)	(48.05%)
NI+ Individual-Choice (n=208)	51.92%	39.32	82.21%	56.25%
	(50.08%)	(11.70)	(38.33%)	(49.73%)
NI+Voting (n=211)	59.72%	38.44	86.73%	58.77%
	(49.16%)	(11.29)	(34.01%)	(49.34%)
Total (n=1564)	52.05%	38.47	83.38%	55.37%
	(49.97%)	(11.61)	(37.24%)	(49.73%)

Balance tests: joint test of orthogonality (p-values, using the variables above)	
Individual-Choice vs. All-Voting	0.1295
Individual-Choice vs. S-Voting	0.5524
NI+ Individual-Choice vs. NI+S-Voting	0.2275
NI+ Individual-Choice vs. Random	0.9724
NI+ Individual-Choice vs. Repeated	0.3780

Note: the mean is reported and the standard deviation between parentheses.

4. A model to rationalize choices in the experiment

We now construct a model to organize our conjectures about choices in the experiment. From previous existing data of behavior in trust games, the model should account for the fact that a majority of individuals return money as receivers, so they need to have distributional preferences. In addition, the model needs to be able to accommodate the fact that in two identical situations from material and distributive points of view (Part 1 of the experiment vs. Part 2: with level of insurance 1), receivers could behave differently. One model that can accommodate both needs is the one in Charness & Rabin (2002).

Denoting x_i the monetary payoff of individual i, her utility v_i can be written as,

$$v_i = x_i - (\alpha_i - \theta_i \phi_j)\, max\{x_j - x_i, 0\} - (\beta_i + \theta_i \phi_j)\, max\{x_i - x_j, 0\}$$

In this model, the parameter α_i is the baseline sensitivity of i towards j if she has a higher payoff than herself. β_i is the baseline sensitivity of i towards j if she has a lower payoff than herself. Then, $\theta_i \phi_j$ modifies the baseline taking into account the attitude of i towards j based on j`s actions, which is why this is important in our experiment. We have that $\phi_j = -1$ if j "misbehaved", and $\phi_j = 1$, if she did not. That is, if player j "misbehaved", player i increases her "envy" parameter α (or decreases her "guilt" parameter β) by a number equal to θ. In other words, both envy and guilt are modulated (softened or increased) as a function of how the "other" behaved previously.

We use risk neutral preferences, since in many trust games risk aversion seems to make no difference in choices (Eckel & Wilson, 2004). This is important because it means we will attribute the differences in choices only to beliefs and heterogeneity in $\beta_i, \theta_i, \phi_j$.

Sender behavior

To rationalize the choice of senders, we will not resort to social preferences, as it will make the analysis unnecessarily complicated and is not really needed. In the case of senders, the key determinant for their choices is to know how expectations will change under the different treatments/environments. The optimal choice of contract in this case is the one yielding highest expected monetary payoff. Formally, denoting by S_i^* the optimal contract choice of player i belonging to group G_i, where G_L is the low trustworthiness group and G_H is the high trustworthiness group.

$$S_i^* = max_{j \in 1,2,3,4} E(x|s_j, G_i)$$

We hypothesize that

Assumption 1.

$$E(x|s_1, G_L) - E(x|s_4, G_L) < E(x|s_1, G_H) - E(x|s_4, G_H)$$

that is, senders expect lower payoff difference without protection relative to full protection in group L than in group H. Of course, with heterogeneous beliefs between individuals it can still be that payoff is expected to be larger under s_1 or s_4. Nevertheless, from assumption 1 it is immediate that:

Observation 1.

$$Pr(S_i^* = s_1|G_L) < Pr(S_i^* = s_1|G_H),$$

$$Pr(S_i^* = s_4|G_L) > Pr(S_i^* = s_4|G_H)$$

that is, the fraction of senders choosing institution s_1 will be lower in $G_L$than in G_H, and the opposite is true for s_4. From Table 1, adding the payoff of sender and receiver, one can see that the surplus of the pair is always lower from higher level of institutions. From Observation 1 for every sender-receiver couple i, j we can then immediately obtain the following observation:

Observation 2.

$$E(x_i + x_j|G_L) < E(x_i + x_j|G_H)$$

that is, G_H groups choose on average lower levels of institutions and that is automatically associated with a higher aggregate payoff for the pair.

Receiver behavior

Receivers have no uncertainty about the action taken by senders, so the only determinant of their choices is their social preferences and their beliefs about what is the socially appropriate action. We expect, from behavior in previous trust games, that very few senders will get a higher material payoff than receivers (Johnson & Mislin, 2011), so that the part of the function related to α_i (spite) will not be important for the results. In addition, it is immediate from our assumption about the utility function of participants that:

Observation 3.

For given values of θ_i and ϕ_j, the level of x_i returned by player j is increasing in β_i That is, individuals with a higher level of compassion return more and variations in the level of spite are not relevant for the results.

However, it is more difficult to establish the effect on receivers of the existence of contracts. In order to see this, if we denote by x_i the amount returned by the receiver, we first observe:

Observation 4.

$$E(x_i|s_1) \neq E(x_i|Part_1) \text{ implies that } \theta_i \neq 0$$

This is true since for the receiver the two situations ($s_1$and $Part_1$)[10] are equivalent from the point of view of material and distributional preferences. That is, for a given x_i, the outcome in terms of the amount of money she obtains and the sender obtains are the same for $s_1$and for $Part_1$, so if θ_i were equal to zero, she should make the same choice in both situations, and thus it must be that $\theta_i \neq 0$. But going beyond this observation is hard, as the amount returned will depend on whether and how the presence of insurance changes θ_i. Nevertheless, the following observation provides some guidance about what to expect.

Observation 5.

If the presence of insurance increases θ_i (say because it signals a social norm to return), then $E(x_i|s_1) < E(x_i|Part_1)$. If the presence of insurance decreases θ_i (say because it allows for a dilution of responsibility), then $E(x_i|s_1) > E(x_i|Part_1)$.

5. Results

5.1 First part: Is there a need for risk-mitigating institutions?

We report the decisions of individuals A (probability of sending) and B (amount returned) in the first part of the experiment in Table 2. We observe that around 50% decided to send their initial endowment to A. Pairwise comparisons using proportion tests show that player A's behavior in the first part is similar across all treatments (Individual-Choice vs All-Voting,

[10] Part1 is the first part of the experiment

p=0.2116; Individual-Choice vs S-Voting, p=0.8324; All-Voting vs S-Voting, p=0.1157).[11] More importantly for our analysis, the behavior of B´s is also not different across treatments (Mann-Whitney-Wilcox test, MWW hereafter; p=0.8587, p=0.8591, p=0.9921).

Table 3. Probability of Sending and Amount Returned in Part 1.

		Individual-Choice	All-Voting	S-Voting
Probability of sending	% choose A1	50.93%	57.00%	50.00%
Amount returned	Average	155.62	153.92	155.20
	Median	200.00	200.00	200.00
	Std. Dev.	70.17	72.86	71.71
	N	214	207	320

We get a clear separation between the low-, and high-, opportunism groups. The average amount returned in the high-opportunism group (M=47.88, SD=49.35) was significantly lower than in the low-opportunism group (M=193.74, SD=20.53; MMW p<0.0001; pairwise comparisons *all p's<0.0001*). Interestingly, the probability of sending is also lower in the high- (21.32%), relative to the low, -opportunism group (63.42%; proportion test, p<0.0001). Its clear that across all treatments, those exhibiting low opportunism, also return larger amounts relative to high opportunism individuals.

In the high-opportunism group, nearly 60% of the subjects make the sender worse off by returning less than 100, while nearly 48% returned zero. By construction, subjects in the low-opportunism group returned more than 150 points (79.6% of those in the low-opportunism group returned exactly 200) and consequently senders associated with them were always better off. Given the large percentage of receivers who make senders worse off, risk-mitigating institutions providing insurance against opportunism seem to be necessary, especially in high-opportunism groups.

5.2. Second part: Risk Mitigating Institutions.

We now analyze the demand for risk-mitigating institutions providing insurance against opportunism. In the second part participants decided on the level of insurance they prefer. They could either directly choose the level of insurance they preferred or vote upon it. The

[11] Using Bonferroni's correction, the p-value threshold for significance at the 10% (5%) level is equal to 0.0333 (0.01667), in case we consider the 3 pairwise comparisons as independent tests.

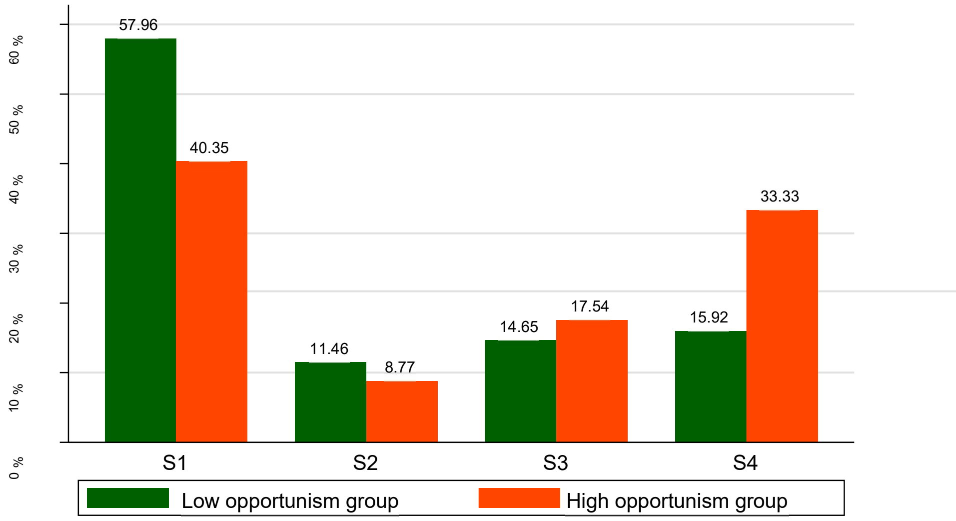
choice of the risk-mitigating institutions (Table 1) is based on the idea that setting them up is second best from the welfare standpoint. The greater is the insurance provided, the higher is the cost of providing it. This is reflected in the decrease in total surplus as the minimum guaranteed amount returned to the trustor increases (from 0 for S1 to 100 for S4). In fact, total available surplus is maximized (=300) with S1 that provides zero insurance to the trustor and decreases subsequently as the level of the insurance for the trustor (sender) increases with a total available surplus of 250 for S4. S1, in effect captures informal social contracts that are at the very heart of trust dealings. However, higher levels of insurance, from S2 to S4, reflect the price one pays for securing higher levels of risk-mitigating institutions that provide insurance. That is, the higher the insurance provided, the greater is the cost to society. While, S1 shows full trust towards the receiver (and zero risk-mitigating institutions per se), S4 exhibits minimal trust and 100% security for the sender.

5.2.1. Individual-Choice treatment: S chooses the level of risk-mitigating institutions

In the purchase treatment, all S´s select the level of insurance they desire by choosing from one of the four possible available levels. In order to analyze the demand for these we restrict the sample to the individual-choice treatment and analyze how the choice of insurance levels varies according to whether individuals are in a high or a low opportunism group.

Figure 1 shows that the majority of individuals (57.96%) in the low-opportunism group demand the lowest level of insurance S1. Meanwhile, in the high-opportunism group, the lowest level of insurance (S1) is demanded by 40.35%, with 33.33% choosing the maximum level of insurance (S4). A Kolmogorov-Smirnov test and a Fisher exact test show that the distributions by groups are different (*p=0.0636 and p=0.0315*, respectively). Thus, individuals’ level of trustworthiness seems to affect the choice of insurance levels, with low-opportunism individuals being more likely to choose a higher level of insurance. This is consistent with our theoretical Observation 1 in Section 4.

Figure 1. Choice of Insurance levels (Individual choice treatment)



5.2.2 Voting treatment: Player S votes for the level of the insurance

In the individual-choice treatment, insurance levels are chosen by individuals by paying a price (in terms of lost surplus) for higher levels of insurance. While a price may be implicit in the choice of insurance levels in certain situations, institutions that provide insurance against opportunism are also chosen through collective choice, for example, they are voted by citizens (or selected by elected politicians, who are supposed to represent the electorate's preferences).

We ran two treatments here, the S-Voting and All-Voting treatments. In the S-Voting treatment only players S could vote for insurance levels while in All-Voting both players S and R voted. Players in both treatments were presented with all possible pairs of insurance levels in random order and had to decide which one they preferred for each pair. Then we apply the Condorcet's voting rule proposed (Young, 1986, 1988, 1995; Young & Levenglick, 1978) to select the insurance level provided for each group.

First, we analyze the results from the S-Voting treatment, where players S vote in groups of 4 for the level of insurance they prefer. Out of the times they are presented with a particular choice we compute the fraction of times subjects vote for insurance levels provided through S1, S2, S3, and S4 in pairwise comparisons. We then analyze differences across groups for these proportions. Results are reported in Table 4 (first three columns). We find that the fraction of times those in the low-opportunism group vote for the lowest level of level of insurance (S1) is significantly higher than that for the high-opportunism group (proportion test, *p=0.0016*). The opposite is true for S4 that provides the highest level of insurance (p=0.0001). This is qualitatively similar to what we observe in Figure 1 and also is consistent with our theoretical Observations 1 and 2 in Section 4.

Table 4. Fraction of time subjects voted for one option (with respect to another one) by High and Low opportunism groups.

Mean (std dev)	S-Voting			All-Voting		
Levels of Insurance	Low	High	p+	Low	High	p+
S1	0.569 (0.424)	0.397 (0.428)	0.0016	0.724 (0.407)	0.780 (0. 388)	0.3768
S2	0.571 (0.248)	0.520 (0.245)	0.1071	0.578 (0.217)	0.613 (0.177)	0.2845
S3	0.499 (0.256)	0.516 (0.216)	0.5813	0.442 (0.202)	0.393 (0.169)	0.1102
S4	0.362 (0.406)	0.567 (0.429)	0.0001	0.256 (0.395)	0.214 (0.378)	0.4951

+ This column corresponds to the p-values of a t-test comparing the High and Low opportunism groups.

Now we analyze results from the All-Voting treatment (Table 4, last three columns) where individuals vote in groups of 4 before knowing if they will be participating as senders or receivers. Our motivation for running this treatment is to see whether strategic voting is observed when one can vote without knowing what role, player R or S, they will be assigned later on. Results show that there are no differences across groups, and both high and low opportunism groups prefer S1 with the lowest insurance level. We also observe that the fraction of votes received declines as the level of insurance increases We analyze this unexpected result in the following section.

Table 5. Linear regressions on the choice of high insurance (S3 or S4 vs S1 or S2)

	All individuals		Low opportunism group		High opportunism group	
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.3598***	0.4627***	0.3057***	0.5218***	0.5088***	0.2651
	(0.0329)	(0.1384)	(0.0369)	(0.1776)	(0.0668)	(0.2822)
S-Voting	0.0572	0.0328	0.0446	-0.0066	0.0769	0.1303
	(0.0455)	(0.0475)	(0.0515)	(0.0540)	(0.0894)	(0.0957)
All-Voting	-0.1303***	-0.1078**	-0.0557	-0.0428	-0.3323***	-0.2376***
	(0.0453)	(0.0472)	(0.0528)	(0.0544)	(0.0858)	(0.0885)
Risk aversion		-0.0014		0.0001		-0.0098
		(0.0095)		(0.0114)		(0.0181)
Envy		0.0791***		0.0756***		0.0612
		(0.0201)		(0.0220)		(0.0517)
Compassion		-0.0731***		-0.0808***		-0.0294
		(0.0214)		(0.0276)		(0.0528)
CRT		0.0173		0.0152		0.0190
		(0.0123)		(0.0138)		(0.0271)
Numeracy		-0.0166		-0.0416**		0.0477
		(0.0153)		(0.0179)		(0.0307)
Female		0.0067		-0.0209		0.1349
		(0.0393)		(0.0450)		(0.0819)
Age		-0.0008		0.0001		-0.0037
		(0.0017)		(0.0019)		(0.0035)
Attended college		0.0197		0.0194		0.0045
		(0.0599)		(0.0696)		(0.1246)
Finished college		-0.0291		-0.0529		0.0826
		(0.0446)		(0.0519)		(0.0885)
Trust unknown		0.0041		-0.0011		0.0451
individuals		(0.0194)		(0.0226)		(0.0380)
Amount returned in		0.0002		0.0003		-0.0005
the first part		(0.0005)		(0.0006)		(0.0010)
Sent in the first part		-0.2034***		-0.1607***		-0.3686***
		(0.0449)		(0.0545)		(0.0784)
Observations	644	564	466	409	178	155
R2	0.0259	0.1440	0.0077	0.1304	0.1205	0.2701

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

5.2.3. Comparison across the three treatments:

Here we compare the choice of insurance levels between individuals across the three treatments. We create a dummy variable for *high insurance* which takes value one if S3 or S4 are selected, and zero otherwise, in the individual-choice treatment. In the treatments where players S vote for the level of insurance, the high insurance variable takes value one if options S3 or S4 are always selected by the individuals when presented in pairs against another option. Therefore, this dummy indicates whether the individual strongly prefer institutions S3 or S4, i.e. a fairly high level of insurance.

In Table 5 we run a linear probability model[12] with the *high insurance* dummy as a dependent variable. In the first two columns we see that the treatments where players S chose the level of insurance, or voted for it, are very similar and subjects remain equally likely to demand high insurance levels (after controlling for individual demographics, risk aversion, envy, CRT and numeracy tests, etc.). In contrast, when players vote for the level of insurance, and this also affects them as player R, they select lower levels of insurance. When we divide the sample into the low and high trustworthiness (i.e. low and high-opportunism) groups, we see that these differences come from those who returned less (the high opportunism group) and are also robust to the inclusion of all these controls. This shows that high-opportunism individuals are more likely to vote strategically.

As predicted in Observation 1, we find that in the low-opportunism group most individuals choose S1. Meanwhile, for the high-opportunism group there is a sizeable percentage of individuals choosing S4. However, many still choose S1. The differences observed in the All-Voting treatment may, however, be due to players' strategic behavior. In this case, players voted for the level of insurance without knowing what role, S or R, they will be playing later on. From the point of view of player R, S1 is always preferable, given that it will maximize payments if they decide to return nothing (or a small amount). From the point of view of player S, their choice may be different depending on what group they are in. For the low-opportunism group, players S would maximize payments choosing S1 if they expect the other players in their group would return, as in part 1, an amount equal to or higher than 150. However, players S in the high-opportunism group would choose S4 if they expect the other players in their group to return less than 150, as in part 1. This could explain why the level of insurance chosen by the high-opportunism group differs across treatments.

5.3. Return Behavior.

Does return behavior change between the individual-choice and the voting treatments? Here we analyze this by level of insurance and group. Figure 2 shows the average payments for players S and R in the first and second part of the experiment by treatment and group. First, we find that the average pattern is practically identical across treatments (there are only minor differences among panels a), b), and c) in Figure 2). Second, we observe that the total

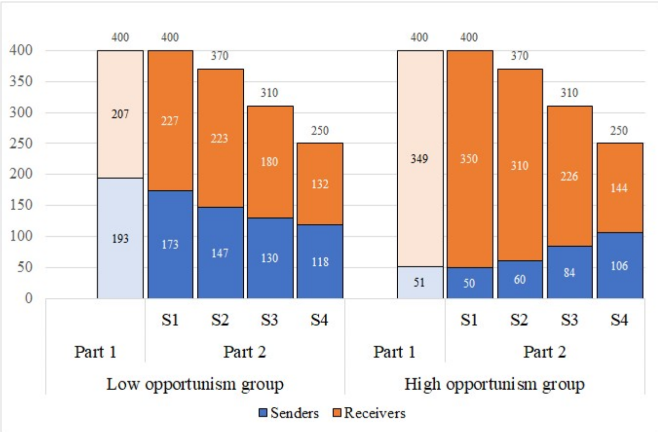
[12] Results from a probit regression are very similar and available on request.

amount of payments received decreases with the level of insurance (400 for S1, 370 for S2, 310 for S3, and 250 for S4). Third, we find strong differences in how the rents are distributed between player S and R, depending on which group they are in. In the low-opportunism group, players S get around 43.2% (between 39.7% and 47.7%) of the rents generated, whereas in the high-opportunism group, player S obtain only 24.0% (between 12.1% and 42.4%) of the rents.

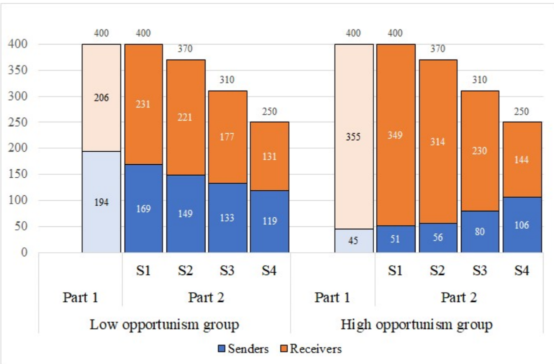
Interestingly, the effect of insurance levels also differs between groups. In the low-opportunism group, player S's earnings decrease with the level of insurance. This result seems consistent with the results of Falk & Kosfeld (2006) if players R perceive higher insurance levels as a signal of distrust. However, in our setting the total rents decrease with the level of insurance provided but, the relative amount sent back by recipients remained stable across the different insurance levels, as mentioned above. In the high-opportunism group, the pattern is the opposite. Players S' earnings, increase with the level of insurance. This is the case as players R are forced to increase the amount returned with the higher minima determined by each level of insurance. In the high-opportunism group, 51.27% (51.78%) [57.87%] {70.56%} returned the minimum amount of 0 (25) [65] {100} under S1 (S2) [S3] {S4}, whereas these proportions were significantly lower in the low-opportunism group 2.94% (2.94%) [3.68%] {25.00%} (proportion tests, all p's<0.0001).

Figure 2: Payments by Treatment and Group

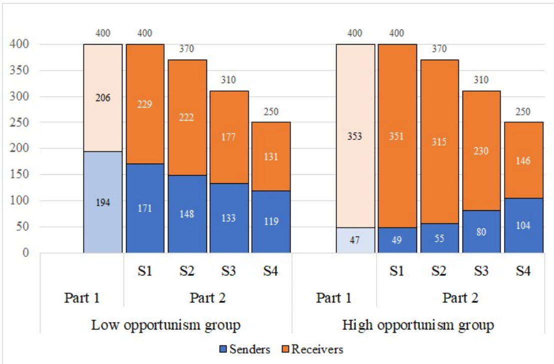
a) Purchase



b) All-Voting



c) S-Voting



The regression analysis reported in Table 6 confirms these results. The first four columns of Table 6 show that for each level of insurance (S1-S4), the amount returned is significantly higher in the high trustworthiness groups, whereas there are no significant differences across treatments. However, differences between the high and low opportunism groups decrease with the level of insurance. We also find that the main observable predictor of the amount returned is the level of compassion (β_i) of the participant, consistent with the theory informing our Observation 3 in Section 4.

Table 6. Linear regressions on the amount returned by level of insurance and the difference between amounts returned in the first and second parts (S1) of the experiment.

	(1) S1	(2) S2	(3) S3	(4) S4	(5) Part 1 – S1
Constant	-13588	8038	61.757***	103.087***	32.107**
	-16589	-13004	-8610	-3562	-16036
S-Voting	4.216	0.560	-0.963	-1.126	-0.557
	(10.519)	(8.188)	(5.146)	(1.936)	(9.539)
All-Voting	0.079	-5.215	-5.089	-0.997	1.129
	(11.319)	(8.534)	(5.212)	(2.050)	(9.272)
Low-opportunism group	95.489***	62.729***	34.766***	8.233***	37.738***
	(10.579)	(8.769)	(5.770)	(2.346)	(9.432)
S-Voting x	-4.350	2.431	4.293	-0.337	-0.238
Low-opportunism group	(11.599)	(9.256)	(6.024)	(2.418)	(10.575)
All-Voting x	-5.572	5.861	7.747	1.908	5.068
Low-opportunism group	(12.673)	(9.814)	(6.200)	(2.550)	(10.638)
Risk aversion	-1.483	-0.684	-0.405	-0.167	1.834**
	(1.025)	(0.798)	(0.524)	(0.236)	(0.880)
Envy	-0.148	-0.736	0.561	-0.315	0.964
	(2.127)	(1.790)	(1.220)	(0.543)	(2.000)
Compassion	19.991***	17.702***	9.937***	2.898***	-14.034***
	(3.178)	(2.515)	(1.567)	(0.655)	(2.790)
CRT	0.043	0.235	-0.096	-0.243	-0.952
	(1.442)	(1.083)	(0.743)	(0.325)	(1.304)
Numeracy	2.819*	2.828**	0.240	-0.333	-2.265
	(1.693)	(1.349)	(0.941)	(0.413)	(1.610)
Female	1.518	-0.330	-1.599	-0.185	2.981
	(4.099)	(3.347)	(2.222)	(0.987)	(3.722)
Age	0.306*	0.172	-0.002	-0.001	-0.341**
	(0.182)	(0.128)	(0.093)	(0.044)	(0.172)
Attended college	-4.344	-3.446	1.166	0.047	0.835
	(6.118)	(5.071)	(3.289)	(1.481)	(5.887)
Finished college	3.961	1.755	-2.015	-0.872	-3.327
	(4.360)	(3.584)	(2.505)	(1.121)	(3.791)
Trust unknown individuals	3.300	3.052*	2.136*	0.136	-1.044
	-2140	-1730	-1151	(0.518)	-1851
Amount returned in the first	0.107*	0.060	0.024	0.020	0.013
part	(0.062)	(0.047)	(0.030)	(0.013)	(0.056)
Sent in the first part	13.371**	10.929**	4706	1565	-6981
	-5295	-4322	-2897	-1264	-4973
Observations	637	637	637	637	637
R2	0.6105	0.5703	0.4886	0.2496	0.1284

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

In the second part, when the level of insurance is lowest (S1), there is effectively no protection as R can always return 0 to player S. This situation is therefore the same as the one in the first part of the game. This allows us to compare the stability of an individuals' level of opportunism (see first two bars, Part 1 and S1 in Part 2, in Figure 2). In order to do this, we calculate the difference in the amounts returned in the first part of the game and, under S1 in the second part. If the difference is positive, this means that the amount returned in the second part is smaller than the amount returned in the first. In the last column of Table 6 we report the results of a regression of the difference in the amount returned between the first and second part (S1).

Overall, we do not observe differences across treatments. However, we find a significant positive effect for the low-opportunism group. This implies that the introduction of insurance makes those in the low-opportunism group less likely to return an amount as high as the one returned in the first part. Introducing the possibility of choosing insurance levels seems to crowd out civic behavior differentially for the low-opportunism group, and this is robust to controlling for risk aversion and social preferences.

Figure 3: Difference in the amount returned in the individual-choice and voting treatments between the first and second (S1) parts by group.

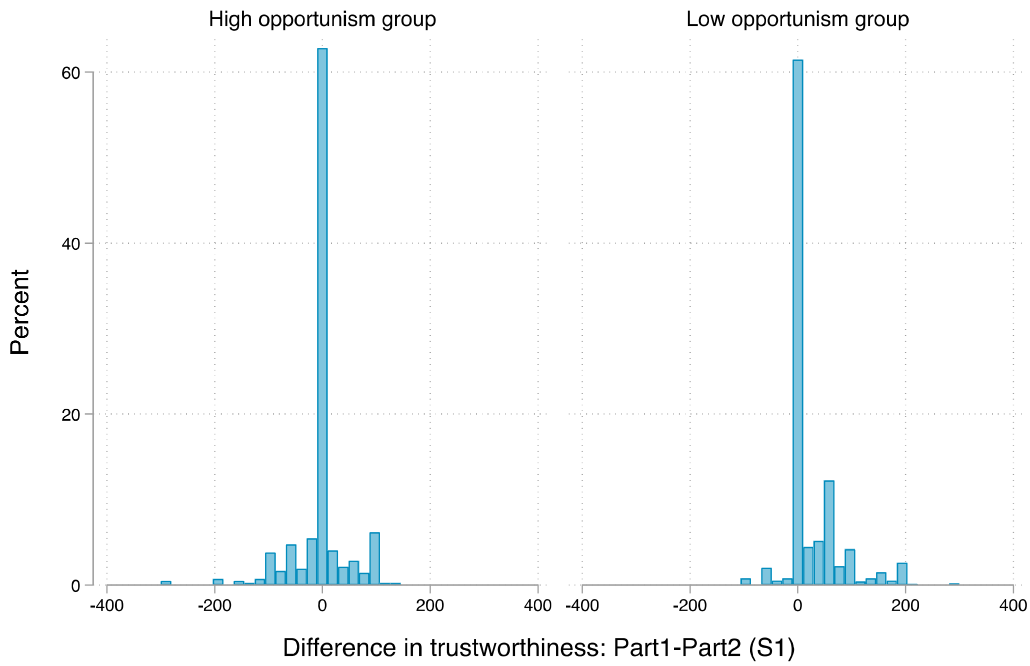


Figure 3 shows the differences in return behavior between the first and second part of the experiment for the three treatments. It can be seen that those in the low-opportunism group are *more likely* to display positive differences than those in the high-opportunism one. A Kolmogorov-Smirnov test confirms that the two distributions are different *(p-value = 0.0003)*.

5.4 Crowding-out of reciprocity: mechanisms

For a given amount returned by the receiver, the outcome in terms of the amount of money she and the sender obtain are the same in Part 1 and Part 2 under S1. Hence, from our Observation 4 in the theory Section 4, we know that $\theta_i \neq 0$, implying that players change their sense of "deservingness" of return behavior in the second part. The fact that there is a decrease means, in accordance with Observation 5 in Section 4, that there is a decrease in θ_i, perhaps because it allows for a dilution of responsibility in the presence of insurance. We will now investigate the mechanisms behind this result in more detail.

In the previous section we saw that individuals in the low-opportunism group return significantly less in the second, than in the first, part of the experiment. This difference arises even when the lowest level of insurance (S1) is chosen (where there is no protection and the amounts that can be returned are the same in the first and the second part). We postulate that this could be due to the fact that players change their sense of "deservingness" of return behavior due to the presence of institutions. However, there could be other mechanisms at play.

To understand this further, it will be useful to look at the changes in the experimental design between the first and second stages. This is important as we compare the amount returned by individuals between these two stages to establish crowding out. We see that besides the introduction of insurance in the second part there are three changes that could possibly confound the results. *First*, in the second part senders did not have the option not to send anything (i.e. to opt out). *Second*, we inform subjects they belong to a group based on the amount returned. *Third,* in the second part participants know that the level of insurance is either chosen or voted by other players. The result earlier mentioned could have arisen due to any one of these factors.

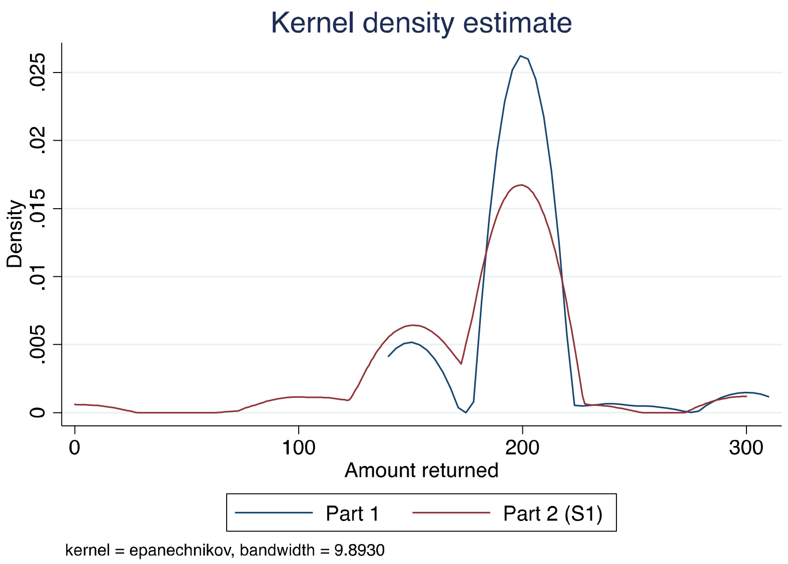
Now we explore whether any of these factors could be driving the crowding out result. We do this by using the additional treatments where they had the option "not to invest" in the second part. In order to understand whether the knowledge of being in the high return group also has an additional effect on our results, we restrict our sample to the *Repeated* treatment where individuals play the same game in both parts, with the only difference being that in the second part they have information about the group they are in.

Comparing the amount returned in the Repeated treatment for the low-opportunism group we find that they return a smaller amount in the second part: 197.93 vs 183.14 (paired t-test, $p = 0.0003$). Thus, part of the effect observed is due to the fact that in the second part, individuals are informed about the group they are in. In particular, we inform them whether members of their group returned less or more than 150. That could change what they perceive to be socially acceptable, or the "social norm", and make them more likely to reduce the amount returned. Results are different for the high-opportunism group, as subjects in the first part returned a slightly lower, but not significant, amount than in the second part (45 vs. 51, $p=0.5458$). When looking at the low-opportunism group, Figure 4 shows how the distribution of amounts returned has a higher mass of points to the left in the second round, indicating the decrease in the amount returned.

However, knowing the group they are in may be part of the mechanism but not the whole answer. In what follows we compare results from this treatment to the rest to analyze the importance of the introduction of risk-mitigating insurance. As we only observe the crowding out effect for the low-opportunism group, we restrict our sample to this group. We then compare the treatment mentioned above where they play the same game in both the stages (and know their group) to the treatments where insurance levels are either chosen randomly, individually or collectively.

As in the previous section, the dependent variable is the difference in the amounts returned in the first and second parts (S1). Thus, a positive number would indicate a decrease in the amount returned in the second part, compared to the first. We first test whether the introduction of insurance further increases the crowding out effect over and above the effect of telling subjects the group they are in (i.e. compared with the difference observed in the Repeated treatment). We run regressions with a dummy called "NI+Insurance", which takes value one for NI+IndividualChoice, NI+Voting, and NI+Random treatments where insurance is introduced, and value 0 for the Repeated treatment. Results are shown in the first column of Table 7.

Figure 4. Distribution of amounts returned in the first and second rounds, low-opportunism group in the *Repeated* treatment.



We find that introducing the possibility of choosing insurance levels significantly increases the difference between the amount returned in the first and the second parts ($\beta(NI + Institutions) = 11.673,\ p = 0.018$), and the effect is larger than the effect of telling them the group they are in, which is the reference category. This means that the introduction of insurance affects crowding out, over and above the effect of telling subjects about the group they are in.

In the second column we introduce another dummy called "NI+IndividualChoice" that indicates the treatments that introduce insurance that is chosen, either directly (NI+IndividualChoice) or by voting (NI+Voting). The "NI+IndividualChoice" dummy variable takes value one for NI+ IndividualChoice and, NI+Voting treatments, and value 0 for the Repeated and NI+Random treatments. Results in this column show that however, once insurance is introduced, the fact that it is chosen does not have a significant effect ($\beta(NI + Choice) = -2.042, p = 0.661$).

Overall, this allows us to conclude that, even if telling subjects about the group they are in affects crowding out, the introduction of insurance has a significantly larger effect, and it does not matter whether insurance is chosen by the other player, just the mere presence of insurance is enough to change subjects' sense of "deservingness" of return behavior in the second part.

Table 7. Crowding out of civic spirit. Linear regressions on the difference between amounts returned in the first and second parts (S1) of the experiment.

	(1)	(2)
Constant	61.546***	62.154***
	(17.801)	(17.790)
NI+Institutions	11.673**	12.894**
	(4.908)	(5.733)
NI+IndividualChoice		-2.042
		(5.588)
Risk aversion	-0.233	-0.237
	(1.218)	(1.218)
Envy	3.795*	3.731*
	(2.203)	(2.257)
Compassion	-15.321***	-15.256***
	(3.530)	(3.563)
CRT	1.592	1.490
	(1.613)	(1.686)
Numeracy	-3.702**	-3.744**
	(1.533)	(1.528)
Female	-5.952	-5.952
	(4.358)	(4.362)
Age	-0.152	-0.153
	(0.183)	(0.183)
Attended college	17.086***	16.906***
	(6.011)	(6.082)
Finished college	-7.946	-7.943
	(5.487)	(5.498)
Trust unknown individuals	0.252	0.237
	(2.650)	(2.653)
Expected amount returned	-0.062	-0.062
(first part)	(0.060)	(0.060)
Sent in the first part	-2.104	-1.919
	(4.815)	(4.846)
Observations	516	516
R2	0.1239	0.1242

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

5.5. Economic cost: Low vs High Opportunism group.

In this section we investigate the economic costs of being in a high-opportunism group. We take advantage of the fact that in the NI+ IndividualChoice treatment the participants had the option "Not to invest" in addition to choosing one of the four levels of insurance as in the Purchase treatment. Given that choosing any level of insurance can also increase gains for both players (see last column in Table 8), we can use this to compute the benefits of exchange lost due to lack of trust in this treatment.

Table 8. Economic costs of high opportunism. Proportion of individuals who choose each level of insurance by group.

Level of insurance	Low-Opportunism group	High-Opportunism group	Total rents
Not to invest	13.38%	29.41%	200
S1	52.23%	31.37%	400
S2	10.19%	5.88%	370
S3	12.74%	7.84%	320
S4	11.46%	25.49%	250
N	157	51	

We find that a smaller proportion of the low-opportunism individuals (13.38%) decided not to invest, while this proportion was significantly larger (29.41%) in the high-opportunism group (test of proportions, $p=0.0085$). In Table 8 we can see the proportion of individuals who chose each type of insurance level. If we multiply each proportion by the size of the pie given by each type of insurance level, we get that while the gains from trade in the low-opportunism group are of 341.53, in the high-opportunism group this is 294.12.

6. Conclusions

The importance of risk-mitigating institutions in exchange and governance has been long appreciated and cannot be overstated. These institutions either emerged endogenously in early societies or are voted upon as in recent times. For example, in early trade it was common to see the use of endogenously developed social networks to enforce trust and trustworthiness in exchange (Greif, 1993; Ghosh, 1993; Sealand, 2013) or to facilitate co-operation (Ostrom, 1990). Evidence points out that such risk-mitigating institutions endogenously arose out of a participative process (mutual agreements, social networks, voting, etc..) or were imposed upon through legal dictate. Interestingly, how the choice of these institutions impacts future actions of the participating agents is little studied. Clearly, the importance of understanding this link in the design of risk-mitigating institutions cannot be understated.

In this paper we have attempted to understand the causes and consequences of risk-mitigating institutions chosen by individuals given their return behavior in the trust game. We call those that return a high amount as being a low-opportunism type, and those that return a lower amount as being a high-opportunism type. We study how the demand for insurance depends on the level of return behavior and on the manner in which it is chosen: individually or collectively. We obtain several new results. First, we find that there is a significant demand for risk-mitigating institutions and that it depends on whether there is a low or a high opportunism environment. When insurance levels are *individually chosen* or *voted* upon only by the senders, individuals in the low-return (high-opportunism) group demand higher levels of insurance than those in the high return (low-opportunism) group. However, when *voted* upon by all individuals, the demand for insurance is the same across both groups. This is explained by the fact that high-opportunism individuals vote strategically to take advantage of future interactions by voting for low levels of insurance.

The behavior of receivers is similar across treatments and those in the high-opportunism group increase the amount returned as the level of insurance increases. However, those in the low-opportunism group return less as the insurance level increases. We find that the return behavior in the first part of the experiment is higher than in the second. We show that this is mostly explained by the introduction of risk-mitigating institutions, that crowd out civic behavior.

Our experiment is static, and in our context, risk-mitigating institutions are a substitute for trust. In this way we miss a potentially important dynamic effect, where good institutions and high insurance can foster trust, create a social norm, and eventually become unnecessary. Historical research, such as Guiso, Sapienza & Zingales (2016), suggests that good institutions can enhance civic virtue in the long run. We believe that this is an important agenda for future experimental research in this context.

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APPENDIX - Instructions

PART I - This is the first part of the HIT.

In this part you are going to be paired with another individual in the experiment. One of you will be player A and another person will be player B. Before the computer randomly determines what player each one of you will finally be assigned to be, both of you will be asked to make decisions in the role of the two players. The decisions are as follows:

As player A. you have to choose between the following two options:

A1. 100 for yourself (player A) and 100 for player B

A2. Player B gets 400 and decides how much A and B receive (see options below).

As player B, your decisions would only apply if player A has selected option A2. In this case, you will have to decide how many points to be allocated to player A.

Payoffs: Your earnings will be:

If player A chooses A1:

- Player A's earnings = 100
- Player B's earnings = 100

If player A chooses A2:

- Player A's earnings = "amount allocated to player A" (selected by player B)
- Player B's earnings = 400 – "amount allocated to player A" (selected by player B)

Note that player B can allocate any number between 0 and 300 to Player A, so Player B's earnings will always be at least 100 points.

After all the individuals have made their decisions, the computer will randomly pair you with another person in the experiment. Then the computer will randomly determine which role each of you will be playing. Your payoffs, and the payoffs of the player you have been paired with, are determined depending on the role you have been randomly assigned by the computer, your decision and the decision of the other player.

Please answer carefully the following two questions regarding the instructions above:

1. If player A chooses A1
    a. Player B gets 400 and decides how much A will receive
    b. Player B obtains 0

c. Player B obtains 100

2. If player A chooses A2 and player B allocates 200 to player A …
    a. Player B will obtain 0
    b. Player B will obtain 200
    c. Player B will obtain 400

Please select an option as ‘Player A’ and another option as ‘Player B’.

<u>As player A</u>, you have to choose between the following two options:

A1. "100 for yourself (player A) and 100 for player B" (1)

A2. "Player B gets 400 and decides how much A and B receive (see below)"

<u>As player B</u>, select how many points you want to allocate to player A, if player A chooses option A2:

0  300

At the end of the survey, the computer will randomly pair you with another person and determine what player you will be playing. Then, depending on the role you have been randomly assigned by the computer, your decision and the decision of the other player, your payoffs, and the payoffs of the player you have been paired with, are determined as follows:

If Player A chooses option A1:

- Player A’s earnings = 100
- Player B's earnings = 100

If Player A chooses option A2:

- Player A’s earnings = "amount allocated to player A" (selected by player B)
- Player B's earnings = 400 – "amount allocated to player A" (selected by player B)

Note that player B can allocate any number between 0 and 300 to Player A, so Player B earnings will always be at least 100 points.

PART I - This is the second part of the HIT.

Purchase treatment

PART II - This is the second part of the HIT.

Your decision as 'Player B' in the previous part was: "Allocate [amount returned in Part I] points to player A."

In this part, **you will be grouped with one individual who, like you, decided to allocate** more/less than 150 **to player A** (while making their choice as player B in the first task).

One of you will be player S and another one will be player R. Before the computer randomly determines what player each one of you will be, both of you will be asked to make decisions in the role of the two players S and R.

As player S you will have to choose among options S1, S2, S3, and S4.

As player R, you will choose the amount to be allocated between you and player S for each possible option (S1, S2, S3 or S4) chosen by player S. The total amount to be allocated, as well as player R's payoffs, depends on the option implemented.

The other individual with whom you are paired will also make his/her decisions for both roles.

After all the individuals have made their decisions, the computer will randomly determine which role each of you will be playing. Your payoffs, and the payoffs of the player with whom you have been paired with, are determined depending on the role you have been randomly assigned by the computer, your decision and the decision of the other player as shown in the table below:

Players' decisions		Payoffs	
Player S	Player R: "amount allocated to player S"	Player S payoff	Player R payoff
S1	between 0 and 300	"amount allocated to player S"	400 - "amount allocated to player S"
S2	between 25 and 270	"amount allocated to player S"	370 - "amount allocated to player S"
S3	between 65 and 210	"amount allocated to player S"	310 - "amount allocated to player S
S4	between 100 and 150	"amount allocated to player S"	250 - "amount allocated to player S"

Example A: The computer randomly determines that you are player S. You choose option S3 and the player R you are matched with allocates 130 points to you. Then your earnings will be:

Player S (you): 130 points

Player R (the other player): 180 points (= 310 – 130)

Example B: The computer randomly determines that you are player R. Suppose that the other player chooses option S2 and you allocate 190 points to player S. Then your earnings will be:

Player S (the other player): 190 points

Player R (you): 180 points (= 370 – 190)

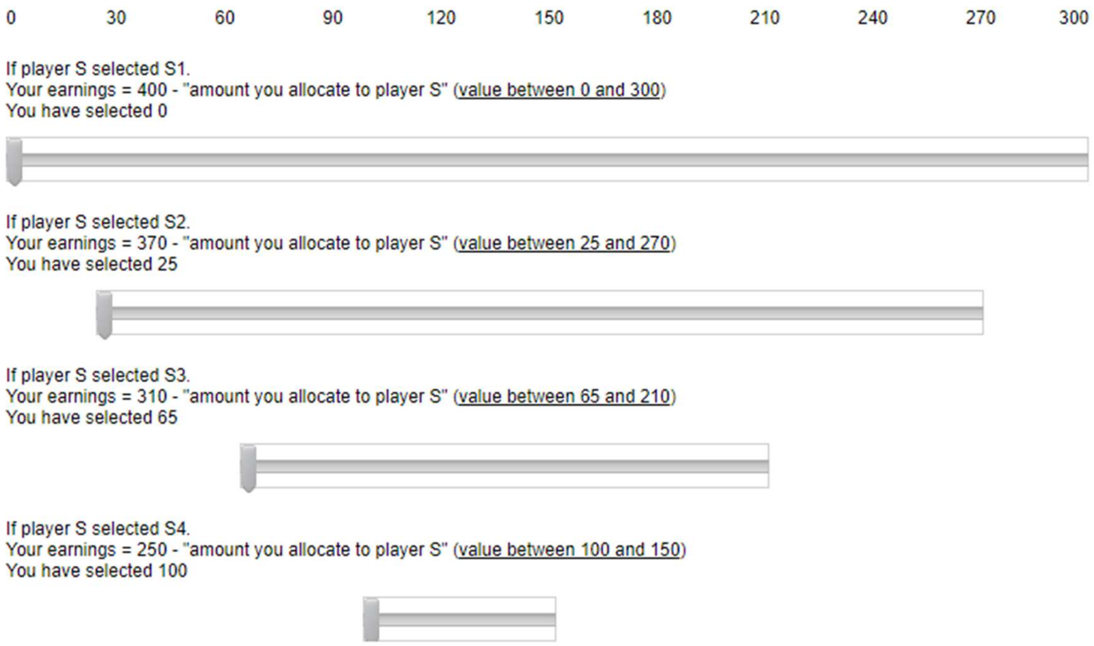
Given the table above, please make a decision for both roles:

As player S, choose an option:

- S1
- S2
- S3
- S4

As player R, select below, using the sliders, the amount to be allocated to player S.

Remember that the amount of points that can allocate to player R depends on the option selected by player S



S-Voting treatment

PART II - This is the second part of the HIT.

Your decision as ‘Player B’ in the previous part was: "Allocate [amount returned in Part I] points to player A."

In this part, **you will be grouped with 7 other individuals who, like you, decided to allocate** more/less than 150 **to player A** (while making their choice as player B in the first task).

Four of you will be player S and the other four will be player R. Before the computer randomly determines what player each one of you will be, all of you will be asked to make decisions in the role of the two players S and R. **Then, you will be paired with one individual in your group who has been assigned a different role than yours.**

As player S, you and the other 3 individuals who are selected to be player S will vote for the option (S1, S2, S3 or S4) that you would like to be implemented. This procedure works as follows. The four available options (S1, S2, S3 and S4) will be presented to each one of you in six pairs. You will have to choose which option of each pair you prefer. For example, when confronted with the choice between S1 and S2 you have to say whether you prefer S1 or S2, the same when confronted with the choice between S1 and S3, and so on. After everybody has voted, the most popular option will be chosen among those who are selected to be player S.

As player R, you will have to choose the amount to allocate between player R and player S for each possible option (S1, S2, S3 or S4) chosen by the other four players S. The total amount to be allocated, as well as player R’s payoffs, depends on the option implemented.

The other individual with whom you are paired will also make his/her decisions for both roles.

After all the individuals have made their decisions, the computer will randomly determine which role each of you will be playing. Your payoffs, and the payoffs of the player with whom you have been paired with, are determined depending on the role you have been randomly assigned by the computer, your decision and the decision of the others player as shown in the table below:

Players' decisions		Payoffs	
Player S	Player R: "amount allocated to player S"	Player S payoff	Player R payoff
S1	between 0 and 300	"amount allocated to player S"	400 - "amount allocated to player S"
S2	between 25 and 270	"amount allocated to player S"	370 - "amount allocated to player S"

S3	between 65 and 210	"amount allocated to player S"	310 - "amount allocated to player S
S4	between 100 and 150	"amount allocated to player S"	250 - "amount allocated to player S"

Example A: The computer randomly determines that you are player S. The option selected by the vote of all 4 subjects who have been selected as players S (including yourself) in the group (as player S) is option S3 and the other player you are matched with (as player R) chose to allocate 130 points to player S for option S3. In this case, your earnings would be:

Player S (you): 130 points

Player R (other player you have been matched with): 180 points (= 310 – 130)

Example B: The computer randomly determines that you are player R. The option selected by the vote of the other 4 subjects who have been selected as player S (not including yourself) in the group (as player S) is option S2 , and you (as player R) chose to allocate 190 points to player S for option S2. In this case, your earnings would be:

Player S (other player you have been matched with): 190 points

Player R (you): 180 points (= 370 – 190)

Given the table above, please make a decision for both roles:

As player S, select what option you prefer for each pair:

[Please note that your vote will count only if you are selected as Player S]

- S1 vs S2, S1 vs S3 S1 vs S4, S2 vs S3, S2 vs S4, S3 vs S4

As player R, select the amount to allocate to player S for each possible option selected by players S:

[Please note that your choice here will be implemented only if you are selected as Player R]

0 30 60 90 120 150 180 210 240 270 300

If player S selected S1.
Your earnings = 400 - "amount you allocate to player S" (value between 0 and 300)
You have selected 0

If player S selected S2.
Your earnings = 370 - "amount you allocate to player S" (value between 25 and 270)
You have selected 25

If player S selected S3.
Your earnings = 310 - "amount you allocate to player S" (value between 65 and 210)
You have selected 65

If player S selected S4.
Your earnings = 250 - "amount you allocate to player S" (value between 100 and 150)
You have selected 100

All-Voting treatment

PART II - This is the second part of the HIT.

Your decision as 'Player B' in the previous part was: "Allocate [amount returned in Part I] points to player A."

In this part, **you will be grouped with 3 other individuals who, like you, decided to allocate** more/less than 150 **to player A** (while making their choice as player B in the first task).

Then, you will be paired with one individual in your group. One of you will be player S and another one will be player R. Before the computer randomly determines what player each one of you will be, both of you will be asked to make decisions in the role of the two players S and R.

As player S, you and the other 3 individuals in your group will vote for the option (S1, S2, S3 or S4) that you would like to be implemented. This procedure works as follows. The four available options (S1, S2, S3 and S4) will be presented to each one of you in six pairs. You will have to choose which option of each pair you prefer. For example, when confronted with the choice between S1 and S2 you have to say whether you prefer S1 or S2, the same when confronted with the choice between S1 and S3, and so on. After everybody has voted, the most popular option will be chosen.

As player R, you will have to choose the amount to allocate between player R and player S for each possible option (S1, S2, S3 or S4). The total amount to be allocated, as well as player R's payoffs, depends on the option implemented.

The other individual with whom you are paired will also make his/her decisions for both roles.

After all the individuals have made their decisions, the computer will randomly determine which role each of you will be playing. Your payoffs, and the payoffs of the player with whom you have been paired with, are determined depending on the role you have been randomly assigned by the computer, your decision and the decision of the others player as shown in the table below:

Players' decisions		Payoffs	
Player S	Player R: "amount allocated to player S"	Player S payoff	Player R payoff
S1	between 0 and 300	"amount allocated to player S"	400 - "amount allocated to player S"
S2	between 25 and 270	"amount allocated to player S"	370 - "amount allocated to player S"

S3	between 65 and 210	"amount allocated to player S"	310 - "amount allocated to player S
S4	between 100 and 150	"amount allocated to player S"	250 - "amount allocated to player S"

Example A: The computer randomly determines that you are player S. The option selected by the vote of all 4 subjects (including yourself) in the group (as player S) is option S3 and the other player you are matched with (as player R) chose to allocate 130 points to player S for option S3. In this case, your earnings would be:

Player S (you): 130 points

Player R (other player you have been matched with): 180 points (= 310 – 130)

Example B: The computer randomly determines that you are player R. The option selected by the vote of all 4 subjects (including yourself) in the group (as player S) is option S2 , and you (as player R) chose to allocate 190 points to player S for option S2. In this case, your earnings would be:

Player S (other player you have been matched with): 190 points

Player R (you): 180 points (= 370 – 190)

Given the table above, please make a decision for both roles:

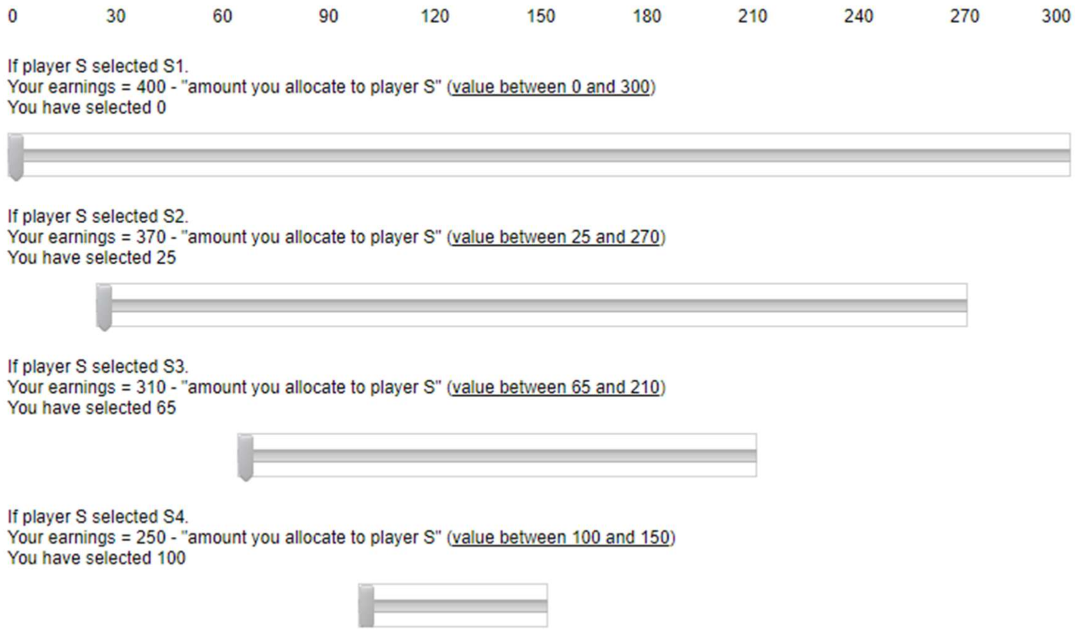
As player S, select what option you prefer for each pair:

[Please note that your vote will count only if you are selected as Player S]

- S1 vs S2, S1 vs S3 S1 vs S4, S2 vs S3, S2 vs S4, S3 vs S4

As player R, select the amount to allocate to player S for each possible option selected by player S:

[Please note that your choice here will be implemented only if you are selected as Player R]



NI+Purchase treatment

PART II - This is the second part of the HIT.

Your decision as 'Player B' in the previous part was: "Allocate [amount returned in Part I] points to player A."

In this part, **you will be grouped with one individual who, like you, decided to allocate** more/less than 150 **to player A** (while making their choice as player B in the first task).

One of you will be player S and another one will be player R. Before the computer randomly determines what player each one of you will be, both of you will be asked to make decisions in the role of the two players S and R.

<u>As player S</u> you will have to choose among options S0, S1, S2, S3, and S4.

<u>As player R</u>, you will choose the amount to be allocated between you and player S for each possible option (S1, S2, S3 or S4) chosen by player S. The total amount to be allocated, as well as player R's payoffs, depends on the option implemented.

The other individual with whom you are paired will also make his/her decisions for both roles.

After all the individuals have made their decisions, the computer will randomly determine which role each of you will be playing. Your payoffs, and the payoffs of the player with whom you have been paired with, are determined depending on the role you have been randomly assigned by the computer, your decision and the decision of the other player as shown in the table below:

Players' decisions		Payoffs	
Player S	Player R: "amount allocated to player S"	Player S payoff	Player R payoff
S0	-	100	100
S1	between 0 and 300	"amount allocated to player S"	400 - "amount allocated to player S"
S2	between 25 and 270	"amount allocated to player S"	370 - "amount allocated to player S"
S3	between 65 and 210	"amount allocated to player S"	310 - "amount allocated to player S
S4	between 100 and 150	"amount allocated to player S"	250 - "amount allocated to player S"

<u>Example A</u>: The computer randomly determines that you are player S. You choose option S3 and the player R you are matched with allocates 130 points to you. Then your earnings will be:

Player S (you): 130 points

Player R (the other player): 180 points (= 310 – 130)

<u>Example B</u>: The computer randomly determines that you are player R. Suppose that the other player chooses option S2 and you allocate 190 points to player S. Then your earnings will be:

Player S (the other player): 190 points

Player R (you): 180 points (= 370 – 190)

<u>Example C</u>: The computer randomly determines that you are player R . Suppose that the other player chooses option S0. Then your earnings will be:

Player S (the other player): 100 points

Player R (you): 100 points

Given the table above, please make a decision for both roles:

<u>As player S</u>, choose an option:

- S0
- S1
- S2
- S3
- S4

As player R, select below, using the sliders, the amount to be allocated to player S.

Remember that the amount of points that can allocate to player R depends on the option selected by player S

NI+S-Voting treatment

PART II - This is the second part of the HIT.

Your decision as 'Player B' in the previous part was: "Allocate [amount returned in Part I] points to player A."

In this part, **you will be grouped with 7 other individuals who, like you, decided to allocate** more/less than 150 **to player A** (while making their choice as player B in the first task).

Four of you will be player S and the other four will be player R. Before the computer randomly determines what player each one of you will be, all of you will be asked to make decisions in the role of the two players S and R. **Then, you will be paired with one individual in your group who has been assigned a different role than yours.**

There are four possible environments: E1, E2, E3, and E4. Only one of these four environments will be implemented.

As player S you will have to make two sets of decisions.

- First, you and the other 3 individuals who are selected to be player S will vote for the environment (E1, E2, E3 or E4) that you would like to be implemented. This procedure works as follows. The four available options (E1, E2, E3 and E4) will be presented to each one of you in six pairs. You will have to choose which option of each pair you prefer. For example, when confronted with the choice between E1 and E2 you have to say whether you prefer E1 or E2, the same when confronted with the choice between E1 and E3, and so on. After everybody has voted, the most popular environment will be chosen among those who are selected to be player S.
- Second, for each possible environment you will choose between two possible options, as described below.

Environment E1: Choose between option T1 or option S1

Environment E2: Choose between option T2 or option S2

Environment E3: Choose between option T3 or option S3

Environment E4: Choose between option T4 or option S4

As player R, you will choose the amount to be allocated between you and player S for each possible option (S1, S2, S3, or S4). The total amount to be allocated, as well as player R's payoffs, depends on the environment voted by the four players S and the options selected by both players for that environment.

The other individual with whom you are paired will also make his/her decisions for both roles.

After all the individuals have made their decisions, the computer will randomly determine which role each of you will be playing. Your payoffs, and the payoffs of the player with whom you have been paired with, are determined depending on what environment is randomly selected by the computer, the role you have been randomly assigned by the computer, your decision and the decision of the other player as shown in the table below:

	Players' decisions		Payoffs	
Environment voted	Player S	Player R: "amount allocated to player S"	Player S payoff	Player R payoff
E1	T1	-	100	100
	S1	between 0 and 300	"amount allocated to player S"	400 - "amount allocated to player S"
E2	T2	-	100	100
	S2	between 25 and 270	"amount allocated to player S"	370 - "amount allocated to player S"
E3	T3	-	100	100
	S3	between 65 and 210	"amount allocated to player S"	310 - "amount allocated to player S
E4	T4	-	100	100
	S4	between 100 and 150	"amount allocated to player S"	250 - "amount allocated to player S"

Example A: The computer randomly determines that you are player S and the environment E3 is voted by you and the other three individuals selected to be player S. Suppose that you choose option S3 and the player R you are matched with allocates 130 points to you. Then your earnings would be:

Player S (you): 130 points

Player R (the other player): 180 points (= 310 – 130)

Example B: The computer randomly determines that you are player R and the environment E2 is voted by the other four individuals selected to be player S. Suppose that the other player chooses option S2 and you allocate 190 points to player R. Then your earnings would be:

Player S (the other player): 190 points

Player R (you): 180 points (= 370 – 190)

Example C: The computer randomly determines that you are player R and the environment E4 is voted by the other four individuals selected to be player S. Suppose that the other player chooses option T4. Then your earnings would be:

Player S (the other player): 100 points

Player R (you): 100 points

Given the table above, please make a decision for both roles:

As player S, select first what environment you prefer for each pair:

[Please note that your vote will count only if you are selected as Player S]

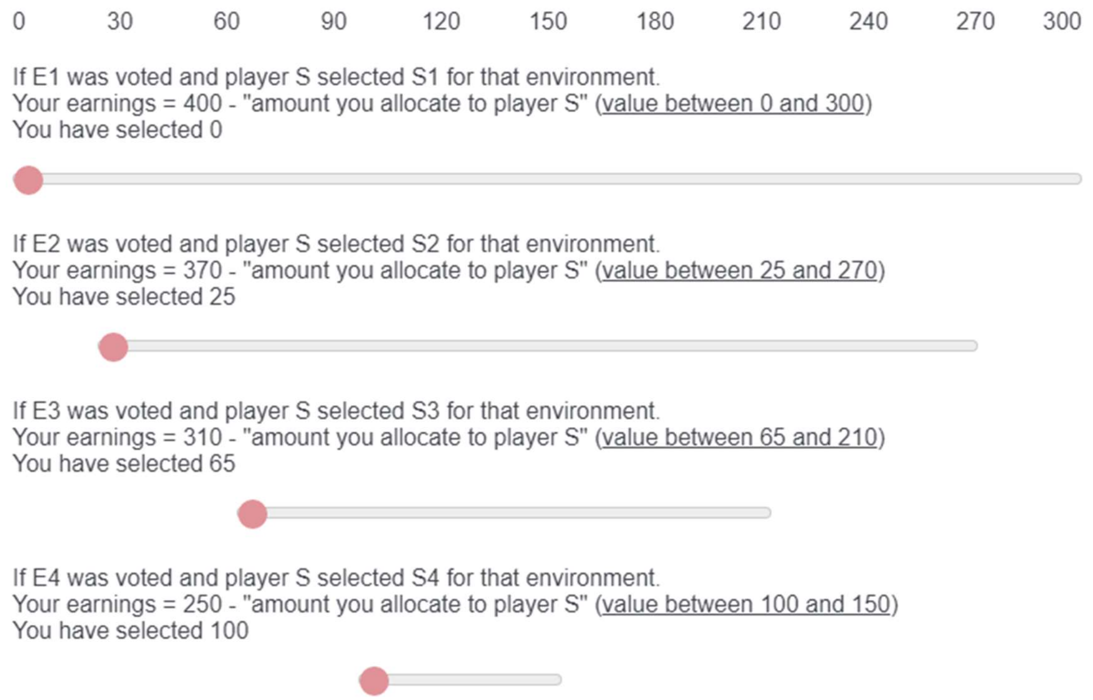
- E1 vs E2, E1 vs E3 E1 vs E4, E2 vs E3, E2 vs E4, E3 vs E4

As player S, choose an option for each environment:

- Environment E1: T1 or S1
- Environment E2: T2 or S2
- Environment E3: T3 or S3
- Environment E4: T4 or S4

As player R, select below, using the sliders, the amount to be allocated to player S.

Remember that the amount of points that can allocate to player R depends on the option selected by player S



Random treatment

PART II - This is the second part of the HIT.

Your decision as 'Player B' in the previous part was: "Allocate [amount returned in Part I] points to player A."

In this part, **you will be grouped with one individual who, like you, decided to allocate** more/less than 150 **to player A** (while making their choice as player B in the first task).

There are four possible environments, which are: E1, E2, E3, and E4. The computer will randomly determine which environment you will be playing in. Each environment has equal chances to be implemented.

One of you will be player S and another one will be player R. Before the computer randomly determines what environment and what player each one of you will be, both of you will be asked to make decisions in the role of the two players S and R for each environment.

As player S you will have to make a decision for each environment:

Environment 1: Choose between option T1 or option S1

Environment 2: Choose between option T2 or option S2

Environment 3: Choose between option T3 or option S3

Environment 4: Choose between option T4 or option S4

As player R, you will choose the amount to be allocated between you and player S for each possible environment: E1, E2, E3, or E4. The total amount to be allocated, as well as player R's payoffs, depends on the environment randomly selected by the computer and the options selected by both players. The other individual with whom you are paired will also make his/her decisions for both roles.

After all the individuals have made their decisions, the computer will randomly determine which environment (E1, E2, E3, or E4) and which role each of you will be playing. Your payoffs, and the payoffs of the player with whom you have been paired with, are determined depending on what environment is randomly selected by the computer, the role you have been randomly assigned by the computer, your decision and the decision of the other player as shown in the table below:

	Players' decisions		Payoffs	
Environment voted	Player S	Player R: "amount allocated to player S"	Player S payoff	Player R payoff
E1	T1	-	100	100
	S1	between 0 and 300	"amount allocated to player S"	400 - "amount allocated to player S"

E2	T2	-	100	100
	S2	between 25 and 270	"amount allocated to player S"	370 - "amount allocated to player S"
E3	T3	-	100	100
	S3	between 65 and 210	"amount allocated to player S"	310 - "amount allocated to player S
E4	T4	-	100	100
	S4	between 100 and 150	"amount allocated to player S"	250 - "amount allocated to player S"

Example A: The computer randomly determines that you are player S and the environment is E3. Suppose that you choose option S3 and the player R you are matched with allocates 130 points to you. Then your earnings will be:

Player S (you): 130 points

Player R (the other player): 180 points (= 310 – 130)

Example B: The computer randomly determines that you are player R and the environment is E2. Suppose that the other player chooses option S2 and you allocate 190 points to player S. Then your earnings will be:

Player S (the other player): 190 points

Player R (you): 180 points (= 370 – 190)

Example C: The computer randomly determines that you are player R and the environment is E4. Suppose that the other player chooses option T4. Then your earnings will be:

Player S (the other player): 100 points

Player R (you): 100 points

Given the table above, please make a decision for both roles:

As player S, choose an option for each environment:

- Environment E1: T1 or S1
- Environment E2: T2 or S2
- Environment E3: T3 or S3
- Environment E4: T4 or S4

<u>As player R</u>, select below, using the sliders, the amount to be allocated to player S.

Remember that the amount of points that can allocate to player R depends on the option selected by player S

0 30 60 90 120 150 180 210 240 270 300

If the computer randomly selected E1 and player S selected S1 for that environment.
Your earnings = 400 - "amount you allocate to player S" (<u>value between 0 and 300</u>)
You have selected 0

If the computer randomly selected E2 and player S selected S2 for that environment.
Your earnings = 370 - "amount you allocate to player S" (<u>value between 25 and 270</u>)
You have selected 25

If the computer randomly selected E3 and player S selected S3 for that environment.
Your earnings = 310 - "amount you allocate to player S" (<u>value between 65 and 210</u>)
You have selected 65

If the computer randomly selected E4 and player S selected S4 for that environment.
Your earnings = 250 - "amount you allocate to player S" (<u>value between 100 and 150</u>)
You have selected 100

Repeated treatment

PART II - This is the second part of the HIT.

Your decision as 'Player B' in the previous part was: "Allocate [amount returned in Part I] points to player A."

In this part, **you will be grouped with one individual who, like you, decided to allocate** more/less than 150 **to player A** (while making their choice as player B in the first task).

One of you will be player S and another one will be player R. Before the computer randomly determines what player each one of you will be, both of you will be asked to make decisions in the role of the two players S and R.

As player S you will have to choose between option S0 and option S1.

As player R, you will choose the amount to be allocated between you and player S in case option S1 is chosen by player S. The total amount to be allocated, as well as player R's payoffs, depends on the option implemented.

The other individual with whom you are paired will also make his/her decisions for both roles.

After all the individuals have made their decisions, the computer will randomly determine which role each of you will be playing. Your payoffs, and the payoffs of the player with whom you have been paired with, are determined depending on the role you have been randomly assigned by the computer, your decision and the decision of the other player as shown in the table below:

Players' decisions		Payoffs	
Player S	Player R: "amount allocated to player S"	Player S payoff	Player R payoff
S0	-	100	100
S1	between 0 and 300	"amount allocated to player S"	400 - "amount allocated to player S"

Example A: The computer randomly determines that you are player S. You choose option S1 and the other player R allocates 170 points to you. Then your earnings will be:

Player S (you): 170 points

Player R (the other player): 230 points (= 400 – 170)

Example B: The computer randomly determines that you are player R . Suppose that the other player chooses option S0. Then your earnings will be:

Player S (the other player): 100 points

Player R (you): 100 points

Given the table above, please make a decision for both roles:

As player S, choose an option:

- S0
- S1

As player R, select below, using the sliders, the amount to be allocated to player S.Remember that the amount of points that can allocate to player R depends will only apply if player S selects S1.

0 30 60 90 120 150 180 210 240 270 300

If player S selected S1.
Your earnings = 400 - "amount you allocate to player S" (value between 0 and 300)
You have selected 0