When Trustors Compete for the Favour of a Trustee – A Laboratory Experiment

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Abstract

We experimentally compare standard two-player trust games to three-player trust games, where two trustors compete for one trustee. We argue that a competitive environment could affect how the trustors' behaviour is perceived by the trustee. If two trustors compete for the favour of a trustee, the trustee might find it difficult to interpret the trustors' investments as kind since they could as well be the outcome of a competitive race; this could negatively affect the trustee's returned amount. We allow for heterogeneous effects of competition for strangers and artificially induced partners. The results of our one-shot trust games show that introducing competition among trustors reduces return ratios of the trustee. We do not find any evidence for statistically different effects of competition for partners and strangers.

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1. Introduction

How do we assess what is fair and what is unfair? What makes an action or an outcome kind or unkind? In general, two main classes of theoretical models have developed to define fairness. According to inequity aversion models of fairness people reward or sanction others in order to reduce inequity (Fehr and Schmidt 1999; Bolton and Ockenfels 2000) while it is irrelevant whether an action is driven by kind or unkind intentions. Intention based models of reciprocity, on the other hand, argue that what matters for an individual's reciprocity towards another individual is how kind or unkind this individual perceives the other individual's intentions (Rabin 1993; Dufwenberg and Kirchsteiger 2004). At the same time, reciprocity might also be influenced by the framing of a situation.[1] Framing effects that occur when presenting the same information by different phrasing have been extensively studied in the psychological literature since the seminal work of Tversky and Kahnemann (1981). Relatedly, it has been shown that simply relabeling games and players affects behaviour (cf. Hoffman et al. 1994). However, naming is not the only way of inducing framing effects. Sometimes, "[i]ncentives alone may provide powerful frames for the decision maker" (Bowles and Polania-Reyes 2012). Henrich et al. (2010) provide a brilliant example how incentives alter the framing of a decision situation and crowd out moral concerns.

We are interested in analysing whether competition might reduce reciprocity via framing effects. To this end, we alter the frame of a trust game by introducing competition as a new incentive which might reduce the salience of kindness. Imagine trustors A and C can invest in trustee B but B can only accept one of the two investments. If A thus competes against C for the favour of B, B might find it difficult to interpret A's behaviour as genuinely kind since it could as well be the outcome of a competitive race with C. In contrast, in a personal two-player trust game, trustee B might more easily be able to interpret trustor A's investments as genuinely kind and trusting behaviour. As a consequence, when confronted with the choice of how much to return to trustor A, trustee B might return less in the three-person game than in the two-person game.

[1] Bowles (1998) and Bowles and Polania-Reyes (2012) provide extensive surveys of how institutions and incentives can affect social preferences through framing and related effects.

In order to experimentally test our presumption we run variations of simple one-shot trust games (Berg et al. 1995) in a 2x2 between-subjects design.[2] In our baseline two-person trust game, a trustor can decide how much of her endowment to send to a trustee; if the trustee accepts, the sent amount (investment) is tripled and the trustee can decide how much to return to the trustor.[3] We compare this simple two-person game to a three-person trust game, where two trustors compete for the favour of one trustee. Both trustors can offer investments but the trustee can accept only one of these investments; the accepted investment is tripled and the trustee decides how much to return to the trustor whose offer she accepted. This situation represents competition between trustors in the sense of Stigler (1987) because it constitutes a kind of rivalry in which several parties strive for something that not all of them can obtain. If this competitive environment indeed negatively affects how kind the trustors' investments are perceived by the trustee, we should see lower return ratios in the three-person trust game than in the two-person trust game.

Strong social ties may make it easier for trustees to interpret a trustor's investment as genuinely kind and trusting although the investment takes place in a competitive environment. Thus, a competitive environment might affect the perceived kindness of group members less negatively than the perceived kindness of non-group members. In other words, the effect of a competitive environment on a trustee's reaction is a function of the trustee's social ties with the trustor. Several experimental studies have shown that group membership induced in the laboratory can affect behaviour in a way that people display greater social concerns for the well-being of members of the same group than for non-members (Chen and Li 2009; Hargreaves Heap and Zizzo 2009). Chen and Li (2009) suggest that random assignment to minimal groups is an efficient way of artificially inducing group identity in the laboratory. Moreover, group attachment can be further increased by letting subjects cooperate in a short problem-solving stage.[4] To investigate whether a competitive environment is less detrimental for the perceived kindness of group members than for non-group members, we run two further treatments. In these treatments, we follow Chen and Li's (2009) suggestions for artificially inducing social groups in the laboratory and let these group members play our two- and three-person trust games. In particular, in the two-person game the trustor and the trustee

[2] Trusting and trustworthy behaviour in the trust game has been shown to correlate strongly with financial transactions in the field (Karlan 2005). Moreover, Glaeser et al. (2000) find that trustworthy behaviour in the trust game also correlates with responses to attitudinal survey questions on trustworthiness.

[3] In what follows, the ratio of return r to sent amount s (r/s) is called "return ratio".

[4] Van Dijk and van Winden (1997) provide a theoretical framework where social ties are modeled by weighted interdependent utility functions where weights depend on the history of interaction between players. Sonnemans et al. (2006) experimentally investigate the dynamics of social ties within groups in public good games.

are group members whereas in the three-person game one trustor and the trustee are group members whereas the second trustor is not a group member. Since every artificially induced social group in our experiment consists of exactly two group-members, we use the term "partnership" as a synonym for an artificially induced social group and refer to the group members as "partners".

In line with other experimental studies we find positive investments (interpreted as "trust") and positive returns (interpreted as "trustworthiness") in the standard two-person trust game; inducing group membership artificially in the laboratory leads to higher investments. In the treatments where two trustors compete for the favour of one trustee, investments slightly, yet not significantly, increase. Our main finding is that trustees react to competition between trustors by lowering return ratios. Indeed, the competitive environment leads to a dramatic decrease of return ratios even for trustors who invest their full endowment of 4€ and thus do the best they can to signal trust and kindness given their choice set. We further investigate whether the negative effect of a competitive environment on return ratios can be mitigated if players are partners. In the treatment where a partner and a stranger trustor compete for the favour of a partner trustee, the trustee returns less than in all other treatments, no matter whether she accepted the partner's or the stranger's offer. Thus, we do not find evidence for statistically different effects of competition for partners and strangers. In sum, the trustee's behavioural response to competition is compatible with the presumption that a competitive environment negatively affects the perceived kindness of an action. When trustors A and C compete against each other for the favour of B, B might find it difficult to interpret A's behaviour as genuinely kind since it could as well be the outcome of a competitive race between A and C. In our experiment, this could make B return less to A in the three-person than in the two-person game.

In the economic literature, two classes of theoretical models have been developed to understand the underlying forces of reciprocity: outcome based models (Fehr and Schmidt 1999; Bolton and Ockenfels 2000) and intention based models (Rabin 1993; Dufwenberg and Kirchsteiger 2004). Falk and Fischbacher (2006) bring these two streams of research together and present a theory of reciprocity where "kindness comprises both *distributional fairness* as well as *fairness intentions*" (p.294). As far as *distributional fairness* is concerned, the equitable share is taken as the reference point to evaluate whether a distributional outcome is fair or not. As far as *fairness intentions* are concerned, two features of an action are crucial. First, an individual A's action can only be considered intentionally kind by another individual

B if A's choice is under her full control. Second, whether A's action is considered intentionally kind by B also depends on the choice set of A. In an extreme case, the same action could be perceived as very kind (if this was the best A could do for B given her choice set) or very unkind (if this was the worst A could do for B given her choice set). McCabe et al. (2003) and Falk et al. (2003) empirically show that free will and the choice set at hand are essential elements to evaluate fairness intentions. However, other aspects influencing whether an action is perceived intentionally kind or unkind have been largely neglected in this strand of literature. A notable exception is provided by Stanca et al. (2009) who argue that–in addition to free will and the choice set–A's "motivation" is crucial for how B evaluates A's intention. Assessing the relevance of A's "motivation" for B's reciprocity, the authors focus on whether A's actions might be driven by strategic concerns (in repeated games) or not. They find that B's reciprocity towards A is substantially stronger if B can rule out strategic concerns, which is in line with B considering strategically driven actions less kind than non-strategic actions. In this paper, we follow a reasoning similar to Stanca et al. (2009) and argue that even if A's choice set is left unchanged and A's choice stays under her full control, a competitive environment could affect how A's behaviour is perceived by B. This can be interpreted as a kind of framing effect.

Very similar arguments about the psychology of competition have been put forward by Brandts and Charness (2004). In their experimental gift-exchange games, they vary whether there is an excess supply of firms or an excess supply of workers in the market. They find that behaviour is "perhaps surprisingly" (p.686)—as they stress—not substantially affected by changes in the degree of competition. Although our experiment is related to Brandts and Charness (2004), it differs from it in at least four points. First, we do not conduct a gift-exchange game but a trust game. We consider this deviation minor because the structure of the gift exchange game is very similar to the trust game. Second, in contrast to them, we analyse the effects of competition in one-shot games and thus do not allow for reputation building in a repeated setting. Third, we allow for heterogeneous effects of competition with respect to group membership since there are reasons to believe that competition might affect strangers and partners in different ways. Fourth, and perhaps most importantly, due to the simplicity of our setup, competition is more salient in our three-person experimental setting than in the multi-player setting of Brandts and Charness (2004).[5]

[5] In a related experimental paper, Brandts et al. (2009) study social dilemmas and explore whether interacting under competition changes people's disposition towards each other. In this framework, competition decreases

The remainder of the paper is organized in the following way: Section 2 describes the details of our experimental design. The experimental results are presented and discussed in section 3. In Section 4, we report some limitations of our study, present ideas for future research and conclude.

2. Experimental Design

The experiment was conducted in May 2009 in the computer laboratory of the Friedrich-Schiller-University Jena, Germany. All subjects were undergraduate students of this university, coming from a wide variety of majors. Subjects were recruited on-line via ORSEE (Greiner 2004). Overall, 248 subjects participated in 14 sessions; each session took about 20 minutes. The outline of the experiment was provided to subjects in printed form. Detailed instructions, the experiment and a final questionnaire providing information on the subjects' gender, age, field of study, risk and trust attitudes were computerized with the use of zTree (Fischbacher 2007). Translated instructions are provided in the appendix. The experiment consisted of four stages. In stages one to three, all subjects participated in different kinds of coordination games. Thereafter, subjects entered a one-shot trust game being the final stage of the experiment. All stages of the experiment were paid according to the subjects' decisions. Depending on assigned role and treatment, subjects had the opportunity to answer up to two bonus questions, where they could earn another 0.10€ for each correct answer. We describe these bonus questions in more detail when explaining the set-up of our specific treatments. On average, subjects earned 7.56€.

2.1.1 Experimental Treatments

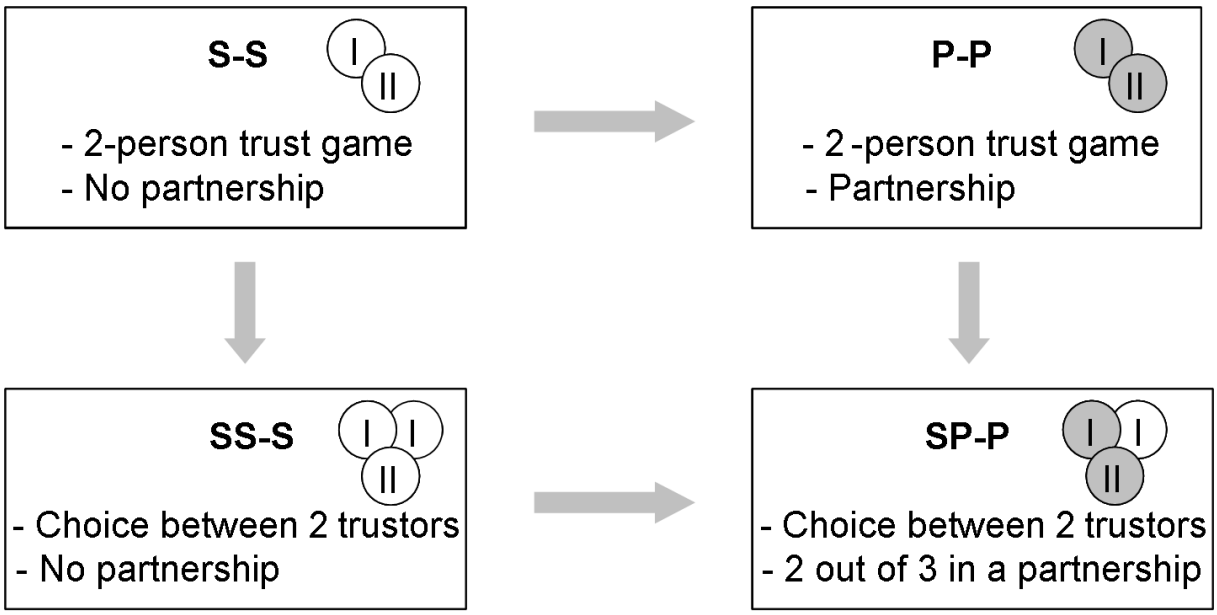
In order to identify the effects of a competitive environment on the behaviour of trustors and trustees, we implemented four distinct experimental treatments. In particular, treatments were implemented so that the final stage was a standard two-person trust game with strangers (S-S), a two-person trust game with partners (P-P), a three-person trust game where the trustee has a choice between two stranger trustors (SS-S), and a three-person trust game where the trustee has a choice between a stranger trustor and a partner trustor (SP-P). The three-person games in treatments SS-S and SP-P represent situations which can be characterized as

subjective well-being for players on the long side of the interaction. Moreover, competition negatively affects the disposition towards others of those on the long side.

competition among trustors according to Stigler (1987) who defines competition as rivalry in which several parties strive for something that not all of them can obtain. The partner setup used in treatments P-P and SP-P allows us to investigate whether any hypothesized negative effects of a competitive environment on the return behaviour of trustees might be less pronounced for partners than for strangers.

Figure 1 gives a graphical representation of our 2 x 2 treatment design where I stands for the first mover ("trustor") and II for second mover ("trustee"). We ran three sessions per treatment S-S and P-P and four sessions per treatment SS-S and SP-P. Each session was conducted with 18 subjects, except for one session of treatment P-P and one session of treatment S-S, where we had to restrict the number of subjects to 16 due to no-shows.

Figure 1: Treatment overview



Notes: I=first mover (trustor/investor), II=second mover (trustee); light grey colour marks partners; S-S stands for "stranger - stranger" and is short for the 2-person trust game with a stranger trustor and a stranger trustee, P-P stands for "partner - partner" and is short for the 2-person trust game with a partner trustor and a partner trustee, SS-S stands for "stranger, stranger - stranger" and is short for the 3-person trust game with two stranger trustors and a stranger trustee, SP-P stands for "stranger, partner - partner" and is short for the 3-person trust game with a partner trustor, a stranger trustor and a partner trustee.

2.1.2 Stages 1 to 3: Coordination Games

The aim of these stages is to induce feelings of group membership among some subjects that later on will be partners in the trust game. Chen and Li (2009) have shown that random assignment to minimal groups is an efficient way of artificially inducing group identity in the laboratory. Moreover, group attachment can be further increased by letting subjects cooperate in a short problem-solving stage. We follow Chen and Li's advice and induce partnership in

the laboratory by random assignment to groups and by letting subjects go through a short problem-solving stage. In particular, subjects who were supposed to be "partners" in the trust games of treatments P-P and SP-P were assigned to the same group by informing them that they were members of the "red group". Moreover, they were explicitly referred to each other as "partners" and informed before the first stage that they would stay with their partners for the rest of the experiment. To further enhance group identity, we let the partners play three incentivized two-person coordination games that have a clear focal point (Schelling 1960). These games ensure a common successful experience which signals as little as possible about a partner's trustworthiness, as coordination should succeed in the large majority of cases.[6]

The first coordination game was framed as a choice of meeting points in Jena where the focal point was "Ernst-Abbe-Platz", i.e., the place in front of the central campus cafeteria, and the alternative was "Eichplatz", a parking lot in the city centre. Subjects were paid 0.25€ each in case of a successful meeting. In the second coordination game, the subjects were asked to put the letters "A," "B," and "C" in a specific order. If both subjects could coordinate on the same order, they were paid 0.50€ each. The focal point in this game was the alphabetical order. The final coordination game again was framed as a choice of meeting points. However, this time it was no meeting point in Jena but in Paris. Subjects could choose between the Eiffel Tower and the Centre Georges Pompidou, where we regarded the first alternative as the focal point. In case of a successful meeting, subjects were paid 1.00€ each. Thus, in sum, subjects could earn 1.75€ in these three coordination games. All partners in treatment P-P and SP-P were informed that they and their partners jointly earned an amount of 0.50€, 1.00€, or 2.00€ respectively, if they were successful in the three coordination games. They were also informed that this joint profit was split equally among the two subjects. Partners received feedback about the choice of their partners and the jointly earned payoffs.

In treatments S-S and SS-S (as well as for stranger trustors in treatment SP-P), where two players are supposed to interact as strangers in the final stage (the trust game), subjects were randomly re-matched in every single stage of the experiment and group membership was not induced by colour assignment ("red group") or naming ("partner"). Yet, these stranger subjects also played the coordination games (albeit with different players at each stage) and were informed that they could earn 0.25€, 0.50€, and 1.00€ respectively, if they succeeded in

[6] We are not interested in the question which way of inducing group identity is most effective in the laboratory. Rather, we simultaneously apply several strategies of inducing group identity (which have proven to be successful in other experiments) in order to build up strong group attachment.

coordinating choices. They did not receive any feedback about the choices of the other player and the earned profits until the end of the experiment.[7]

2.1.3 Stage 4: Trust Game

In the final stage of the experiment, we implemented a Berg et al. (1995) one-shot trust game with slight modifications across treatments. The roles of trustor and trustee were randomly assigned for this game and subjects were informed about their roles just before the trust game. The trustor and the trustee each receive an initial endowment of 4€. The trustor can decide how many euros (if any) to send to the trustee. The sent amount is called *s* and has to be a multiple of 0.1€. The trustee can then decide whether she wants to accept or reject the offer of the trustor.[8] If the trustee rejects the offer, *s* is returned to the trustor and the game ends. If the trustee accepts the offer, *s* is tripled and given to the trustee. The trustee then decides how many euros (if any) to return to the trustor. The trustee is restricted to return at most 3*s* to the trustor; the returned amount *r* has to be a multiple of 0.1€.

$$\begin{aligned} s &\in [0,4] \\ r &\in [0,3s] \end{aligned} \qquad (1)$$

Thus, the payoffs π of the trustor and the trustee are:

$$\begin{aligned} \pi_{trustor} &= 4 - s + r \\ \pi_{trustee} &= 4 + 3s - r \end{aligned} \qquad (2)$$

In line with the trust game literature, the amount sent by the trustor can be interpreted as trust, whereas the fraction returned to the trustor by the trustee can be interpreted as trustworthiness.

2-Person Trust Game with Strangers (Treatment S-S)

This treatment presents the baseline case of the experiment. Pairs of subjects are randomly formed at the beginning, and trustor and trustee are neutrally referred to as "sender" and "receiver." After the sending decision, we elicit the trustor's belief about the returned amount

[7] Although this is a potential confound, we chose not to give feedback to strangers because the salience of common success might induce group identity in small groups even if players are randomly re-matched at each stage. This allows us treating these data as independent.

[8] Slonim and Garbarino (2008) and Slonim and Guillen (2010) have shown that partner selection *per se* has effects in bilateral games (even without competition). Therefore, we implement the selection decision also in our two-player trust games to avoid a potential confound when comparing our two-player and three-player trust games.

with an incentivized bonus question. In case of right guess, a subject earns an additional 0.10€.

2-Person Trust Game with Partners (Treatment P-P)

Again, we have pairs of subjects. But in contrast to the treatment S-S, all subjects stay in the same pair of subjects, in the coordination games as well as in the final trust game. In this treatment, trustor and trustee are referred to as "partners" as they have already been referred to during the coordination games. Subjects are reminded that they play the trust game together with their partners from the previous stages and that the partner is also a member of "red group". Also in this treatment, we elicit the trustor's belief about the returned amount with a bonus question asked after the sending decision, again incentivized with 0.10€.

3-Person Trust Game with Choice between Stranger Trustors (Treatment SS-S)

In this treatment, we introduce a choice of the trustee B between two trustors, A and C. Groups of three are randomly formed and roles of trustor and trustee randomly assigned. Thus, we extend the original two-person trust game to a three-person game. Similar to the standard trust game, the two trustors and the trustee each receive an amount of 4€. Then trustors decide simultaneously how many euros (if any) to send to the trustee. We call the sent amounts s_A and s_C. Subsequently, the trustee can decide whether he accepts s_A or s_C or neither of the two offers. If the trustee rejects both offers, s_A and s_C are returned to their senders and the game ends. If the trustee accepts an offer, the accepted amount is tripled and sent to the trustee while the rejected offer is returned to its sender. Finally, the trustee can decide how many euros (if any) to return to the trustor whose offer was accepted. For example, if the trustee accepts s_A, s_C is returned to trustor C, and the trustee can return an amount up to $3*s_A$ to trustor A. Trustors are informed that there is another trustor and that only one of the two offers can be accepted by the trustee. In this treatment, we elicited the beliefs of trustors about the returned amount in the case of acceptance of the offer and about the amount sent by the other trustor by means of bonus questions, each incentivized with 0.10€.

3-Person Trust Game with Choice between Partner and Stranger Trustor (Treatment SP-P)[9]

In this treatment, the game is the same as the three-person game in treatment SS-S. However, now, trustor A and the trustee B have gained some common experience in the previous

[9] We deliberately chose not to play a three-person trust game with choice between two partner trustors since the induction of group identity with three partners would naturally deviate from the way of inducing group identity with two partners and thus possibly blur the comparability of treatments.

coordination games, are both members of the "red group" and are referred to as "partners", just like subjects in P-P. However, there is also trustor C who can offer an amount s_C to the trustee. Trustor C does not have any previous experience with the trustee, is not assigned to the "red group" and not referred to as "partner". As in treatment SS-S, both trustors are informed about the existence of the other trustor. The stranger trustor C is informed that trustor A and the trustee have previous common experience from the coordination games. After the trustors' sending decisions, we elicited their beliefs about the returned amount in the case of acceptance of the offer and about the amount sent by the other trustor by means of bonus questions, each incentivized with 0.10€.

3. Results

3.1 The Coordination Games

Descriptive statistics show that our coordination games indeed had focal points on which subjects were able to coordinate. 97.6 percent of them chose Ernst-Abbe-Platz instead of Eichplatz as the common meeting point in Jena, which led to a successful meeting in 95.2 percent of all cases. The second coordination game, in which subjects were asked to put the letters A, B, and C in a certain order, proved to be slightly more difficult but we can still discern a clear focal point: 85.1 percent of all subjects chose the alphabetical order. As a result, 75.8 percent of all subjects successfully coordinated, out of which 96.8 percent chose the alphabetical order, with the remaining 3.2 percent coordinating on the order A, C, B. In the final coordination game, 96.8 percent of all subjects chose the Eiffel Tower as a meeting point in Paris, which led to a successful coordination for 93.6 percent of all subjects.

3.2 The Trust Game

We start the empirical analysis of the trust games with the trustor side and compare the means of the offered amounts across the different treatments and types. As Table 1 depicts, trustors on average offered 1.74€ out of 4.00€ in our baseline two-person trust game S-S. This is in contrast to the zero investment prediction based on rational and self-interested individuals but in line with standard behavioural theories. Furthermore, we find evidence that is consistent with the interpretation that our attempt to build up a feeling of partnership in the laboratory was successful. Trustors in the P-P treatment sent 2.59€ out of 4.00€ to their partners. A non-parametric Mann-Whitney two-sided test shows that this is significantly more than in the S-S

treatment (p = 0.019)[10]. OLS regressions that include session dummies as control variables show that the number of successful coordinations has a positive and weakly significant effect on the amount sent by the partner trustor to the partner trustee (p = 0.097) but, just as expected, not on the amount sent by stranger trustors to the stranger trustees (p = 0.357). The detailed results of these regressions are available from the authors upon request.

Table 1: Investment behaviour of trustors: Descriptive statistics

	Partner			Stranger		
Treatment	Accepted	Not accepted	Total	Accepted	Not accepted	Total
P-P	2.80	0.00	2.59			
	1.12	*0.00*	*1.32*			
	[24]	[2]	[26]			
S-S				1.96	0.03	1.74
				1.12	*0.06*	*1.22*
				[23]	[3]	[26]
SS-S				2.53	1.18	1.83
				1.37	*1.16*	*1.42*
				[23]	[25]	[48]
SP-P	3.21	1.84	2.70	3.38	1.64	2.29
	0.91	*1.31*	*1.25*	*0.78*	*1.37*	*1.45*
	[15]	[9]	[24]	[9]	[15]	[24]
Total	2.96	1.51	2.64	2.43	1.26	1.92
	1.05	*1.39*	*1.27*	*1.27*	*1.25*	*1.38*
	[39]	(11]	[50]	[55]	[43]	[98]

Notes: The figures are mean amounts in euros, standard errors in italics, no. of observations in square brackets. S-S stands for "stranger - stranger" and is short for the 2-person trust game with a stranger trustor and a stranger trustee, P-P stands for "partner - partner" and is short for the 2-person trust game with a partner trustor and a partner trustee, SS-S stands for "stranger, stranger - stranger" and is short for the 3-person trust game with two stranger trustors and a stranger trustee, SP-P stands for "stranger, partner - partner" and is short for the 3-person trust game with a partner trustor, a stranger trustor and a partner trustee.

If we introduce competition between trustors in a framework where no partnership has been built up, we find no effect on the sending behaviour of trustors. Although the investments from stranger trustors in SS-S are slightly higher than in S-S (1.83€ as compared to 1.74€), they are clearly not statistically different from each other (Mann-Whitney test, p = 0.950). However, stranger trustors more strongly increased their investments to 2.29€ in treatment SP-P where they were confronted with a trustee and a trustor who had common experience. In this setting, stranger trustors might have felt that they had to increase their investments in order to have a chance of being chosen by the trustee who was a partner of the competitor trustor.[11] Still, the effect is not significant at the conventional confidence levels (Mann-Whitney test, p = 0.139). Moreover, comparing partner investments in P-P and SP-P (2.59€

[10] All Mann-Whitney test statistics in this paper result from two-sided tests.

[11] Indeed, stranger trustors' beliefs about the investments of their competitors are higher in treatment SP-P than in treatment SS-S (Mann-Whitney test, p=0.073).

and 2.70€), we do not find that competition significantly changed the investments of partner trustors (Mann-Whitney test, p = 0.904).

The results obtained from non-parametric tests can also be gained from a multivariate framework where we take the sent amounts as the outcome variable of multivariate OLS regressions.[12] From column I of Table 2 we can see that compared to the two-person treatments, trustors do not invest higher amounts in our competition treatments. In column II, we additionally control for whether the trustor is a partner of the trustee or not. We find that stranger trustors send significantly lower amounts to trustees than partner trustors while the effect of competition remains insignificant. Finally, we introduce an interaction between the competition and stranger dummies in column III. The coefficient on the interaction is positive, yet far from being significant, which means that on average, competition does neither affect partners nor strangers in their sending behaviour. The general negative effect of being a stranger on investments remains unaffected. In further estimations which are available from the authors upon request, we find that female trustors send less than males. Moreover, those individuals who state in the questionnaire at the end of the experiment that, in general, humans can be trusted invest higher amounts.[13]

Table 2: Investment behaviour of trustors: Regression results

	Sent amount (I)		Sent amount (II)		Sent amount (III)	
	coeff.	std.err.	coeff.	std.err.	coeff.	std.err.
Competition	-0.002	0.234	0.191	0.227	0.112	0.361
Stranger			-0.773***	0.230	-0.850**	0.350
Competition x Stranger					0.132	0.465
Constant	2.163***	0.184	3.324***	0.393	2.588***	0.257
N	148		148		148	
R^2	0.000		0.066		0.066	

Notes: The table shows the results of OLS regressions using robust standard errors, where the trustor is the unit of observation. *** 1% level of significance, ** 5% level of significance, * 10% level of significance.

In all treatments, trustees were allowed to reject the trustors' offers. In the two-person trust games, all offers above 0.10€ were accepted while offers below or equal to 0.10€ were rejected. This resulted in two rejections in the treatment P-P and three rejections in the treatment S-S (Table 1). In the three-person games, there was only a single occasion in the SS-S treatment in which both offers were rejected (offers were 0€ and 0.50€); in 47 out of 48

[12] Tobit specifications yield very similar results (see Table A.2 of the Appendix).

[13] Analyzing heterogeneity in this effect, we find that trusting attitudes as revealed in the questionnaire increase investments of strangers while there is no significant effect for partners. One possible interpretation could be that our way of inducing partnership was successful and, as a consequence, partner trustors invested in their partner trustees no matter their general attitude of trust towards human beings.

observations, one of the two offers was accepted. The trustee's choice in the three-person trust game was mainly based on the size of trustors' offered amounts. In one occasion in the treatment SP-P, the partner was preferred although her offer was lower (offers were 2€ by the partner trustor and 3€ by the stranger trustor). Overall, in 46 out of 47 observations the selected trustor made an offer which was at least as high as the offer of the other trustor. Offers by trustors tied in two occasions in the asymmetric competition treatment SP-P; in both cases all trustors offered the full amount of 4€. The partner trustor was selected in one occasion and the stranger trustor in the other. Thus, trustees accept positive amounts and prefer higher offers. Additionally, we do not observe an obvious preference for partners in the asymmetric competition treatment SP-P. Since trustees choose the higher of two offered investments in the competition treatments, accepted investments are higher in the three-player treatments than in the two-player treatments. This effect is most prominent and statistically significant for the accepted investments of stranger trustors in the SP-P treatment as compared to the S-S treatment (Mann-Whitney test, p=0.002).

Turning to the return behaviour of the trustees, our results again clearly contradict the selfish prediction. Despite the fact that contracts are incomplete, we in general observe positive investments as well as positive returns and thus often find mutual gains. Table A.1 in the Appendix shows positive average returned amounts throughout all treatments. We also see that partners in the two-person trust game (P-P) receive the highest average returns (3.58€). However, of course, these figures cannot provide a clear picture of the trustworthiness of trustees in different frameworks as long as investments vary across treatments. This is why, as a next step, we analyse return ratios for trustors r/s, where r is the amount the trustee returned and s is the amount sent by the accepted trustor. Since we have no accepted zero investments, the ratio is computable for all observations. Table 3 presents simple mean return ratio comparisons across treatments. In the treatments without competition (S-S and P-P), the return ratio is greater for partner trustors (1.24) than for their stranger counterparts (1.05). However, the difference is not statistically significant at the conventional significance levels (Mann-Whitney test, p = 0.203). Turning to the competition treatments SS-S and SP-P, we see that the return ratios are universally lower than in the non-competition treatments; the lowest return ratio is found for stranger trustors in the asymmetric competition treatment SP-P (0.76). We observe a slight, yet not significant drop when we compare return ratios for strangers in treatment S-S (1.05) to those in treatment SS-S (0.96). This drop of return ratios becomes more pronounced if we move to treatment SP-P (0.76); yet, it does not reach conventional significance levels (Mann-Whitney test, (p = 0.284). Turning to partners, a comparison of the

mean return ratios across the SP-P and P-P treatments shows that competition leads to a decrease of return ratios for partners. The return ratio declines substantially from 1.24 to 0.88, which is statistically significant according to a two-sided Mann-Whitney rank sum test ($p = 0.095$). Note that this two-sided test is rather conservative given that the null hypothesis could also be expressed one-sided in our particular setting.

Table 3: Return behaviour of trustees: Descriptive statistics

Treatment	Partner	Stranger	Total
P-P	1.24		1.24
	0.56		*0.56*
	[24]		[24]
S-S		1.05	1.05
		0.61	*0.61*
		[23]	[23]
SS-S		0.96	0.96
		0.60	*0.60*
		[23]	[23]
SP-P	0.88	0.76	0.84
	0.71	*0.51*	*0.63*
	[15]	[9]	[24]
Total	1.10	0.97	1.02
	0.64	*0.59*	*0.61*
	[39]	[55]	[94]

Notes: The figures are mean amounts in euros, standard errors in italics, no. of observations in square brackets. S-S stands for "stranger - stranger" and is short for the 2-person trust game with a stranger trustor and a stranger trustee, P-P stands for "partner - partner" and is short for the 2-person trust game with a partner trustor and a partner trustee, SS-S stands for "stranger, stranger - stranger" and is short for the 3-person trust game with two stranger trustors and a stranger trustee, SP-P stands for "stranger, partner - partner" and is short for the 3-person trust game with a partner trustor, a stranger trustor and a partner trustee.

Again, we can alternatively analyse the trustees' return behaviour in a multivariate setting. To this end, we take the return ratios as the outcome variable of multivariate OLS regressions. Column I of Table 4 confirms that compared to the two-person treatments we observe significantly lower return ratios in our competition treatments. Holding constant whether the relationship between the accepted trustor and the trustee is one of strangers or partners does not affect this finding. The effect of competition on return ratios still turns out negative and significant (column II of Table 4).[14] In column III, we introduce an interaction term of the competition and stranger dummies. The coefficient of the interaction is positive, yet not significant while the main effect of competition stays significantly negative and even increases. The coefficient on competition can now be interpreted as the effect of competition on partners. The insignificant coefficient on the interaction means that we cannot reject the

[14] The coefficient on competition is significant at the 10 percentage point level in this specification. Yet, note again that the two-sided test is rather conservative given that the null hypothesis could be expressed one-sided.

hypothesis that the negative effect of competition is the same for strangers and for partners at the conventional significance levels. In further regressions which are available from the authors upon request, we find that return ratios of individuals who state in the questionnaire at the end of the experiment that, in general, humans can be trusted are higher than those of less trusting individuals while there is no significant difference between males and females. The negative and significant of competition on return ratios is also confirmed in this specification.[15]

Table 4: Return behaviour of trustees: Regression results

	Return ratio (I)		Return ratio (II)		Return ratio (III)	
	coeff.	std.err.	coeff.	std.err.	coeff.	std.err.
Competition	-0.251**	0.123	-0.234*	0.130	-0.358*	0.214
Stranger			-0.089	0.133	-0.186	0.171
Competition x Stranger					0.210	0.269
Constant	1.150***	0.085	1.282***	0.211	1.241***	0.115
N	94		94		94	
R^2	0.043		0.048		0.055	

Notes: The table shows the results of OLS regressions using robust standard errors, where the accepted trustor – trustee pair is the unit of observation. *** 1% level of significance, ** 5% level of significance, * 10% level of significance.

Checking the accepted trustors' beliefs about the returns, we observe that, in general, beliefs are higher than the actual returns. Consistent with our previous findings, we also observe that partner trustors in the treatment P-P expect their partners to return significantly more than their stranger counterparts in the treatment S-S (p-value 0.053). However, there is a striking pattern in the data, suggesting that the gap between beliefs and actual returns becomes considerably larger once we introduce competition among trustors. This is to say, trustors tend to overestimate the trustworthiness of their trustees in a competitive environment. While the trustors' beliefs still have predictive power in treatments without competition, this power is lost in the competition treatments. This pattern is especially prevailing in the treatment SP-P. Introducing competition does not affect the trustors' beliefs, neither in the SS-S treatment nor in the asymmetric competition treatment SP-P. The gap between beliefs and actual returns emerges because of the decline in return ratios in the competitive setting.

[15] Adding the amount sent by the accepted trustor as a covariate to our main specification, the coefficient on this variable is close to zero and not significant whereas the negative effect of competition remains qualitatively the same (see Table A.3 of the Appendix). Accordingly, there is no general nonlinear relationship between returns and investments. Further, we do not find any evidence for significantly different effects in the SP-P and the S-SS treatment, which suggests that it is not merely asymmetry which drives our results.

The investment and return behaviour in the different treatments results in a payoff pattern as shown in Table A.4 of the Appendix. Similar to other studies on the trust game, the payoffs of the trustees are higher than the payoffs of the trustors. This difference in the payoffs between trustor and trustee becomes even larger once we introduce competition. In other words, competition leads to larger inequalities in payoffs. The variance in payoffs is largest in the SP-P treatment, where we also observe the largest decline in return ratios. This observation is not compatible with an outcome-based model of reciprocity where the trustee tries to minimize inequality between trustee and accepted trustor. Indeed, if the trustee is concerned with inequality between herself and the accepted trustor, the introduction of competition should not have any effects on the return behaviour since the second (not-accepted) trustor does not enter the trustee's utility function. However, competition should also not affect the return behaviour if the trustee is concerned with inequality between herself, the accepted and the not-accepted trustor and would like to minimize the distance between the best off and the worst off of these three players. Since the rejected trustor leaves the game with her endowment of 4€, this distance is minimized if the accepted trustor and the trustee finish the trust game with equal payoffs. However, this is exactly the same solution to the distance minimization problem as in the two-player game. Thus, competition should have no effects on return behaviour in our trust game if the trustee's behaviour is driven by these kinds of inequality aversion.

3.3 Discussion

The effects of supply side and demand side competition on fairness considerations have been systematically investigated in ultimatum bargaining games. Similar to our findings, competition seems to lead to more unfair distributions in ultimatum games (e.g., Roth et al. 1991; see Fehr and Schmidt 1999, or Fehr and Schmidt 2006, for a discussion). However, as discussed for example in Falk and Fischbacher (2006), proposers do not have a chance of reaching a fair outcome in these settings with two competing proposers from the very beginning. This is because proposers overbid each other mutually in order to increase their material payoff (by increasing the chance of being chosen) while accepting a marginal disutility from an unfair outcome. In contrast to ultimatum games, in our sequential trust game the trustees can react to the trustors' investments being made in a competitive environment in whichever way they consider to be fair and thus directly influence the final outcome of the game.

At first sight closely related to our approach, Cassar and Rigdon (2011) study trust and trustworthiness in three-node networks trust games with two senders and one receiver, and one sender and two receivers, respectively. However, since Cassar and Rigdon (2011) do not implement partner choice by the trustee; in the two trustors - one trustee treatment the trustee can accept both offers. Thus, the authors do not introduce competition in Stigler's sense. Further, they allow for reputation building and learning effects by playing multiple rounds. In contrast, our paper investigates the effects of competition between trustors since the trustee can only accept one of two trustors' investments; this is done in a one-shot game, which abstracts from any reputation and learning effects. Additionally, we allow for heterogeneous reactions of trustees toward stranger and partner investors in some of our treatments where we artificially induce social groups in the laboratory. Despite these differences, Cassar and Rigdon's (2011) study yields a result which is interesting for our paper. As already mentioned, they argue that trust is comparative, i.e., whether a trustor's investment is perceived kind and trusting also depends on the investment of the second trustor. Since our trustees almost exclusively chose the trustor with the highest investment, we might expect that in our two-trustors-one-trustee treatments (SP-P and SS-S) the trustor with the highest offered amount could benefit from being perceived more kind and trusting than her competing trustor, which should result in higher return ratios. Interestingly, however, this is not the case: the competitive environment that we introduce in our setting seems to over-compensate any potentially positive comparison effects and finally results in a decline of return ratios.

Moreover, our competitive environment leads to a dramatic decrease of returns even for trustors who invest the full endowment of 4€. Indeed, 7 out of 36 trustors (19.4 percent) who invested the full amount and whose offer was accepted by the trustee got a return of 0€. In the two-player games, this was only true for 2 out of 27 trustors (7.4 percent). Thus, it seems that the competitive environment drives down returns even if the trustors do the best they can to signal trust and kindness given their choice set. Interestingly, Brandts and Charness (2004) find very similar behavioural responses of workers in a gift-exchange framework with a minimum wage. In their experiment, an imposed minimum wage leads to a decrease in effort provision even by workers who receive the maximum wage from their employer.

Instead of looking at the effect of competition among trustors, Huck and Tyran (2007) look at the effects of competition among trustees and allow for reputation building in a repeated trust game. They find that competition or reputation alone cannot increase efficiency; yet, the combination of both improves market performance. In contrast, our experiment introduces competition among trustors (not trustees) without allowing for reputation building. In this

setting, competition does not increase investments, which is very similar to Huck and Tyran's (2007) finding that competition alone does not improve market performance in the absence of reputation building. Brandts et al. (2009) find that competition does not even increase efficiency in social-dilemma situations although they allow for reputation building.

Finally, it might be worthwhile to discuss one remaining point on symmetric versus asymmetric competition (treatments SS-S and SP-P). One anonymous referee stressed the point that, in the public goods game literature, social fragmentation can decrease contributions to public goods because of disagreement between the social groups on the question which public goods should be provided, or because the fact that another social group benefits from the public good negatively affects the utility gained from the public good (Easterly and Levine 1997, Alesina et al. 1999). Note that our setting does not deal with "non-excludable" goods. Rather, the trustee can explicitly choose whom of the two trustors she would like to accept and return money to. Thus, only the person the trustee chooses benefits from the trustee's reciprocity; in other words, the trustee can "exclude" one of the two trustors in the three-person games. This is different from a public good situation where all individuals benefit from a single individual's contribution to the public good. However, even if the standard fragmentation reasoning from the public goods literature is not directly applicable to our setting, the question whether the strong decline in return ratios in the competition treatment SP-P could also be explained by fragmentation/ group asymmetry is an interesting issue which deserves discussion. As explained earlier, we do not find any statistically significant differences between the symmetric and asymmetric competition treatments SS-S and SP-P. Further, there is no evidence that the negative effect of competition is stronger for strangers (out-group) than for partners (in-group); if at all, it is the other way round. Still, due to lack of statistical power we should not draw the rigorous conclusion that fragmentation/ group asymmetry does not play any role in our setting.

4. Conclusions

Our study is the first to analyse the effect of competition among trustors on the trustee's behaviour in one-shot trust games, while allowing for heterogeneous effects of competition for partners and strangers. We implement competition in a way that does neither change the trustors' choice sets nor their ability to fully control their decisions. Still, we argue that the mere presence of a competitive environment might affect how the trustors' behaviour is perceived by the trustee. In particular, we argue that competition as a new incentive alters the framing of the decision situation and might thus reduce the salience of kindness and affect

behaviour. Imagine trustors A and C can invest in trustee B but B can only accept one of the two investments. If A thus competes against C for the favour of B, B might find it difficult to interpret A's behaviour as kind since it could as well be the outcome of a competitive race with C. In contrast, in a personal two-player trust game, trustee B might more easily be able to ascribe trustor A's investments as genuinely kind and trusting behaviour.

To experimentally test this hypothesis, we let subjects play modified versions of simple one-shot trust games. In particular, standard two-person trust games are compared to three-person trust games where two trustors compete for one trustee. By artificially inducing social groups in the laboratory, we also investigate whether the potentially negative effect of a competitive environment on return ratios might be mitigated by social ties. The main finding of this paper is that trustees react to competition among trustors by lowering return ratios. This negative effect of competition on return ratios cannot be mitigated by social ties between subjects. Thus, our results confirm Stanca et al.'s (2009) hypothesis that apart from free will and the choice set at hand, there are other elements which could affect how intentions are perceived. While Stanca et al. (2009) look at the effect of potentially strategic actions in a repeated game on perceived kindness we present evidence that a competitive environment could negatively affect perceived kindness in one-shot games.

Our experiment can give some first insights into behavioural responses of a trustee to competition between trustors. However, the underlying forces driving the trustee's return behaviour still remain rather hidden. Therefore, it would be a worthwhile next step to open this black box to better understand the trustee's reaction to competition between trustors. This could, for example, be done by explicitly asking trustees to report how trustors' actions (and underlying intentions) are perceived under various settings. Moreover, we did not explicitly tell the trustees that the trustors knew that there was a competitor who was stranger (or partner) of the trustee. When this information is explicitly provided, we would expect that competition becomes still more salient, which could result in an even more pronounced effect of competition on behaviour. Additionally, it might be worthwhile for future research to more rigorously study which role fragmentation/ group asymmetry plays in a competitive setting. Further, it would be interesting to analyse the effects of competition on trustworthiness in the field. This is a difficult task since competition outside the laboratory usually emerges endogenously and, consequently, causal effects of competition are hard to pin down. Yet, McIntosh et al. (2006) provide some interesting evidence using panel data, which indicates that competition might indeed harm trustworthiness in financial transactions in Uganda.

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Appendix A: Instructions

A.1 Printed (English Translation)

Welcome to this experiment and thank you for your participation!

In this experiment – financed by the German Research Foundation (DFG) – you can earn money, depending on your own performance and decisions. Therefore, it is important that you read these instructions carefully.
If you have any questions during the experiment, please raise your hand. We will then come to you and answer your question. Please pose your question quietly. All participants of this experiment receive the same printed instructions. The information on the screen, however, is only intended for the respective participant. Please do not look at the screens of other participants and do not talk to each other. If you offend against these rules, we are unfortunately required to expel you from the experiment. Please switch off your mobiles now.

General Schedule
The experiment comprises **four stages**. Every stage is fully relevant for your payoff. That is, your payment will be the sum of your results in all four stages.
You will receive detailed instructions for every stage during the experiment on your screen. Please read these instructions carefully.
The **fourth stage** of this experiment includes decisions for which simple calculations are necessary. To simplify these decisions a small calculator is integrated in the program. After your decision, you can press the button **"Calculate without consequences"** to learn about the consequences of your decision. After that, you can change your decision as you wish. Once you pressed the button "**This is my final decision"**, your decision is final and no longer revisable.
A short questionnaire will follow after the experiment. Having filled out this questionnaire, please remain seated until we call you separately for payment.

Further Schedule
After you have read the instructions carefully, please wait for the other participants and then start with the computer program on your screen.
Good luck!

A.2 On-screen (English Translation)

Before stage 1 (treatment P-P and partners in treatment SP-P)

Welcome to this experiment!
You are a member of the **red group**.
You are assigned to a **Partner**, this partner is also a member of the **red group**
This partner remains your partner for the rest of the experiment.
The experiment comprises 4 stages.
You receive information on your payoff at the end of each stage.

Before stage 1 (treatment S-S, SS-S and strangers in treatment SP-P)

Welcome to this experiment!
On every stage of the experiment fellow players are randomly assigned to you.
The experiment comprises 4 stages.
You receive information on your payoff at the end of the experiment.

Stage 1/2/3 (treatment P-P and partners in treatment SP-P)

In this stage you play with your partner.
Only stage 1/3: Imagine, you and your partner have to meet in Jena/Paris. Where would you meet?
Only stage 2: Please sort the letters "A","B", and "C" as you wish!
You and your partner have to answer the same question at this moment.
If you both reach the same answer, you and your partner earn an amount of 1€/2€/4€.
This amount is split equally between you and your partner.
Only stage 1/3: Where do you want to meet your partner?
Only stage 2: How do you sort the letters?

Stage 1/2/3 (treatment S-S, SS-S and strangers in treatment SP-P)

You are assigned to a random fellow player.
Only stage 1/3: Imagine you and the fellow player have to meet in Jena/Paris. Where would you meet?
Only stage 2: Please sort the letters "A","B", and "C" as you wish!
You and your fellow player have to answer the same question at this moment
If you both reach the same answer, you each earn an amount of 0,50€/1€/2€.
Only stage 1/3: Where do you want to meet your fellow player?
Only stage 2: How do you sort the letters?

Stage 4: Trustors' information (treatment S-S)

You are assigned to a random fellow player.
This randomly chosen player will be called "receiver".
You and the randomly chosen "receiver", each get the following amount in euros: 4
You can now decide how much you want to send to the "receiver".
If the "receiver" accepts your offer, the amount received is the tripled amount you sent.
After that, the "receiver" can decide how much of the tripled amount is returned to you.
If the "receiver" does not accept your offer, you will keep your amount of 4 euros.

Stage 4: Trustors' information (treatment P-P)

In this stage you play with your partner.
You and your partner, each get the following amount in euros: 4
You can now decide how much you want to send to your partner.
If your partner accepts your offer, the amount received is the tripled amount you sent.
After that, your partner can decide how much of the tripled amount is returned to you.
If your partner does not accept your offer, you will keep your amount of 4 euros.

Stage 4: Trustors' information (treatment SS-S)

You are assigned to two random fellow players.
One randomly chosen player will be called "sender", the other "receiver".
You, the randomly chosen "receiver", and the "sender", each get the following amount in euros: 4
You can now decide how much you want to send to the "receiver".
At the same time, the "sender" decides how much to send to the "receiver".
The "receiver" can either accept your offer, the offer of the "sender" or none of the two offers.
If the "receiver" accepts an offer, the amount received is the tripled amount accepted.
After that, the "receiver" can decide how much of the tripled amount is returned to the one whose amount was accepted.
If the "receiver" does not accept your offer, you will keep your amount of 4 euros.

Stage 4: Trustors' information (strangers in treatment SP-P)

You are assigned to two random fellow players.
One randomly chosen player will be called "sender", the other "receiver".
The "sender" and the "receiver" know each other from the last three stages of this experiment.
You, the randomly chosen "receiver", and the "sender", each get the following amount in euros: 4
You can now decide how much you want to send to the "receiver".
At the same time, the "sender" decides how much to send to the "receiver".
The "receiver" can either accept your offer, the offer of the "sender" or none of the two offers.
If the "receiver" accepts an offer, the amount received is the tripled amount accepted.
After that, the "receiver" can decide how much of the tripled amount is returned to the one whose amount was accepted.
If the "receiver" does not accept your offer, you will keep your amount of 4 euros.

Stage 4: Trustors' information (partners in treatment SP-P)

In this stage you play with your partner.
Additionally, you are assigned to a random fellow player called "sender" who is not a member of the red group.
You, your partner, and the randomly chosen "sender", each get the following amount in euros: 4
You can now decide how much you want to send to your partner.
At the same time, the "sender" decides how much to send to your partner.
Your partner can either accept your offer, the offer of the "sender" or none of the two offers.
If your partner accepts an offer, the amount received is the tripled amount accepted.
After that, your partner can decide how much of the tripled amount is returned to the one whose amount was accepted.
If your partner does not accept your offer, you will keep your amount of 4 euros.

Stage 4: Trustees' information (treatment S-S)

You are assigned to a random fellow player.
This randomly chosen player will be called "sender"
You and the randomly chosen "sender", each get the following amount in euros: 4
The "sender" can now decide how much to send to you.
If you accept the "sender's" offer, this amount will be tripled and given to you.
After that, you can decide how much of the tripled amount you want to return to the "sender".
If you do not accept the "sender's" offer, the "sender" will keep the amount of 4 euros.

Stage 4: Trustees' information (treatment P-P)

In this stage you play with your partner.
You and your partner, each get the following amount in euros: 4
Your partner can now decide how much to send to you.
If you accept your partner's offer, this amount will be tripled and given to you.
After that, you can decide how much of the tripled amount you want to return to your partner.
If you do not accept your partner's offer, your partner will keep the amount of 4 euros.

Stage 4: Trustees' information (treatment SS-S)

You are assigned to two random fellow players.
The two randomly chosen players will be called "senders".
You and the two randomly chosen "senders", each get the following amount in euros: 4
The two "senders" can now decide how much to send to you.
You can either accept one of the two offers or none of the two offers.
If you accept an offer, this amount will be tripled and given to you.
After that, you can decide how much of the tripled amount you want to return to the one whose amount you accepted.
If you do not accept an offer, the one whose offer was not accepted will keep the amount of 4 euros.

Stage 4: Trustees' information (treatment SP-P)

In this stage you play with your partner.
Additionally, you are assigned to a random fellow player called "sender" who is not a member of the red group.
You, your partner, and the randomly chosen "sender", each get the following amount in euros: 4
Your partner and the "sender" can now decide how much to send to you.
You can either accept one of the two offers or none of the two offers.
If you accept an offer, this amount will be tripled and given to you.
After that, you can decide how much of the tripled amount you want to return to the one whose amount you accepted.
If you do not accept an offer, the one whose offer was not accepted will keep the amount of 4 euros.

Table A.1: Returns to trustors

Treatment	Partner	Stranger	Total
P-P	3.58		3.58
	2.47		*2.47*
	[24]		[24]
S-S		1.97	1.97
		1.90	*1.90*
		[23]	[23])
SS-S		2.34	2.34
		2.09	*2.09*
		[23]	[23]
SP-P	2.95	2.44	2.76
	2.52	*1.70*	*2.22*
	[15]	[9]	[24]
Total	3.34	2.20	2.67
	2.47	*1.93*	*2.23*
	[39]	[55]	[94]

Notes: The figures are mean amounts in euros, standard errors in italics, no. of observations in square brackets. S-S stands for "stranger - stranger" and is short for the 2-person trust game with a stranger trustor and a stranger trustee, P-P stands for "partner - partner" and is short for the 2-person trust game with a partner trustor and a partner trustee, SS-S stands for "stranger, stranger - stranger" and is short for the 3-person trust game with two stranger trustors and a stranger trustee, SP-P stands for "stranger, partner - partner" and is short for the 3-person trust game with a partner trustor, a stranger trustor and a partner trustee.

Table A.2: Investment behaviour of trustors: Regression results from a Tobit specification

	Sent amount (I)	
	coeff.	std.err.
Competition	0.197	0.593
Stranger	-1.175 **	0.523
Competition x Stranger	0.090	0.716
Constant	2.943 ***	0.420
N	148	
R^2	0.066	

Notes: The table shows the results of a Tobit regression OLS regressions using robust standard errors, where the trustor is the unit of observation. *** 1% level of significance, ** 5% level of significance, * 10% level of significance.

Table A.3: Return behaviour of trustees: Regression results from an alternative specification

	Return ratio (I)	
	coeff.	std.err.
Competition	-0.350^{+}	0.220
Stranger	-0.203	0.177
Competition x Stranger	0.217	0.270
Amount accepted	-0.020	0.057
Constant	1.297***	0.179
N	94	
R^2	0.057	

Notes: The table shows the results of OLS regressions using robust standard errors, where the accepted trustor – trustee pair is the unit of observation. *** 1% level of significance, ** 5% level of significance, * 10% level of significance, $^{+}$ 12% level of significance.

Table A.4: Profits in the Trust Game

	Partner trustor			Stranger trustor			Partner trustee	Stranger trustee	
Treatment	Accepted	Not accepted	Total	Accepted	Not accepted	Total			Total
P-P	4.78	4.00	4.72				8.46		6.59
	1.96	*0.00*	*1.89*				*2.83*		*3.04*
	[24]	[2]	[26]				[26]		[52]
S-S				4.01	4.00	4.01		7.46	5.73
				1.59	*0.00*	*1.49*		*2.92*	*2.88*
				[23]	[3]	[26]		[26]	[52]
SS-S				3.82	4.00	3.91		9.02	5.61
				1.78	*0.00*	*1.22*		*3.55*	*3.31*
				[23]	[25]	[48]		[24]	[72]
SP-P	3.73	4.00	3.83	3.07	4.00	3.65	11.07		6.18
	2.31	*0.00*	*1.81*	*1.89*	*0.00*	*1.21*	*2.88*		*4.04*
	[15]	[9]	[24]	[9]	[15]	]24]	[24]		[72]

Notes: The figures are mean amounts in euros, standard errors in italics, no. of observations in square brackets. S-S stands for "stranger - stranger" and is short for the 2-person trust game with a stranger trustor and a stranger trustee, P-P stands for "partner - partner" and is short for the 2-person trust game with a partner trustor and a partner trustee, SS-S stands for "stranger, stranger - stranger" and is short for the 3-person trust game with two stranger trustors and a stranger trustee, SP-P stands for "stranger, partner - partner" and is short for the 3-person trust game with a partner trustor, a stranger trustor and a partner trustee.