Do the Reciprocal Trust Less?

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DISCUSSION PAPER SERIES

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ABSTRACT

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We study the intrapersonal relationship between trust and reciprocity in a laboratory experiment. Reciprocal subjects trust significantly more than selfish ones. This finding raises questions about theories of social preferences which predict that "fairer" players should trust less.

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1 Introduction

By now there seems to be broad agreement that trust and reciprocity are conducive to economic performance and efficiency (e.g., Knack and Keefer, 1997). Mutual trust between trading parties facilitates the realization of gains from trade, for instance by reducing contracting costs. Reciprocity can also enhance performance in many areas of economic life, for example by mitigating moral hazard problems (Fehr et al., 1997). In order to better understand the economic implications of reciprocity, several formal models of social preferences have been developed (e.g., Fehr and Schmidt, 1999; Falk and Fischbacher, 2006).

In spite of the importance of trust and reciprocity surprisingly little is known about their relationship on an intrapersonal level. In other words, do reciprocal persons trust more or less than selfish ones? In this paper we address precisely this question with the help of a controlled laboratory experiment, employing a variant of the trust game that allows us to measure both variables for each individual. [1]

We find a strong and positive relationship between a person's reciprocity and her trusting behavior. Reciprocal players exhibit much higher levels of trust than more selfish ones, even when personal characteristics and preferences such as gender or risk attitudes are controlled for. This finding is also interesting from a theoretical perspective because theories of social preferences typically assume—at least implicitly—a connection between trust and reciprocity. In particular, the observed positive relation between the two raises important questions about theories which predict that *ceteris paribus* "fairer" players trust *less*.

The remainder of the paper is organized as follows. The next section describes the design of our experiment, section 3 presents the empirical results. Section 4 concludes by discussing the implications of our findings for modelling social preferences.

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[1] Several studies (e.g., Cox, 2004; Ashraf et al., 2006) have analyzed behavior across games in order to disentangle subjects' unconditional kindness or altruism from trust and reciprocity, but these studies do not look at the direct link between a person's (own) reciprocity and trust. In addition, it is not clear to what extent inferences can be made from behavior in non-strategic environments (e.g., the dictator game) to players' motives in strategic interactions. See Fehr and Schmidt (2006) for a discussion of this point.

2   Experimental Design

In our experiment, subjects were anonymously matched in pairs and played a modified version of the trust game (Berg et al., 1995). Both players received an endowment of 120 points. The first mover (the *sender*) could send any amount $t \in \{0, 20, 40, 60, 80, 100, 120\}$ to the second mover (the *receiver*). The amount sent was tripled by the experimenter. Then, the second mover could send back any amount between zero and 480 points. The crucial feature that distinguishes our design from the original version of the trust game is the use of the strategy method to elicit each subject's trust and reciprocal inclination. In our experiment, subjects made decisions both in the role of the sender and the receiver. In the role of the receiver subjects had to decide how much to send back for any possible amount received. This procedure allows us to measure both the level of trust and the level of reciprocity for each subject in the same strategic environment.[2]

To give subjects the monetary incentives to take all decisions seriously while at the same time avoiding potential confounds if subjects interact repeatedly in different roles, we employed the following incentive-compatible procedure. After all decisions had been made, a random mechanism determined which player of a given pair actually had the role of the sender and which player had the receiver role. Then, players' decisions were implemented and subjects were paid accordingly.

The experiment was programmed with the software z-Tree (Fischbacher, 2007) and conducted at the BonnEconLab. Twenty subjects participated in each of the 12 sessions that we ran so that we observe the choices of 240 different subjects. The trust game was part of a sequence of tasks (see Dohmen and Falk, 2006, for details). Before subjects played the trust game they had to solve math problems under different monetary incentives.[3]

After the trust game, we elicited subjects' risk preferences using a series of 15 choices between a safe payment and a lottery. The lottery was the same across choices (400 points or 0 points, each with probability 0.5) while the safe option increased from 25 points to 375 points in increments of 25. If subjects

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[2] Other studies have employed the strategy method in trust games in which subjects play only one role (e.g., Bellemare and Kröger, 2007; Falk and Zehnder, 2007). Burks et al. (2003) have subjects play both roles but do not use the strategy method.

[3] In 4 of the 12 sessions subjects worked under purely individual incentives (fixed wages and piece rates). In the remaining 8 sessions they could select into an incentive scheme (team or tournament) which involved anonymous interaction with another player. All subjects were randomly rematched in the trust game. In view of our results we are confident that neither solving math problems nor the different incentive schemes systematically affect behavior in the trust game (see below).

have monotonous preferences, they prefer the lottery up to a certain level of the safe option, and then switch to preferring the safe option in all subsequent choices. After a subject had made decisions for all 15 choices, it was randomly determined which choice became relevant for the payment.[4] Together, the trust game and the lottery choice task lasted about 20-25 minutes and subjects earned 6.87 Euro on average.

3 Results

We measure *trust* by the amount that a subject sends as a first mover. Our measure of *reciprocity* (also denoted "r") is derived as follows: for each subject, we used the decisions as a second mover and ran a simple OLS-regression of the amounts sent back on the (hypothetical) amounts sent by the opponent, forcing the slope through the origin. The slope coefficient gives us a measure of a subject's willingness to reward kind actions of an opponent by own kind behavior, i.e., positive reciprocity. If a receiver, for example, always matches his final payoff with that of the sender, his reciprocity coefficient is $r = 2$.

In order to graphically present our main result, we classify subjects according to their behavior as second movers. We call subjects with a reciprocity parameter $r > 1$ "reciprocal", and subjects with a slope parameter $r = 0$ "selfish". Reciprocal types leave their opponent with a positive return to trust, sending back more than the amount sent to them by the sender. 64.6% of our subjects fall into this category. Selfish types, who make up 12.5% of subjects, never send back anything, irrespective of the first mover's behavior. The remaining 22.9% of subjects whose slope parameter is positive, but small ($r \leq 1$) are categorized as "intermediate" types.

Figure 1 plots the amount that the three types of subjects send on average in the trust game. Reciprocal types clearly send most (69.2 points on average), and selfish types send least (23.3 points). Subjects in the intermediate category send 43.6 points. Pairwise Mann-Whitney-U-tests indicate that all differences between the groups are highly statistically significant (all p-values < 0.01). Subjects who always "split the pie equally" as a responder (i.e., subjects with $r = 2$) trust most (83.5 points). The result depicted in Figure 1 is robust to different classifications of types using a finer "grid".

OLS-regressions of individuals' trust, measured by the amount sent in the trust game, on their reciprocal inclination, measured by the slope parameter r described above, confirm that reciprocal individuals trust more: an increase

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[4] The experimental instructions as well as the full description of the experimental procedures are available upon request.

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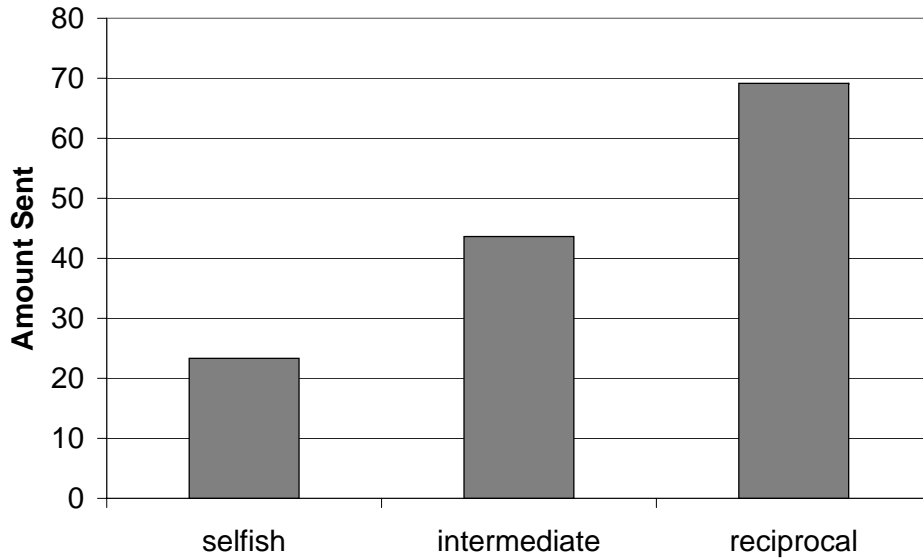
Fig. 1. *Average amount sent by selfish, intermediate, and reciprocal players.*

of one unit in the reciprocity measure is associated with sending 16.1 points more in the trust game (see column 1 of Table 1).[5]

This key result is also robust to controlling for gender (cf. column (2) of Table 1) and subjects' risk attitudes (cf. column (3) in Table 1).[6] The positive influence of reciprocity on trust is highly significant and also quantitatively very similar in all specifications. Remarkably, the effects of gender and risk attitudes are consistent with the findings in the literature. Men trust more than women (cf. Bohnet and Zeckhauser, 2004), sending about 15 points more than female participants in our sample. Our results also confirm the importance of risk attitudes for trusting behavior: subjects who are more willing to take risks send significantly more (cf. Eckel and Wilson, 2004).

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[5] This result still holds if we restrict the sample to the 4 sessions in which there was no interaction between subjects in the tasks preceding the trust game. In addition, we find the significant positive correlation between trust and reciprocity in the remaining 8 sessions irrespective of the chosen incentive scheme.

[6] The certainty equivalent cannot be determined unambiguously for 19 subjects because they switched more than once between the safe option and the lottery. These subjects were excluded from the regression in column (3). Including them with the lowest or highest switching point from the lottery to the safe option does not change the results.

	Dependent variable: Amount sent		
	(1)	(2)	(3)
Reciprocity	16.091**	17.234**	17.761**
	(2.235)	(2.199)	(2.316)
1 if male		16.301**	15.167**
		(4.401)	(4.688)
Certainty equivalent			0.100*
			(0.044)
Constant	34.081**	24.329**	3.665
	(3.957)	(4.668)	(10.151)
R^2 adj.	0.175	0.217	0.230
Observations	240	240	221

Table 1
Trust-Regressions. OLS estimates (standard errors in parentheses). "Certainty Equivalent" indicates the switch from the risky lottery to the safe option (=0 if subject is strongly risk averse, ..., =400 if subject is strongly risk loving). Significance at the 5% and 1% level is denoted by * and ** respectively.

4   Discussion and Concluding Remarks

The strong, positive relationship between a person's reciprocal inclination and her trusting behavior has important implications for the evaluation and advancement of theories that incorporate social preferences. Some of the most prominent models (e.g., Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000; Falk and Fischbacher, 2006) predict that individuals who are more reciprocal (or inequity averse) ceteris paribus trust *less* than others in the trust game. The intuition for this result is that a selfish sender just suffers from the loss of her investment if the receiver sends back too little, whereas a fair-minded sender experiences additional disutility because his trust has been exploited. [7]

Our results show, however, that the relationship between trust and reciprocity may be more complex than captured by most models. The finding that people trust more the more reciprocal they are allows at least two different preliminary interpretations—one based on norm adherence and the other on system-

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[7]   Along these lines, Fehr et al. (2007) have argued that "fairness preferences inhibit trusting behavior because trust typically involves a risk of being cheated."

atic differences in beliefs. The idea of the former is that some people value adherence to a certain moral norm in itself. If these people follow a norm that, e.g., dictates cooperative behavior in either role, this could account for our main finding. Such norm-guided behavior could also help to explain why some senders in trust games send positive amounts despite expecting to get back less than they send (cf. Dufwenberg and Gneezy, 2000; Ashraf et al., 2006).

A different interpretation is that fair and selfish types have fundamentally different beliefs regarding the behavior of others. Such differences in beliefs might be the result of a "false consensus effect" (Kelley and Stahelski, 1970). As an extreme example, assume that reciprocal players expect all others to behave reciprocally, and that a selfish subject expects all others to be selfish as well. In this case reciprocal types will send positive amounts and expect a positive return, while selfish types will never send anything since they expect that the receiver will not send anything back. Such systematic differences in beliefs would have interesting implications for the modelling of social preferences as they require giving up the widely used common-prior assumption. They potentially also have important practical implications as they could lead different types of players to select into different institutional settings. This could help to explain why environments with different degrees of exogenous enforcement coexist, e.g., in the labor market. Which of the two interpretations is more relevant cannot be answered with our data but remains an important question for future research.

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