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## Belief in others' trustworthiness and trusting behaviour

**Abstract:** Data from surveys indicate that people, in general, do not trust others. On the other hand, in one-shot trust games, where the player decides whether to send money to an anonymous partner, the actual rate of trust is relatively high. In two experiments, we showed that although reciprocity expectations and profit maximization matter, they are not decisive for trusting behaviour. Crucial factors that motivate behaviour in trust games seem to be altruism and a type of moral obligation related to a social norm encouraging cooperative behaviour. Finally, we were able to divide participants into specific profiles based on amount of money transferred to the partner, altruistic motivation, and belief in partners' trustworthiness. This shows that the trust game is differently perceived and interpreted by different participants.

**Key words:** trust, trust game, beliefs, altruism, compromise effect

### 1. Introduction

There is hardly any need to justify or emphasize the vital role of trust in economic and social activities. Let us quote just two classics: "Virtually every commercial transaction has within it some element of trust" (Arrow, 1972, p. 357) and "Trust determines the performance of all institutions, including firms" (Fukuyama, 1995). It is clear that, in almost any economic interaction, one party or more finds itself in a position of being dependent on some other party (or parties). For example, a seller shipping goods to a buyer believes that the buyer will pay its price and a buyer believes that the goods purchased will be of the declared quality. This substantially reduces transaction costs and, in fact, some researchers (e.g., Zak & Knack 2001) have observed that level of trust in a society is positively correlated with the rate of growth of GDP.

However, a natural question that arises is: *what actually* is level of trust and how should it be measured? As pointed out by Fehr (2009), when studying trust one has to clearly distinguish between beliefs in others' trustworthiness (whatever the method of measuring it) and trusting

behaviour. In this paper we identify "trust" with trusting behaviour characterized by voluntary acceptance of being vulnerable to possible betrayal by another person. A person behaves trustfully when (s)he chooses a decision whose outcome depends on another person's decision and where a gain occurs if the trust is reciprocated and a loss occurs if it is not, instead of a decision whose outcome is certain and neutral. An additional condition is that reciprocating the trust is costly for the other decision maker so that the person who makes a trusting decision relies on, or hopes for, the goodwill of the partner who is being trusted.

Trust as defined above has frequently been studied in laboratory experiments using the trust game. In the *trust game*, a participant (sender) decides whether to send money to an anonymous partner (responder). If he chooses to send money, the transferred sum increases before it reaches the receiver and the responder can either return some of the money to the sender or keep all of the money for himself. Thus, the sender can trust or distrust the responder and the responder can either reciprocate (reward the sender) or betray the trust.

There is abundant and strong evidence of very

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high levels of trust revealed by experimental subjects. In the now classical experiment by Berg, Dickhaut and McCabe (1995) 30 of 32 participants, when given the opportunity to send some or all of their \$10 (received for participation) to an anonymous partner, sent at least some of the money. This result is particularly striking because the senders knew that the responders had also received \$10 for participation; therefore, seemingly, their decision to transfer money was not driven by considerations of equality or fairness. In numerous later experiments, both with the original trust game and with its variants, most participants entrusted some of their money, and entrusting the entire endowment was not uncommon. Thus, it can be safely concluded that when people have an opportunity to place their trust in an anonymous partner in a laboratory setting, they usually do so.

The high level of revealed trust might, of course, result simply from a *belief* in the trustworthiness of partners. A rational utility-maximizing sender may transfer a positive amount in the trust game because of his belief that the receiver will, with some nonzero probability, reciprocate the trust. A sender who uses this reasoning treats his decision of trust as a risky investment (as captured by the alternative name for the game – the *investment* game). Here, to send his money to the receiver, he should assign a sufficiently high probability to the event of receiving a positive return on his “investment.”

Several studies have investigated people’s beliefs that other people are trustworthy, and the relationship between such beliefs and behaviour in trust games. In a beautiful citywide experiment with the general public (newspaper readers), Falk and Zehnder (2013) asked participants who had actually entrusted some money about their expected return. On average, the senders expected a slight positive return on their “investment” but they also greatly underestimated the eventual *actual* return. Similarly, when Fetchenhauer and Dunning (2009) asked participants to estimate the percentage of anonymous partners who would keep all of the received money for themselves, the average predicted “trustworthiness” was 45%. At the same time, however, as much as 79% of participants were ready to split the received money equally and give back half to the sender when playing the role of responder. Thus, in terms of beliefs, people definitely trust “too little.” On the other hand, in terms of trusting behaviours, people trust “too much” in relation to their (pessimistic) beliefs, accepting the risk of loss that they declared they would not accept with a standard binary lottery with the same probabilities of gain and loss. This clearly indicates that the high levels of trust in trust games cannot be explained simply by high reciprocity expectations.

Another phenomenon very frequently observed in trust games is senders transferring only part of the endowment (typically half) to partners instead of sending all or nothing. This behaviour is never consistent with profit

maximization motivation and very seldom with utility maximization (see: Section 2), so another explanation is required.

All this suggests that factors other than expected utility maximization are responsible for trusting behaviour. In a recent paper, Dunning, Fetchenhauer and Schlosser (2012) point to emotional and social factors. We agree with their claim, and assert that while reciprocity expectations matter for trusting behaviour, they are not decisive.

In line with this, we conduct two studies on beliefs and behaviour in the trust game. In both, we compare individual beliefs in partners’ trustworthiness with transfer decisions. In the first study we introduce, in particular, three different types of responders (prisoners, bus drivers and monks) into the trust game who, according to popular opinion, strongly differ with respect to their reputation for trustworthiness, and check whether the experimental subjects discriminate among them in their trusting decisions.

Additionally, in the second study we focus on the above mentioned phenomenon of transferring only part of the endowment to partners. This phenomenon is similar to the *compromise effect* known in research on consumer behaviour. In our context<sup>1</sup>, sending a “compromise” amount of money to the partner instead of transferring nothing may be seen as a type of moral obligation related to the social norm encouraging cooperative behaviour. Social pressure (Fehr & Fischbacher 2003), or motives described by Andreoni (1998) as “impurely altruistic motivation” (e.g. “warm-glow giving”) may lead the sender to transfer some “compromise” amount of money to the receiver. We therefore introduce altruism into the senders’ profiles by also asking them to play a dictator game. It is well known (e.g. Cox, 2004) that people actually do transfer some money to their partners even in dictator games in which the trust motive is necessarily absent since the partner has no possibility of reciprocating.

Thus, assuming that trusting decisions may be driven by different factors, including both trustworthiness expectations (beliefs) and altruistic preferences, we aimed to identify typical profiles of players in trust games: profiles comprising their beliefs, altruistic preferences and trusting behaviour.

## 2. Study 1: Is the sender in a trust game a rational investor?

### 2.1 Introduction

Study 1 investigated whether sending money to the receiver in a trust game can be explained in terms of rational risky investment (i.e., whether transferring a positive amount of money is positively correlated with the belief that the receiver will return the “investment”). For this purpose, the so called trust mini-game was used. In this variant of

<sup>1</sup> Research on consumer behaviour shows that adding an extreme alternative to the two alternatives in choice set makes consumer preferences shift to the now middle option (Simonson, 1989). Such behaviour is explained in terms of risk reduction (expected-loss minimization - Simonson & Tversky, 1992; Sheng, Parker, & Nakamoto, 2005).

the game the sender could send the receiver either (1) no money, (2) half of the money he was endowed with, or (3) the entire endowment. Any sum sent was tripled before reaching the responder and the responder could either (i) return half of the (tripled) sum to the sender or (ii) return nothing. At the same time, senders were asked to estimate the trustworthiness of anonymous partners.

In order to elicit some systematic differences in senders' reciprocity expectations, an additional manipulation was introduced in this study. It involved differentiating the types of responders in the trust game. The senders were divided into three groups and players in groups 1,2 and 3 were informed that their partners in the game were respectively, prisoners (denoting potentially untrustworthy persons), bus drivers (denoting ordinary persons) and monks (denoting likely trustworthy persons).

Assuming investor rationality we formed **hypothesis 1**: transferring money to the receiver will be positively correlated with the belief that the receiver will return half of the (tripled) sum to the sender. Moreover, assuming that the sender is a rational investor, one would expect a direct effect of senders' risk attitude on transfer behaviour. Thus, **hypothesis 2** stated: the more positive the attitude of the sender to the risk, the more money he or she will transfer to the receiver.

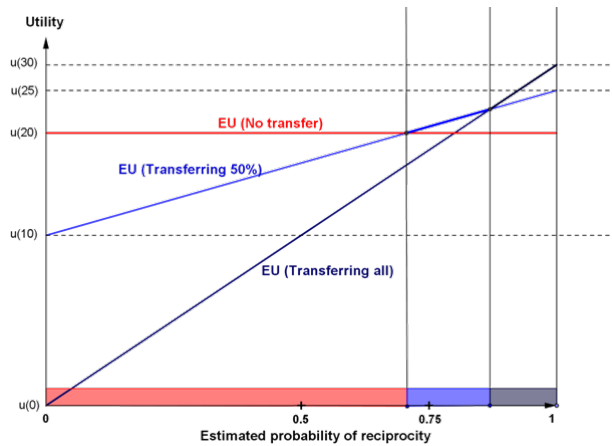
Finally, let us take a closer look at the behaviour of a "rational" utility-maximizing sender when he believes that his "trust" will be reciprocated by the responder with some nonzero probability. Because, in this game, the sender can either gain 50% on his entrusted money when his trust is reciprocated or can lose all the money when it is not, it is obvious that a risk-neutral (i.e., profit-maximizing) sender would invest his entire endowment if he believes that the probability of reciprocity is higher than 2/3 and invest nothing when it is lower than 2/3. This implies, in particular, that he will never invest half of his endowment.<sup>2</sup> More interestingly, a similar conclusion can be drawn for a sender who maximizes expected utility, but is not risk-neutral. Assume that the sender's initial endowment is 20 units and denote the sender's reciprocity expectation - his subjective probability of receiving half of the money back from the responder<sup>3</sup> - by  $\psi_r$ . The decision of transferring nothing results in a certain payoff of 20, with utility  $u(20)$ ; the decision of transferring  $k$  units ( $k = 10$  or  $20$ ) results in a lottery  $(20 + k/2, \psi_r; 20 - k, 1 - \psi_r)$  with expected utility  $\psi_r(20 + k/2) + (1 - \psi_r)(20 - k)$ . Thus, it is easy to check that the necessary condition for the decision of entrusting 10 of 20 units to be optimal is:

$$\frac{u(20) - u(10)}{u(25) - u(10)} \leq \psi_r \leq \frac{u(10) - u(0)}{u(10) - u(0) + u(30) - u(25)}$$

(when both inequalities are strict, this decision is the only optimal one). This necessary condition for the sender entrusting 50% of units never occurs for a risk-seeking sender, i.e. one with strictly convex utility function, and for

a risk-averse sender it only occurs within a relatively small interval of values of  $\psi_r$  which are included in the range of high probabilities (see Figure 1).

**Figure 1. The ranges of beliefs (estimated probabilities of reciprocity) for which particular decisions are optimal for a utility-maximizing risk-averse sender. EU = expected utility.**



Thus, assuming that the senders behave as rational investors, one may expect that they transfer half of their endowment in only few cases and, in particular, this should only be the case for (some) risk-averse participants who have high reciprocity expectations.

## 2.2 Method

### Participants

Participants included 118 nascent entrepreneurs who took part in a project financed from a start-up supporting fund that offered some training for starting and running a business, and also offered financial support for some beneficiaries (those with the best results during the training courses) to start their business. Sixty-five participants were women and 53 were men. The age of participants ranged from 25 to 45. Participation was voluntary after attending one of the project's training classes.

### Procedure

Participants played the role of player 1 (sender) in the following variant of the trust game:

- Each sender was initially endowed with 20 LCU<sup>4</sup>.
- Of this, he could send to the anonymous responder (1) no money, (2) half of his money (10 LCU), or (3) the entire amount (20 LCU).
- Any sum sent was tripled before reaching the receiver.
- The responder could either (1) return half of the (tripled) sum to the sender or (2) return nothing.
- The anonymous responder was introduced to the sender as (1) a prisoner, (2) a bus driver or (3) a monk.

<sup>2</sup> Unless the estimated probability of receiving money back is exactly 2/3. However, even when it is, two other decisions are also optimal.

<sup>3</sup> Recall that in this game the responder can only transfer either half of the money or nothing back to the sender.

<sup>4</sup> LCU – Local Currency Units

Each participant played the game once, with one fictitious anonymous partner.

After participants made their choices in the trust game, they were asked to estimate the trustworthiness of their partners by answering the question: "How many of 100 prisoners (bus drivers, monks) will return half of the received sum to the sender?" Finally, they completed a task that measured their risk aversion and an additional set of questionnaires in which their risk attitude was measured.

**Risk taking task.** Participants were presented with a set of ten choices between two risky lotteries – lotteries A (a safer one) and B (a riskier one). In lottery A payoffs were either 20 LCU or 16 LCU, and in lottery B payoffs were either 37 LCU or 1 LCU. In each pair of lotteries probabilities for high payoffs were the same, ranging from 0 to 0.9 among the pairs. This is a well-known procedure for measuring risk propensity, developed by Holt and Laury (2002). A participant's risk aversion was measured by the number of choices of lottery A. Participants were told that one of their decisions would be chosen and the lottery they chose in that decision would be played.

**Attitude towards risk.** Three proverbs that encouraged risk-taking and three that discouraged risk-taking were combined in such a way that each proverb that encouraged risk-taking (i.e. "Nothing ventured, nothing gained", "Fortune favours the brave" and "I might as well be hung for a sheep as for a lamb") was paired with each proverb that discouraged risk-taking (i.e. "A bird in the hand is worth two in the bush", "Better safe than sorry" and "Who aims high falls deep") to produce nine pairs. In each of the nine pairs, participants saw one proverb on the left side and one on the right side of the scale and were asked to mark which proverb they found more convincing. Proverbs were rated on a 7-point scale: 3 2 1 0 1 2 3 with 3 on the left meaning complete agreement with the proverb on the left, 0 meaning similar level of agreement with both proverbs and 3 on the right meaning complete agreement with the proverb on the right. These ratings were later recoded to a 7 point scale in such a way that 3 on the side of proverbs discouraging risk-taking corresponded to a value of 1, and 3 on the side of proverbs encouraging risk-taking corresponded to a value of 7. The final score was the average of 9 ratings, with its increasing value indicating amore positive attitude towards risk.

**Payoffs.** After the session, a number of players (about 20%) were drawn at random from each group and paid in cash according to their payoffs in the trust game. The exchange rate was about 0,25 EUR for 1 LCU. Of the remaining players, another 20% were drawn at random to be paid according to the outcome of the lottery they had chosen in the risk-taking task. This incentive scheme was known to the participants in advance before they were asked to make any decisions.

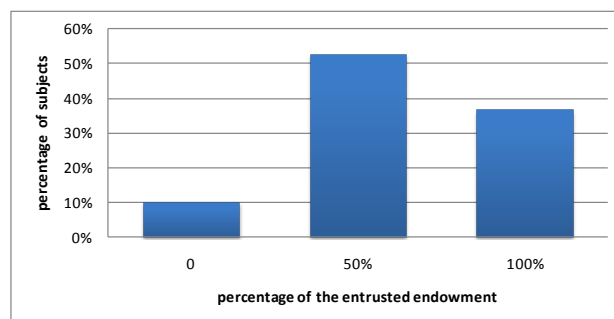
The participants were not informed that they actually were playing the game with fictitious responders. The responders' decisions in the trust game were determined

by a random mechanism, with the probability of returning half of the amount received to the sender set at 0.8. This probability was approximately the frequency of subjects willing to split their responders' earnings equally in the study of Fetschenhauer and Dunning (2009).

### 2.3 Results

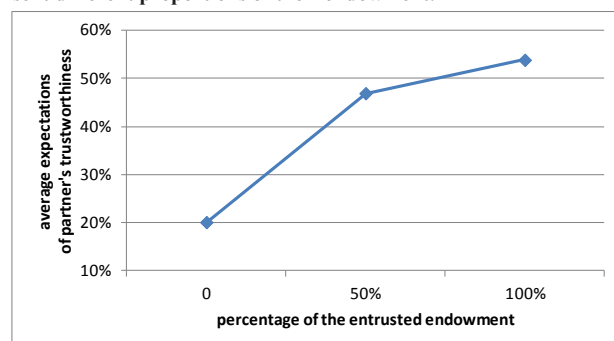
As shown in Figure 2, about 90% of participants sent money to receivers. However, only 37% decided to send the entire amount and as many as 53% decided to send half of their endowment. Thus, it turned out that the prediction that senders would transfer half of the endowment only in special circumstances was in sharp contrast to the observed behaviours. This shows that many participants were not motivated by expected utility maximization.

**Figure 2. The percentages of participants who sent different amounts of their endowment in the trust game.**



The overall correlation between beliefs in partners' trustworthiness and amount of the endowment sent to the receiver was 0.32 ( $p < 0.001$ ), i.e. significant as hypothesized, but moderate. Figure 3 illustrates the relationship between beliefs in partners' trustworthiness and percentage of the endowment sent to the receiver. There were significant differences in trustworthiness expectations between groups of participants who transferred different proportions of their endowments ( $F(2, 115) = 8.60, p < 0.001$ ). Post-hoc (HSD) Tukey tests revealed that the difference in beliefs between participants who transferred half vs. all of their endowment was statistically insignificant; however, the differences between participants who transferred no money and those who transferred half or all of their endowment were statistically significant ( $p = .03$  and  $p = .004$ , respectively).

**Figure 3. Average beliefs in trustworthiness of a partner in groups that sent different proportions of their endowment.**



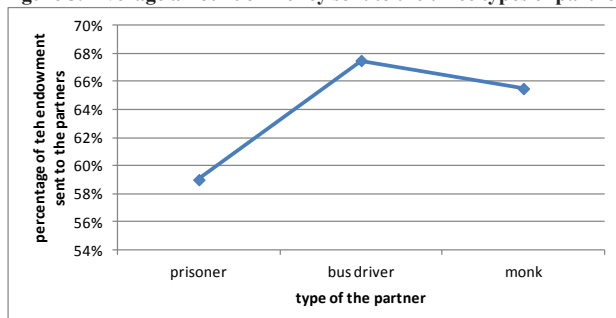


Another interesting evidence of the discrepancy between trust as belief and trusting behaviour is provided by comparison of results for the three different types of partners. Figures 4 and 5 show differences in participants' beliefs in the trustworthiness of the three types of partner (bus drivers, prisoners, and monks) and differences in the average proportions of the endowments that were sent to each type of partner. (The beliefs in partner's trustworthiness are measured by expectations of trustworthiness, i.e. by answers to the question about the percentage of partners supposed to send the money back). Here it can be seen that participants believed more in the trustworthiness of monks than either bus drivers or prisoners ( $F(2,115)=5.41, p=.006$ ). Post-hoc (HSD) Tukey tests revealed no significant difference between prisoners and bus drivers; however, there was a significant difference between monks and bus drivers ( $p=.004$ ) and the difference between monks and prisoners ( $p=.08$ ) approached significance. On the other hand, differences between the average amounts of money sent to different types of partners were not significant. This suggests that an a priori differentiation of prospective partners in the trust game influences beliefs but not necessarily behaviour.

Figure 4. Average beliefs in trustworthiness of the three types of partner.



Figure 5. Average amount of money sent to the three types of partner.



Finally, multiple linear regression analysis performed with the amount of money transferred to a partner as a dependent variable and propensity to take risk and attitude towards risk as independent variables revealed no influence of either risk propensity or attitude towards risk on the amount of money entrusted to the partner ( $\beta = .065, p = .52$ ;  $\beta = -0.038, p = .71$  respectively). This result

accorded with those obtained in earlier studies (e.g., Bohnet & Zeckhauser, 2004; Eckel & Wilson, 2004).

No significant correlations were found between either propensity to take risk or positive attitude towards risk and beliefs in partners' trustworthiness:  $r = -.04, p = .65$  and  $r = -.10, p = .33$ , respectively.

## 2.4 Discussion

As in other experiments with the trust games, we found that a large majority of participants decided to transfer money to a receiver. Consequently, the results of Study 1 cannot be reconciled with the idea that behaviour in the trust game can be explained in terms of rational risky investment. First, transferring different amounts of money to a partner was only weakly related to expectations concerning trustworthiness of the partner (i.e., to a belief that the receiver will return the "investment"). Although there was a significant difference in the trustworthiness beliefs of participants who entrusted some of their money to the partner and those who entrusted no money, this difference was not significant between those who entrusted half of their money and those who entrusted all of their money. Moreover, although the three types of partner were differently rated by participants with respect to trustworthiness (monks were perceived as the most trustworthy partners), they did not differ significantly in the amounts of money they were entrusted by participants.

Second, we found no significant effect of participants' risk attitude on the amount of money transferred to the receiver; such an effect would be expected under the assumption that the sender is a rational investor.

Finally, as many as half of the participants sent half of their money to the partner. As previously mentioned, in most circumstances such behaviour is not rational when the decision maker is motivated by (expected) utility maximization. Moreover, it should also be stressed that most of the participants who transferred 50% of their endowment to their partners had rather low expectations of the partners' trustworthiness (below 50% on average, cf. Figure 3), which, according to the expected utility maximization hypothesis, should have made them transfer nothing. To summarize, the results of Study 1 offer moderate support for hypothesis 1 of moderate positive correlation between size of the transfer and reciprocity expectation and lead to rejection of hypothesis 2 of positive impact of sender's risk attitude on transfer decisions. Taken together, they clearly demonstrate that participants do not perceive the trust game as a situation involving rational (risky) investment.

## 3. Study 2: Decomposition of different motives in the trust game

### 3.1 Introduction

The main assumption of Study 2 was that the trust game might evoke different motives in different participants, i.e. that transferring money to a partner may be motivated not only by maximization of a sender's own profit, but also by at least two other types of motives: other-

oriented altruistic preferences, and impure altruistic motives influencing pro-social behaviour (leading to a reluctance to choose extreme alternatives; the compromise effect).

In order to identify all of these motives, we presented participants with four alternatives concerning the transfer of money to a partner; in addition to two extreme alternatives (entrusting none or all of the money) they could send either smaller or larger intermediate (“compromised”) amounts of their money. Additionally, participants estimated the trustworthiness of their partners and, finally, they played a dictator-type game to measure their altruistic motivations. This is another novel element of this study; to our knowledge, behaviour of the same subjects in the trust game and the dictator game has not been compared and analysed before.

Our hypothesis was that one can classify individuals into consistent profiles based on the amount of money transferred to a partner, altruistic motivation, and belief in the trustworthiness of a partner. By a consistent profile, we mean: (1) altruists entrust all of their endowment when they have high expectations of their partner’s trustworthiness; (2) altruists entrust at least some part of their endowment when they have low expectations of their partner’s trustworthiness; (3) non-altruists entrust nothing when they have low expectations of their partner’s trustworthiness, and entrust, at most, a small fraction of their endowment when they have relatively high expectations of their partner’s trustworthiness.

### 3.2. Method

#### Participants

Participants included 67 part-time university students; 48 women and 19 men. Participation in the study was voluntary.

#### Procedure

The experiment consisted of two sessions. During the first session, the participants made their choices in the trust game and estimated the trustworthiness of their partners. In the second session (completed two weeks after the first session), the same participants played a dictator-type game.

The trust game of Study 1 was modified as follows:

- An individual could send the receiver either: (1) no money; (2) a “smaller amount” (10 LCU); (3) a “larger amount” (20 LCU); or (4) the entire amount (30 LCU).
- The responder could (1) return half of the (tripled) sum to the sender, or (2) return nothing.
- There was only one type of partner: the anonymous responder was introduced to the sender as an anonymous bus driver.

The responses of fictitious responders were determined in the same way as in Study 1.

In the dictator-type game of the second session,

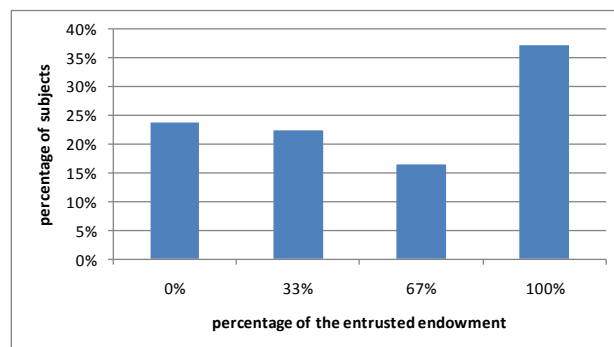
participants were endowed with 25 LCU (about 6 EUR) and matched with an anonymous partner, introduced as a person in another room taking part in a similar experiment. Participants could send their partners any (integer) amount from 0 to 25 LCU. In this game, the partner is actually a dummy; all payoffs depend only on the sender’s decision.

As in Study 1, the participants were informed before each session that only a fraction of them would be chosen at random to be paid accordingly to their game payoffs. These random selections were independent in both sessions.

### 3.3 Results

Figure 6 illustrates the groups of individuals who decided to entrust different amounts of their money to the partner: none, all, and a smaller or larger “compromise” amount. We see here that, as in the previous study, a substantial group of participants (though somewhat less than in Study 1) decided to send a “compromise” amount of money.

**Figure 6. The percentages of participants who sent different amounts of their endowment in the trust game.**



As in Study 1, there were some significant differences in expectations of partners’ trustworthiness ( $F(3,62) = 5.70, p = .002$ ). Post-hoc (HSD) Tukey tests revealed that this effect resulted from significant differences between those who entrusted nothing and those who entrusted most (67%) or all of their endowment ( $p = .06$  and  $p = .003$ , respectively). For participants who entrusted nothing vs. those who entrusted 1/3,  $p$  was .1 (however, Fisher’s LSD test for these two groups showed a significant difference in beliefs:  $p = .02$ ).

Figures 7 and 8 present, respectively, the trustworthiness expectations and levels of altruism (as measured by percentage of endowment sent to the partner in the dictator game) in the four groups that made different decisions in the trust game.

Linear regression with belief in trustworthiness as the only predictor of the amount of money transferred to a partner revealed significant effect of belief:  $\beta = .44, p = .0003, R^2 = .19$ . To analyze joint impact of two variables - belief in trustworthiness of partners and altruism - on the amount of money transferred to a partner multiple linear regression analysis was performed. Both variables were found to be equally significant predictors of the amount of

money transferred to partners ( $\beta = .37, p = .001$  and  $\beta = .31, p = .006$  respectively,  $R^2 = .28$ ). It might be thought that more altruistic people would hold more optimistic beliefs about others, and therefore that the independent variables would be correlated. However, this was not the case:  $r = 0.20, p = 0.053$  (one-tailed).

Additionally, simple linear regression analyses were conducted with amount of money transferred to a partner as a dependent variable and belief in partner's trustworthiness as an independent variable for different types of participants defined according to their decisions in the dictator game. The players who gave their partners at least 12 of their 25 LCU ( $n = 26$ ) were labelled "altruists", and all of the others who gave no more than 10 LCU were labelled "non-altruists" ( $n = 41$ ). In the "non-altruist" group, belief in partners' trustworthiness was a highly significant predictor of the entrusted amount of money:  $\beta = .50, p = .001$ . In the "altruist" group, however, this significance was no longer present:  $\beta = .31, p = 0.13$ .

Figure 7. Average beliefs in trustworthiness of the partner in groups that sent different fractions of their endowment.

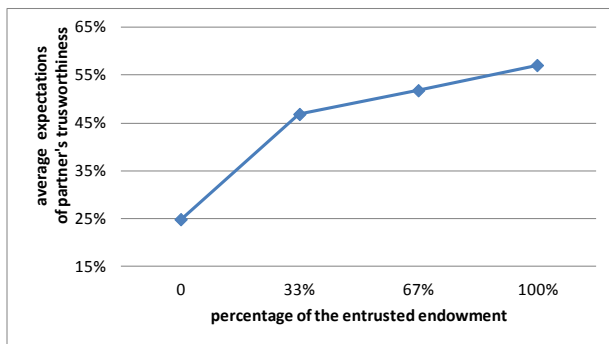
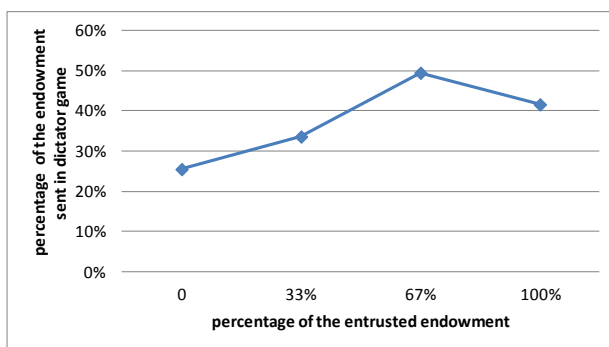
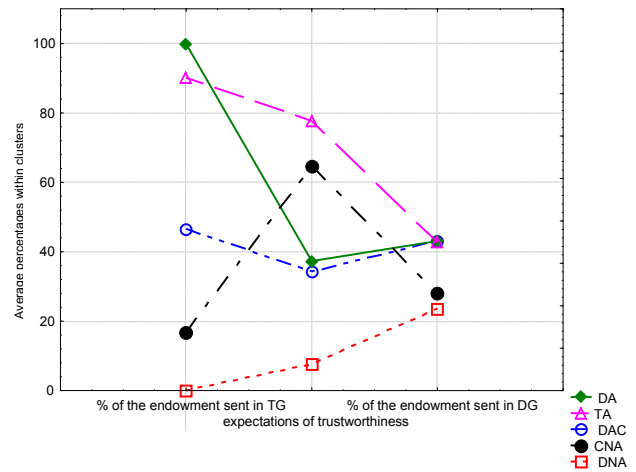


Figure 8. Average level of altruism in groups that sent different fractions of their endowment.



A cluster analysis (k-means clustering) identified five groups of individuals who differed with respect to three characteristics: trusting behaviour (proportion of money transferred to a partner), belief in trustworthiness of a partner, and altruism of the participant. The results are shown in Figure 9.

Figure 9. Five clusters of participants, based on the amount of money transferred to a partner, belief in trustworthiness of a partner, and altruism of the participant.



- Individuals in cluster 1 (N = 13) – “Distrustful Altruists” (DA) transferred all of their money to the partner, which was accompanied by a weak belief in the trustworthiness of the partner and relatively high altruism.
- Individuals in cluster 2 (N = 17) – “Trustful Altruists” (TA) transferred, on average, virtually all of their money to the partner, strongly believed in trustworthiness of the partner, and displayed a relatively high level of altruism (participants in this group may also be viewed as “trustful rational investors under risk”).
- Individuals in cluster 3 (N = 15) – “Distrustful Altruists succumbing to the Compromise effect” (DAC) transferred a “compromised” amount of money to the partner, which was accompanied by a weak belief in the trustworthiness of partners and a relatively high level of altruism.
- Individuals in cluster 4 (N = 10) – “Trustful Non-Altruists succumbing to Compromise effect” (CNA) transferred a “small compromised” amount of their money to the partner, had a relatively strong belief in the trustworthiness of partners, but were not altruistic.
- Individuals in cluster 5 (N = 11) – “Distrustful Non-Altruists” (DNA) transferred no money to their partner, did not believe in the partner’s trustworthiness, and demonstrated lack of altruism.

Clearly, clustering of 67 participants should only be seen as tentative, and a definite description of profiles would require a much greater number of participants.

### 5. General discussion

Both studies 1 and 2 confirmed that trust as belief (in the present context, expectations about partners' trustworthiness in the trust game) had some impact on trust as behaviour (decision to entrust money to the partner), but this was not very strong. In both studies the correlation between the two variables was positive and significant,

but moderate. In Study 1 we observed an interesting divergence between beliefs and behaviour in groups facing three different types of partner (prisoners, bus drivers and monks) in the trust game. The subjects' beliefs about trustworthiness of partners were significantly differentiated among the three types of partner in a way consistent with popular opinion; however, at the same time, type of partner did not significantly affect subjects' trusting decisions.

Even more interestingly, Study 2 showed that the level of the correlation between reciprocity expectations and trusting behaviour was different in groups of subjects differing in altruistic behaviour as measured by allocation of the endowment in the dictator game. The correlation was highest (and significant) in the group of "non-altruists", i.e., those dividing the endowment in a selfish way, and was lowest in the group dividing the endowment in an altruistic way. This dissimilarity in correlations suggests that the main reason for the discrepancy between trust as a belief and trusting behaviour arises from the fact that not all participants in the trust game are motivated by maximizing their profit or utility. While beliefs in the trustworthiness of a partner clearly influence trusting behaviour when the decision maker is motivated to maximize own utility, they are much less related to trusting behaviour when the decision maker is motivated by altruism or by "impurely altruistic" motives.

The divergence between trusting behaviour and trust as belief has been observed (on the aggregate level) in many earlier studies. In some studies, beliefs were measured by means of verbal opinions expressed, for example, in surveys. Generally, survey results demonstrate that people do not trust others. When asked about trust with the following response options: "most people can be trusted" or "you can't be too careful in dealing with people", the majority of respondents<sup>5</sup> (ca. 70%) choose the second answer (European Values Study Group & World Values Survey Association [EVSGWVSA], 1999-2002, A.165; Hong & Bohnet, 2007). Similarly, in the study of Glaeser, Laibson, Scheinkman, and Soutter (2000) which tried to predict trusting behaviour in the trust game from attitudinal survey questions about trust (including the same standard General Social Survey question), no significant correlation was found. Of course, it can be argued that survey questions about trust are too ambiguous to predict behaviour in the trust games. When an individual answers questions on a verbal survey, he or she simply expresses his or her general beliefs concerning the trustworthiness of people, this not necessarily being even related to trusting beliefs in economic situations. However, reciprocity expectations declared in the specific situation of playing a trust game also cannot predict trusting behaviour, as confirmed in our studies. This result, in particular, offers another argument for the assertion that transferring money to an anonymous partner in the trust game is in most cases not motivated by utility maximization.

Moreover, as we have already said, we found that the size of the relationship between reciprocity expectations

and trusting behaviour differs across individuals. This led us to more careful examination of how different people treat the trust game. We assumed that the same game might evoke different motives in different participants. Indeed, cluster analysis revealed that individuals playing as senders in trust games could be classified into consistent profiles based on their altruistic vs. non-altruistic motivations, their belief in the trustworthiness of the partner, and the amount of money they decided to transfer to the partner. Individuals who revealed a higher level of altruism in the dictator game (clusters 1, 2, and 3) also transferred larger amounts of money to partners in the trust game than individuals in clusters 4 and 5 who, in the dictator game, revealed non-altruistic motivation. The belief or disbelief in the trustworthiness of the partner was only a secondary factor influencing trusting behaviour. Interestingly, individuals in clusters 1 and 2, who differed very strongly in their trustworthiness expectations (individuals in cluster 1 believed in the partner's trustworthiness, while those in cluster 2 did not), sent roughly the same amount of money (i.e., virtually all of their money) to the partner. In their case, trusting behaviour was completely independent of their beliefs in others' trustworthiness. However, it should also be noted that another group of altruistic individuals, those in cluster 3, who did not believe in the trustworthiness of the partner (i.e., who were similar to those in cluster 2) decided to send not all, but part of their money to the partner. Thus, even among some altruists, disbelief in the trustworthiness of a partner had an impact on trusting behaviour. Naturally, as already mentioned, belief or disbelief in the trustworthiness of the partner distinctly influenced the trusting behaviour of non-altruistic individuals (clusters 4 and 5). Those who did not believe in the trustworthiness of the partner sent no money at all (cluster 5) and those who believed in the trustworthiness of the partner sent part of their money to the partner (cluster 4).

Finally, we replicated the common finding that many players are reluctant to choose extreme alternatives and send only part of their own money to a partner. It is interesting to ask what makes this decision so popular in the trust game, given the fact that it usually cannot be explained by utility maximization. Our explanation is that this is due to compromise between two motivations: that of profit maximizing and that of moral obligation related to the social norm encouraging cooperative behaviour. Under generally low expectations concerning return of invested money, senders avoid entrusting their entire endowment. However, at the same time, they want to avoid negative moral emotions associated with sending nothing and perhaps also avoid being perceived as selfish. In particular, we found that participants with altruistic motivations who at the same time did not believe in trustworthiness of the partner, decided to send a compromise amount of money rather than all of their money. The interesting problem of isolating and measuring the compromise effect remains open.

<sup>5</sup> The survey was conducted on representative samples of size about N = 1000 in more than 30 European countries.



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