The Effect of Group Identity in an Investment Game*

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Abstract

The present research experimentally examines the influence of group identity on trust behavior in an investment game. In one treatment, group identity is manipulated only through the creation of artificial (minimal) groups. In other treatments group members are additionally related by outcome interdependence established in a prior public goods game. In moving from the standard investment game (where no group identity is prompted) to minimal group identity to two-dimensional group identity, we find no significant differences in trust decisions. However, trust is significantly positively correlated with contribution decisions. This suggests that cooperative attitudes are idiosyncratic preferences, which are not affected by the creation of an arbitrary group identity.

Keywords: *trust*; *group identity*; *outcome interdependence*; *experiment*

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1 Introduction

Economic transactions often require trust since contracts are incomplete and proper dealings cannot be enforced legally. Arrow (1974) defines trust as “a lubricant of the social system”, and much research has accumulated across various academic fields linking trust with institutional efficiency and economic growth (cf., e.g., Putnam 1993; Fukuyama 1995; Knack and Keefer 1997; La Porta et al. 1997). Being trust so important to social and economic relationships, it is worthwhile studying the role that individual identification with a group plays in fostering the propensity to trust others in the same or in another, e.g., neighboring, group.

The idea that shared social identity may provide a basis for “depersonalized” trust has been advocated by Brewer (1981). Empirical research appears to support this argument: laboratory studies using the “minimal group paradigm” (cf., Tajfel 1970), for instance, indicate that an experimentally induced ingroup-outgroup classification suffices to activate ingroup-favoring behavior in reward allocations. No matter how arbitrary and trivial the group distinction is, individuals are more likely to act in a trustworthy and cooperative fashion when interacting with ingroup rather than outgroup members (see overviews by Brewer 1979; Schopler and Insko 1992).

Several explanations have been suggested for these findings. According to some authors (e.g., Karp et al. 1993; Jin and Yamagishi 1997; Kiyonari 2002), the expectations of reciprocity are critical for the emergence of ingroup-favoring behavior. Since we naturally anticipate more repeated interaction with ingroup than with outgroup partners, we tend to expect more reciprocity by the former, and this explains our ingroup-favoring attitude. Thus, trust behavior in group settings must be understood as an economic decision about risk and benefit.[1]

On the other hand, social identity and categorization theorists argue that ingroup-favoring behavior reflects a motivation to create and maintain positive distinctiveness for the group with which the self is identified (cf., e.g., Kramer 1991; Kramer et al. 1996; Brown 2000). Along these lines, the process of psychological group formation leads to the perception of the self as an interchangeable exemplar of the group and, through this process, "others' interests become our own interests" (Bourhis et al. 1997, p. 382). Trust behavior must, hence, be understood as a social decision.[2]

Both explanations of identity-based trust, although divergent, can account for more efficiency enhancing ingroup cooperation. Plenty of experimental research on trust and trustworthiness in the economic domain has shown, however, that individuals are willing to trust and to honor trust (i.e., to reciprocate) even when no group identity is prompted.[3] This suggests that cooperative attitudes are intrinsic and just triggered by other-regarding concerns. The present experimental study is designed to assess whether these attitudes can be manipulated by artificially establishing the status of being the member of one group rather than another.

For measuring intra as well as intergroup cooperation we rely on the investment game introduced by Berg et al. (1995). In a dyadic relationship, a trustor can send some, all, or none of her monetary endowment to a trustee, who receives three times the trustor's sacrifice, i.e., the social benefits of giving are greater than the social costs. After learning about how much

[1]On this issue, see also Williamson (1993) who describes trust as "calculativeness" regarding the probable future actions of others.

[2]See Haslam (2001) for an excellent review of experiments supporting the social identity approach to organizations.

[3]Examples of experiments in which trust and reciprocity are important are provided, among others, by Berg et al. (1995); Güth et al. (1997); Fehr et al. (1998); Gneezy et al. (2000); Ortmann et al., 2000; Cox, 2004.

she has got (and therefore about the trustor's sacrifice), the trustee chooses how much of the received money she wants to return to the trustor. In this setting, trust is highly profitable due to a multiplier of 3, but also very dangerous due to the one-shot nature of the game.

One of our experimental treatments resembles the minimal group paradigm by merely assigning symbols to participants, where the symbols for the sender (or trustor) and the recipient (or trustee) can be either equal or different. Because of the low emotional and strategic content of such symbols, this kind of group treatment minimizes "social distance" defined as a measure of closeness between players (see, e.g., Buchan and Croson 2004; Buchan et al. forthcoming).

However, as Worchel et al. (2000) indicate, an individual's behavior, rather than being based on a single identity point, is guided by several identity concerns acting simultaneously.[4] We therefore explore further experimental treatments where group identity can be triggered in two ways: mere labelling and shared interests. These treatments start out with a public goods game between two subgroups (or neighboring regions), each of which provides a (local) public good whose benefits favor one's own region but transcend local boundaries. Hence, "labelling" refers to the two subgroups or neighborhoods, and "shared interests" to the strength of external effects measuring how much one is affected by what *another* individual chooses to do. In such an environment, the minimal group paradigm is just a limit case: by letting the positive spillovers between neighboring regions vanish, we approximate the pure labelling-case. In our view, approximating pure labelling of subgroups by small but positive outcome interdependence can reduce or even avoid the implicit demand effect (participants pay attention

[4] On the importance and salience of multiple identities in organizational contexts, see Ashforth and Johnson (2001).

to subgroups, and favor ingroup partners, just because they are mentioned in the instructions) of former minimal group studies.[5]

According to our findings, trust in reciprocity and reciprocity are, in general, not affected by how group identity between trustor and trustee is induced: investment decisions do not vary with label or strength of shared interests. On the other hand, trust behavior in the experimental treatments is not different from that in the investment game of Berg et al. (1995), which is our control treatment. Moreover, trust behavior and contribution decisions in the public goods game are highly correlated. We interpret these results as meaning that, at least for the explored situations, cooperative behavior results from a basic attitude, i.e., from an intrinsic inclination to trust others, although they belong to different groups.

The second section reviews some related literature in more detail. The third section describes the basic games. The fourth section introduces the treatments and procedures of our experiment, and the fifth section reports our findings. The final section concludes with a brief discussion.

2 Related literature

Messick (1991) identifies group membership as a "proximal cause" leading to trust among humans. Salient group membership may induce a bond facilitating trust and mutual aid. This type of trust has three basic properties. First, it is not extended to everyone, but only to those who are common group members; as a consequence, some people will not be trusted. Second, what constitutes the group is unspecified and depends on the context and

[5]Kramer et al. (1993, p. 648) expressly warn about the possibility of biasing results due to demand effects.

the details of the interaction.[6] Finally, this type of trust is "depersonalized", in the sense that it does not depend on kinship or past interaction between the parties, but it is extended to strangers when a common identity is evoked. A perceived common group identity enhances not only depersonalized trust but also the perception that others will be trustworthy (Messick et al. 1983).

Eurobarometer survey data on trust attitudes, undertaken among a number of countries in Western Europe, supports the hypothesis of a positive own-country bias: with a few marginal exceptions among the lowest-trust countries (Italy and Greece), people rate their own people as more trustworthy than any of the remaining nationalities.[7]

Previous experiments using minimal groups include, among others, Orbell et al. (1988), Kramer et al. (1993), and Frey and Bohnet (1997). Focusing on social dilemmas, Orbell et al. find that 79% of participants cooperate when paired with an ingroup member, but only 30% when paired with an outgroup member. Kramer et al. investigate the relevance of group identity for negotiation research, showing that, when group identity is made salient, negotiators are more concerned about what the other person obtains. Frey and Bohnet demonstrate that, in three-person dictator games, recipients with whom the dictator has interacted receive 37% of the pie, while excluded recipients only 17%. In general, most previous laboratory studies of the minimal group paradigm draw on settings different from the investment game.

An exception is the cross-cultural experiment of Buchan et al. (forthcom-

[6]As Messick and Kramer (2001, p. 102) note, "Canadian and American men should be more willing to trust each other following a lecture on feminism than following a lecture on Canadian-American trade disputes."

[7]See Mackie (2001) for a more detailed examination of the *Eurobarometer* surveys. See Glaeser et al. (2000) for an experimental study supporting the importance of social connection – the number of common friends, same race or nationality – to trust.

ing), investigating how "social distance" – manipulated via minimal groups – affects trust. Their categorization consists in assigning participants to one of four color-coded groups, and letting each group engage in some type of non-relevant communication (either personal like birthdays or impersonal like answering questions from the World Almanac). Half the participants are then paired with a member of their discussion group, and the other half with a member of a different discussion group. Their findings reveal that while Americans display the expected ingroup-outgroup bias in trust and trustworthiness, participants from China do not. They attribute these results to the different cultural orientation across countries.

Aside from being restricted to one country only, our experiment differs from Buchan et al.'s study in inducing group identity without communication.[8] Moreover, unlike Buchan et al., some of our treatments induce group identity in two ways: subjects are distinguished not only by labels but also by mutual outcome interdependence that, furthermore, can be varied parametrically. We thus can approximate the minimal group design by letting positive spillovers within and across groups almost coincide.

Partitioning the whole group in two separate subgroups and systematically varying the strength of outcome interdependence between subgroups, our study allows to compare how group identity and intra/intergroup shared interests affect trust and trustworthiness, a topic that has remained largely unexplored to date. Existing evidence on the relationship among outcome interdependence, group identity and cooperative behavior is controversial. On the one hand, experimental and field studies on the "contact hypothesis" support the conclusion that cooperative interdependence in pursuit of

[8]The effect of face-to-face, relevant communication on cooperation is well-established (see, e.g., the meta-analysis by Sally 1995), albeit the evidence regarding the effects of strategy-irrelevant communication is far from being conclusive (compare, for instance, the results of Dawes et al. 1977, to those of Roth 1995).

common, superordinate goals can reduce intergroup conflicts (see, for instance, Gaertner et al. 1990). On the other hand, the work by, e.g., Brewer (1996) demonstrates that positive outcome interdependence is not sufficient to prevent the emergence of conflict between *distinct* groups.

3 The games

To address our main issues we rely on two different games. Berg et al. (1995)'s sequential investment game is used to assess people's propensity to cooperate. A linear public goods game systematically varying outcome interdependence is used to induce group identity not only in a *minimal* way but also via shared interests.

3.1 The investment game

Let A and B be two interacting players, each endowed with 10 ECU (Experimental Currency Unit). Trustor A can send any integer amount x_A to B, with $0 \leq x_A \leq 10$. The amount sent is then tripled and received by trustee B, who can return any integer amount x_B to A, with $0 \leq x_B \leq 3x_A$. The payoffs are $\pi_A = 10 - x_A + x_B$ for A, and $\pi_B = 10 + 3x_A - x_B$ for B. If it is commonly known that players maximize their own monetary payoff, trustee B will keep everything, i.e., $x_B^* = 0$ for all $x_A \in \{0, 1, 2, \cdots, 10\}$, and, anticipating this, trustor A will send nothing, i.e., $x_A^* = 0$. This yields the solution payoffs $\pi_A^* = \pi_B^* = 10$. On the other hand, positive investments by player A increase the sum of both payoffs, which is $20 + 2x_A$ and maximal for $x_A^+ = 10$. Thus, social efficiency requires A to send everything. In this case, $\pi_A^+ + \pi_B^+ = 40$, which is twice the solution welfare $\pi_A^* + \pi_B^*$, and which can be freely allocated by choosing x_B appropriately.

3.2 The linear public goods game

We induce (more or less) shared interests between trustor A and trustee B by means of *local* public goods (Güth et al., forthcoming). Let $N = \{1, \ldots, 4\}$ be a society with 4 individuals. This society is composed of two subgroups, X and Y, with members $i \in X = \{1, 2\}$ and $j \in Y = \{3, 4\}$. All individuals $l = 1, \ldots, 4$ receive an endowment of 10 ECU. Members i of subgroup X can contribute to public good C by choosing $c_i \in \{0, 1, \ldots, 10\}$. Members j of subgroup Y can contribute to public good D by choosing $d_j \in \{0, 1, \ldots, 10\}$. The size of the two public goods, therefore, is $C = \sum_{i \in X} c_i$ and $D = \sum_{j \in Y} d_j$.

Each individual $l \in N$ benefits from both public goods, albeit these benefits differ for the members of the two subgroups: C is more valuable for X-members whereas D is more valuable for Y-members. Each individual's payoff is linear in her own contribution and in both public goods, and is given by:

$$\pi_i = e - c_i + \alpha C + \beta D \qquad \forall i \in X \tag{1}$$

and

$$\pi_j = 10 - d_j + \beta C + \alpha D \qquad \forall j \in Y \tag{2}$$

with $1 > \alpha > \beta > 0$. Due to these inequalities, X-members profit more from C and Y-members more from D although, due to $\beta > 0$, all individuals gain from both public goods. Because of $\alpha < 1$, each player would maximize her own payoff by setting $c_i^* = 0$ and $d_j^* = 0$. However, imposing the usual assumption of public goods games, namely $2(\alpha + \beta) > 1$, implies that all individuals gain by fully contributing. To render full contribution worthwhile even when being concerned with subgroup-efficiency only, one can require $2\alpha > 1$. In this case, there are already efficiency gains from a subgroupperspective, regardless of what one expects from the other subgroup.

By varying $\alpha - \beta$ (i.e., the tension between subgroups), we can manipulate the interest in the own subgroup/region as compared to the whole group/society. Letting the difference between α and β vanish, we thus approach the minimal group paradigm as members of the two subgroups differ only in labels (either X or Y).

4 Experimental design and procedures

Overall, we implement nine different treatments in a between-subjects design. The *control* treatment (hereafter C-treatment) is the standard investment game as described in Section 3.1.

The *labelling* treatments induce group identity in a minimal way. They differ from the C-treatment in that participants are assigned one of two different labels (either X or Y). As participants enter, they receive an envelop containing their label (either X or Y, in equal numbers). Pairs with either the same or different labels then play the investment game. Participants are aware of their partner's label, i.e., they know whether the person they are matched with is carrying their same or a different label. Henceforth, $LAB\text{-}IN$ will denote the treatment where the two interacting players have the same label, and $LAB\text{-}OUT$ the treatment where they have different labels.

In the other six treatments the public goods game is played before the investment game. Like in the labelling treatments, half of the participants gets an X-label (the so-called X-types) and half a Y-label (the so-called Y-types). Groups with two X-types and two Y-types each then play the linear public goods game described in Section 3.2. Aside from assigning different labels, the public goods game relates players via positive spillovers affecting the X- and the Y-types differently. Subjects are informed – by payoffs (1) and (2) and a series of examples – that the externality generated by the player of the same type on one's payoff is always greater than that generated by either player of the other type.

Intergroup tension is varied by distinguishing three treatments systematically varying the difference between α (i.e., the marginal per capita return of one's own public good) and β (i.e., the marginal per capita return of the neighboring public good).

- In one treatment, with $\alpha = 0.55$ and $\beta = 0.45$, the difference between α and β is negligible and equal to $\epsilon = 0.1$.
- In the intermediate treatment, with $\alpha = 0.65$ and $\beta = 0.35$, one has $\alpha - \beta = 3\epsilon = 0.3$.
- In the third treatment, with $\alpha = 0.95$ and $\beta = 0.05$, the difference $\alpha - \beta = 9\epsilon = 0.9$ is substantial.

Henceforth, the three treatments will be addressed as ϵ-treatment, 3ϵ-treatment, and 9ϵ-treatment, respectively. Whereas $\alpha - \beta = \epsilon$ approximates the minimal group design, in case of $\alpha - \beta = 9\epsilon$ the intergroup connection is rather weak compared to the intense intragroup interest. The intermediate constellation with $\alpha - \beta = 3\epsilon$ allows us to check the monotonicity of possible $\alpha - \beta$-effects. The various marginal per capita returns are chosen so as to equalize the efficiency gains in all three treatments; specifically, $2(\alpha + \beta) = 2$ always. Furthermore, in all treatments, $2\alpha > 1$ meaning that perfect ingroup solidarity alone would inspire fully contributing behavior.

After the public goods game, participants play the investment game either with the member of the same subgroup/region (hereafter IN-treatment) or with a member of the other subgroup/neighboring region (hereafter OUT-treatment). The two matching procedures in the investment game and the three levels of outcome interdependence in the public goods game yield a 2×3-factorial between-subjects design. Table 1 summarizes the main characteristics of our nine treatments.

Insert Table 1 about here

The experimental sessions were run computerized, using z-Tree (Fischbacher, 1999), at the experimental laboratory of the Max Planck Institute in Jena. Participants were undergraduate students from different disciplines at the University of Jena. Overall we ran eight sessions with 32 participants each. One session was devoted to each treatment, except for the two (pure) labelling treatments (*LAB-IN* and *LAB-OUT*) which were performed in one session.

Written instructions were distributed after all participants had been seated at a visually isolated computer terminal. In the six sessions comprising the public goods experiment, the instructions distributed at the beginning explained the rules of the public goods experiment only.[9] Understanding of the rules was ensured by a control questionnaire that subjects had to answer before the public goods experiment started. Since the payoffs attained in the public goods experiment might affect behavior in the investment game, subjects received no feedback after the public goods game.[10]

In all experiments amounts were denoted by ECU (Experimental Currency Unit), where 10 ECU equal €2 in the public goods game and €5 in the investment game. The six sessions with the public goods game prior to the investment game lasted about one-and-a-half hours, and the other two sessions (with the investment game only) about one hour. Average earnings

[9] English translations of instructions for both the investment game and the public goods game can be found in the Appendix.

[10] On the relevance of group performance for the establishment of group identity, see Worchel et al. (2000, p. 23).

were €7.20 when subjects faced the investment game only, and €16.78 when they played both games.

5 Experimental results

Tables 2 and 3 summarize investment decisions in each of the nine treatments. Table 2 refers to the trustor and reports on absolute amounts sent (i.e., x_A). Table 3 refers to the trustee and reports on the ratio between reciprocated and received amount (i.e., $x_B/3x_A$).

Insert Tables 2 and 3 about here

First, we focus on the mere labelling treatments (*LAB-IN* and *LAB-OUT*), and compare these with the control (*C*-) treatment. Then we investigate the treatments with prior interaction in the public goods game. Finally, we try to identify some features of individual behavior by studying participants' choices in more depth.

5.1 The impact of mere labelling

According to the minimal group paradigm, even in the absence of prior interaction, an arbitrary ingroup-outgroup classification should suffice to activate ingroup-favoring behavior. This is not supported by the first three rows of Tables 2 and 3. Overall average amounts sent are 4.44, 4.13, and 4.50 in *C*, *LAB-IN*, and *LAB-OUT*, respectively; the respective overall average percentages returned (for positive amounts sent) are 33%, 22%, and 24%. Kolmogorov-Smirnov tests (two-sided) comparing amounts sent and amounts returned in *C* vs. *LAB-IN* or *LAB-OUT*, and in *LAB-IN* vs. *LAB-OUT* confirm that there is no difference between treatments at the 5 percent significance level.

Result 1 *Trust and reciprocity are not affected by a mere ingroup-outgroup distinction.*

5.2 The impact of outcome interdependence

Will trust and trustworthiness be different when the ingroup-outgroup distinction relies not only on labels but also on shared interests? Before answering this question, we shortly analyze behavior in the public goods experiment. Table 4 displays the average, the median and the standard deviation of contributions for each level of outcome interdependence.[11]

Insert Table 4 about here

The most scattered contributions (see the standard deviations in Table 4) are observed in the intermediate 3ϵ-treatment whose mean and median are the lowest (4.87 and 5.00, respectively). By contrast, average contributions in the border (ϵ- and 9ϵ-) treatments are slightly more in line (with means 6.41 in ϵ and 6.34 in 9ϵ, and standard deviations 3.69 and 3.53, respectively). According to two-sided Mann-Whitney tests, we cannot reject the null hypothesis of equal contributions for ϵ vs. 9ϵ ($p = 0.88$), while we can reject it for 3ϵ vs. ϵ ($p = 0.03$) and for 3ϵ vs. 9ϵ ($p = 0.02$). This is confirmed by a generalized linear regression (relying on a negative binomial distribution) with the amount contributed as dependent variable and treatment dummies as independent variables. Among the considered explanatory variables, only the coefficient of the 3ϵ-dummy is significantly negative ($\beta = -0.347$, $p = 0.015$). Thus, average contributions are lower in the 3ϵ-treatment than in the ϵ- and 9ϵ-treatments.

[11] Note that the two matching procedures do not apply to the public goods game, for which we can pool the data from the *IN* and *OUT* treatments and, hence, obtain 64 independent observations for each value of $\alpha - \beta$.

Let us now examine how differences in outcome interdependence translate into trust behavior. Starting with the trustors' behavior, Table 2 shows that the non-monotonicity observed in the public goods experiment extends to the investment game: the 3ϵ-treatments (3ϵ-IN and 3ϵ-OUT) always yield the lowest average x_A-amounts, whereas the standard deviations of the investment decisions do not exhibit a clear-cut pattern. Kolmogorov-Smirnov tests (two-sided) reveal, however, that differences in outcome interdependence as well as in matching procedure do not affect the level of amounts sent in statistically significant ways ($p > 0.5$ for any comparison of treatments). Further non-parametric tests comparing trustors' decisions in the six experimental treatments with those in the control treatment indicate no significant difference in amounts sent ($p > 0.82$ in any comparison).

Result 2 *Trustors do not react to differences between treatments: in no treatment they send statistically significantly different amounts.*

Thus, according to our data, the level of trust does not depend on either treatment aspect.

By contrast, amounts sent are significantly correlated with the trustors' contribution decisions in the public goods experiment. The Pearson correlation coefficient between contribution and investment decisions is 0.44 ($p < 0.01$). This strong positive correlation suggests that trust may be explained in terms of innate characteristics of the decision maker (i.e., by an intrinsic predisposition to cooperate).[12]

Table 5 reports the results of a generalized linear regression with trustors' sending decision (x_A) as dependent variable, and the amount contributed

[12]The strong correlation between contribution and investment decisions does not, however, imply a statistically significant difference between 3ϵ and ϵ or 9ϵ as observed in the public goods game.

to the public good (pg) and treatment dummies as independent variables.[13] *Matching* equals 1 for the IN-treatments and 0 for the OUT-treatments. The dummy 3ϵ takes value 1 in the 3ϵ-treatments and 0 otherwise. Similarly, 9ϵ is 1 in the 9ϵ-treatments and 0 otherwise.

Insert Table 5 about here

There is a highly significant positive effect of the amount contributed to the public good. On the contrary, the coefficients of the various dummies are not significant.[14] The findings confirm that differences in matching procedure and outcome interdependence do not matter for investment decisions, and that cooperation is mainly governed by an intrinsic predisposition.

Turning to the trustees' reciprocating behavior (cf., Table 3), it follows the same non-monotonic pattern observed for contribution decisions and amounts sent: the intermediate 3ϵ-treatments trigger the most extreme behavior, although the effects differ between IN and OUT (the amounts returned are the highest in 3ϵ-IN and the lowest in 3ϵ-OUT). Kolmogorov-Smirnov tests (two-sided) confirm that the different matching procedure affects significantly trustees' choices only when $\alpha - \beta = 3\epsilon$ ($p = 0.05$ for 3ϵ-IN vs. 3ϵ-OUT; $p > 0.4$ for any other comparison). Therefore, the ingroup-favoring behavior advocated by the minimal group paradigm is detected only for trustees, and is restricted to the intermediate 3ϵ-treatments.

Result 3 *Trustees reciprocate significantly less in the OUT-treatment than in the IN-treatment only when $\alpha - \beta = 3\epsilon$. In case of extreme $\alpha - \beta$ values, the different matching procedure does not trigger significantly different reciprocity.*

[13] Due to censored observations, we assume a negative binomial distribution so as to model over-dispersion.

[14] Controlling for possible interaction effects does not alter the results.

The correlation between amounts contributed to the public good and amounts returned in the investment game is positive but not significant at the 10 percent level. This is confirmed by the results of a generalized linear regression (cf., Table 6).[15] The dependent variable is the amount returned by trustees (i.e., x_B). The independent variables x_A and pg are the amount sent by trustors and the contribution to the public good by trustees, respectively. The other independent variables are treatment dummies having the same interpretation as in Table 5.

Insert Table 6 about here

The amount received, x_A, has a significantly positive effect on the amount returned, implying that reciprocity is to some extent important. The coefficient of pg is not significant, meaning (as suggested by the correlation results) that reciprocity in the investment game does not depend on former contribution decisions. Finally, among all treatment dummies, only the coefficient of $Matching \times 3\epsilon$ is significantly positive, implying (in line with Result 3) that trustees tend to return more when matched with an ingroup, rather than an outgroup, member only in the 3ϵ-treatment.

5.3 A closer look at the individual data

We first focus on trustors, and rely on the following classification:

1. *Non-trust* or *opportunism*: $x_A = 0$.
2. *Minimal trust*: $0 < x_A \leq 5$.
3. *Strong trust*: $5 < x_A < 10$.
4. *Full trust*: $x_A = 10$.

Insert Table 7 about here

[15] Such a regression, like the previous ones, assumes a negative binomial distribution.

Table 7 reports the proportion of trustors' choices in each treatment. In line with previous findings, the distribution of choices is very similar in all treatments with minimal trustors being always dominant. Except for ϵ-OUT, where we observe an higher proportion of strong trustors, $x_A \leq 5$ is the most prevalent behavior. The percentage of trustors sending exactly half of their endowment is the mode in any treatment.

As regards extreme behavior ($x_A = 0$ or 10), Table 7 shows that full trustors are moderately more frequent when intra and intergroup outcome interdependence is very similar, regardless of the subsequent matching procedure: in both ϵ-IN and ϵ-OUT, 3 out of 16 trustors (i.e., 19%) are fully trusting. The same proportion of full trustors is detected only in the control treatment where, however, we observe more opportunism. Subjects who send zero are more numerous in the intermediate 3ϵ-treatments than in the ϵ- and 9ϵ-treatments, especially when they interact with an outgroup member: in 3ϵ-OUT, 3 out of 16 trustors (i.e., 30%) behave opportunistically. In contrast, in any of the border treatments, 12.5% or less of the trustors send nothing. This confirms that participants in the intermediate share-treatment are less trusting.

Since the distributions of trustors' choices in the various treatments are statistically non different, we can pool the data from all sessions so as to obtain a sample with 118 independent observations. The x_A-distribution for the pooled data is reported in Figure 1. Comparing the observed distribution with the ideal normal distribution (drawn on the figure) indicates that trustors rely either on extreme values ($x_A = 0$ or 10) or on the mean.

Insert Figure 1 about here

Examining the relationship between contribution and sending decisions of the various types (in the six treatments with prior interaction in the public goods game), we find that contribution levels of minimal and strong trustors are not statistically significantly different ($p = 0.246$, Kolmogorov-Smirnov test), but contribution levels of the other types differ at the 5 percent significance level.

Turning to trustees, based on the return ratio $r = x_B/3x_A$ (for $x_A > 0$), we classify their choices as follows:

1. *Non-reciprocity* or *opportunism*: $r = 0$.
2. *Half-exploitation*: $0 < r < 1/3$ (or $x_B < x_A$).
3. *Minimal reciprocity*: $r = 1/3$ (or $x_B = x_A$).
4. *Strong reciprocity*: $r > 1/3$ (or $x_B > x_A$).

Insert Table 8 about here

Table 8 depicts the proportion of trustees' choices in each treatment. Quite generally, choices tend to concentrate on extreme values: for each positive amount received, the proportion of opportunistic and strongly reciprocal choices is higher than the proportion of the other two choices. In no treatment trustees send back the amount received (minimal reciprocity is never detected).[16] Half-exploitative choices are relatively more frequent in 9ϵ-IN (28.6% of the possible cases) than in any other treatment.

Table 8 spells out that the aggregate results are due to return ratios bimodally distributed (with modes on extreme values) and biased towards zero in all treatments, except in the control and in the IN-treatments with no substantial intragroup outcome interdependence. The percentage of strong reciprocal choices is 58.33%, 53.33%, and 69.23% in C, ϵ-IN, and 3ϵ-IN, respectively. By contrast, in all the other treatments this percentage is

[16] This finding stands against the $x_A = x_B$-modal behavior observed by Glaeser et al. (2000). However, Glaeser et al.'s experiment differs from ours in that trustees receive no endowment and the multiplier equals two.

at the most 50%, and reaches its minimum (27.27%) in 3ϵ-OUT, where the overwhelming proportion of choices (45.45%) is opportunistic. This confirms that only in the intermediate 3ϵ-treatment trustworthiness favors ingroup members.

Do the four different types of trustees contribute differently to the public good (in the six respective treatments)? A series of Kolmogorov-Smirnov tests (two-sided) comparing the distributions of contributions by the various types reveals no statistically significant differences at the 10 percent level.

6 Discussion

The primary purpose of this paper was to experimentally investigate possible linkages between individual identification with a group and trust in its other members. Group identity was manipulated through two channels: by creating a minimal ingroup-outgroup distinction (merely based on labels), and via positive outcome interdependence.

Unlike earlier experiments using the minimal group paradigm (for other social dilemma games), we found no significant effects of label-induced group identity on trust decisions. Only in the case of intermediate level of outcome interdependence, trustees exhibited the predicted ingroup-favoring behavior.

A possible explanation for our results may be the cultural tradition of Eastern Germany. That cultures differ along a collectivism dimension has been claimed by Hofstede (1980) and Triandis (1994), and experimentally tested by Buchan et al. (forthcoming). In collective cultures (like Asia, Latin America and the Middle East), the group has priority over the well-being of its individual members; in individualistic cultures (like the United States and Western Europe) this seems to be reversed. Besides the fact that our participants were students aged less than 30, had they been collectively-oriented, they would send and return more in the experimental treatments (where a group identity was artificially created) than in the control treatment (where no group identity was prompted). However, this was not observed.

Another explanation is suggested by the "contact hypothesis" (Cook 1985): if positive externalities between subgroups suffice to create attraction and trust, and to overcome the tension between subgroups, this could weaken ingroup-favoring behavior. However, if such an hypothesis were to be supported, we should have again found significantly less trust in the control treatment.

According to our data, the decisive explanation is that trust decisions result from individuals' intrinsic dispositions, which remain largely unaffected by mere labels or shared interests. We observed, indeed, a significant positive correlation between amounts sent in the investment game and contribution decisions in the public goods game. The same qualitative conclusions held for the amounts reciprocated, although the effects were insignificant. These results are in line with those by Gächter et al. (2004), who found contributions in public goods experiments to be significantly correlated with three trust indicators.

A further main result of our experiment is the non-monotonic interdependence of contribution and trust behavior since the intermediate 3ϵ-treatments always triggered the most extreme behavior. From a methodological point of view, this illustrates that parameters should be varied more systematically when trying to understand what is driving choices in experimental settings.

Appendix: Experimental instructions

This appendix reports the instructions (originally in German) we used for the ϵ-treatments. The instructions for the other treatments were adapted accordingly and are available upon request.

Instructions for the public goods game

Welcome and thanks for participating in this experiment. Please read the following instructions carefully. From now on any communication with other participants is forbidden. If you have any questions or concerns, please raise your hand. We will answer your questions individually. It is very important that you follow this rule, otherwise we will exclude you from the experiment and from all payments.

The experiment allows you to earn money. Your experimental income will be calculated in ECU (Experimental Currency Unit), where 1 ECU = €0.20. At the end of the experiment, the ECU-income you have earned will be converted to Euro and paid to you in cash.

DETAILED INFORMATION ON THE EXPERIMENT

In this experiment, you are randomly matched with three other persons, whose identity we will not reveal to you at any time. Two of you will be of type X and two of you of type Y. You will learn your type before the experiment starts.

Each participant − regardless of his/her type − receives an endowment of 10 ECU, and must face **only once** the following choice situation.

- X-types must decide **how many ECU they want to contribute to project X**.
- Y-types must decide **how many ECU they want to contribute to project Y**.

Whatever is not contributed is kept for oneself. The sum of all contributions to X is called X-amount. The sum of all contributions to Y is called Y-amount. Your earnings is the sum of

(1) the "ECU you keep"; i.e.: 10 ECU − your contribution;

(2) your “income from the projects”:

Your earnings $=$ (**10**$-$**your contribution**) $+$ **your income from the projects**.

Your “**income from the projects**” is determined as follows:

$$\textit{Income from the projects for } X\textit{-types} = \boxed{\begin{array}{c} \mathbf{0.55} \times [\mathbf{X\text{-}amount}] \\ + \\ \mathbf{0.45} \times [\mathbf{Y\text{-}amount}] \end{array}}$$

$$\textit{Income from the projects for } Y\textit{-types} = \boxed{\begin{array}{c} \mathbf{0.45} \times [\mathbf{X\text{-}amount}] \\ + \\ \mathbf{0.55} \times [\mathbf{Y\text{-}amount}] \end{array}}$$

Thus, both X-types receive the same income from the projects. If, for example, the X-amount is 20 ECU and the Y-amount is 10 ECU, X-types receive $(0.55 \times 20) + (0.45 \times 10) = 11 + 4.5 = 15.5$ ECU. Likewise, the income from the projects is the same for all Y-types; i.e., both Y-types receive the same income from the projects. If, for example, the X-amount is 1 ECU and the Y-amount is 10 ECU, Y-types receive $(0.45 \times 1) + (0.55 \times 10) = 0.45 + 5.5 = 5.95$ ECU.

Note that the contribution by an X-type increases only the X-amount. Likewise, the contribution by a Y-type increases only the Y-amount. If you are a participant of type X and contribute, for instance, 1 ECU, this increases the X-amount by 1 ECU and leaves the Y-amount unchanged. As a consequence, your income as well as the income of the other X-type increase by 0.55 ECU, and the income of the two Y-types increases by 0.45 ECU.

If you are a participant of type Y and contribute, for instance, 1 ECU, this increases the Y-amount by 1 ECU and leaves the X-amount unchanged. As a consequence, your income as well as the income of the other Y-type increase by 0.55 ECU, and the income of the two X-types increases by 0.45 ECU.

Each ECU that you keep for yourself raises “ECU you keep”. Thus, each ECU that you keep yields money for YOU ALONE. The others do not receive anything for the ECU that you keep.

You will receive information about the number of ECU contributed by the others and your earnings at the end of today session.

Before the experiment starts, you will have to answer some control questions to verify your understanding of the experiment.

Please remain quiet until the experiment starts and switch off your mobile phone. If you have any questions, please raise your hand now.

Instructions for the investment game

Please read the instructions carefully. If you have any questions or concerns, please raise your hand. As before, your experimental income will be calculated in ECU but now 1 ECU = €0.50.

In this experiment, participants are randomly divided into pairs composed by persons who were of the **same type** in experiment I. That is, if you were an X-type in the previous experiment, you will be paired with the other X-type; if you were a Y-type in the previous experiment, you will be paired with the other Y-type.

[*In the OUT-treatment this paragraph was replaced by*: In this experiment, participants are randomly divided into pairs composed by persons who were of **different types** in experiment I. That is, if you were an X-type in the previous experiment, you will be paired with one of the two Y-types; if you were a Y-type in the previous experiment, you will be paired with one of the two X-types.]

At the beginning of the experiment, the two members of a pair will be randomly assigned one of two roles: either A or B.

Each A-person and each B-person will receive an endowment of 10 ECU, and must take **only one decision**.

- *A-participants' task*

As an A-person, you must decide **how much of your endowment you want to give to B**. You can choose only integer amounts; i.e., 0, 1, 2, $\cdots$, 9 or 10 ECU.

For any amount you decide to give to B, what B actually receives is the triple. If you give, for instance, 1 ECU, B receives 3 ECU. If you give 3 ECU, (s)he receives 9 ECU. If you give 5 ECU, (s)he receives 15 ECU.

- *B participants' task*

As a B-person, you are informed about the number of ECU you receive from A, which is three times what A has given to you. You must then decide **how much of the received amount you want to give back to A**. If A has given you, for example, 5 ECU and thus you have received 15 ECU, you must decide how many of these 15 ECU you want to return to A. Only integer amounts can be sent back. The earnings of A and B are given by:

A's earnings = **10** − [**what (s)he gives to B**] + [**what (s)he receives from B**]

B's earnings = **10** + [**3** × **what (s)he has been given by A**] − [**what (s)he returns to A**]

Your role (A or B) will be told to you before the experiment starts.

After all participants have made their choice, you will receive information about your earnings as well as about the number of ECU you received from B if you are an A-person.

Please remain quiet until the experiment starts. If you have any questions, please raise your hand now.

References

Arrow, Kenneth J. 1974. *The Limits of Organizations*. New York: Oxford University Press.

Ashforth, Blake E., and Scott A. Johnson. 2001. Which hat to wear? The relative salience of multiple identities in organizational contexts. In *Social Identity Processes in Organizational Contexts*, edited by M.A. Hogg and D.J. Terry. Ann Arbor, MI: Sheridan Books.

Berg, Joyce, John Dickhaut, and Kevin McCabe. 1995. Trust, reciprocity, and social history. *Games and Economic Behavior* 10: 122–142.

Bourhis, Richard Y., Lena C. Moise, Stephane Perreault, and Sacha Senecal. 1997. Towards an interactive acculturation model: A social psychological approach. *International Journal of Psychology* 32(6): 369–386.

Brewer, Marilynn B. 1979. In-group bias in the minimal intergroup situation: a cognitive-motivational analysis. *Psychological Bulletin* 86: 307–324.

———. 1981. Ethnocentrism and its role in interpersonal trust. In *Scientific Inquiry in the Social Science*, edited by M.B. Brewer and B. Collins. San Francisco, CA: Jossey-Bass.

———. 1996. When contact is not enough: Social identity and intergroup cooperation. *International Journal of Intercultural Relations* 20(3/4): 291–303.

Brown, Rupert. 2000. Social identity theory: Past achievements, current problems and future challenges. *European Journal of Social Psychology* 30(6): 745–778.

Buchan, Nancy and Rachel Croson. 2004. The boundaries of trust: Own and other's actions in the US and China, *Journal of Economic Behavior and Organization* 55: 485–404.

Buchan, Nancy, Eric J. Johnson, and Rachel Croson. Forthcoming. Getting to know you: An international experiment of the influence of communication, culture, and social distance on other regarding preferences. *Journal of Economic Behavior and Organization*.

Cook, S. W. 1985. Cooperative interaction in multiethnic contexts. In *Groups in Contact: The Psychology of Desegregation*, edited by N. Miller and M. B. Brewer. San Diego, CA: Academic Press.

Cox, James C. 2004. How to identify trust and reciprocity. *Games and Economic Behavior* 46: 260–281.

Dawes, Robin M., Jeanne McTavish, and Harriet Shaklee. 1977. Behavior, communication, and assumptions about other people's behavior in a common dilemma situation. *Journal of Personality and Social Psychology* 35: 1–11.

Fehr, Ernst, Georg Kirchsteiger, and Arno Riedl. 1998. Gift exchange and reciprocity in competitive experimental markets. *European Economic Review* 42: 1–34.

Fischbacher, Urs. 1999. Zurich toolbox for readymade economic experiments. Working Paper No. 21, Institute for Empirical Research in Economics, University of Zurich.

Frey, Bruno S., and Iris Bohnet. 1997. Identification in democratic society. *The Journal of Socio-Economics* 21(1): 25–38.

Fukuyama, Francis. 1995. *Trust: The Social Virtues and the Creation of Prosperity*. New York: The Free Press.

Gächter, Simon, Benedikt Herrmann, and Christian Thöni. 2004. Trust, voluntary cooperation, and socio-economic background: survey and experimental evidence. *Journal of Economic Behavior and Organization* 55: 25–30.

Gaertner, Samuel, Jeffrey Mann, John Dovidio, Audrey Murrell, and Marina Pomare. 1990. How does cooperation reduce intergroup bias? *Journal of Personality and Social Psychology* 59(4): 692–704.

Glaeser, Edward L., David Laibson, Jose A. Scheinkman, and Christine L. Soutter. 2000. Measuring trust. *Quarterly Journal of Economics* 115(3): 505–531.

Gneezy, Uri, Werner Güth, and Frank Verboven. 2000. Presents or investments? An experimental analysis. *Journal of Economic Psychology* 21: 481–493.

Güth, Werner, Peter Ockenfels, and Markus Wendel. 1997. Cooperation based on trust. An experimental investigation. *Journal of Economic Psychology* 18: 15–43.

Güth, Werner, M. Vittoria Levati, and Rupert Sausgruber. Forthcoming. Tax morale and (de)centralization: An experimental study. *Public Choice*.

Haslam, S. Alexander. 2001. *Psychology in Organizations: The Social Identity Approach*. Thousand Oacks, CA: Sage Publications.

Hofstede, Geert H. 1980. *Culture's Consequences*. Berkeley, CA: University of California Press.

Jin, Nobuhito, and Toshio Yamagishi. 1997. Group heuristics in social dilemma. *Japanese Journal of Social Psychology* 12: 190–198. (In Japanese with English summary)

Karp, David, Nobuhito Jin, Toshio Yamagishi, and Hiromi Shinotsuka. 1993. Raising the minimum in the minimal group paradigm. *Japanese Journal of Experimental Social Psychology* 32(3): 231–240.

Kiyonari Toko. 2002. Expectations of a generalized exchange system and ingroup favoritism: An experimental study of bounded reciprocity. *Japanese Journal of Psychology* 73(1): 1–9. (In Japanese with an English abstract)

Knack, Stephen, and Philip Keefer. 1997. Does social capital have an economic payoff? A cross-country investigation. *Quarterly Journal of Economics* 112(4): 1250–1288.

Kramer, Roderick M. 1991. Intergroup relations and organizational dilemmas: The role of categorization processes. In *Research in Organizational Behavior*, edited by L.L. Cummings and B.M. Staw. Greenwich, CT: JAI Press.

Kramer, Roderick M., Marilynn B. Brewer, and Benjamin A. Hanna. 1996. Collective trust and collective action in organizations: The decision to trust as a social decision. In *Trust in Organizations: Frontiers of Theory and Research*, edited by R.M. Kramer and T.R. Tyler. Thousand Oaks, CA: Sage Publications.

Kramer, Roderick M., Pamela Pommerenke, and Elizabeth Newton. 1993. The social context of negotiation: Effects of social identity and interpersonal accountability on negotiator decision making. *The Journal of Conflict Resolution* 37(4): 633–654.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny. 1997. Trust in large organization. *American Economic Review Papers and Proceedings* 87(2): 333–338.

Mackie, Gerry. 2001. Patterns of social trust in Western Europe and their genesis. In *Trust in Society*, edited by K. S. Cook. New York: Russell Sage Foundation.

Messick, David M. 1991. On the evolution of group-based altruism. In *Games Equilibrium Models*, vol. 1, edited by Reinhard Selten. Frankfurt: Springer Verlag.

Messick, David M., and Roderick Kramer. 2001. Trust as a form of shallow morality. In *Trust in Society*, edited by K. S. Cook. New York: Russell Sage Foundation.

Messick, David M., Henk Wilke, Marilynn B. Brewer, Roderick Kramer, Patricia E. Zemke, and Layton Lui. 1983. Individual adaptations and structural changes as solution to social dilemmas. *Journal of Personality and Social Psychology* 44: 294–309.

Orbell, John M., Alphons van de Kragt, and Robyn M. Dawes. 1988. Explaining discussion-induced cooperation. *Journal of Personality and Social Psychology* 54(5): 811–819.

Ortmann, Andreas, John Fitzgerald, and Carl Boeing. 2000. Trust, reciprocity, and social history: A re-examination, *Experimental Economics* 3: 81–100.

Putnam, Robert. 1993. *Making Democracy Work: Civic Tradition in Moder Italy.* Princeton, NJ: Princeton University Press.

Roth, Alvin. 1995, Bargaining experiments. In *Handbook of Experimental Economics*, edited by J. H. Kagel and A.E. Roth. Princeton, NJ: Princeton University Press.

Sally, David. 1995. Conversation and cooperation in social dilemmas: A meta-analysis of experiments from 1958-1992. *Rationality and Society* 7: 58–92.

Schopler, John and Chester A. Insko. 1992. The discontinuity effect in interpersonal and intergroup relations: Generality and mediation. In *European Review of Social Psychology* 3: 121–151. edited by W. Stroebe and M. Hewstone. Chichester, England: John Wiley.

Tajfel, Henry. 1970. Experiments in intergroup discrimination. *Scientific American* 223(5): 96–102.

Triandis, Harry C. 1994. *Culture and Social Behavior.* New York: McGraw-Hill.

Williamson, Oliver E. 1993. Calculativeness, trust and economic organization. *Journal of Law and Economics* 36(1/Part 2): 453–486.

Worchel, Stephen, Jonathan Iuzzini, Dawna Countant, and Manuela Ivaldi. 2000. A multidimensional model of identity: Relating individual and group identities to intergroup behavior. In *Social Identity Processes*, edited by D. Capozza and R. Brown. Thousand Oacks, CA: Sage Publications.

Table 1: Summary of experimental design

	Public Goods Game	Investment Game
Treatment	$\alpha - \beta$	*Pairs*
C (Control)	–	random
LAB-IN	–	same label
LAB-OUT	–	different label
ϵ-*IN*	0.05	same label/subgroup
3ϵ-*IN*	0.30	same label/subgroup
9ϵ-*IN*	0.90	same label/subgroup
ϵ-*OUT*	0.05	different label/subgroup
3ϵ-*OUT*	0.30	different label/subgroup
9ϵ-*OUT*	0.90	different label/subgroup

Table 2: Average absolute amount sent by the trustor in each treatment

Treatment	ν^a	Mean	Median	Std deviation
Control	16	4.44	4.50	3.72
LAB-IN	8	4.13	4.50	2.03
LAB-OUT	8	4.50	5.00	3.50
ϵ-*IN*	16	5.06	4.50	2.95
3ϵ-*IN*	16	3.75	4.00	2.96
9ϵ-*IN*	16	4.31	4.00	2.94
ϵ-*OUT*	16	5.13	5.50	3.44
3ϵ-*OUT*	16	3.38	2.50	3.32
9ϵ-*OUT*	16	4.69	4.00	2.98

[a] ν denotes the number of observations.

Table 3: Average relative amount sent by the trustee in each treatment

Treatment	ν^a	Mean	Median	Std deviation
Control	12	0.33	0.37	0.28
LAB-IN	8	0.22	0.13	0.27
LAB-OUT	6	0.24	0.23	0.26
ϵ-*IN*	15	0.26	0.33	0.24
3ϵ-*IN*	13	0.33	0.33	0.28
9ϵ-*IN*	14	0.20	0.09	0.22
ϵ-*OUT*	14	0.24	0.29	0.21
3ϵ-*OUT*	11	0.15	0.06	0.17
9ϵ-*OUT*	14	0.21	0.12	0.22

[a] ν has the same interpretation as in Table 2.

Table 4: Average contributions to the public good

Treatment	Mean	Median	Std deviation
ϵ	6.41	7.50	3.69
3ϵ	4.87	5.00	3.93
9ϵ	6.34	6.00	3.53

Table 5: Generalized linear regression on trustors' sending decisions

Independent variable	Coefficient	Std errors
Constant	0.970***	0.228
pg	0.091***	0.021
$Matching$	0.061	0.220
3ϵ	-0.279	0.262
9ϵ	-0.091	0.225
$Matching \times 3\epsilon$	0.083	0.349
$Matching \times 9\epsilon$	-0.147	0.319
Log likelihood = -228.470		LR $\chi^2(7) = 24.21$
Number of obs. = 96		Pseudo $R^2 = 0.05$

Note Significance levels: $*** \leq 0.01$

Table 6: Generalized linear regression on trustees' sending decisions

Independent variable	Coefficient	Std errors
Constant	0.317	0.433
x_A	0.191***	0.041
pg	0.007	0.030
$Matching$	-0.199	0.370
3ϵ	-0.582	0.453
9ϵ	-0.300	0.394
$Matching \times 3\epsilon$	1.075*	0.589
$Matching \times 9\epsilon$	0.193	0.560
Log likelihood = -185.839		LR$\chi^2(7) = 20.40$
Number of obs. = 81		Pseudo $R^2 = 0.05$

Note Significance levels: $*** \leq 0.01$, $* \leq 0.1$

Table 7: Trustor: percentage of choices in accordance with each type (I: non-trust, II: minimal trust, III: strong trust, IV: full trust)

Treatment	I	II	III	IV
Control	4	6	3	3
LAB-IN	0	6	2	0
LAB-OUT	2	4	1	1
ϵ-*IN*	1	10	2	3
3ϵ-*IN*	3	9	3	1
9ϵ-*IN*	2	10	2	2
ϵ-*OUT*	2	6	5	3
3ϵ-*OUT*	5	8	1	2
9ϵ-*OUT*	2	9	4	1

Table 8: Trustee: percentage of choices in accordance with each type (I: opportunism, II: half-exploitation, III: minimal reciprocity, IV: strong reciprocity)

Treatment	I	II	III	IV
Control	3	2	0	7
LAB-IN	4	1	0	3
LAB-OUT	3	0	0	3
ϵ-*IN*	5	2	0	8
3ϵ-*IN*	4	0	0	9
9ϵ-*IN*	5	4	0	5
ϵ-*OUT*	5	2	0	7
3ϵ-*OUT*	5	3	0	3
9ϵ-*OUT*	6	2	0	6

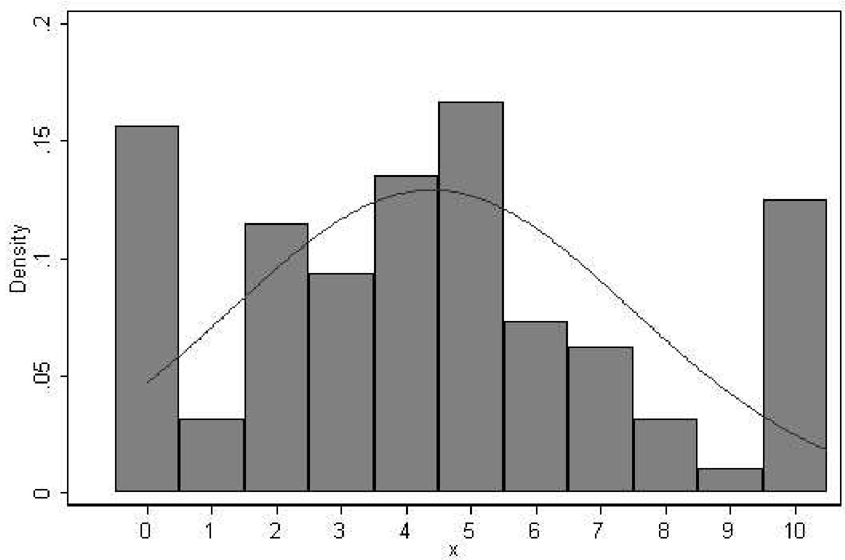

Figure 1: Trustor: pooled choices