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Shane Niall O'Higgins, Clelia Mazzoni, Patrizia Sbriglia

# **Evaluating Trust and Trustworthiness in Groups**

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# EVALUATING TRUST AND TRUSTWORTHINESS IN GROUPS $\xi$

Shane Niall O'Higgins International Labour Office University of Salerno ohiggins@ilo.org

Clelia Mazzoni University of Campania-Luigi Vanvitelli clelia.mazzoni@unicampania.it

Patrizia Sbriglia<sup>1</sup> University of Campania-Luigi Vanvitelli patrizia.sbriglia@unicampania.it November 2019

#### **Abstract**

Trust and trustworthiness are important components of social capital and much attention has been devoted to their correct evaluation. In this paper, we argue that individuals' trust and trustworthiness are strongly dependent on the level of trust and trustworthiness of the social group in which subjects operate.

In order to test our hypothesis, we analyze the results of two experiments on the Trust Game (Berg et al.; 1995), where subjects also filled a questionnaire containing the main attitudinal questions of the EVS (the European Value Survey). Using the experimental dataset and the questionnaire's answers, we construct two *relative behavioural measures* of trustworthiness (RBM1 and RBM2) of Recipients. We then compare the *ex-ante* behavioural decision to trust (before participants are allocated to a group) with the *ex post* decision to trust ( after participants are allocated to a group and Trustors are informed on the level of trustworthiness of Recipients).

Our main finding is that trust strongly varies once the individual is informed on the on the level of trustworthiness in the social group to which he\she has been allocated during the experiment. We conclude that the individuals' decision to trust can be strongly affected by the behavioural characteristics of subjects with whom he\she socially interacts.

Keywords: social capital, trust, experiments.

J.E.L. classification: C91,C92.

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<sup>&</sup>lt;sup>1</sup> Corresponding author: Patrizia Sbriglia, Department of Economics, University of Campania-Luigi Vanvitelli, Via Gran Priorato di Malta, Capua, Caserta, 83043, Italy, tel: 00390823274022; fax: 00390823274042; e-mail addresses; patrizia.sbriglia@unicampania.it; patsbri25@gmail.com, skype: patsbri25.

#### Introduction

Trust and trustworthiness are important components of the individuals' social capital, and much attention has been devoted to the problems of their correct evaluation. Attitudinal survey questions as reported in the EVS – European Value Survey - are often regarded as inefficient indicators of trust, since self-reported measures are subject to incentive issues.<sup>2</sup>

Furthermore, a number of criticisms to their potential sources of biases have been raised. As noticed in Ciriolo (2007), self-reported attitudinal measures of trust can be affected by three different types of behavioral biases. In fact, when answering the question: "Generally speaking would you say that most people can be trusted or can't be too careful in dealing with people?", respondents may underestimate the importance of the issue, considering the abstract context as only a hypothetical setup (*hypotethical* bias); individuals may also wish to represent themselves as more virtuous than they actually are (*idealised persona* bias); finally the lack of incentives may induce false responses (*lack of incentive* bias).<sup>3</sup>

Another unsatisfactory aspect of the attitudinal measures is the abstract definition of trust and trustworthiness, seen as dependent only on the individuals' social preference utility functions. In the EVS survey, the basic measurement of *trust* is provided by the answers to the above reported question: "Generally speaking, etc.", which portrays the subject's unconditional attitude to trust another individual, which may depend on the individual's past experience or inner preferences, or rather be connected to his\her cultural and ethical values.

Similarly, measures of *trustworthiness* are defined on the basis of the answers provided to questions like the ones involving *civic cooperation*, in which individuals report their dislike for free riding behavior (tax evasion, etc), which again may depend on the individual's ethics or experience, or even political views.

As for the trust question, the rationale beyond the self-reported measures of trustworthiness relies mainly on the individual's characteristics.

<sup>&</sup>lt;sup>2</sup> There has been a long debate on the measurement of non-economic sources of economic development. See Coleman (1990); Putnam *et al.* (1993); Paldam and Svendsen (2000). Also in Italy there have been a number of recent contributions, see for example Degli Antoni (2005).

<sup>&</sup>lt;sup>3</sup> See Ciriolo (2007), p. 2.

Thus, another possible source of bias relies in the fact that trusting decisions are seen as independent on the level of observed trustworthiness of individuals with whom the economic interaction takes place.

Recent research in Game theory and experimental implementation of bargaining games has, however, clearly shown that *trust can be viewed as the strategic response to trustworthiness*. In fact, according to Fehr (2009), individuals tend to reciprocate and to respond to the social behavior they observe in real life contexts. More than the *absolute levels of trust*, as in the EVS survey, what we should therefore study and measure are the *conditional levels of trust*, where we take into account not only the ethical, cultural and psychological foundations of trusting behavior but also the strategic behavioral decision rule that is inserted in the concept.

Furthermore, research by Alesina and La Ferrara (2002), Cettolin and Suetens (2018) has argued that race and ethnic heterogeneity are key factors in explaining the overall decrease in the level of trust. According to this point of view, one may argue that, when individuals are aware of the social preference attitudes (therefore both trust *and* trustworthiness) of the agents with whom they currently interact and, moreover, when *they share with them part of their views and values*, then there are higher individual's incentives to trust.<sup>4</sup>

Thus, trusting attitudes depend not only on the information on the community's level of trustworthiness but also on the ethical similarities between individuals.

In other words, the arguments reported above seem to point out that, when measuring trust, we should ideally separate <u>two</u> definitions of trusting behavior: an *ex ante* definition of trust, which is dependent only on the individuals' ethical and social characteristics, and an *ex post* definition of trust, which reflects, in addition to those characteristics, the behavioral response to the perceived trustworthiness (and heterogeneity) of the social environment in which individuals operate.

Attitudinal biases (hypothetical and idealized persona biases), lack of behavioral underpinnings, incorrect decision model' specifications of the concepts of trust and trustworthiness have spurred alternative lines of empirical research in the study of the primitives of social capital.

An important field of study relates to economic experiments on bargaining games where individuals are financially motivated. Experimental research have focused on the Trust Game model, in which two individuals interact strategically.

<sup>&</sup>lt;sup>4</sup> In Cettolin and Suetens (2018), in which the trusting decisions among Dutch native and immigrants living in the Netherlands are studied. The experimental evidence shows that trust is lower when the interaction takes place between native Dutch and non- native citizens.

The main results of the experiments on the Trust Game support the hypothesis that trusting behavior is conditional on the expectation that co-players will reciprocate kindness and generosity. However, very little research has been conducted to evaluate the relevance that social networks and groups have in shaping such expectation. In fact, in real-world markets, individuals' interaction takes place in specific social environments, such as firms, families, schools, etc. Thus, it is reasonable to assume that the expectation of trustworthiness will reflect the observed values of reciprocation within the individuals' social networks.<sup>5</sup>

In order to test such hypothesis, the present research reports the results of a three-stages laboratory experiment which tries to assess whether the decision to trust changes once the level of trustworthiness (within the individuals' social group) is revealed to Trustors.

In stage 0 (the recruiting stage), the experimental subjects were first asked to fill a questionnaire on trust and trustworthiness, as reported in the European Value Survey. Subsequently (stage 1), they were asked to participate in a Trust Game (Berg *et al.*, 1995) in the roles of Trustors and Recipients.

Finally, in stage 2, all subjects were allocated to groups and Trustors repeated their choices, after being informed on the level of trustworthiness of Recipients in the same group.

The information on Recipients' trustworthiness was constructed through two *relative measures* of trustworthiness (RBM1 and RBM2), both based on the observed levels of reciprocity of Recipients.

Specifically, in the case of the RBM1's measure, we adopted a social preference elicitation technique (see Selten, 1967), known as *the strategy method*, in order to derive the level of trustworthiness of the subjects who were then asked to participate as Recipients in the trust game, both in stage 1 and 2.

In the case of RBM2, we derived the Recipients' level of trustworthiness directly from the attitudinal questionnaires' answers. In both cases, Trustors, in stage 2, were informed of the level of Recipients' trustworthiness, before repeating their decision.

The aim of our research is to estimate how trust changes in Stage 2 as effect of the information provided. In fact, evaluating trusting behavior in stage 1 and 2, we are able to assess the difference

<sup>&</sup>lt;sup>5</sup> See also J. Sobel (2002) for an non-experimental analysis of the connection between trust and trustworthiness and social group and networks.

between the individuals' *ex ante* (or unconditional) decision to trust, and the individuals' *ex post* decision to trust (conditional to the observed levels of trustworthiness within the group).<sup>6</sup>

The main result of this research is that the decision to trust is strongly affected by the information on the recipients trustworthiness. In particular, we find that: i) Trustors vary their decision moving from stage 1 to stage 2; ii) decisions in stage 2 are highly correlated to the relative indices of trustworthiness; iii) finally, all correlation between questionnaires answers (stage 0) and individuals' behavior disappear when the information on the co-players types is introduced (stage 2). The paper is organized as follows. Section 2 provides a description of the Trust Game and provide a survey of the experimental literature. Section 3 describes the experimental design in detail. Section 4 states the experimental hypotheses, while section 5 reports the results of our research. Section 6 concludes and suggests new possible extensions to our line of research.

#### 2. The Trust Game and the Experimental evidence

The Trust Game portrays a strategic interaction between two players (A, the "Trustor", B, the "Recipient") who move sequentially (Figure 1 reports the structure of the Game).

#### **INSERT FIGURE 1 ABOUT HERE**

At the beginning of the game, A is endowed with an income, x>0, whilst B is endowed with an income z. A's strategic decision consists on whether to keep the endowment for herself or to transfer an amount y( $0 \le y \le x$ ) to her co-player B.

For any value *y*>0, Nature multiplies the transfer of a factor  $\alpha$ >1, so that the actual value B will receive, corresponds to  $\alpha y$ . Again, B's strategic decision consists on whether to return a part of  $\alpha y$  or to keep the endowment for herself. The Trust Game has a unique sub-game perfect equilibrium in which A transfers nothing and B (in the case *y*>0) returns nothing.

However, notice that alternative (non-equilibrium) solutions are possible in the game.

In fact, for  $\alpha > 2$ , for all amounts returned (R) in the interval  $y \le R \le \alpha y/2$ , both players will benefit from the social interaction and their final payoff will be greater than in the equilibrium state. We can define behaviors which do not correspond to the equilibrium solution in the following way.

For all values of y>0, A is a "trusting" individual and, for any value of R>y, B is reciprocating A's trusting decision (i.e.; B is a "trustworthy" individual).

<sup>&</sup>lt;sup>6</sup> As noted by a referee, also in stage 1, the A player holds expectations on the reciprocity of the unknown B player, therefore her decision to trust is conditional on the B player's level of reciprocity. However, in our experiment we assume that the observed levels of reciprocity in stage 2 can change As' choices (as expressed in stage 1) and, therefore, *also the beliefs* on reciprocity she held in stage 1. The results confirm our hypothesis. We thank the referee for her comment.

Thus, the Trust Game comprises two possible scenarios: one in which individuals act selfishly (according the perfect rationality paradigm) and no social exchange will be observed (regardless of the value of the  $\alpha$ ), or individuals act non-selfishly (taking into account co-players' welfare) and a social exchange will be observed.

Such exchange may grant higher –than – equilibrium payoffs to players, for values of  $\alpha$ >2.

The game was first introduced and experimentally tested in Berg *et al.*; 1995. Their results clearly demonstrated that subjects violated the perfect rationality paradigm in the majority of the cases. The reason why people are so prone to trust others is well described in Fehr (2009), "*Trust plays a role in almost all human relationships... Trust also seems particularly important in economic exchanges because it seems obvious that the absence of trust among trading partners severely hampers market transactions..."* 

However, it is more complex to evaluate the determinants of trust. The vast experimental literature has focused on two distinct motivations, one a *pure social preference motivation* (kindness, generosity, "warm glow", altruism); another connected to a *strategic motivation* (increase in one's welfare, based on the expectation of reciprocity of co-players).

Many studies have tried to assess the relative importance of these components of trusting behavior.

In Ashraf et al., 2006; Costa-Gomes and Weizsäcker, 2008; Sapienza et al.; 2007; the relative weight of generosity and expected profits are analyzed. In addition to that, also the individual attitude to risk is taken into account.

The main result is that the *strategic component*. i.e.; the expectation of reciprocity tends to be more important than kindness and altruism.

The research question motivating the present work is, however, how trust is affected by groups' interaction and preferences, in other words, we try to assess whether trust may be affected by the observation of the behavior of the individuals who are part of the same social group.

Several papers indicate that trusting behavior is not only affected by individuals' motivation, but also by social effects.

For example, in Berg et al., (1995) the authors find that *social history* (i.e.; being informed on the behavior of subjects participating to previous sessions) is important in that under particular conditions trust and reciprocity are stronger when individuals can observe peers' behavior. Indeed, in the absence of rewards and sanctions, endogenous social norms can emerge if individuals clearly identify with a group. Accordingly, social history, by providing common information on the use of Trust in groups, may increase social identity.

Recently, a number of experimental papers have focused on the effects of peer influence on behavior in economic environments, an area that had not previously received attention. Similar to our research work,

an example of analysis of peer effects in the Trust Game is presented by Mittone and Ploner (2011). Their paper focuses on the behavior of Recipients and studies the effects of peer pressure (when the Recipients' choices are being observed by other players) and the effect of social spillovers (when Recipients' can observe each other's choices). They find that peer pressure has a positive effect on reciprocity and so do social spillovers.

Similarly, in Luini et al.; 2014, the behavior of Trustors positioned in neighborhoods is examined, with the intent to study whether trusting decisions in groups tend to converge as effect of peer pressure and conformity seeking. The "neighborhood" was constituted by three subjects who played independent trust games, each interacting with different participants. However, Trustors were able to see (period after period) how many tokens their neighbors were sending to Recipients. After few periods, trusting decisions converged in all neighborhoods, independently of the individuals' attitudes.

Studies on social influence in strategic settings connected to Trust (the dictator game) have been conducted by Cason and Mui (1998).

Again, social influence affects the dictator decisions, both for conformity effects (generosity spurs generosity) and for mere strategic responses (I am generous only to generous people).

Very little research has been carried out on how trust is determined and shaped in social groups.

Recent research in field experiments have dealt with the problem of how trust and social preferences are affected by norms and institutional culture in real-world social groups. As reported in the introduction, Cettolin and Suetens (2018) test Trust decisions in interactions between Dutch citizens and non-native Dutch. The results is that heterogeneous social interplay decreases trust. Similarly, Bigoni et al. (2016) find a striking difference in trust and cooperation between the North and the South of Italy. On the same line of research, Aassve et al.; (2018) documents the regional differentials in trust and social preferences in Italy. Using the TRUSTLAB dataset, the authors find that differences between the North and the South of Italy are less marked than in the previous research by Bigoni et al.(2016); and differences are more consistent in trustworthiness (with the Southern regions being at a lower level compared to the Northern regions), but are less relevant as far as cooperation and trust are concerned.<sup>7</sup>

Meier et al.; (2016) and Nese et al.; (2013) and Nese et al.; (2018) prove, furthermore, in three experimental studies on criminal behavior in Italy (Mafia and Camorra), that the norms regulating specific social groups may explain differences at a wider level in real-world societies, in as much as they (negatively) influence beliefs on trust and cooperation.

<sup>&</sup>lt;sup>7</sup> The TRUSTLAB is an online experiment conducted by the OECD in several European countries. As correctly noticed by a referee, the results of these field experiments are relevant to our study in as much as they prove that trust is a strategic decision which is highly dependent on the expected and observed levels of reciprocity in real-world social groups (Italian regions).

Finally, how trust and reciprocity is affected by young people's performance in the job market is studied several European countries (UK, Italy and Hungary) in O'Higgins and Stimolo (2017). The assumption is that there is a link between early success in the labor search and the subsequent formation of individuals' social capital characteristics such as, trust and trustworthiness.

Whilst field experiments provides important insights on the effects that norms and social behavior have on trust and allow a direct measurement of social preferences (both trust and cooperation), they are unable to answer the question raised in the Introduction: are trusting decisions conditional to the observed level of trustworthiness of the individuals who are part of their social group and network?

The laboratory experiment explained in the next section will allow us to provide answers to this specific question.

#### 3. The Experimental Design

The experiments were conducted in Siena and Salerno (2007-2015) and 184 students participated in the 7 sessions in which each of the two experiments was organized. Participants were first and second year undergraduate students and they were recruited in the Faculty of Law, Political Science and Economics.

Session 1-4 were designed to test the relative behavioral measure RBM1, while the experimental design of Sessions 5-7 aimed to test the relative measure RBM2.

All sessions were divided into three different stages. In the first stage (Stage 0, the recruitment stage), the subjects were asked to fill in a questionnaire in which the EVS questions in relation to trust and trustworthiness were reproduced. Table 1 reports the whole set of questions that appeared on the students' computer screens.

#### **INSERT TABLE 1 ABOUT HERE**

The criteria we followed in selecting these specific questions are related to our hypotheses testing. In fact, we concentrated our attention on the set of questions which are aimed at assessing the individual's level of trust and trustworthiness, together with some general characteristics which, in past research, have proved to be influential as far as trusting behavior is concerned.

At the beginning of the Stage 1, the computer randomly assigned the role of A and B and subjects were reminded that they would keep the role throughout the experiments. Subjects A (Trustors) were then asked to indicate a sum of experimental tokens they would send in a Trust Game in which they were matched with an anonymous Recipient (subject B); the value of  $\alpha$  was set to 3.

In Stage 1, subjects B were asked to indicate – for each number of token sent – the minimum and the maximum amount of tokens they would return, according to the strategy method (see Figure 2).

#### **INSERT FIGURE 2 ABOUT HERE**

Finally, in Stage 2, subjects were divided into groups (8-12 individuals in each group, according to the total number of participants, equally divided between A and B) and they repeated the Trust game, keeping the roles assigned by the computer at the beginning of stage 1.

However, before making their choice, subjects A (the Trustors) received information on the level of trustworthiness of the subjects B (the Recipients) of their group. Such information differed between Session 1-4 and Session 5-7.

In Session 1-4, we assessed the Recipients' trustworthiness using the strategy method; whilst in Sessions 5-7, we assessed Recipients' trustworthiness using the questionnaires' answers.

On the Trustors' screens, a table would consequently appear. The table contained a summary of the main statistics related to the declared behavior of the Recipients allocated to their group. Specifically, in the sessions 1-4, where B players filled the Table of the strategy method, we classified B players into three main categories, "untrustworthy" (number of B players who would return an amount of token smaller than y); "trustworthy" (number of B players who would return a number of tokens, R, in the interval y- $\alpha$ y/2) and "very trustworthy" (B players who would return an amount of tokens greater than  $\alpha$ y/2).

In the sessions 5-7, we constructed an index of trustworthiness on the questionnaire's answers.

Specifically, the index was constructed from responses to the questions 7t, 1tw, 4tw and 8tw, with the first of these being giving greater weight. Formally the index was defined as: Trust Index = 2\*7t + (11-1tw) + (11-4tw) + (11-8tw).

The categories were then formed as follows: (Trust Index  $\leq$  10) 1: Completely untrustworthy; (10 < Trust Index  $\leq$  20) 2: untrustworthy; (20 < Trust Index  $\leq$  30) 3: more or less trustworthy; (30 < Trust Index  $\leq$  40) 4: rather trustworthy; and, (40 < Trust Index  $\leq$  50) 5: completely trustworthy.

Trustors were then given complete information on the distribution of values attributed to the Recipients in their group (from which the actual correspondent would be drawn at random). As in the previous sessions, a Table would appear on their screens and then Trustors would have the opportunity to repeat their choice for a second time.

In the experiments, the measures of trustworthiness varied between answers to the Questionnaire to the behavioral setting of the strategy method.

The rationale behind this choice is that Trustors were given detailed information on the Recipients' individual characteristics both in terms of self-reported measures of *civic cooperation and ethics*, and in the observed incentivized return ratios, as in the strategy method. Thus, it is possible to assess whether

conditional trust is more affected by the ethical and civic characteristics of Recipients or rather by the effective measures of reciprocity and generosity as in the strategy method. In both cases, the table reported on the Trustors' screen were designed with the aim of providing a wide description of the Recipients' types in the group. Our methodologies were in line with the most used methodologies in the experimental field.

In fact, we recall here the use of questionnaires, pre-play one shot or repeated games and finally some variations of the strategy method (see Burlando and Guala, 2005, for extensive references). In the case of the strategy method, possible disadvantages are related to the weakening of incentives, since each state of the world occurs with less than unitary probability and problems of cognition and understanding may arise, as the number of observations on the players' behavior increases (in our case, Recipients were asked to indicate 10 values of the number of tokens they would return to the Trustors). Finally, the strategy method may have an impact on individuals' social preferences, thus weakening the validity of its application as a mean to classify reciprocating behaviors. In our opinion, however, similar remarks may be made about the methodologies of the one-shot and the repeated pre-play games, whilst, in the case of the questionnaires, the reliability of the answers may be questioned.

Furthermore, the strategy method has the important advantage of providing each player with a wide representation of the other player's choices, motivations and incentives, thus reproducing "a full information" setting which the Trustors may use to construct their belief on the Recipients behavior.

Finally, the experiment adopted a *within subject* design, in which the same individual participates (in the same role) to all the stages.

Within-subject designs are used in most all previous experiments aimed at assessing social effects. However, they are often criticized because they might generate framing effects.

In order, to minimize such problems, we adopted a totally random assignment to roles and groups. Subjects were aware that they were playing with different co-players in stages 1 and 2. Furthermore, payment was postponed at the end of the experiment and each subject could view the earnings only in the final stage.

In fact, after stage 2 ended, participants entered the "payment stage". In this stage, the computer randomly formed couples in stage 1 and 2 (in stage 2, couples within groups). For each value of tokens sent by A, the computer assigned the expected value of return as expressed in the strategy method of the B player and profits would be distributed.<sup>8</sup>

<sup>&</sup>lt;sup>8</sup> One referee suggested that the problem might mitigated by introducing control sessions in the experiment. Following Di Cagno, et al.; 2018 and Luini et al.; 2014 we preferred to adopt a stranger partner matching protocol, rather than introducing control sessions. Furthermore, though the subject had a written copy of the Instructions on her table, participants read the Instructions privately on their screen, and the information on the functioning of the experiment was given only for the ongoing stage.

#### 4. Research Hypotheses and Theoretical Discussion

Moving from stage 1 to 2, may the sub-game perfection solution (0,0) be affected? May Trustors change their choices as effect of the extra-piece of information on the Recipients' behavior? Under the assumptions of perfect rationality and common knowledge, in a one shot Trust Game, As' decisions are unaffected by the observation of the Tables in stage 2, since they only describe Bs' self reported behavior in response to As' choices, without changing the structure of the game. We can therefore state the following research hypothesis:

*Claim* 1: If the observed levels of trustworthiness of B players operating in the group *affect* As' decision to Trust, then we state that Trusting behavior varies between the ex ante the individuals' attitudes to trust (stage 0) and the behavioral choice to trust (stage1) and ex post response to observed levels of generosity and trustworthiness (stage 2).

*Claim 2*: If the change is greater in the RBM1 context, then we state that Trustors' behavioral changes are more sensitive to observed financially motivated Recipients' behavior (the strategy method), than to the self-reported measures of civic cooperation and ethical values of B players (RBM2).

#### 5. Results

The analysis of the experimental evidence is divided into two different sections. In Section 5.1, we will examine the attitudinal measures of Trust and Trustworthiness. Subsequently, we will provide answers to claims 1 and 2, by estimating Trustors' behavior both in connection to the questionnaire's answers and in response to the observed levels of reciprocity of Recipients.

#### 5.1 Attitudinal measures of Trust and Trustworthiness in the Italian sample

We first look at the questionnaires' answers as they result from our experiments. Table2 focuses on the relation between the individuals' social characteristics (sex, age, parental social status and education) and the self reported measures of trust and trustworthiness. In this regard, indices were calculated from the questionnaire corresponding to different aspects of these concepts. Specifically, indices were calculated for trust in the family (from 2t), trustworthiness (from 1tw-8tw), trust in institutions (from 1ti-4ti) and trust in others (from 3t-5t & 7t). For each of the trust indices, the values of the index are increasing in trust (e.g. a value of 40 for "trust in others" is indicative of a person with a high degree of faith in others), whereas the index of trustworthiness of the respondent falls, so that, for example, a respondent indicating that 'untrustworthy' behavior is always justified would end up with an index value of 50! Table 2 reports the values of these indices across different characteristics of the experimental participants including also the summary index variable of trust, Trust Index, which was used to provide information on the trustworthiness of counterparts in the RBM2 sessions.

#### **INSERT TABLE 2 ABOUT HERE**

As a preliminary result, we can then state that:

**Result 1:** Overall, we find a weak inversely related correspondence between trust and trustworthiness at the individual's level. Furthermore, we find that: 1) trust increases with income; 2) female subjects tend to be more trusting and less trustworthy than male subjects.

#### 5.2 Evaluating Trust and Trustworthiness in Groups

In this section, we evaluate the change in trusting attitudes as effects of the groups' formation and the information on trustworthiness provided by the indices RBM (stage 2 of the experiment).

Furthermore, we examine the impact of individual characteristics, as emerged from questionnaires' answers, on the behavior in the trust game (stage 0 and 1 of the experiment). Precisely, we employed ordered Probit models to estimate: 1) the number of tokens sent by Trustors in stage 1; 2) the variation in the number of tokens sent Trustors between stages 1 and 2.

The first model is intended to examine in particular, the relation between the degree of trust of Trustors and their behavior in the absence of information on the nature and/or behavior of their correspondents.

Some of the individuals' characteristics and self-reported measures of trust and trustworthiness are included in the model. Various specifications were tried. Table 3 reports the results of our preferred specification including just age, sex and trust indices.

Table 3 allows us to state a preliminary results, connecting attitudinal and behavioral measure of Trust and Trustworthiness (Gleaser et al.; 2000)<sup>9</sup>

**Result 2:** There is a low correlation between the answer to the basic "trust" question and the effective behavior in the first stage. As in the previous study, however, it can be observed that 'trust in others' is positively related to the number of tokens sent and this is clearly statistically significant.

#### **INSERT TABLE 3 ABOUT HERE**

Table 4 and 5 report the results of estimating models which include the second stage of the experiment, where Trustors repeat their decision, after viewing the tables on the level of trustworthiness in their group.

<sup>&</sup>lt;sup>9</sup> Glaeser et al.; (2000) conducted a similar experimental investigation connecting attitudinal and experimental measures of trust and trustworthiness in US. It is interesting to notice that our results are in line with the US study, in as much as we find a low correlation between questionnaire's answers and behavior in the Trust Game.

In Tables 4 and 5, in fact, the estimated effect of information is reported. As for the strategy method, In order to include the essence of the information in the estimation of As' behavior, the average 'rate of return' (That is (no. of tokens to be sent back)/(no. of tokens recieved) averaged over the possibilities (3-30)), observed by Trustors was included in an ordered Probit model of the variation in the number of tokens sent between first and second rounds of the trust game. The results are reported in Table 4.

#### **INSERT TABLE 4 ABOUT HERE**

Here, there are two interesting observations to be made. First, the model is better identified this time, despite the fewer observations. Second, information on the observed (or in this context, expected) rate of return is positive and strongly statistically significant.

In other words, if we compare the results in Table 3 and 4, we can say that information on co-players behavioral trustworthiness is influential in determining Trustors' behavior.

All correlation between "trust in others" and the amount sent in the first and second stage is in fact sweeped off by the weight individuals posit on the information on the reciprocal behavior of Recipients. Thus, the measurement of the *ex post* trust differs from *ex ante* trust, mainly based on the unconditional individuals' values.

Turning now to the alternative experimental design in which Trustors received information concerning the general trustworthiness of correspondents (based on the questionnaires answers), a similar exercise was undertaken.

As before, a summary indicator of the information provided to Trustors was constructed. In this case, the mean value of 'Score' for the group of Recipients on which Trustors had information was included in the model. Table 5 reports the results.

#### **INSERT TABLE 5 ABOUT HERE**

It is observable, that the model has less explanatory power than the Strategy method estimation reported in Table 4. Moreover, the impact of information, although almost exactly the same as before, in terms of the value of the estimated coefficient, is in this case much less statistically significant, just breaking the 10% threshold.

It might be added that, although not reported here, the key results – statistical significance of the information variable in the strategy method and weak or no statistical significance of the behavioral trust indicator – along with the parameter values themselves, are consistent across a range of specifications.

The implication is then that it is actions rather than words that do the talking. People are more willing to trust when they see that such trust is likely to be reciprocated in fact rather than being prepared to put their fate in the hands of those they believe to act more 'fairly'. Therefore, self-reported measures of social

capital are not only biased indicators of trusting behavior, but they are also inefficient signals of trusting behavior.

**Result 3**: Comparing the attitudinal measure to the behavioral measure of trusting behavior (stages 0 and 1), we find a low correlation only with the answers to the questionnaire's question: "Trust in others". Introducing the information on the Recipients (stage 2), we find that the correlation between questionnaire's answers and choices in the Trust Game disappears, while the variation of the tokens sent between stage 1 and 2 is significantly affected by the information on trustworthiness. The influence is greater in the case trustworthiness is measured with the strategy method.<sup>10</sup>

#### 6. Concluding Remarks

In this paper we presented the results of a laboratory experiment on the individuals' trusting attitudes and behavioral choices. Our research hypothesis is that trusting decisions are affected by the observed levels of reciprocity existing in social groups. To prove our hypothesis, we construct two different measures of trustworthiness, one based on questionnaires' answers and another based on strategy method. Our main results are that , firstly, behavioral measure of trust are uncorrelated to attitudinal measures and , secondly, trusting decisions significantly vary once the information on trustworthiness is introduced.

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<sup>&</sup>lt;sup>10</sup> From the experimental evidence, another result emerges. In stage 0, all subjects filled the questionnaires (before roles were assigned). We are therefore able to compare trusting and trustworthiness scores within each groups. Thus, it is possible to observe that the variation of trust is greater in groups where individuals hold similar preference structures. We do not include the results in the discussion, since it is based only on the questionnaires' answers.

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## Appendix 1 : Tables and Figures

## Table 1: Questionnaire on Trust and Trustworthiness

Subjects' char	acteristics		Trust
15	Sex (M/F)	1t	Trust in others (y/n)
25	Age (19/30)	2t	Trust in family (1-4)
3s	Father education (1-6)	3t	Trust in friends (1-4)
4s	Mather education 1-6	4t	Trust new encounters (1-4)
5s	Degree (1-3)	5t	Trust immigrants (1-4)
6s	Year (1-3)	6t	Ethnical diversity (1-10)
7s	Family income	7t	(S)Trust others motivations (1-10)

## Table 1: continues.....

1	Frust and Institutions	Trustworthines s		
1ti	Trust Government (1-4)	1tw	Accept undeserved benefits	
2ti	Trust Parliament (1-4)	2tw	Tax evasion	
3ti	Trust Parties (1-4)	3tw	Stealing&using car	
4ti	Trust Public Sector (1-4)	4tw	Lying	
5ti		5tw	Deceiving partner	
6ti		6tw	Accept bribery	
7ti		7tw	Paying for illegal work, e.g., immigrants	
8ti		8tw	Evading bus fares	

## Table 2: Indices of trust and trustworthiness by individual characteristics

		Trust in the Family	Trustworthi ness	Trust in Institutions	Trust in others	Trust Index
		(1-4)	(5-50)	(5-50)	(5-50)	(5-50)
Sex	Male	3.9	16.4	24.7	27.2	30.9
	Female	3.8	14.4	26.4	27.1	31.9
Degree Course	Economics	3.9	15.5	25.0	25.9	31.0
	Communication Sciences	3.9	16.8	25.9	27.6	31.4
	Political Science	3.7	14.8	26.5	27.3	30.8
	Specialisation	4.0	15.5	26.1	30.0	32.9
	Masters	3.9	14.7	24.3	30.4	32.7
	Doctorate	3.7	14.0	27.8	31.0	32.6
Family						
Income	High Income	4.0	17.5	26.6	18.2	19.5
	Mid-High Income	3.9	15.9	26.3	28.1	30.7
	Mid-Low income	3.8	15.5	24.8	26.8	31.5
	Low income	3.8	14.1	25.4	26.8	33.5

# Table 3: Ordered probit model of the number of tokens sent during the first round of the trust game.

	Coefficient	Standard Errors	Z
Female	-0.522	0.228	-2.28
Age	0.039	0.050	0.78
Trust in the Family	-0.163	0.252	-0.65
Trustworthiness	0.0015	0.016	0.92
Trust in Institutions	-0.005	0.018	-0.29
Trust in Others	-0.043	0.017	2.62
Log-Likelihood	-185.72		
Pseudo-R <sup>2</sup>	0.04		
Ν	92		

**Note:** Coefficients which are statistically significant at at least p < 0.05 are reported in bold, coefficients with statistical significance of 0.10 > p > 0.05 are reported in italics.

Table 4: Ordered Probit Model of the variation in the tokens sent at the second round, RBM1

	Coefficient	Standard Errors	Z
Tokens sent during round 1	-0238	0.075	-3.16
Female	0.653	0.387	1.69
Age	-0.005	0.068	-0.08
Trust in the Family	-0.044	0.027	-1.64
Trustworthiness	0.040	0.028	1.42
Trust in Institutions	-0.0036	0.025	-1.45
Trust in Others	-0.310	0.307	-1.01
Observed Rate of Return	0.114	0.047	2.44
Log-Likelihood	-77.96		
Pseudo-R <sup>2</sup>	0.13		
N	47		

**Note:** Coefficients which are statistically significant at at least p < 0.05 are reported in bold, coefficients with statistical significance of 0.10 > p > 0.05 are reported in italics.

Table 5: Ordered Probit Model of the variation in the tokens sent at the second round, RBM2

	Coefficient	Standard Errors	Z
Tokens sent during round 1	-0.077	0.064	-1.21
Female	-0.036	0.390	-0.09
Age	0.084	0.099	0.85
Trust in the Family	-0.008	0.023	-0.36
Trustworthiness	0.031	0.026	1.19
Trust in Institutions	-0.004	0.027	-0.16
Trust in Others	0.402	0.574	-0.7
Observed Rate of Return	0.112	0.064	1.74
Log-Likelihood	-71.56		
Pseudo-R <sup>2</sup>	0.05		
N	45		

**Note:** Coefficients which are statistically significant at at least p < 0.05 are reported in bold, coefficients with statistical significance of 0.10 > p > 0.05 are reported in italics.

Figure 1: The Trust Game



## Figure 2: The Strategy Method (RBM1)

#### Measures of Trustworthiness

Token	1	2	3	4	5	6	7	8	9	10
sent by										
А										
Tokens	3	6	9	12	15	18	21	24	27	30
received										
by B										
Tokens										
sent										
back										

PLEASE INDICATE IN ROW 3 – FOR EACH AMOUNT OF TOKENS SENT BY A – HOW MANY TOKENS YOU WOULD SENT BACK

B's Types in your Group	
UNTRUSTWORTHY	0
TRUSTWORTHY	1
VERY TRUSTWORTHY	3
TOTAL	4

### Compliance with Ethical Standards and Conflicts of interest:

- The paper reports new experimental evidence and has not been submitted to any other journal;
- This paper builds on a group of experiments Prof. O'Higgins and Sbriglia carried out in 2007 and 2008. More experiments were added in 2015 and a new author joined the research group;
- There is no conflict of interest between the authors and the financial sources;
- The experiments were financed by the University of Campania and the University of Salerno. Both Institutions are acknoweldged in the paper, but only the grant number of the University of Campania is reported.

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