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Social Distance, Cooperation  
and Other Regarding  
Preferences: A New Approach  
Based on the Theory of  
Relational Goods

Working papers



Social Distance, Cooperation and Other Regarding Preferences:  
A New Approach Based on the Theory of Relational Goods

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Abstract

The last few years have witnessed a significant growth of the experimental and behavioral economics research on deviations from purely selfish behavior. Several new theoretical models have been developed which are based on a more complex view of economic agents' motivations. At the empirical level, many studies have been focused on the context-dependent nature of other-regarding behavior. From a socio-economic point of view, particularly interesting is the experimental evidence on the relation between the reduction of the social distance among the subjects and the probability of observing deviation from purely selfish choices.

An original approach to the idea of social distance reduction has been recently proposed by Becchetti et al. (2007) and Becchetti, Degli Antoni and Faillo (2009). They study the effects of the reduction of the social distance when the removal of anonymity is not decided by the experimenters, but it is the consequence of a voluntary choice made by the subjects themselves. They run two experiments based on two well-known games: the Investment Game (Becchetti et al., 2007) and the Traveler's Dilemma (Becchetti, Degli Antoni and Faillo, 2009). The results of these experiments turned out to be very interesting, even because they could not be accounted for by appealing the "standard" explanations of the effect of the reduction of social distance. In this paper we go back to the Becchetti's et al. (2007) and Becchetti, Degli Antoni and Faillo's (2009) results, and we show that it is possible to give an interpretation of this kind of evidence by referring to the concept of relational goods (Uhlener 1989; Gui 2000, 2002).

**Keywords:** Pro-social behaviour, Relational Goods, Cooperation, Social distance.

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## 1. Introduction

The last few years have witnessed a dramatic growth of the experimental and behavioral economics research on deviations from purely selfish behavior. Several new theoretical models have been developed which are based on a more complex view of economic agents' motivations. At the empirical level, many studies have been focused on the context-dependent nature of other-regarding behavior. From a socio-economic point of view, particularly interesting is the experimental evidence on the relation between the reduction of the social distance among the subjects and the probability of observing deviation from purely selfish choices. Social distance has been manipulated by introducing impersonal communication (Frohlich and Oppenheimer 1998), face to face interaction (Bohnet and Frey 1999b, Rankin, 2006), silent identification (Bohnet and Frey 1999a and 1999b, Scharlemann et al. 2001), information about personal characteristics (Bohnet and Frey 1999b, Charness, Haruvy and Sonsino, 2007) and by varying the degree of anonymity (Hoffman, McCabe and Smith 1996) between subjects.<sup>1</sup> What emerges from these studies is a positive and significant correlation between the reduction of social distance and the frequency of no-selfish and cooperative choices. Two explanations have been offered to account for this evidence. According to some authors, the reduction of the social distance promotes the emergence of a feeling of empathy among subjects, which results in higher levels of cooperation (Bohnet and Frey 1999a). A second explanation is based on the idea that "the 'framing' of the decision can influence expectations by associating a subject's decision with past experience" (Hoffman, McCabe and Smith, 1996: 655) and, more in general, with her everyday social life. In particular, the reduction of the social distance would increase the subjects' concern for the social consequences of their decisions, and this would result in a higher probability of adopting in the laboratory the same rules which drive their everyday social interactions.

Becchetti et al. (2007) and Becchetti, Degli Antoni and Faillo (2009) proposed a different approach to the study of the effects of the reduction of the social distance in which the removal of anonymity is not decided by the experimenters, but it is the consequence of a voluntary choice made by the subjects themselves. They run two experiments based on two well-known games: the Investment Game (Becchetti et al., 2007) and the Traveler's Dilemma (Becchetti, Degli Antoni and Faillo, 2009). The results of these experiments turned out to be very interesting, even because they could not be accounted for by appealing neither to the Bohnet and Frey's (1999a)

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<sup>1</sup> The reduction of social distance was considered for example in public good games (Bohnet and Frey 1999a), dictator games (Hoffman, McCabe and Smith 1996, Bohnet and Frey 1999a and 1999b), prisoner's dilemmas (Frohlich and Oppenheimer 1998) and trust games (Scharlemann et al. 2001).

nor to the Hoffman, McCabe and Smith's (1996) explanations discussed above. In this paper we go back to the Becchetti's et al. (2007) and Becchetti, Degli Antoni and Faillo's (2009) results, and we show that it is possible to give an interpretation of this kind of evidence by referring to the concept of relational goods (Uhlener 1989; Gui 2000, 2002).

The paper is divided in six sections. In the second section we provide a short survey of the literature on relational goods. In the third section we describe the experimental design of the two experiments presented in Becchetti et al. (2007) and Becchetti, Degli Antoni and Faillo (2009) (hereafter also B2007 and B2009). In the fourth section we discuss the hypotheses on the effect of relational goods on players' behaviour in the two experiments. In the fifth section we discuss the main findings. The sixth section concludes.

## 2. The Concept of Relational Goods

Over the last few years, economic analysis has devoted more and more attention to the role of factors connected with interpersonal relations. One of the main attempts that economists have made in order to improve their understanding of them is linked to the concept of relational goods (Gui 1987, Uhlener 1989). Relational goods "depend upon interactions among persons" (Uhlener 1989, p. 253) and are peculiar *intangible outputs of an affective and communicative nature* (Gui 2000) that are produced through social interactions. In particular, Gui (2002) proposes to consider every form of interaction as a particular productive process that the author calls "encounter". Relational goods may be generated in an encounter, but they are not the encounter in itself, which can generate many other different outputs<sup>2</sup> (Gui 2000, p.155). Examples of relational goods are: social approval, friendship and its benefit, the desire to be recognized or accepted by others, but also the "atmosphere" that is created among waiting customers in a hair dresser's shop, or a conversation concerning non-professional matters occurring during breaks in a business meeting" Gui (2000, p. 152). By looking at these examples, it is clear that relational goods can be either an asset, like a friendship, or else a one-shot consumer good like the "atmosphere" that is created among waiting customers in a hair dresser's shop or, more in general, the relational goods associated with the "well-being" (or "bad-being") produced by a conversation with other people (Bruni and Stanca 2008).

Relational goods have three main characteristics. *First*, they are a subset of local public goods, since they are non rival and non exclusive but only with regard to the people who

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<sup>2</sup> Examples of outputs which are accounted for by standard economic concepts and which are produced during an encounter are: the reallocation of goods of people involved in the interaction (e.g a buyer and a seller) and the provision of a service (e.g in case of a legal advice) (Gui 2000).

participate in their production. According to Uhlener, “Relational goods can only be enjoyed with some others. They are thus unlike private goods, which are enjoyed alone, and standard public goods, which can be enjoyed by any number” (Uhlener 1989, p.254). The consumption of relational goods is contextual and simultaneous to their production, since they can not be enjoyed alone, but only through interpersonal relations with other people (Sacco and Vanin 2000; Bruni and Stanca, 2008). They can be actually considered anti-rival since the joint fruition is essential to their value. *Second*, contributions to their production depend on mutual agreement (Uhlener 1989). Goodwill is important for their production, they can not be imposed. Even though relational goods may be generated through encounters which happen in different environments, some circumstances seem more convenient than others. In particular, relations that are not constrained but that people voluntarily decide to start, such as relations inside volunteering associations, are more likely to generate relational goods (Prouteau and Wolff, 2004). Relational goods also “acquire value through sincerity or genuineness –which is impossible to buy, so they can be generated as a by product of some instrumental activity but not by making contracts for their supply” (Becchetti, Pelloni, Rossetti 2008, p.346). *Third*, their value depends on the characteristics of people sharing the goods (Sacco and Vanin 2000) and is increased by fellow feeling.<sup>3</sup> With this respect, one could prefer to share time with people she trusts or she finds friendly. For this reason, the expected value of relational goods’ consumption depends on the disposition that agents have on the personal characteristics of people they are going to meet. A good disposition increases the probability that agents enjoy the encounter and, consequently, the quality of the relational good produced (and consumed) by it. On the contrary, feelings such as rancour or envy can interfere with their production (and, consequently, with their consumption). Therefore, it is clear that some circumstances can promote better than other their creation.

Until now relational goods have been mostly considered to explain social behaviour such as political participation (Uhlener 1989) or associational membership (Prouteau and Wolff 2004). Our analysis opens a new interesting field by experimentally testing whether the possibility of consuming relational goods has a direct impact also on variables such as trust and trustworthiness that are key elements for socio-economic development. In the next pages we will report the results of two experiments aimed at studying the impact of voluntary reduction of social distance on trust, trustworthiness and cooperation and we will present an interpretation of the evidence in terms of relational goods.

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<sup>3</sup> The *fellow feeling* hypothesis of Adam Smith has been recently re-elaborated by Sugden (2002) arguing that the intensity of common consent (and “the consequent removal of unease and dissonance caused by perception of disparities in sentiments”) is a source of pleasure in relational activities.

### 3. Two Experiments on the Voluntary Reduction of Social Distance.

The experiment run by Becchetti et al. (2007) is based on a two-player Investment Game (Berg, Dickhaut and McCabe, 1995) in which both players are endowed with 10 tokens (1 token=0,50 euros). The first mover, the Trustor, must decide how much of her endowment to send to the second mover, the Trustee. The amount sent is tripled and delivered to the Trustee, who must decide how much of the tripled sum to send back to the Trustor. Note that assuming rational and selfish individuals, the sub-game perfect Nash equilibrium of this game is the strategy vector in which the Trustee sends zero whatever the Trustor's transfer and the Trustor sends zero anticipating the Trustee's choice.

The Investment Game is particularly useful for detecting the willingness to cooperate. In this context, we say that an agent behaves in a cooperative way if she does not play only in order to maximize her monetary payoff. A Trustor plays in a cooperative way if she is interested in the total payoff which may be generated in the game and exposes itself to the risk of other opportunism. A Trustee is cooperative as far as she decides not to keep all the amount sent by the Trustor and send back a positive amount.<sup>4</sup>

The experimental literature on the Investment Game shows that Trustors send on average about 50% of their endowment, and Trustees repay by sending back between 95 and 110% of the amount sent by Trustors. Hence, the return to a "trustful behaviour" tend to be zero (Berg et al. 1995; Camerer, 2003; Camerer and Fehr, 2004).

In the B2007 experiment subjects played the Investment Game under two different treatments: the Baseline Treatment and the Encounter Treatment. In the Baseline Treatment subjects played a standard Investment Game under full anonymity, while subjects participating in the Encounter Treatment had the possibility to decide whether to remove anonymity by encountering, at the end of the experiment, their counterpart. In particular, in this second treatment, subjects were first instructed about the rules of the Investment Game, then they decided whether to opt or not for the encounter, they signed in, they discovered their role and they played the game. Before playing the game they were aware of the fact that the meeting would take place only if both players decided to opt for the encounter and they were informed on their opponents' choice about the encounter only at the end of the experiment. The subjects expressed their willingness to opt for the encounter by replying with a "Yes" to the following

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<sup>4</sup> With respect to the Traveler's Dilemma which will be introduced later, a cooperative behavior entails that players do not try to obtain the reward (and consequently try to avoid that the sanction against the other player arises).

written question: “Do you want to meet, at the end of the experiment, the person you are paired with?”. At the end of the experiment, and before leaving the room, members of the pairs in which both the subjects opted for the encounter were introduced to each other. The meeting did not involve any post-play activity.

In both the treatments, the game was one-shot, and the experiment finished just after the subjects’ choice. Each subject participated only in one of the two treatments. 16 sessions for have been conducted in three Italian universities (Trento, Milano-Bicocca, and Forli). A total of 368 subjects participated in the experiment.

The primary objective of the authors was to assess whether the introduction of the choice to remove anonymity have a significant impact on the level of cooperation (in terms of reciprocal contributions). As we will see in the fifth section, the results seem to confirm the existence of this kind of effect.

In order to check for the robustness of this result Becchetti Degli Antoni and Faillo2009 run a second experiment, with a design similar to that of B2007, but based on a Traveler’s Dilemma (Basu, 1994). The game owes its name to the example used to illustrate it. Two travelers returning from a remote island lose their luggage because of the airline company. In order to be reimbursed for the same souvenir contained in the luggage, they have to write down on a piece of paper the value of the souvenir which may range between 2 and 100 (in the original Basu 1994 paper). If the travelers write a different number, they are reimbursed with the minimum amount declared. Moreover, a penalty equal to 2 is paid to the traveler who declares the higher value, while a reward of the same amount is paid by the traveler who writes the lower value. If the two claims are the same, the two travelers receive the declared value without reward or penalty. Considering the characteristics of the game, if both of travelers want to maximize their monetary payoffs, the (2,2) outcome is the only Nash equilibrium of the game, independently of the size of the penalty or reward (hereafter also P/R).

The Traveler’s Dilemma has been introduced as an example of strategic interaction in which the Nash solution appears as far less plausible than the strategy profile in which each player declares a large number, believing that the other does the same (Basu, 1994). It has been observed that the size of the punishment (reward) has a key role in emergence of Nash equilibrium, both in the one-shot and in the repeated version of the game (Goeree and Holt, 2001; Capra et al. 1999). In particular, an important conclusion in the literature is that “the Nash equilibrium provides good predictions for high incentives ( $R = 80$  and  $R = 50$ , when the possible choice ranges between 80 and 200) but behavior is quite different from the Nash prediction

under the treatments with low and intermediate values of  $R$ ". (Capra et al. 1999, p.680). The scarce predictive capacity of the Nash equilibrium is confirmed by Rubinstein (2007) showing that around 50 percent of more than 4.500 subjects who played the Traveler's Dilemma online opted for the maximum choice (the minimum and maximum choice allowed were 180\$ and 300\$ respectively and  $P|R$  was 5%).<sup>5</sup> Rubinstein, by using response time data, concludes that in his experiment declaring 300\$ (the largest number) can be interpreted as an instinctive (emotional) choice, while choices in the range 255-299 appear as the ones which imply the strongest cognitive effort.

The B2009 study was based on a one-shot Traveler's Dilemma with minimum choice 20 and maximum choice 200, and punishment/reward equal to 20. The experiment consisted of three treatments: Baseline Treatment (BT), Compulsory Encounter Treatment (CET) and Voluntary Encounter Treatment (VET), with subjects participating only in one treatment. In the BT subjects play the basic Traveler's Dilemma. In the CET, before playing the game, subjects are informed that they would meet their counterpart at the end of the experiment. The VET differs from the CET because (as in the B2007 experiment) in the former the meeting is a voluntary choice of the players (the willingness to meet their counterparts was collected by means of the same procedure adopted in the B2007 experiment). The introduction of the treatment with the compulsory meeting allowed the authors to distinguish between the effects of social distance associated with empathy and framing discussed in the introduction (which can be observed in the CET) and the preferences for the production and the consumption of a relational good (which can be observed only in the VET).

In all the treatments, at the end of the game, beliefs about the opponent's choice were elicited by asking each subject to guess the number chosen by her opponent and paying her 1 euro if the distance between her guess and their opponent's actual choice was less than 10<sup>6</sup>. In both the B2007 and the B2009 experiments, some socio-demographic and attitudinal data have been collected by means of a questionnaire. As we will show in the following pages, some of these data turned out to be very helpful for the interpretation of the evidence.

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<sup>5</sup> Note that subjects who participated in the online experiment were not paid. Rubinstein stresses that the distribution of answers of his experiment is similar to that of Goeree and Holt (2001) when they use the low  $P|R$ .

<sup>6</sup> The author decided to adopt this rule because, in this kind of experiment, a prize exclusively given to the correct guess could be considered too difficult to achieve, and can discourage players and increase the likelihood of casual answers. At the same time, eliciting procedures based on quadratic scoring rules (Davis and Holt 1993) are useless for a game - like our version of the Traveller's Dilemma - characterized by a large number of possible strategies. The use of tolerance thresholds for subjects' guesses is used in the literature as a valid method for eliciting beliefs (see for example Charness and Dufwemberg 2006; Croson 2000).



The experiment was conducted in two Italian universities (Milano and Forli) with 2 sessions for the BT, 2 sessions for the CET and 3 sessions for the VET. A total of 140 undergraduate students participated in the experiment.

#### 4. The Role of Relational Goods in Increasing Cooperation when the Reduction of Social Distance is a Voluntary Choice of Players

The novelty of B2007 and B2009 experiments is the introduction of a voluntary option to meet the counterpart after having played an Investment Game and a Traveler's Dilemma respectively. It generates the possibility to consume relational goods through a personal encounter that agents will share after having interacted in the laboratory.

Even if experimental results on Ultimatum games (Güth, Schmittberger and Schwarze, 1982, Camerer and Thaler 1995), Dictator Games (Andreoni and Miller 2002), Gift Exchange Games (Fehr, Kirchsteiger and Reidl, 1993, Fehr, Kirchler, Weichbold and Gächter 1998), Investment Games (Berg, Dickhaut and McCabe 1995, Ben-Ner e Putterman 2006) and Public Good Games (Fischbacher, Gächter and Fehr 2001, Sonnemans, Schram and Offerman 1999, Fehr and Gächter 2000) have widely stressed that human behaviour is also strongly motivated by the consideration of others (i.e., for example, by fairness, reciprocity and inequity aversion), we are not aware of previous experimental studies that introduce the possibility of consuming relational goods in order to analyse their impact on cooperation.

According to our interpretation (see also the original papers to a more detailed explanation related to the two single experiments) agents who took part in the experiments carried out by Becchetti et al (2007) and Becchetti Degli Antoni and Faillo (2009) may opt for the encounter in the two games for three main reasons: 1) curiosity; 2) desire to meet the counterpart in order to negatively reciprocate if she behaves opportunistically in the game; 3) desire to have a good time with the counterpart (i.e. desire to consume relational goods). Note that, if we assume nonzero opportunity cost of time, the decision to meet the counterpart at the end of the game reveals a positive utility which player may associate to one (or more) of these three different motivations for the meeting.

By focussing on these three motivations, B2009 show that only when the third motivation is present a significant difference between the behaviour of players who voluntarily opt for the meeting and other agents emerges. In fact, B2009 present an empirical test (see next section) which disentangles between the first two motivations (curiosity and negative reciprocity) and the third one (relational goods) and show that the desire to consume relational goods is a necessary

condition to observe departure from individual rationality in the strategies of players who opt for the meeting.

Moreover, the more cooperative attitude of players who opt for the meeting both in the Investment Game and in the Traveler's Dilemma may be interpreted as the willingness to increase the probability to consume relational goods during the meeting. Since the production and the consumption of relational goods depends on the disposition of people who meet (section 2), players who opt for the meeting are more cooperative because of the effect that game's result have on the counterpart's disposition. Trustors, Trustees and the two "Travelers" of the Traveler's Dilemma know that disposition of their counterpart towards them is affected by their behaviour in the game. A trustful contribution by the Trustor reveals the willingness to create a cooperative relation with the Trustee and creates positive conditions for the production of relational goods after the game. On the social and economic point of view such contribution entails a monetary risk for the Trustor which may be traded off by nonmaterial benefits generated by the relational good consumed during the encounter. The Trustee can, in turn, affect the disposition of the Trustor by showing herself trustworthy (i.e. by sending back to the Trustor a "fair" amount). The trade-off between giving away monetary benefits to "pay" non material gains applies also to her. Disposition of the two players in the Traveller's Dilemma will be affected by the payment (or by the win) of the penalty (of the reward).

Trustors, Trustees and players in the Traveller's Dilemma who voluntarily decide to meet the counterpart after the game could decide to be relatively more cooperative in the game in order to increase the expected value of the relational goods they have the possibility to produce through the encounter.

An important qualification, relevant to the experiments used in B2007 and B2009, is that the concept of relational good may vary from a minimum to a maximum content. The minimum content is just the desire to avoid the hostility of the counterpart. The maximum content may be, for example, the hope to begin a cooperative relation with the other player starting from the small joint experience lived during the game. We may just observe in the experiment whether contributions grow when the opportunity of the encounter is chosen, but we cannot discriminate whether the players do it by having in mind the minimum or the maximum content of the relational good.

Finally, note that, if a subject decides not to meet her counterpart, she will play a standard anonymous game. According to the role of goodwill in the creation of relational goods (section

2), the voluntary character of the encounter should create (if supported by the suitable dispositions) a favourable environment for the relational goods to arise in the meeting.

## 5. Social Distance, Relational Goods and Cooperation: Evidence from the Investment Game and the **Traveler's** Dilemma

This section resumes the main results reported in B2007 and B2009 and proposes a discussion of these results in the light of the concept of relational goods. The hypothesis behind this analysis is that the possibility to create and consume relational goods through the meeting increases cooperative behaviour by players who have preferences for relational goods.

Evidence seems to indicate a significantly difference in agent's behaviour when the meeting option is introduced and chosen. With this respect, three points must be stressed.

### *1. In the investment game:*

- a. Trustors who opt for the meeting follow a behavior consistent with Nash equilibrium when players have standard self-interested preferences based only on monetary arguments (that is, sending no money to the Trustee, which we define from now on as standard (textbook) behavior) significantly less than Trustors who do not opt for the meeting;*
- b. the average contribution of Trustors is significantly larger when the meeting option is available than when it is not available. Moreover, when we restrict the analysis within the sample of the 93 Trustors who are given the opportunity to opt for the encounter, the average contribution of those who opt is significantly higher than that of those who do not opt.*

The share of Trustors who send no money to the Trustee is 11.41 on the overall sample of 184 observations. It rises to 19.78 percent in the 91 cases in which the opportunity of the encounter is not available and falls sharply to 3.22 percent when the opportunity is offered (93 observations). Within this subsample the share is slightly higher for Trustors who do not opt (4.17 percent on 48 cases) and slightly smaller for those who opt for the encounter (2.22 percent with 45 cases)<sup>7</sup>.

Hence, the opportunity of consuming a relational good has significant effects on the deviation from the *standard behavior*. This finding shows that, with a slight departure from an aseptic context with no possibility of creating relational goods, benchmark concepts, such as Nash

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<sup>7</sup> In relation to the Trustors' decision when the meeting is available in the Investment Game, we observe that 45 out of 93 subjects opted for the meeting.

equilibria under the assumption of self-interested players, become less and less adequate to describe agents' choices. On another perspective we may as well interpret this finding by arguing that absence of relational opportunities reduces the capacity to create trust and trustworthiness and the productivity gains which may arise from cooperation.

The comparison of the average Trustor's contribution under the two different treatments (when the option of meeting the Trustee is available or not) yields results consistent with those commented above. The average contribution is significantly larger when the option is available (5.16 tokens) than when it is not (3.78 tokens) and the difference in means is significant at 95 percent.<sup>8</sup> This implies that the simple availability of the opportunity of the encounter raises on average the Trustor contribution, independently from her decision to meet the counterpart. It may be argued that the result is determined by the expected larger contribution of those who actually opt for the possibility of the encounter when the option is available. However, this does not seem to explain the entire story since the mean contribution of those who have the opportunity but do not opt for the encounter is still higher (4.37 tokens) than that of those who are devoid of such opportunity (3.78 tokens). An interpretation for this finding may be that part of the higher contribution of the sender in presence of the opportunity to opt for the encounter is independent from the Trustor's decision to opt for it and has a *strategic component*, represented by the anticipation that the Trustee may be willing to pay back more if she opts for the encounter. Consider, however, that the difference between those who have the possibility to opt and do not and those who are not given such opportunity is only weakly significant both with parametric and non parametric tests (77 percent significance). When we restrict our descriptive analysis within the sample of the 93 Trustors who are given the opportunity to opt for the encounter, we observe that the average contribution of those who opt (6.82 tokens) is significantly higher than that of those who do not opt (4.37 tokens).<sup>9</sup> It seems that the opportunity to meet the counterpart generates a significant effect on the decision to send by Trustors which cannot be simply explained by a selection bias effect.

Given the standard assumption that the amount given by the Trustor is tripled, our finding implies that, on average, the 'aggregate gain' generated by the option of the encounter - i.e. the extra amount of tokens generated by it - is  $15.48 - 11.40 = 4.08$  tokens or a 42.1 per cent increase with respect to the benchmark in which the relational good is not available.

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<sup>8</sup> Since the distribution of Trustor's contributions departs from normality we also consider non parametric diagnostics and find that the significance is confirmed by Wilcoxon rank-sum (Mann-Whitney) test= -2.940 Prob > |z| = 0.003.

<sup>9</sup> The significance is confirmed by the nonparametric Wilcoxon rank-sum (Mann-Whitney) test: test= -2.451 Prob > |z| = 0.014).

2. In the investment game, the amount sent back by Trustees and the number of Trustees who do not behave according to the standard economic behavior (i.e. who do not send back anything) is significantly higher when the option of the meeting is selected.

The dependent variable chosen to study Trustees' behavior is the share of the amount paid back on the total amount received. The share of Trustees behaving consistently with the *standard behavior* is higher for Trustees than for Trustors (26.38 percent on the overall sample against 11.41 among Trustors) (Table 2).

Table.2 **Descriptive statistics on the Trustee's contribution under different experiment designs (Total sample)**

Sharerest (Amount paid back/ Total amount received)	All experiments (163 obs.)	Encounter option not available (73 obs.)	Encounter option available		
			Trustee's decision to opt for the encounter YES and NO (90 obs.)	YES (36 obs.)	NO (54 obs.)
0	26.38	26.03	26.67	16.67	33.33
0 < sharerest ≤ 0.1	7.98	8.22	7.78	8.33	7.41
0.1 < sharerest ≤ 0.2	16.56	20.55	13.33	8.33	16.67
0.2 < sharerest ≤ 0.3	3.07	5.48	1.11	0.00	1.85
0.3 < sharerest ≤ 0.4	21.47	19.18	23.33	25.00	22.22
0.4 < sharerest ≤ 0.5	7.98	6.85	8.89	11.11	7.41
0.5 < sharerest ≤ 0.6	4.29	2.74	5.56	11.11	1.85
0.6 < sharerest ≤ 0.7	7.98	5.48	10.00	13.89	7.41
0.7 < sharerest ≤ 0.8	1.84	0.00	3.33	5.56	1.85
0.8 < sharerest ≤ 0.9	0.61	1.37	0.00	0.00	0
0.9 < sharerest ≤ 1	1.84	4.11	0.00	0.00	0
Total	100	100	100	100	100

Percent values. Source: Becchetti et al. 2007.

This is reasonable if we assume that the Trustee, differently from the Trustor, has no strategic reasons (such as the hope to stimulate the contribution of the Trustee) to deviate from the standard behavior. Another striking difference is that most of the variability is not explained just by the opportunity of the encounter (conformity to the "standard behavior" is even higher for those who are given the opportunity of the encounter but do not opt (33.33 percent) than for those who are not given the opportunity) but by the actual choice of opting for the encounter (in such case the share of individuals which follows "standard behavior" drops to 16.67 percent).

Our interpretation is that the receiver has no expected additional gains from the possibility that, even though she does not opt for the encounter, the other player does. Hence there is no point to her in giving more when the option is available but she does not want to meet the Trustor. This interpretation is also supported by the fact that the opportunity of the encounter has no significant effects on the average share paid back<sup>10</sup>.

When we restrict the analysis to the subsample of the 90<sup>11</sup> individuals who have the opportunity to opt for the encounter we find that the amount sent back is significantly higher (it almost doubles) when the Trustee opts for the encounter (around 35 percent for those who opt against around 21 percent of those who don't). Since the distribution of the dependent variable is definitely not normal, we use non parametric test to evaluate whether this difference is significant and find that it is.<sup>12</sup>

### *3 In the Traveler's Dilemma agents who voluntarily decide to meet the counterpart are more likely to have a choice which is higher or equal than their belief (in this way trying to avoid that a sanction against the other player arises)*

The comparison between choice and belief in the Traveler's Dilemma gives us important insights into the effect of preferences for relational goods and agents' behaviour. If we look at the distribution of the difference between choice and belief we find that only 18 percent of players choose one unit below the belief, while around 11 percent of them are such that  $C > B + 10$

Notice that if players' belief is correctly expressed (and we do not have reason to doubt about it) agents who chose a number higher than their belief + 10, voluntarily decide to incur in the traveler's game penalty. With this respect, we find that the percentage of agents who declare a number higher than their belief + 10 is equal to 17% in the voluntary encounter treatment, it is equal to 7.5% in the baseline treatment and it is equal to 7.5% in the compulsory encounter treatment. More specifically, 21% of subjects who opted for the meeting declared a number higher than their belief + 10 while this percentage drops to 12.5% among people who did not opt for the meeting. If we look at the difference between choice and belief, we find that agents who want to meet their counterpart in the voluntary meeting treatment have on average a choice which is 6.89 points higher than their belief. This is a remarkable result considering that, as we expect, all the other subgroup means are negative (the choice is below the belief). More

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<sup>10</sup> Two-sample Wilcoxon rank-sum (Mann-Whitney) test  $z = -0.802$  Prob  $> |z| = 0.422$ .

<sup>11</sup> The sample is slightly smaller than the corresponding one among Trustors since Trustees receiving zero amounts are obviously dropped from the sample.

<sup>12</sup> Two-sample Wilcoxon rank-sum (Mann-Whitney) test  $z = -2.703$  Prob  $> |z| = 0.007$ .

specifically, all the rest of the sample has a -5.40 average, the baseline group -5.85 and the compulsory treatment group -2.77. Differences between choice and belief are not statistically significant with respect to the different subsamples. However, it does not undermine the idea that the willingness to consume relational goods reduces opportunistic behavior. In fact, Becchetti, Degli Antoni and Faillo (2009) consider a dummy variable which takes the value of 1 if players choose a number higher than their belief minus 1. We may consider these agents as cooperative (or non opportunistic) agents in the sense that they want to reduce the probability that the counterpart has to pay the penalty in the game. Becchetti, Degli Antoni and Faillo (2009) show that the probability to observe this kind of behavior is significantly higher when players opt for the meeting and, at the same time, they declare a level of generalized trust above median.<sup>13</sup> The role of generalized trust is very important for the interpretation of the increase of cooperative behavior in terms of willingness to consume relational goods (and to rule out the alternative hypotheses which are usually considered by the literature on social distance reduction). In fact, the authors' interpretation is that generalized trust incorporates player's expectation on the counterpart in terms of social orientation. In particular, generalized trust in others would approximate players' trust that the counterpart is a social oriented subject. Only agents who trust that their counterpart will be socially oriented (i.e. disposed to produce and consume relational goods) will avoid opportunistic behavior in order to generate an agreeable atmosphere in the meeting. In other words, it is only when players who opt for the meeting have high level of generalize trust that we may reasonably assume that their meeting decision is due to the desire to consume relational goods.<sup>14</sup> In case players opt for the meeting without having high generalized trust we assume that their decision to meet the counterpart is driven by the other two motivations (curiosity or negative reciprocity).

These different hypotheses on the reason behind the decision to opt for the meeting (i.e. willingness to consume relational goods, curiosity and negative reciprocity) are tested in B2009 by verifying if the probability to observe choices  $\geq$  beliefs are more likely to happen:

- in the compulsory encounter treatment for players who declare or who do not declare level of generalized trust higher than the median with respect to the baseline treatment;

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<sup>13</sup> The question which measures the level of generalized trust is the usual one: "Generally speaking do you believe that others should be trusted?" Answers range is from 10 (highest level of trust) to 0.

<sup>14</sup> Notice that, without considering generalized trust, there is no a significant difference between the percentage of players who chose a number higher than their belief minus 1 in the three treatments. As a whole, 63% of players declared a number higher than belief-1. Both in the baseline and in the compulsory encounter treatment this percentage is 65%. In the voluntary encounter treatment it is 62% (the percentage increases to 64% among players who choose to meet the counterpart).

- in the voluntary encounter treatment for players who opt for the meeting and who declare or who do not declare level of generalized trust higher than the median with respect to the baseline treatment.

Since the difference is statistically significant only for players who opt for the meeting in the Voluntary Encounter Treatment and who, at the same time, declare high level of generalized trust, B2009 conclude that the explanation based on the idea of relational goods seems to be appropriate to account for the non standard behavior emerging in their Traveler's Dilemma experiment. Moreover, since the mere reduction of social distance due to the removal of anonymity after the experiment do not generate effect (in the Compulsory Encounter Treatment or in the Voluntary Encounter Treatment for players who do not have high level of generalized trust) on players behavior in terms of willingness to reduce opportunistic behavior, authors conclude that the usual explanation connected with the reduction of social distance (i.e. the promotion of empathy among subjects and the possibility of emergence of social norm of cooperation or fairness) do not seem to be effective in this case.<sup>15</sup>

## 6. Conclusions

Two recent papers contributed to the literature on the effects of the manipulation of social distance by making its reduction a voluntary choice of players. This original element was introduced both in an Investment Game (Becchetti et al. 2007) and in a Traveler's Dilemma (Becchetti, Degli Antoni and Faillo 2009) by giving players the opportunity to declare if they want to meet the counterpart at the end of the experiment.

The present paper aimed at summarizing the main results of these two contributions in the conviction that they take a significant step forward in the behavioral literature by creating for the first time an experimental design in order to study the effect relational goods on cooperation. In particular, a result which also opens interesting insights for further research has been considered in this paper: the willingness to consume relational goods with another player (i.e. the desire to share a pleasure time with her/him) increase the probability to observe cooperative or non-

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<sup>15</sup> At a theoretical level, the possibility to consume relational goods could affect players' behavior with high level of generalized trust also in the CET. However, this effect, which does not arise in the game, may be excluded for a simple reason connected with the characteristic of the production of relational goods. In fact, the literature on relational goods stresses that, even though relational goods may be generated through meetings which happen in different environments, some circumstances seem more convenient than others (section 2). In particular, relations that are constrained (such as the meeting in the CET) are less likely to generate relational goods (Prouteau and Wolff, 2004). For this reason, we may assume that players in the CET may think that the "forced" encounter after the game is not a good occasion to generate relational goods. This interpretation is confirmed by experimental data.



opportunistic behavior among players involved in economic interactions even though it entails a monetary risk or a sure material sacrifice. In this paper, we showed that:

- Trustors who opt for meeting the counterpart are more likely to depart from individual rationality (i.e. to send positive amount to the Trustees) and send on average higher amount than Trustors who do not opt for the meeting;
- The amount sent back by Trustees and the number of Trustees who do not behave according to the standard economic behavior (i.e. who do not send back anything) is significantly higher when the option of the meeting is selected;
- In the Traveler's Dilemma, agents who voluntarily decide to meet the counterpart (and who trust others) are more likely to have a choice which is higher or equal than their belief (in this way trying to avoid that a sanction against the other player arises).

We showed that these results may be interpreted as the willingness to positively affect (through decisions in the game) the disposition of the other players in preparation for the meeting which is a crucial factor to create and consume relational goods during the encounter.

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