Social capital formation: Some theory and experimental evidence.

Eline van der Heijden*
CentER and Department of Economics, Tilburg University

Terje Lensberg
Norwegian School of Economics and Business Administration

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Abstract

We use a rule-based decision model to study social capital formation and economic performance, where the agents are sometimes motivated by norms and sometimes by pure self-interest. In this framework, the normative concepts of trust, cooperation and reciprocity have natural counterparts in terms of observable behavior, which allows us to disentangle the interaction between them and form hypotheses that can be tested on experimental data. We apply the model to data from experiments with a gift exchange game in Norway and the Netherlands, and find that observed differences in trust and cooperation between the two subject groups are accounted for by differences in reciprocity. This indicates that reciprocity may be a key to understanding social capital formation and its effect on economic performance.

*Mailing addresses: Eline van der Heijden, Dept. of Economics, Tilburg University, P.O. Box 90153, 5000 LE Tilburg, The Netherlands, e-mail Eline.vanderHeijden@kub.nl. Terje Lensberg, Norwegian School of Economics and Business Administration, Helleveien 30, 5035 Bergen-Sandviken, Norway, e-mail terje.lensberg@nhh.no. We would like to thank Georg Kirchsteiger, Jan Potters, Karim Sadrieh, Kjell Gunnar Salvanes, and Arthur van Soest for helpful comments and discussions.

1 Introduction

There is a growing body of empirical evidence that differences in economic performance across countries and regions are associated with differences in social capital. Broadly speaking, social capital is externalities in social structures, which arise from reciprocated trust, sanctioned norms, and efficient information networks (Coleman (1988)).[1] The interest in empirical research on social capital was spurred by Putnam's (1993) comparative study of local government in Italy.[2] Subsequently, Knack and Keefer (1997), La Porta et al. (1997) and Zak and Knack (2001) have used data from the World Values Surveys[3] to estimate the effect of social capital on various aspects of economic and bureaucratic performance. All three studies show that trust has a strong and significant positive effect on their respective performance measures. Knack and Keefer (1997) find that norms of civic cooperation have a significant positive effect as well, and that trust and norms of civic cooperation are positively correlated across countries.

While these studies indicate that social capital is important for growth and development, there is only a limited amount of economic theory that can explain how. The positive effect of trust and cooperative norms on performance is usually attributed to the fact that it enables economic agents to transact without the need for costly formal agreements (Arrow (1974)). As regards the relationship between trust and cooperation, Coleman (1988), and Putnam (1993) argue that trust is based on justified expectations of reciprocity, and this claim is supported by the positive correlation between trust and cooperative norms found by Knack and Keefer (1997). However, the general message from the experimental literature on e.g. bargaining games and public goods games is that standard economic theory has low explanatory power in decision situations where social norms are likely to be an important motivational factor besides pure self-interest.[4]

In this paper, we use the theory of rule-based decision making introduced by March and Simon (1958) to construct a model of social capital formation which includes both norms and self-interest as motivational bases for behavior. In the model, social capital emerges from the interaction between these forms of motivation, and the normative concepts of trust, cooperation and reciprocity have natural counterparts in terms of observable behavior. To illustrate its applicability for empirical work, we estimate the model on a set of experimental data from Norway and the Netherlands with a gift exchange game.

[1] Coleman (1990) attributes the term "social capital" to Loury (1977).

[2] Putnam (1993) emphasizes trust, norms of civic-minded behavior and associations between groups and horizontal networks as important forms of social capital.

[3] The World Values Surveys contain data on the norms and values of thousands of respondents in some 40 countries (see e.g. Inglehart (1997)).

[4] See Ledyard (1995) for a survey on public goods experiments and Roth (1995) for an overview of bargaining experiments.

Using our model, we are able to relate differences in economic performance to differences in trust, cooperation and reciprocity, and we identify the effect of reciprocity on the feedback relationship between trust and cooperation suggested by Coleman (1988), Putnam (1993), and in particular, by Knack and Keefer (1997). Our main findings are as follows: Trust induces cooperation, and there is no significant difference between the two subject groups with regard to the nature and strength of this relationship. However, the extent to which trust induces reciprocal behavior differs significantly between the two subject groups. Differences in trust are accounted for by this difference in reciprocity, and hence indirectly, reciprocity accounts for cooperation as well.

Our paper belongs to the growing literature that attempts to incorporate social norms, like fairness, reciprocity and trust, as motivational bases for behavior. A pioneering paper in this tradition is Rabin (1993). Based on the idea that people are willing to reward fair intentions and to punish unfair intentions, Rabin develops a model of fairness in which beliefs are incorporated explicitly. His approach is restricted to two-person, normal-form games, but Dufwenberg and Kirchsteiger (1998) extend Rabin's model in order to deal with sequential games (like the gift exchange game of the present paper). Both Rabin and Dufwenberg and Kirchsteiger focus on reciprocity.

In two other recent papers, some form of inequality aversion is the driving force of the model. Fehr and Schmidt (1999) and Bolton and Ockenfels (2000) develop theories of fairness, competition and cooperation, based on the premise that people are motivated by their pecuniary payoff as well as their relative payoff standing. The main difference between them concerns their choice of a reference point for assessing equity of outcomes. Both models take the distribution of preferences as fixed, and the crucial assumption is that, in addition to purely self-interested agents, there are some agents who care for equitable outcomes.

The idea of norms and pure self-interest as joint determinants of behavior is at the heart of our model as well, but it differs from those of Fehr and Schmidt and Bolton and Ockenfels in some important respects. In contrast to their consequential logic of decision making, we assume that people act according to a logic of appropriateness, where the agents follow rules or procedures that they see as appropriate to the situation (March (1994)). One advantage of this approach is that it accommodates Rabin's (1993) idea that the agents attach intentional significance to the actions of others, which may influence the way in which they perceive the situation and hence their choice of an appropriate action. More importantly, it allows for other norms besides fairness and inequity aversion to play an explicit motivational role, in particular norms of trust and reciprocity. In our model, these concepts have natural counterparts in terms of observable behavior, which facilitates its use for empirical work on these issues.

Our paper is also related to a recent paper by Glaeser et al. (2000), which combines data from two experiments and a survey to measure individual and situational correlates

of trust and trustworthiness. They argue that attitudinal trust surveys at best weakly predict trust behavior but are much better in predicting trustworthy behavior. Trusting behavior in the experiments is correlated with past trusting behavior outside the experiments. Their experimental results from a trust game and our results from a gift exchange game are consistent and suggest that trustworthiness/reciprocity is an important ingredient of social capital.[5] However, the present paper goes one step further by developing some theory for social capital formation.

The remainder of this paper is organized as follows. In the next section, we present our model of rule-based decision making, and in section 3, we introduce the gift exchange game and the experimental procedure. Section 4 describes the data. Section 5 contains the econometric results, and section 6 concludes.

2 A model of rule-based decision making

In a trust-sensitive transaction between two parties, the benefits to one of them depends in general on some future action by the other. Most business transactions are sensitive to trust, even when some aspects of the transaction are regulated by formal contracts that can be enforced in a court of law. In this paper we follow the interpretation Berg et al. (1995) gave to Coleman's (1990) definition of trust. Subjects have used trust to facilitate exchange if the following conditions are met: 1) Placing trust in the trustee puts the trustor at risk; 2) Related to the set of possible actions, the trustee's decision benefits the trustor at a cost to the trustee; and 3) both trustor and trustee are made better off from the transaction compared to the outcome which would have occurred if the trustor had not entrusted the trustee. As we will see, all these conditions are applicable to the situations we are considering here.

In this section, we develop a simple model of behavior in trust-sensitive decision situations. In this model, social capital is simply reciprocated trust. Our point of departure is the theory of rule-based decision making introduced by March and Simon (1958). It rests on a "logic of appropriateness", which involves classifying the decision situation, identifying one's role in that situation, and choosing an action which is appropriate for someone who plays that role in the given situation (March (1994), March and Olsen (1989)). The decision process is seen as complex, due to ambiguous roles and situations, and therefore outcomes are non-deterministic at the individual level. The usefulness of

[5]This conclusion is strong, given the fact that the experiments differ in several ways, the most important difference probably being that subjects in the trust game know the other subject in the pair (and they may even be close friends) while in our experiment subjects do not know with whom they are paired. Secondly, the trust game is played only once, while our experiment consists of 15 repetitions of a one-shot game (although it is not a truly one-shot game, subjects do not know against whom they are playing so it is impossible to build (individual) reputation).

that framework for our purpose, is that it allows decision makers to be driven by conflicting motives, and this permits us to study the interaction of norms and pure self-interest which seems to be a key to understanding trust and cooperation.

Formally, we consider situations where two agents, 1 and 2, choose non-negative effort levels e_1 and e_2 in periods 1 and 2, and obtain symmetric payoffs $u^1(e_1, e_2)$ and $u^2(e_2, e_1)$, respectively. As we will only consider situations where the payoff functions are symmetric, we will henceforth drop the superscript and refer to the payoff functions of agents 1 and 2 as $u(e_1, e_2)$ and $u(e_2, e_1)$, respectively. Let u_k denote the derivative of u with respect to its k'th argument. We assume that effort is individually costly, and that some effort is collectively beneficial, in the sense that $u_1(e_i, e_j) < 0$ and $u_1(0, 0) + u_2(0, 0) > 0$.

Note that the unique subgame perfect equilibrium is for both agents to supply zero effort. However, we assume here that agents are sometimes motivated by social norms and sometimes by pure self-interest, according to some random mechanism that is not a result of conscious deliberation, but that may depend on the details of the choice situation at hand. More precisely, we consider two alternative decision modes, one cooperative (mode C), and one opportunistic (mode O), and for each agent i a random mode selection mechanism, represented as a probability distribution p_i on the set of modes $\{C, O\}$.

In decision mode O, the agent interprets the situation as a strategic game against an opponent who is likely to pursue his interests at her cost. She therefore feels free to exploit her own profit opportunities, and chooses an action which maximizes her expected utility. In decision mode C, she interprets the situation as one that calls for collective action, identifies her own interests with those of her transaction partner, and chooses an action based on her ideas about fair division and proper conduct in such situations.[6]

Let p_i and $1 - p_i$ denote the probabilities of selecting mode C and O, respectively, for agents $i = 1, 2$. As regards p_1, it may depend on agent 1's experience with similar decision situations in the past, and possibly on his beliefs about how agent 2 will interpret the situation. However, it cannot depend on the actual behavior of agent 2, and therefore p_1 is a predetermined variable in any given decision situation. As regards p_2, however, we shall allow for the possibility that it depends on the amount of effort supplied by agent 1, in order to accommodate Rabin's (1993) idea that the agents are sensitive to perceived intentions of others: A high effort by player 1 may reasonably be interpreted by player 2 as an invitation to cooperate and share the potential benefits of the game, while a low effort is a signal that player 1 does not expect player 2 to cooperate. Thus, e_1 is a behavioral measure of the *trustfulness* of agent 1, as seen from the point of view

[6]Williamson (1993) makes a distinction between calculative trust and personal trust. Calculative trust occurs when the trustor decides whether or not to entrust the trustee on the basis of an expected utility calculation. Personal trust is based on more of a noncalculative "feeling" that entrusting the trustee is the correct decision. These definitions come rather close to our concepts of being in the opportunistic or the cooperative mode, respectively.

of agent 2, while p_2 measures the *trustworthiness* of agent 2. In what follows, we adapt the hypothesis of Knack and Keefer (1997) that trust induces cooperation, i.e. that $p_2'(e_1) > 0$.

Consider agent 2's decision problem under the two alternative decision modes. In the opportunistic mode, she maximizes expected utility by setting $e_2 = 0$, since $u_1(e_2, e_1) < 0$, while in the cooperative mode, she chooses an effort level $e_2(e_1)$, which, as indicated, may also depend on e_1. If $e_2'(\cdot) > 0$, we say that agent 2 behaves *reciprocally*, i.e. by supplying more effort in response to more effort by agent 1.[7] In what follows, we will assume that this is the case.

Consider next agent 1's decision problem. If 1 is in the cooperative mode, he chooses an appropriate action which we denote by e_1^C. As is the case with p_1, it may depend on 1's beliefs and experience, but it is a predetermined variable in any given decision situation. If agent 1 is in the opportunistic mode, he maximizes expected utility, which is given by

$$p_2(e_1)u(e_1, e_2(e_1)) + (1 - p_2(e_1))u(e_1, 0).$$

Let $e_1^O(p_2(\cdot), e_2(\cdot))$ denote the optimal effort by agent 1 in the opportunistic mode. As indicated, it will depend on the functions $p_2(\cdot)$ and $e_2(\cdot)$, which describe agent 1's expectations about 2's behavior. The first-order condition for an optimum yields some insight into the nature of these dependencies. It is given by

$$\begin{aligned} 0 &= p_2'(e_1)(u(e_1, e_2(e_1)) - u(e_1, 0)) \\ &+ p_2(e_1)u_2(e_1, e_2(e_1))e_2'(e_1) \\ &+ p_2(e_1)u_1(e_1, e_2(e_1)) + (1 - p_2(e_1))u_1(e_1, 0), \end{aligned} \tag{1}$$

and has the following interpretation: The first term is the effect of 1's trust on 2's trustworthiness, multiplied by the gain in 1's utility if agent 2 switches from the opportunistic to the cooperative mode. The second term is the expected increase in the reciprocal effort by agent 2 in response to increased effort by agent 1, and the third term is agent 1's expected marginal cost of effort.

The main point to notice is that an increase in the trustworthiness or reciprocity of agent 2 increases the optimal amount of effort supplied by agent 1 under the opportunistic decision mode. This in turn increases the trustworthiness of agent 2, and induces increased reciprocal efforts by cooperative second players. Thus, the model captures the two-way causality between trust and cooperation suggested by Knack and Keefer (1997), and indicates that reciprocity plays an important part in it.

[7] We follow the narrow defintion of recipocity, in the sense that we assume that reciprocity refers to a conditional obligation: Good behavior is rewarded and bad behavior is punished (Gouldner (1960)). See also footnote 18.

Note that by this model, the normative concepts of trust, reciprocity, and cooperation are translated into behavioral counterparts, which enables one to analyze the implications for actual behavior. These behavioral implications are summarized in Table 1 below.

Table 1: Agent behavior in the rule-based decision model

Mode	Agent 1	Agent 2
C	e_1^C	$e_2(e_1)$
O	$e_1^O(p_2(\cdot), e_2(\cdot))$	0
$\Pr(C)$	p_1	$p_2(e_1)$

3 The gift exchange game

The gift exchange game (see also Van der Heijden et al. (1998a)) is a special case of a trust-sensitive decision situation as described in the previous section. In this game, the payoff-function u is given by

$$u(e_i, e_j) = (9 - e_i)(e_j + 1)k, \tag{2}$$

where e_i is an integer between 0 and 7 inclusive, which represents a transfer (effort) from player i to player j.

The gift exchange game can be given the following interpretation: Each of the two players has a high endowment (of 9) in one period and a low endowment (of 1) in the other period. In the first period, player 1 has a high endowment and he decides on his gift e_1 to player 2, who has a low endowment. In the second period the roles are reversed; player 2 has a high endowment, player 1 has a low endowment, and player 2 decides on her (return) gift e_2 to player 1. In the basic treatment, also called the information treatment, player 2 is informed about the size of the gift e_1 before she has to decide on e_2.[8] Endowments and gifts together determine players' final asset levels in the two periods. If player i gives a gift of e_i when he has an endowment of 9, then his final assets in that period are $9 - e_i$. If player i receives a gift of e_j when he has an endowment of 1, then player i's final assets in that period are $1 + e_j$. The payoffs to player i are defined as the product of the final assets levels in the two periods, as shown in (2), where k is a constant used to transform the payoffs in points to monetary earnings.

Note that in the gift exchange game the payoff to both players is 9 when no gifts (efforts) are made, while the maximal symmetric payoff is 25, which is obtained when all

[8] We have also performed a control treatment in which player 2 is not informed about the size of the gift made by player 1. For the moment, we focus on the basic treatment but we will briefly discuss the results of the control treatment in section 5.

players give 4. However, it is possible to achieve higher expected payoffs. If the players somehow managed to transfer 0 as player 1 and 7 as player 2, or vice versa, they would get an expected payoff of 37 under random assignment of players to positions: 72 in the position in which one expects to give 0 and to get 7, and 2 in the opposite position.

3.1 The experimental procedure

Five sessions of the basic version of the gift exchange game were run in Tilburg, the Netherlands and six sessions were run in Bergen, Norway. The procedure of the experiment was identical in both countries. All sessions were run with eight participants except for one session in Norway, which was run with six participants.[9] A session typically lasted for about an hour.

The Norwegian participants were undergraduate and graduate students from the Norwegian School of Economics and Business Administration in Bergen, who all studied (business) economics. They were mainly recruited by posters and in classrooms, asking for participants for a decision-making experiment, and promising monetary rewards contingent on performance. The Dutch participants were undergraduate and graduate students from Tilburg University. These students came from various disciplines like law and psychology, but the majority studied economics.[10] Dutch subjects were mainly recruited by an announcement in the University Bulletin and by posters. None of the participants had previous experience from any related experiment and none of them participated more than once. In both countries, people showing up together when signing up for the experiment were allocated to different sessions. Subjects did not get to know anything more specific about what type of game they would be playing before the experiment started.

Upon arrival, subjects were randomly seated behind computer terminals, which were separated by partitions. Instructions in the subjects' own language were distributed and read aloud by the experimenter.[11] After that, subjects got several minutes to study the instructions more carefully and to ask questions.

After one practice round, the subjects played 15 repetitions of the gift exchange game. In each round, subjects were randomly and anonymously paired into four couples, and also randomly assigned to have a high endowment in either the first or the second period. For each couple, player 1 made a transfer (e_1) to player 2, after which player 2 was informed about e_1. Then the two players switched roles, and player 2 made a

[9]The fact that one session had only 6 participants was not planned but occurred because of no shows. Since the results of that session are not substantially different from those of other sessions within the same treatment, we pool the data from this session with the data from the other sessions.

[10]We have not found any significant difference in behavior between economics students and other students in the Netherlands.

[11]An English translation of the instructions is included as appendix to this paper.

transfer (e_2) to player 1. Earnings of player i in each round (u_i) were denoted in points and calculated according to equation (2). Subjects could also use a table included in the instructions, which gave u_i as a function of e_i and e_j (see appendix). Subjects knew that a total of 15 rounds would be played and that after the last round the points earned in all rounds would be accumulated and transferred into money earnings at a fixed known rate.

After 15 rounds, subjects were privately paid their earnings in cash and left. Each point in the experiment in Norway and the Netherlands earned 20 øre and 5 cents, respectively. In addition, Norwegian participants received 20 Norwegian Kroner for showing up in time and the Dutch ones 5 Dutch Guilders.[12] From the remarks subjects could make on a sheet during the experiment and from discussions we had with subjects afterwards, we infer that they understood the game very well. They were typically more concerned with how to play the game rather than with its interpretation.

It is important to note that in every round a new random and anonymous assignment of the players to the couples took place, i.e. that a subject was not matched with the same subject for all rounds. Furthermore, in each round it was randomly determined who was first to decide on a gift. By this procedure, the 15 repetitions are almost one-shot games and the scope for individual reputation building is minimized.[13]

In cross-cultural experimental studies one should in general be aware of three potential risks: experimenter effects, currency effects and language effects (Roth et al. (1991)). In our experiment we have tried to minimize these effects by taking the following precautions. One of the experimenters was present during the experimental sessions in both countries. Existing exchange rates were used to transform the payoff schedules. Finally, the instructions were translated from Dutch to Norwegian by one of the experimenters who is familiar with both languages. After that, they were compared with an English translation by another person who speaks all three languages.

4 The data

In this section, we summarize the main features of our experimental data. Table 2 presents for both countries separately, a detailed overview of the gifts e_1 and e_2 exchanged by all matched pairs of first and second players, respectively, over the 15 rounds of all relevant sessions of the gift exchange experiment, along with means and standard deviations.

[12] At the time of the experiment, one Norwegian Krone exchanged for about 0.27 Dutch Guilders, and one Dutch Guilder was about \$0.50. The potential earnings in both countries were similar in relative terms. Expected earnings, based on previous experience of the experimenters, were somewhat higher than what students could earn with one hour of work in, for instance, a bar.

[13] See Kreps and Wilson (1982) for reputational effects in repeated games.

Table 2: Gifts by matched pairs of players

Netherlands

$e_1 \setminus e_2$	0	1	2	3	4	5	6	7	*Total*
0	78	0	2	1	3	0	0	7	91
1	19	3	1	0	0	0	0	1	24
2	35	7	3	0	1	0	0	0	46
3	42	3	7	14	0	0	0	1	67
4	40	7	4	4	6	0	0	0	61
5	2	2	0	0	0	0	0	0	4
6	0	0	0	0	0	0	0	0	0
7	7	0	0	0	0	0	0	0	7
Total	223	22	17	19	10	0	0	9	300

$\bar{e_1} = 2.10$, $s_{e_1} = 1.74$, $\bar{e_2} = 0.72$, $s_{e_2} = 1.54$

Norway

$e_1 \setminus e_2$	0	1	2	3	4	5	6	7	*Total*
0	54	1	0	0	1	0	0	5	61
1	15	5	0	1	0	0	1	0	22
2	26	0	8	2	0	0	0	0	36
3	48	7	10	15	3	0	1	0	84
4	74	3	6	13	28	0	0	0	124
5	6	0	0	0	5	1	0	0	12
6	1	0	0	0	0	0	0	0	1
7	3	0	1	0	0	0	0	1	5
Total	227	16	25	31	37	1	2	6	345

$\bar{e_1} = 2.73$, $s_{e_1} = 1.63$, $\bar{e_2} = 1.06$, $s_{e_2} = 1.70$

A first observation from the table is that average gifts are positive, which contrasts the game-theoretic prediction of zero transfers. Second, the average gifts by both first and second players are significantly higher in Norway than in the Netherlands: A non-parametric Mann-Whitney U test with session averages as units of observation reveals that for first and second players the hypothesis that average gifts are equal across countries can be rejected at the 10-percent level (see also section 5, in particular Table 8). Third, the average value of e_1 is much higher than the average value of e_2; in both countries this difference is significant at the 5-percent level (using a non-parametric Wilcoxon test with session averages as units of observation). Notice, moreover, that all gifts range from 0 to 7, but that only for Norwegian first players a positive gift occurs most frequently: the mode of e_1 is 4 in Norway.

[Insert Figures 1 and 2 about here]

If one considers the development of gifts over time, it turns out that gifts decline over rounds, but that last round gifts are still positive (see Figures 1 and 2 for the average gift

by round for the Netherlands and Norway, respectively). More importantly, it appears that the large differences between e_1 and e_2, as suggested by Table 2, are persistent over time: In all rounds, the average value of e_1 is about 2.5 - 3 times as high as the average value of e_2 in both Norway and the Netherlands.

Consider again the frequency distributions of gifts by first and second players in Table 2. The table shows that the percentage of zero gifts by player 2 is in the neighborhood of 70 percent for both countries, and somewhat higher for the Netherlands than for Norway. Thus, on average across both countries, some 70 percent of second players act in agreement with individual rationality, while the remaining 30 percent display cooperative behavior by giving positive amounts. Turning next to the distribution of gifts by first players, we see that the percentage of zero transfers is much lower in Norway than in the Netherlands (18 and 30 percent, respectively). Examining the positive transfers made by players 1 and 2 a bit closer, it turns out that in Norway, higher positive transfers (3, 4) occur more frequently than lower ones (1, 2) for both players, at least for transfers in the interval [1,4], whereas in the Netherlands, this only holds for first players, but not for second players.

In sum, we see that the Norwegian subjects exchange larger gifts and hence reap greater benefits than their Dutch counterparts, and that these differences in behavior and performance are persistent across all rounds of the game.

One puzzling feature of the data, which can be seen from Table 2, is that the largest gifts by player 2 come in response to zero gifts by player 1. For both subject groups, the median gift is the largest possible one of 7 for those second players who transfer positive amounts in response to zero gifts by first players. We believe that this apparent anomaly is due to an attempt by some subjects to signal their interest in establishing one of the asymmetric socially optimal strategies, which were shown in section 3 to yield the maximal expected payoff in the gift exchange game, for one of these strategies is to give 7 as player 2 in response to a zero gift by player 1.

This type of *social maximizing* behavior is clearly quite different from the cooperative behavior mode of our rule-based decision model, and so the question is how to deal with it. Given the nature of the rule-based decision model, one natural alternative would be to include it as a third behavior mode, and estimate submodels for it along with the submodels for the other two behavior modes. For player 2, this is clearly a feasible alternative, since the social maximizing behavior mode is easily distinguishable from the other modes by its return gift of 7 in response to zero. For player 1, one would need information about expected return gifts in order to distinguish between social maximizers, who make zero gifts because they expect high gifts in return from other social maximizers, and players in the opportunistic mode, who make zero gifts because they expect nothing in return from anybody. Our data set does include information about first players' expectations, and in 16 out of all 645 cases, player 1 makes a zero gift and expects to

get 7 in return. As can be seen from Table 2, the corresponding number of observations with social maximizing second players is 12 (5 in Norway (all different subjects) and 7 in the Netherlands (1 subject does it in 4 rounds, and 3 other subjects)). In any case, the number of observations where some player is in the social maximizing mode is so small that it makes little sense to add submodels for that behavior mode. Instead, we will exclude those observations where player 2 gives 7 in response to zero when we estimate the reciprocity part of the model, and those observations where player 1 expects 7 in response to zero when we investigate the behavior of player 1.

5 Estimation of the rule-based decision model

In this section, we estimate the rule-based decision model described in section 2 on the set of cross-country experimental data from the gift exchange game. Recall that by this model, the decision making process is a two-stage procedure: In stage 1 the player's decision mode is determined by a draw from a probability distribution p on the two decision modes C (cooperative) and O (opportunistic), and in stage 2, the agent chooses a non-negative effort level e (i.e. transfers an amount e to the other player), conditional on the mode selected in stage 1.

We begin by considering the behavior of second players, as described by the mode selection mechanism and the reciprocity model: In subsection 5.1, we estimate the probability that subjects are in the cooperative mode (the function $p_2(e_1)$) while in subsection 5.2 we estimate the reciprocity model (the function $e_2(e_1)$). We estimate these functions for the Dutch and Norwegian subgroups separately, to uncover possible differences in trustworthiness and reciprocity between them. Subsection 5.2 also presents some results from a control treatment with the gift exchange game as a validity check on our findings. In subsection 5.3, we first present some empirical results on the behavior of first players. We then compare differences between the Dutch and Norwegian subject groups in terms of joint behavior of first and second players to check the overall consistency between our empirical results and the theoretical model.

5.1 Estimation of the mode selection mechanism for player 2

In order to determine the probability that subjects are in the cooperative mode (given by $p_2(e_1)$), and to identify possible differences in trustworthiness between the two groups of subjects, we introduce the binary variable C (for cooperative mode), which is 1 if e_2 is positive, and zero if no effort is made, i.e. if $e_2 = 0$ (see also Table 1). Thus, the variable C_i (for agent i) is defined as

$$C_i = \begin{cases} 1 \text{ if } e_{2i} > 0 \\ 0 \text{ if } e_{2i} = 0 \end{cases}$$

with e_{2i} the effort made by player i when acting as a second player. We then estimate the probability that $C_i = 1$ by the following standard logit model

$$P(C_i = 1|x_i) = P(y_i^* > 0|x_i) = P(x_i'\beta + \epsilon_i > 0|x_i) = P(\epsilon_i > -x_i'\beta|x_i) = (1 + e^{-x_i'\beta})^{-1}$$

where $y_i^* = x_i'\beta + \epsilon_i$, and ϵ_i follows a logistic distribution. We use the data set consisting of all Dutch and Norwegian player pairs. As potential explanatory variables x we take all linear and quadratic terms in e_1 (transfer by player 1) and r (round number), i.e. e_1, r, $e_1r = e_1 \times r$, $e_1sq = e_1 \times e_1$, and $rsq = r \times r$. By using a forward selection procedure and a 5 percent minimum significance level, the model appears to consist of the 3 explanatory variables e_1, e_1r and e_1sq. To allow for individual-specific effects, we have also estimated a fixed effect logit model.[14] The results of both models are shown in Table 3. As can be seen from the table, allowing for individual-specific effects has no significant impact on the results.

Table 3: Estimated trustworthiness. Pooled data

	standard logit		fixed effects logit	
variable	coeff.	p-value	coeff.	p-value
e_1	1.072	0.000	1.024	0.000
e_1sq	-0.108	0.000	-0.095	0.010
e_1r	-0.039	0.000	-0.045	0.000
constant	-1.877	0.000	na.	na.
log-likelihood	-361.04		-158.05	

By taking the derivative of $P(C_i = 1|x_i)$ with respect to e_1 and r, using the estimates of Table 4, we can derive how the probability of being in the cooperative mode is related to changes in the transfer of player 1 and the number of the round, respectively. It turns out that for the large majority of the observed values of e_1 and r (79% of all observations), the probability of triggering the cooperative mode of player 2 is an increasing function of e_1, but that the effect of round number is always negative. Thus, in particular, it becomes more difficult for player 1 to trigger a cooperative response by player 2 as the game approaches the final round.

In order to see if there are any systematic differences between the trustworthiness of the two groups of subjects, we introduce a dummy *hol* for the Netherlands (Holland),

[14]See, e.g. Baltagi (1995) for a general introduction to panel data techniques and Chamberlain (1980) for estimation methods for fixed effects logit models. The fixed effects logit model (or conditional logit model) is obtained if we assume that the error term ϵ_i is given by $\epsilon_i = \mu_i + \nu_{it}$, where the μ_i are assumed to be unknown fixed individual-specific parameters and the remainder disturbances ν_{it} are iid $(0, \sigma_v^2)$, independent of each other and of x_{it}. We have also performed a random effects logit regression, but the results are very similar to the other specifications (available upon request).

and the variables $he_1 = e_1 \times hol$, $he_1sq = e_1sq \times hol$ and $he_1r = e_1r \times hol$. We then re-estimate the model and obtain the results depicted in Table 4.

Table 4: Test of country-specific differences in trustworthiness

	standard logit		fixed effects logit	
variable	coeff.	p-value	coeff.	p-value
e_1	1.062	0.000	1.135	0.000
e_1sq	-0.094	0.027	-0.109	0.019
e_1r	-0.043	0.000	-0.057	0.000
he_1	-0.013	0.970	-0.356	0.421
he_1sq	-0.034	0.603	0.052	0.516
he_1r	0.011	0.481	0.031	0.121
hol	-0.071	0.872	na.	na.
constant	-1.827	0.000	na.	na.
log-likelihood	-359.54		-156.45	

As can be seen from Table 4, none of the country-specific variables are individually significant. Moreover, a joint likelihood ratio test of these variables reveals no significant difference between the two data sets as regards cooperative behavior. This implies that Dutch and Norwegian subjects display the same degree of trustworthiness and that the probability of being in the cooperative mode, as affected by stimuli in terms of varying transfers, is also the same. Given the differences in gift behavior between the two groups of subjects, as mentioned in the previous section, this suggests that the observed differences must be related to differences in trust and reciprocity among cooperating subjects, and not to differences in the probabilities of choosing the cooperative mode.

5.2 Estimation of the reciprocity model for player 2

To see if differences in trust and reciprocity among cooperative subjects can explain the observed differences, we consider for each country the set of second players who display cooperative behavior by transferring a positive amount to player 1.[15] We estimate the reciprocity function $e_2(e_1)$ both by means of a simple OLS regression of e_2 on e_1, as well as a fixed effect regression. The results for the Netherlands and Norway are depicted in Tables 5 and 6, respectively.

The table shows that the reciprocity coefficient in the Netherlands is not significantly different from zero ($p > 0.49$), while in Norway it is significant and close to 1/2 ($p <$

[15] As mentioned earlier, we exclude 12 observations where player 2 gives 7 in response to a zero gift by player 1, which indicates that player 2 is in the social maximizing mode discussed in section 4.

Table 5: Estimated reciprocity model for the Netherlands

	OLS		fixed effects	
variable	coeff.	p-value	coeff.	p-value
e_1	-0.086	0.495	0.015	0.886
constant	2.627	0.000	2.343	0.000
R^2	0.0		na.	

Table 6: Estimated reciprocity model for Norway

	OLS		fixed effects	
variable	coeff.	p-value	coeff.	p-value
e_1	0.472	0.000	0.584	0.000
constant	1.345	0.000	0.971	0.002
R^2	0.20		na.	

0.001). Again, the size of the estimated coefficients and the p-values are robust across the chosen specifications.[16] It implies that there are two incentives for Norwegian players 1 to make positive gifts to player 2: First it increases the probability of triggering the cooperative mode of player 2, and second, it increases the transfer by player 2, given that player 2 is in the cooperative mode. In the Netherlands, however, only the first effect is present, and this explains the relatively low transfers by first players in the Netherlands as a rational response by opportunistic first players to the absence of reciprocity, and the low transfers by second players as the result of low gifts by first players triggering few cooperative second players. It appears that trust induces cooperation, and this relationship is as strong in the Netherlands as in Norway. However, the degree to which trust induces reciprocity proves to be much higher in Norway.[17]

Additional evidence for this conclusion can be derived from the control treatment. Recall that the only difference between the basic treatment and the control treatment is that in the former treatment, player 2 is informed about e_1 before she has to decide on e_2 whereas she is not informed about this in the latter treatment (see footnote 8). Consequently, in the control treatment, players can display trust and cooperation, but

[16]The results still hold if we control for potential dynamic effects by including round number, gifts received and made in the previous round, and player position in the previous round as additional explanatory variables.

[17]In an overlapping generations variant of the gift exchange experiment, only run in the Netherlands, Van der Heijden et al. (1998b) also find hardly any signs of reciprocity among Dutch subjects.

not reciprocity.[18] Table 7 lists average gifts by country and by player, averaged over all 15 rounds and 5 sessions that were run with the control treatment in each country, with standard deviations in parentheses. For the sake of comparison, Table 8 presents the corresponding results of the basic treatment. The bottom rows of the tables show whether the gifts by players 1 and 2 are different in a particular treatment (using a non-parametric Wilcoxon test with session averages as units of observation). The last columns show the results of a non-parametric Mann-Whitney U test to see whether the average values of e_1 and e_2 differ across countries.

Table 7: Average gifts by player and country for the control treatment

	Netherlands	Norway	significance
e_1	0.99 (1.50)	1.43 (1.92)	p=0.35
e_2	1.03 (1.47)	1.21 (1.80)	p=0.83
significance	p=0.35	p=0.69	

Table 8: Average gifts by player and country for the basic treatment

	Netherlands	Norway	significance
e_1	2.10 (1.74)	2.73 (1.63)	p=0.07
e_2	0.72 (1.54)	1.06 (1.70)	p=0.10
significance	p=0.03	p=0.05	

As can be seen from Table 7, the average gifts by players 1 and 2 are not significantly different in the control treatment. This contrasts with the results of the basic treatment shown in Table 8, where these differences are significant at the 5% level. Furthermore, whereas the Norwegian and Dutch subjects behave quite differently in the basic treatment, these differences do not show up in the control treatment. In fact, the frequency distributions of e_1 and e_2 (not shown here) hardly differ across countries. In particular, the percentage of zero gifts is 55.8% for the Netherlands and 56% for Norway in the control treatment.

The results from the control treatment thus lend additional support to our claim that the two groups of subjects are similar on the dimensions of trustworthiness and

[18] That is, the experimental design is such that reciprocal acts, in the sense of reacting to observed behavior (as in the definition of Gouldner (1960)), are only possible in the basic treatment. A much weaker form of reciprocity, namely reciprocating anticipated gifts (as in the reciprocity definition of Sugden (1984)), is possible in both treatments. The literature on social capital (Coleman (1988), Putnam (1993), and Knack and Keefer (1997)) emphasizes, however, the conditional element of reciprocity, and this strong form of reciprocity is precluded in our control treatment.

cooperation, and that the difference in aggregate performance between the two groups is due to differences in reciprocal behavior.

The average payoffs of the subjects illustrate this: recall that the Nash equilibrium payoff is 9, while the average payoffs are 18.7 and 20.7 for Dutch and Norwegian subjects, respectively. Thus the difference in reciprocated trust between the two countries results in an increase in the value of social capital of approximately 20%.

5.3 Some empirical results for player 1

We conclude this section by presenting some results on the behavior of first players in our experiment. Ideally, we would like to proceed in the same manner as for second players, and distinguish between opportunistic and cooperative players to see if there are any systematic differences between the two behavior modes. However, the data do not allow us to distinguish sharply between the behavior modes of first players. In particular, a positive gift by player 1 does not necessarily mean that he is in the cooperative behavior mode, because opportunistic first players may also find it in their interest to make positive gifts in order to trigger the cooperative behavior mode of player 2. We suggest to deal with this problem by considering only those first players who played second in the previous period, and using their behavior mode in that period as a proxy for their behavior mode in the current period. To that end, we introduce a dummy variable NICE, which is 1 if the player made a positive gift in the previous round, and zero otherwise.[19]

Table 9: Average gifts by first players who played second in the previous round

NICE	Netherlands	Norway	significance
0	1.92 (1.72)	2.49 (1.61)	p=0.07
1	2.84 (1.27)	3.52 (1.10)	p=0.09
significance	p=0.07	p=0.02	

Table 9 shows the average gifts for the first players who played second in the previous round, conditional on the dummy variable NICE and country, along with standard deviations.[20] We also present significance levels of a Wilcoxon test and a Mann-Whitney U test of equality between rows and columns, respectively, using session averages as units of observation.

[19]The implication of this definition is that returning zero in response to a zero gift in the previous round is classified as non-NICE behavior, which may be questionable. Dropping those observations does not yield any significant changes in the results, however.

[20]We exclude 16 observations where player 1 makes a zero gift and expects to get 7 in return, which indicates that player 1 is in the social maximizing mode.

The table shows that NICE first players make significantly higher gifts than the non-NICE ones, especially in the Norwegian subject group. In other words, cooperative first players are more inclined to trust their partners, as compared to opportunistic ones, which suggests that social norms are a stronger motivational basis for trust than pure self-interest. The table also shows that the Norwegian first players make higher gifts than the Dutch ones, no matter whether they played NICE or not in the previous round.[21] In view of our main result on the differences in reciprocity between the Dutch and Norwegian subject groups, this suggests that trust is vulnerable to lack of reciprocity, not only among those subjects who act according to pure self-interest, but also among those who are mainly motivated by social norms. Although the psychological mechanisms that link trust and reciprocity may be different in the two decision modes, the result is the same: Reciprocity induces trust, which in turn induces reciprocity.

6 Conclusion

Trust, cooperation and reciprocity have been identified as important elements of social capital formation in several earlier empirical and experimental studies. In particular, Knack and Keefer (1997) suggest that there exists a positive feedback relationship between trust and trustworthiness, whose strength is in part determined by the degree of reciprocity present in society. With aggregate data it is difficult to disentangle the effects and interactions of these variables in the formation of social capital. The present paper contributes to this literature by constructing and estimating a decision model that combines norms and individual rationality, which allows one to examine the relationship between trust, cooperation and reciprocity.

Our model is an instance of the theory of rule-based decision making introduced by March and Simon (1958). The theory of rule following rests on a "logic of appropriateness", which involves classifying the situation, identifying one's role in that situation, and choosing an action which is appropriate for someone who plays that role in the given situation (see also March (1994) and March and Olsen (1989)). In our model, individual behavior is sometimes motivated by norms on trust and cooperation, and sometimes by pure self-interest, according to a random mechanism that is not the outcome of conscious deliberation, but that may depend on the specific characteristics of the choice situation in which the individual finds herself. In the model, social capital emerges from the interaction between these forms of motivation, and the normative concepts of trust, cooperation and reciprocity have natural counterparts in terms of observable behavior.

[21] One could argue that the decision to make a positive gift as a first player is not related to the mode a player is in, but is (purely) driven by the expectation that other players cooperate (in response to a positive gift). It turns out, however, that the expected return gifts do not differ significantly between Norwegian and Dutch subjects who played NICE in the previous round.

Our model is different from other models that have recently appeared in the literature. We suppose that people do not behave according to a logic of consequences (where decisions are made on the basis of intendedly rational calculation) but according to a logic of appropriateness (based on rule following). Recently, Messick (1999) has argued that the theory of rule-based decision making may be more adequate than traditional consequentialist models (like e.g. Rabin (1993), Bolton and Ockenfels (2000), Fehr and Schmidt (1999), and Levine (1998)) to account for human decision making in some circumstances, stressing the need for "a theory to improve our understanding of how social situations are perceived and what the role of personal and environmental factors are in this process" (p. 27). The present paper may be seen as a first attempt to meet this need. We believe that our model can be applied to other experimental situations, where interaction between norms and individual rationality is likely to be of some importance. Examples are the trust game of Berg et al. (1995), and experimental labor market situations as studied by Fehr and others (e.g. Fehr et al. (1993, 1997, 1998), Kirchler et al. (1996)). In such experiments, the typical finding is that subjects behave cooperatively to some degree, but it is often difficult to explain why they do so, and, in particular, whether they are motivated by trust, reciprocity or some other social norm. Whereas most models are only suited to explain behavior in the long run (equilibrium behavior), our model can be used for the short run as well.

We have applied our rule-based decision model to a set of experimental data from a gift exchange game for Norway and the Netherlands. At first sight, a cross-cultural experimental study between Norway and the Netherlands may not look so interesting as the two countries seem to be very similar on most dimensions (like location, type of welfare state etc).[22] In spite of that, data from surveys like the World Value Surveys suggest that the countries differ in ways that agree with our findings. We find that the Norwegian subject group performs better in our experiment than the subject group from the Netherlands. In addition, we find that trust induces cooperation, and that there is no significant difference between subjects in the Netherlands and Norway with regard to the nature and strength of this relationship. However, the extent to which trust induces reciprocal behavior differs significantly between the two subject groups. Differences in trust are accounted for by this difference in reciprocity, and hence indirectly, reciprocity accounts for cooperation as well. We believe that the fact that such sharp conclusions can be drawn from data from two countries that look similar, gives us a stronger case than if we had found differences between say Norway and Indonesia.

[22]See also e.g. Hofstede (1980) for differences in cultural dimensions.

Appendix

This appendix gives the English translation of the (Dutch) instructions of the gift exchange experiment. The text between square brackets ([ ]) was added in the basic (information) treatment. The text between brackets ({ }) was added when more than 8 participants showed up.

Introduction (read aloud only)

You are about to participate in an experimental study of decision-making. The experiment will last for about one hour. The instructions of the experiment are simple and if you follow them carefully and make good decisions you may earn a considerable amount of money. All the money you earn will be yours to keep and will be paid to you, privately and confidentially, in cash right after the end of the experiment

{For the experiment it is of crucial importance to have 8 participants. However, experience learns that often 1 or 2 persons do not show up or do not show up in time. Therefore, we need to have 10 instead of 8 subscriptions. This sometimes has, as now, the consequence that too many participants are present and that 1 or 2 persons cannot participate in this experiment. These persons can still put their name down for one of the following experiments and receive Dfl 10 for any inconvenience. These persons are determined by lot because one or two blank envelopes are added to the box with seating numbers, unless one of you checks in voluntarily not to participate in the experiment and receive Dfl 10 instead.}

Before we go on with the instructions, I would like to ask all of you to draw an envelope from this box and open it. The number denotes the terminal you have to be seated. {If you draw a blank envelope you cannot participate in the experiment and you receive Dfl 10.}

We will distribute the instructions of the experiment now and read through them together. After that, you will have the opportunity to ask questions. From now on, you are requested not to talk to, or communicate with, any other participant.

Instructions (distributed and read aloud)

Decisions and earnings

The experiment exists of fifteen separate rounds. In every round, each of you will earn a certain amount of points. At the end of the experiment the points earned in the 15 rounds are added up for each participant separately. Every point earned is worth 5 cent ($\approx$\$0.028) at the end of the experiment. In addition to this, all participants receive a fixed extra amount of Dfl 5. Your total earnings will thus be equal to Dfl 5 plus the

number of points earned times 5 cent. Now, we describe how the points earned in each round will be determined.

In each round you will be matched with another participant. Each round will consist of two periods. In every round you have in one period the role of Decider and in the other period the role of Receiver. The earnings of a participant in a round are determined by the final assets of a participant in the period in which he or she is a Decider, and by the final assets of the participant in the period in which he or she is a Receiver. We denote the final assets as Receiver by EO and the final assets as Decider by EB. The earnings in points of a participant in a round are determined by the product of the final assets as Receiver and the final assets as Decider. The earnings of a participant in a round are thus equal to EB $\times$ EO points. Next, we describe how the final assets as Decider EB and the final assets as Receiver EO are determined.

In each round the participants are first randomly matched two by two. After that the computer determines for each couple who will be the Decider in the first period and who will be the Decider in the second period. In the second period the roles are reversed: the Decider in the first period is thus the Receiver in the second period and the Receiver in the first period is the Decider in of the second period. The Receiver starts with an endowment of 1, whereas the Decider starts with and endowment of 9. The Decider has to decide which part of his or her endowment he or she wants to transfer to the Receiver. This transfer, which we will denote by T, is 0 at the minimum, and 7 at the maximum. After the Decider has decided about the transfer T to the Receiver, the final assets of the Receiver are EO=1+T, and those of the Decider are EB=9-T. After the Decider has decided about her or his transfer to the Receiver, the second period of the round will be started, in which the roles are reversed.

In the second period, the other participant of the couple, who is the Decider now, will have to make a decision. The determination of the final assets of the new Receiver and Decider in this period is similar to the previous period. The Receiver starts with an endowment of 1 and the Decider starts with an endowment of 9. The Decider decides again on the part of her or his endowment that will be transferred to the Receiver. This transfer T determines the final assets of both participants in the second period: EO=1+T for the Receiver and EB=9-T for the Decider.

As said, your earnings in a round are determined by the product of your final assets EB in your role of Decider and the final assets EO in your role of Receiver. Your assets EB are dependent on your transfer to the Receiver in the period you are Decider and your assets EO are dependent on the transfer from the Decider to you in the period you are Receiver. To facilitate the determination of your earnings, you may use the table below.

The table states your earnings in points in a round dependent on the transfer from you to the Receiver when you are Decider and the transfer to you by the Decider when

you are Receiver. In this table the rows present the transfer from you as Decider to the Receiver and the columns present the transfer to you as Receiver from the Decider. When you first look for the transfer from you in the row and then go to the right to the column stating the transfer to you, you can read your earnings in points, EB × EO, for the round. The earnings in money are determined by multiplying the stated amount in points by 5 cents.

		Transfer *to you*							
		0	1	2	3	4	5	6	7
	0	9	18	27	36	45	54	63	72
	1	8	16	24	32	40	48	56	64
	2	7	14	21	28	35	42	49	56
Transfer	3	6	12	18	24	30	36	42	48
from you	4	5	10	15	20	25	30	35	40
	5	4	8	12	16	20	24	28	32
	6	3	6	9	12	15	18	21	24
	7	2	4	6	8	10	12	14	16

When the two period in a round are over, so when both participants have decided on a transfer, a new round will be started.

Procedure and usage of the computer

After we have gone through the instructions, first a practice round will be run. After the practice round, the fifteen rounds that determine your earnings for this experiment will be run.

In every round the computer, in a completely random manner, first determines who will be matched to whom. Then the computer determines, again in a random manner, for each couple who will get the role of Receiver and Decider in the first period. On the upper left part of the screen the Decider will see the number of the current round and the message " You are now Decider in the first period". Underneath the Decider will seethe question "How much of your endowment do you transfer (0-7)?" The Decider has to type an integer from 0 up to and including 7. The number typed is the transfer T to the Receiver with whom he has been matched in this round.

Next, the current Decider will be asked the question "How much do you expect to receive?". Here, the Decider types an integer from 0 up to and including 7, dependent on her or his expectation about the transfer she or he expects to receive as Receiver in the next period. This expectation is used by us when analyzing the experiment, but your earnings will be unaffected by it. Besides, the other participants are not informed about

your expectations stated.

After all Deciders have made a decision, the first period is over. In the second period the Receivers of the first period are now the Deciders. Every new Decider will see on the screen that in this round he or she is Decider in the second period [and how much he or she has received in the previous period]. Underneath there is the question "How much of your endowment do you transfer (0-7)?. The Decider has to type an integer from 0 up to and including 7. The number typed is the transfer T to the Receiver with whom he has been matched in this round. When all Deciders of the second period have made a decision all participants will see how much they have received and what their earnings for the rounds are. These earnings are in points and are equal to the product of the final assets as Decider and the final assets as Receiver: EB $\times$ EO. After one has been informed about this, the round is over and a new round will be started.

In the new round, the computer again determines first who will be matched with whom and next for each couple who will be the first Decider. So, you do not know with whom you are matched in a particular round and whether you will be the first or the second Decider.

Summary

The experiment consists of 15 rounds, and every round consists of 2 periods. In each round the participants are randomly matched two by two by the computer. In each round every participant has in one period the role of Decider and in the other period the role of Receiver. When you are Decider your endowment is 9 and your final assets depend on your transfer T to the Receiver: EB=9-T. When you are Receiver your endowment is 1 and your final assets depend on the transfer T by the Decider to you: EO=1+T. Your earnings in points in a round are determined by the product of your final assets as Decider and your final assets as Receiver: EB $\times$ EO. [After the first period of a round is over the new Deciders are informed about the transfer T which they have received in the first period.] After both periods in a round have been finished, everybody is informed about the transfer T to him or her and his or her earnings in that round.

The matching of the participants and the order in which participants are Decider in the two periods of a round are determined by the computer in a completely random way time after time. You will never be able to know whether you will be the first or the second Decider in a particular round, or with whom you are matched in a particular round.

Final remarks

After the last round, you will first be requested to answer some questions to evaluate the experiment. This questionnaire is anonymous. We can link your answers to your seat

number but not to your name. After that, you will be called by your seat number to receive your earnings privately and confidentially. Your earnings are your own business; you do not need to discuss with anyone. It is not allowed to talk to or communicate with other participants during the experiment in either way.

On your table you will find an empty sheet, which you can use to take notes. Additionally, you will find a sheet labeled "REMARKS". On this sheet you can make remarks about the instructions or your decisions.

You get a couple of minutes to go through the instructions and to ask questions. When you want to ask something, please raise your hand. One of us will come to your table to speak to you.

After that we will start the practice round.

Are there any questions?

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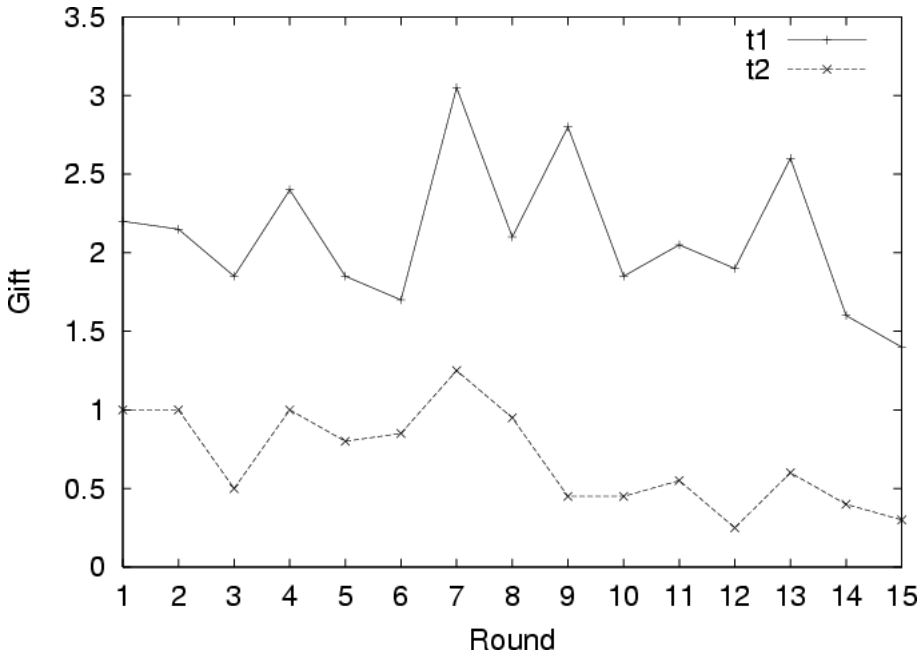

Figure 1: Average gifts t_1 and t_2 by round in the Netherlands

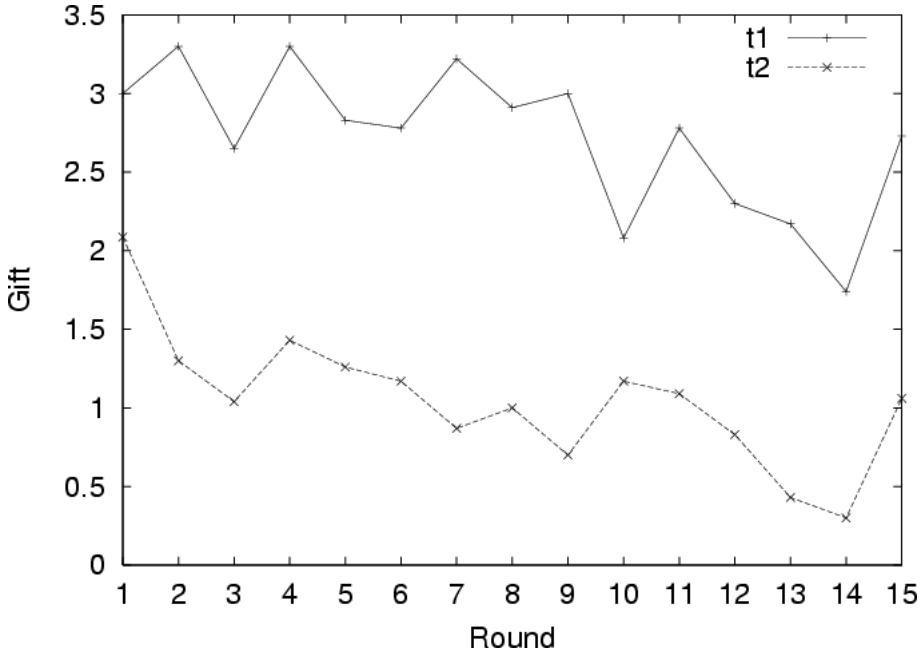

Figure 2: Average gifts t_1 and t_2 by round in Norway