Sociality is Not Lost with Monetary Transactions within Social Groups

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Sociality is Not Lost with Monetary Transactions within Social Groups

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Abstract. This paper investigates how the group membership fee influences the cooperation rate within the groups formed through the socialization. Our previous findings suggest that socialization, or social interactions in groups, create sociality and, therefore, establish a society with sustained cooperation and fairness. In line with Social Identity Theory, we assert some esteem or value to be gained through group differentiation. What will happen with this additional value once we try to quantify it? For this purpose, we observed two cases: socialized participants should pay the fee to stay in-group; participants should pay the fee to join the group, socialize and stay there. We find that monetary transactions are not determinative on their own; rather the consequences of these transactions can hurt collective action through a forced division of participants into those who paid enough (in-group) and those who did not (out-group). Moreover, despite the fact that being in-group and out-group is an economically equal situation, participants are willing to pay the fee to stay in their socialized group or pay the fee to join the group before socialization.

Keywords: Prisoner's Dilemma, Socialization, Cooperation, Auction, Group Formation, Membership Fee, Experimental Economics.

1   Introduction

Over the time of the human existence, people interact with each other through communication, everyday activities, solving personal and social issues. In addition, the same social contacts are bound by commodity-money relations. In general, the human interactions progress with humanity. Development of new technologies allowed uniting large numbers of people despite the geographical distance, the difference in time and education. Such interaction is beyond the scope of models that are based on personal contact. What remains the same? It is the creation of collective action for any group of people. Inter alia while interacting socially, a group of people consistently faces economic interactions.

How often do money change our behavior? The answer is obvious - constantly. Is the attitude to money different inside circles of friends, clubs, dance schools and other community organizations? Often, the maintenance of these institutions requires certain investments, of which you are not even aware when you decide to enter them. How can the requirement of cash contributions affect the motivation and the cooperative spirit of the group? Even in a circle of old friends, issues related to money may give rise to a discord in the relationship. On the other hand, monetary relations are an integral part of our lives. Therefore, the question of money influence on the creation and maintenance of collective action is urgent.

From the point of voluntary investments, we can recall the study [1] that showed that voluntary contributions are not only characteristic of long-established organizations. It is inherent to the groups formed in the laboratory too. So, a group of not familiar people can be switched to collective action resulting in maximizing non-individual utility. What if we are talking about the entrance fee? How often do we deny ourselves something when we need to pay for it? We go to less popular clubs, do not dare to enter into a private organization, etc. Still, we understand that the fee is not commensurate with what gives you a club membership. What motivates us, and does it work for everyone?

The work [2] demonstrated that segregation is arranged in such a way that the person seeks the group, in which he expects to benefit the most. On the other hand, the article [3] claims that any movement between the groups adversely affects the cooperation. It turns out that the highest cooperation is expected in the group set up by personal preference with a strictly fixed number of participants. We have previously found [4–7] that the cooperation rate in a laboratory group where subjects can interact and choose a group can be similar to the cooperation of groups that have longstanding ties and that brain area associated with self-control can modulate the valuation system for cooperating in-group [8]. Thus, the purpose of this study is to explore how fee changes the behavior of the members within the group, as well as attitudes towards auctions from different types of personalities.

The article [9] states that the participants tend to overpay in the auctions. Nevertheless, it is logical to assume that a certain baseline should be different for the prosocial, individual and competitive types, according to Social Value Orientation (SVO) test [10, 11]. We also want to study the attitudes towards groups for different types of personalities. For someone to feel belonging to a group is more important than the big

profit inside this group. Does it work in the case of a paid entry into the group? Researchers [12] argue that the prosocial type does not change their behavior in any situation. However, what happens to the other types? Perhaps the fee for being in a group can change the behavior of individualists, because this type tends only to maximize personal utility, rather than the difference between their own and other utility [13, 14]. Since the payment obviously contributes to the individual utility, it also changes the individual behavior. Thus, we hypothesize that a change in cooperation depends on the personality type of the subject.

2 Materials and Methods

The study procedures involving human participants were approved by Skolkovo Institute of Science and Technology (Skoltech) Human Subjects Committee. Written informed consents were obtained from participants.

Subjects (N = 168, 105 males) for the experiment were recruited from the students at the Moscow Institute of Physics and Technology (MIPT). The MIPT Experimental Economics laboratory was used to carry out all experiments. Each experiment consisted of 12 students, pre-selected before the experiment to be unfamiliar with one another. Before each experiment we collected the "social value orientation" (SVO) scale [10], which is a measure of the subjective utility individuals tend to place on social interaction and belonging. A specialized tool to design and carry out group experiments in experimental economics, z-Tree developed at the University of Zurich, was used [15]. Experimental z-Tree files are available on Dropbox: https://www.dropbox.com/sh/5awykl6iu8dv4hl/AAD8qmPX5QaO3_-Bczwnwf0_a?dl=0

After the end of each treatment, participants provided feedback about the experiments received payments and left the experimental facility.

Each experiment was divided into the following phases:

Anonymous Game phase, where participants played the two-person one-shot Prisoner's Dilemma (PD) (Table 1) with a random human partner. Participants were randomly paired with an anonymous partner each round of the game and alternated roles on subsequent trials between column chooser and row chooser for the PD. This game phase lasted for 20 rounds.

Table 1. Prisoner's Dilemma payoffs.

Payoffs	Cooperation	Defection
Cooperation	**5, 5**	**0, 10**
Defection	**10, 0**	**1, 1**

Socialization (Choice) phase (10-15 min), where all 12 subjects participate in the icebreaker: first of them said his/her name and an adjective that started from the same letter, second subject repeated first subject's name and adjective and said his/her own name and adjective, and so on till the last participant said all names and adjectives in

order. Then, in a reverse order each participant shared his/her life facts. After that, participants were asked who wanted to become a group leader. Other players one by one decided which leader they want to be in a group with, not exceeding total of six people. The participants get to choose a group, which easily satisfies the minimal group requirement and social identity theory [16]. Finally, each group socialized, communicated, and selected their group's name (it is called Group Socialization) and passed to the experimenter.

Socialized Game phase, where participants played the PD with a random human partner from their socialized group of 6. Their partner changed each round of the game. There was total of 20 rounds in this game phase.

Auction Game phase. Auction is carried out once every 5 rounds. Participants need to tell what proportion of their profit they want pay, i.e. bid (in %) for staying in their socialized group (in-group). Eight participants (4 participants out of each socialized group) with the highest bids pay proportion only in this round and play in-group. Four participants (2 participants out of each socialized group) with the least bids do not pay and play out-group. Thus, three groups of 4 are formed for the next 5 rounds till the next Auction happens. There was total of 20 rounds and 4 Auctions in this game phase. Therefore, the Auction Game phase includes four blocks; every block begins with the Auction and consists of five rounds of PD game.

There was an additional experiments with Socialization with Money treatment (N = 96). It was divided into 3 phases and followed the same scenario as in the main treatment for phase 1, Anonymous Game phase.

Phase 2, Socialization started the same way until the identification of the group leaders. Then information on the number of points earned through the Anonymous Game phase of each participant became available. Participants (except the group leaders) were asked to indicate how many points (from 0 to 50) they want to pay to be in a group with one or the other group leader. Three participants with the highest bids (for one of the group leaders) make a payment only once and form a group with the group leader of their choice, thus, forming two groups of 4, in-group. Four participants whose bids were not high enough to join the group of their choice formed a third group of 4, i.e. out-group. After the groups formed, the in-groups were allowed to socialize, communicate, and decide on the group name (Group Socialization), whereas members of the out-group were not allowed to talk with each other and were separated from each other and the in-groups.

During phase 3, Money Socialized Game participants played the PD with a random human partner from their group of 4. Their partner changed each round of the game. There was total of 20 rounds in this game phase.

To summarize this section, in this article we observe two types of the experiments.
The first type includes:
1. Anonymous Game phase (PD game for 20 rounds);
2. Socialization with division in two groups of 6;
3. Socialized Game phase (PD game for 20 rounds in groups of 6);
4. Auction Game phase (PD game for 4 blocks of 5 rounds with the Auction in the every block, which divide the participants into three groups of 4).

The total profit in the first type of the experiment is the sum of Anonymous Game phase plus Socialized Game phase, plus Auction Game phase (approximately 1000 RUR).

The second type includes:

1. Anonymous Game phase (PD game for 20 rounds);
2. Socialization with money treatment and division in three groups of 4;
3. Money Socialized Game phase (PD game for 20 rounds in groups of 4).

The total profit in the second type of the experiment is the sum of Anonymous Game phase plus Money Socialized Game phase, and minus payment in Socialization with money treatment phase (approximately 1000 RUR).

According to the division process, the in-group is the group with Group Socialization; the out-group is the group without Group Socialization.

3 Results

3.1 Money does not disturb sociality in-group

Table 2 portrays that average cooperation rates (the proportion of the choosing Cooperate in the Prisoner's Dilemma game from all rounds in the considering phase) decline from Socialized to Auction phases ($Z = 5.7$, $p < 0.001$, Wilcoxon signed-rank test). However, this is due to significant decline in out-group cooperation ($Z = -6.7$, $p < 0.001$, Wilcoxon rank-sum test). In-group cooperation in Auction goes along with the average cooperation level of Socialized phase, both on average and in dynamics (Table 3; Fig. 1) ($p = 0.11$, t-test).

Table 2. The average cooperation rate.

Experimental phases	M	SD
Anonymous	**0.23**	0.21
Socialized	**0.53**	0.37
Auction	**0.30**	0.28

Table 3. The average cooperation rate within the in-group and the out-group during Auction Game phase.

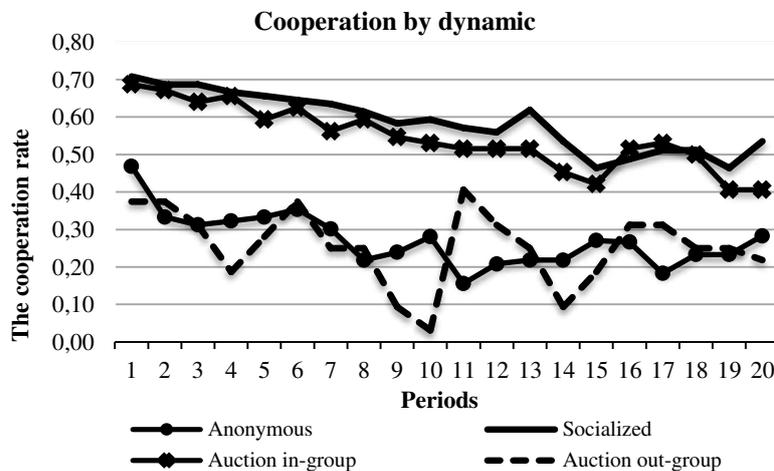| Auction blocks	Block 1		Block 2		Block 3		Block 4	
	M	SD	M	SD	M	SD	M	SD
In-group	**0.57**	0.42	**0.49**	0.40	**0.39**	0.41	**0.35**	0.36
Out-group	**0.27**	0.30	**0.16**	0.20	**0.21**	0.27	**0.27**	0.37

Fig. 1. Dynamics of the cooperation rate during Anonymous, Socialized and Auction Game phases.

3.2 Cooperation within the in-group or the out-group depends on the social value orientation (SVO) type

During the Anonymous and Auction Game phases for the out-group, the average cooperation rate for prosocial and neutral participants is not significantly different from each other (Anonymous: $Z = 0.62$, $p = 0.53$; Auction for the out-group: $Z = -0.42$, $p = 0.68$, Wilcoxon rank-sum test) (Table 4). However, during the Socialized and Auction Game phases for the in-group the difference between all SVO types exists: the most cooperation rate corresponds to prosocial type, then neutral, individualistic and competitive types (Socialized: $p < 0.001$; Auction for the in-group: $p < 0.001$, Kruskal-Wallis test). Similarly, within the in-group SVO types were distributed compared to the out-group. Within the out-group in the auction, individualistic participants reduce their cooperative behavior the most. As seen in Table 4 the largest difference between the Socialized and the Auction Game phase for the out-group occurs for individualistic type – 0.43. Moreover, for all SVO types the cooperation rate reduces from Socialized to Auction for out-group or for in-group phases except competitive type. It is interesting to notice that for the competitive type the difference between Socialized and Auction phases for the in-group is negative – the cooperation rate increases in 0.07. All this confirms that the fee affects the utility and the behavior of the participant.

Table 4. Distributions of SVO types for the in-group and the out-group.

Cooperation in Auction	In-group		Out-group		Anonymous		Socialized	
	M	SD	**M**	SD	**M**	SD	M	SD
Prosocial	**0.57**	0.40	**0.36**	0.32	**0.30**	0.22	**0.68**	0.32

Individualist	**0.37**	0.38	**0.04**	0.08	**0.10**	0.13	**0.47**	0.37
Competitive	**0.13**	0.28	**0.03**	0.07	**0.10**	0.11	**0.06**	0.13
Neutral	**0.43**	0.41	**0.32**	0.31	**0.33**	0.16	**0.49**	0.36

3.3 Participants tend to stay in their own group despite of the social type

The difference is only observed in the baseline of the tendency to pay for each of the social groups. Moreover, the correlation between the fee and the cooperation rate is positive and equal to 0.43 ($p < 0.001$, Spearman's rank correlation).

In-group and out-group bids on average converge: in-group bids decline, whereas out-group bids increase as depicted in Fig. 2.
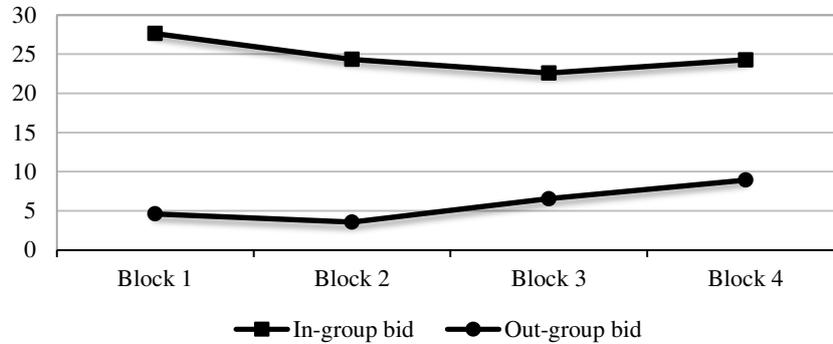

Fig. 2. Average in-group and out-group bids (in %).

When left out of the group for one round of the Auction (5 periods), participants desire to get into the group in the next round. On average, SVO types pay the equal amounts ($p = 0.5$, Kruskal-Wallis test), however competitive type tends to pay less (Table 5).

Table 5. Distributions of the pay in the Auction of SVO types for the in-group and the out-group in four blocks during the Auction Game phase.

Type/Bids in the Auctions	Average		Block 1 Bid		Block 2 Bid		Block 3 Bid		Block 4 Bid	
	M	SD	M	SD	M	SD	M	SD	M	SD
Prosocial	**13.99**	14.39	**16.62**	17.05	**12.18**	15.71	**11.68**	12.97	**15.46**	17.72
Individualist	**13.17**	16.34	**11.31**	15.56	**14.05**	20.69	**13.60**	19.11	**13.70**	20.22
Competitive	**9.81**	19.19	**16.22**	26.09	**1.90**	4.05	**10.59**	26.22	**10.50**	26.26
Neutral	**13.81**	13.07	**20.47**	20.68	**11.19**	14.30	**12.10**	13.95	**11.47**	13.90

Participants' transfer from the out-group to the in-group correlates with increase in cooperation while transfer from the in-group to the out-group with decrease in cooperation (Table 6).

Table 6. The change in the cooperation rate from the in-group to the out-group and vice versa in four blocks during the Auction Game phase for SVO types.

in-group → out-group	Block 1 → Block 2		Block 2 → Block 3		Block 3 → Block 4	
Prosocial	0.67	0.23	0.62	0.38	0.49	0.33
Individualist	0.56	0.08	0.35	0.05	0.48	0.08
Competitive	0.00	0.00	NO DATA	NO DATA	0.00	0.00
Neutral	0.50	0.10	0.60	0.20	0.60	0.40
out-group → in-group	Block 1 → Block 2		Block 2 → Block 3		Block 3 → Block 4	
Prosocial	0.47	0.50	0.28	0.44	0.29	0.49
Individualist	0.10	0.45	0.10	0.30	0.00	0.30
Competitive	0.10	0.10	0.00	0.00	NO DATA	NO DATA
Neutral	0.90	0.90	0.17	0.50	0.00	0.80

3.4 Entry to the out-group removes positive effect of sociality on cooperation

Out of the group, there is a sharp decline in cooperation. Perhaps this is because the member of the other group is perceived as an enemy who will not cooperate, thus, the participant does not cooperate in return. Out-group cooperation in Auction oscillates around average Anonymous cooperation levels (Fig. 3). An interesting pattern is also visible if cooperation dynamics is considered. Spikes of cooperation for the out-group in Auction only in the first period of each Auction, i.e. periods 1, 6, 11, 16. Although the intent to cooperate out-group in the beginning of each Auction is higher than in other periods of the same Auction, it is still smaller than cooperation in Socialized phase. For the prosocial type cooperation rate remains around 0.3 whereas for the competitive type drops to 0 in some cases (Table 6). This difference in behavior also stimulates a decrease in cooperation because participants see for themselves a real chance to defect with impunity on the cooperative participants.

3.5 Money triggers sociality for individualists and competitive types

When competitive and individualistic types get the in-group in the auction, they change their behavior to a more cooperative one. As shown in Table 7 the cooperation of any type is higher in-group, than out-group (Z = -6.7, p < 0.001, Wilcoxon rank-sum test). This is also consistent with the fact that the participants sought to get into the group. Cooperation rate of the competitive type in some cases even exceeds the cooperation on the group stage, while remaining at a lower level than other types. Apparently, realizing that everyone in the group pays something to enter the group increases cooperativeness. Roughly speaking, they feel ashamed to defect. Greatest difference in the cooperation between being in a group and out is observed for individualists - up to 0.5! We can conclude that an additional criterion of being in a group

in the form of payment makes them more prosocial. At the same time, individualists, who were out-group, tend to enter the group in the next block and show cooperative behavior. Therefore, we can conclude that the individualists perceive the fee as a mechanism of cohesion, and not vice versa.

Table 7. Distributions of the cooperation rate for the in-group and the out-group in four blocks during the Auction Game phase.

SVO types	Block 1		Block 2		Block 3		Block 4	
	In-group	Out-group	In-group	Out-group	In-group	Out-group	In-group	Out-group
Prosocial	0.79	0.41	0.62	0.31	0.54	0.37	0.52	0.41
Individualist	0.61	0.06	0.56	0.08	0.54	0.03	0.49	0.04
Competitive	0.30	0.07	0.20	0.00	0.03	0.00	0.04	0.00
Neutral	0.33	0.43	0.65	0.17	0.50	0.13	0.50	0.32

3.6 The requirement to pay the membership fee for joining the group does not kill the Socialization effect. The cooperation rate within the out-group without Socialization and without the membership fee is staying at the baseline level.

In the experiments with Socialization with Money treatment during the Anonymous phase the cooperation rate is equal to 0.28 (SD = 0.25) (in-group – 0.32 (SD = 0.27), out-group – 0.21 (SD = 0.17)). There is no significant difference between the in-group and the out-group during this phase ($p = 0.0776$, Wilcoxon rank-sum test).

After Socialization the cooperation level within the in-group increase to 0.80 (SD = 0.30), but within the out-group it becomes equal to 0.32 (SD = 0.24), which is comparable with the cooperation rate before Socialization ($Z = -1.815$, $p = 0.07$, Wilcoxon rank-sum test). The behavior within the in-group and the out-group behaviors become significantly different ($p < 0.0001$, Wilcoxon rank-sum test) (Fig. 3).
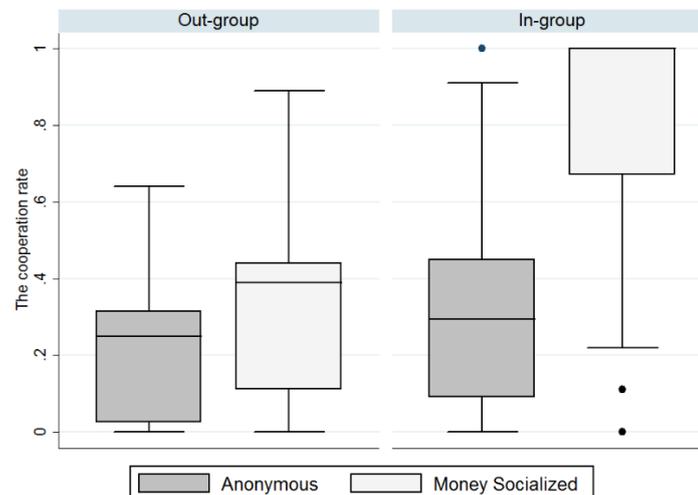
Fig. 3. The difference in the cooperation rate between Anonymous and Money Socialized Game phases for the in-group and the out-group.

Thus, despite the fact that the in-group members pay the membership fee, this does not affect Group Socialization and the cooperation. Out-group participants are in the better game conditions than the in-group, because they do not need to pay the fee, but without Socialization, they show a low basic level of cooperation.

3.7 The cooperation rate in-group and out-group in the experiment with socialization with money treatment depends on the SVO types

The highest cooperation rate corresponds to the prosocial type; in order from the most cooperative to less cooperative the next types are neutral, individualist, and competitive (Table 8). The interesting fact is that before Socialization there is difference between SVO types in the cooperation rate ($p < 0.05$, Kruskal-Wallis test), but after Socialization the cooperation rates of the SVO types become indistinguishable ($p = 0.24$, Kruskal-Wallis test).

Table 8. Distributions of SVO types by the cooperation rate during the Anonymous and Money Socialized Game phases.

SVO types	Anonymous		Money Socialized	
	M	SD	**M**	SD
Prosocial	**0.37**	0.28	**0.72**	0.33
Individualist	**0.22**	0.22	**0.56**	0.37
Competitive	**0.10**	0.09	**0.54**	0.41
Neutral	**0.31**	0.16	**0.67**	0.34

Within the in-group, Socialization influences the competitive type the most: growth in the cooperation rate is equal to 0.59 (Z = -2.366, p < = 0.05, Wilcoxon signed-rank test) (Table 9).

Table 9. Distributions of SVO types by the cooperation rate during the Anonymous and Money Socialized Game phases for the in-group and the out-group.

SVO types	Anonymous		Money Socialized		Anonymous		Money Socialized	
	In-group				Out-group			
	M	SD	**M**	SD	**M**	SD	**M**	SD
Prosocial	**0.45**	0.32	**0.93**	0.13	**0.24**	0.17	**0.38**	0.23
Individualist	**0.26**	0.22	**0.70**	0.33	**0.16**	0.18	**0.32**	0.24
Competitive	**0.10**	0.08	**0.69**	0.38	**0.14**	0.19	**0.00**	0.00
Neutral	**0.30**	0.19	**0.78**	0.29	**0.33**	0.05	**0.30**	0.21

Within the out-group, competitive and neutral types decrease the cooperation rate after Socialization: competitive on 0.14 and neutral on 0.03 (Table 9).

4 Discussion

We carried out experiments to study the attitudes of people to the social and economic interactions. We have found that the payment does not change the overall level of cooperation. However, it turns out that people long to stay within their social groups and interact cooperatively there. In the out-group people change their behavior to non-cooperative. Various types of personalities change their behavior following distinct patterns. Even the competitive type shows higher cooperation in the group with a fee. The prosocial type retains the level of cooperation on a higher level than other types. Individualists tend to stay in the group, they are even ready to pay quite a lot. In-group individualists continue to cooperate, but the interaction with the out-group members forces cooperative behavior to fall rapidly. Hence, the very existence of certain fees is not as important as the relationships between distinct social types within a group. Perhaps if the division of participants into three groups will happen randomly and will not be produced by an auction the results would be the same! On the other hand, the more subjects pay for the entry into the group the more cooperation is observed.

In addition, we found that the membership fee as a division mechanism of people into groups has no effect on the sociality and the cooperation level between members. However, the groups formed without a fee and without Socialization show the low level of cooperation. It indicates that Socialization gives the highest collective action regardless of the membership fee presence or absence. Studying this more might be helpful for the organization of online-closed communities with paid content to improve the utility of the participants.

An interesting conclusion is that participants on average evince the same attitude to money regardless of the social type. In the midst of various online communities such results are quite useful and can help developers make more flexible monetary components in communities, such as voluntary organizations, charities, united by one goal or idea, etc.

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