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Estimation of Exit Behaviors

– Panel Data Analysis of an Experiment with Intergroup Mobility –

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Abstract

We estimate exit behavior in a repeated social dilemma situation with intergroup mobility, using experimental data. Estimated results show that absolute levels of cooperation of others in one's own group is a significant determinant. Also, the difference between the absolute levels of cooperation and the cooperation index based on a subject's actual choices for cooperation, from the first some periods, is significant. Information about other groups is not important. Based on these results, we draw the following conclusions: (1) subjects care about the information concerning their own group. (2) the higher the cooperation index for a subject, the higher is the probability that he/she will move, given the same level of cooperation of others.

JEL classification: C91, H41

Keywords: Estimation, Exit behaviors, Free riding, mobility, laboratory experiments

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1 Introduction

Modern societies enjoy increasing mobility in such areas as job changes, accommodation changes and immigration. Conversely there is the free-riding problem, manifested in shirking in workplaces and a collapse of social norms.

According to the "folk theorem" of the repeated prisoners' dilemma game, there is a relation between these two phenomena: mobility has negative effects on cooperation. Where there is no mobility, players continue to interact with each other in a fixed group or society. They know that free-riding will have harmful effects on their future payoffs. In situations where there is mobility, however, players can cut relationships with other members of their group. As mobility increases, players care less about the harmful effects of free riding.

Conversely, there are positive effects of mobility on cooperation in the coordination game (Dieckmann (1999), Bhaskar and Vega-Redondo (2004), Oechssler (1997)). In the well-known coordination game, there exist both a Pareto-efficient equilibrium and a risk-dominant but inefficient equilibrium. In the risk-dominant equilibrium there is an advantage to risk taking. The decrease in a player's payoff that arises from making an error in the risk-dominant equilibrium is less than in the Pareto-efficient equilibrium. The risk-dominant but inefficient equilibrium is selected under various conditions (Kandori, Mailath and Rob (1993), Ellison (1993), Young (1998)). If, however, there is a choice to move into another group, the Pareto efficient equilibrium may be preferred over the risk dominant equilibrium. The logic is very simple. Players in the inefficient group can exit in order to change the action from the inefficient one to the efficient one.

The logic in the coordination game does not apply directly in the social/prisoners' dilemma game. In the coordination game, all players wish to change to the efficient action, so that the action of players who are moving into a group is desirable for players who are in that group. On the other hand, in the social/prisoners' dilemma game, the non-cooperators aim to enjoy free riding by moving into another group. Because of these free riders, the cooperators in the group do not continue to cooperate. Consequently, the Pareto efficient equilibrium is not supported by mobility.

In the social/prisoners' dilemma game, the cooperators and the non-cooperators both move. However, if there are differences in moving behavior between them, it is possible that the best use of differences allows us to distinguish the cooperators from the non-cooperators in a social/prisoners' dilemma game.[1] Less attention has been paid to actual moving behavior in the social/prisoners' dilemma game.[2] There is a need for empirical work to estimate this.

This paper examines a social dilemma experiment with intergroup mobility. We conducted ten sessions. In each session there are 17 subjects and 4 groups. Subjects play a social dilemma game within each group. After five times of play of the social dilemma game, subjects have an exit option simultaneously. This process is repeated ten times. We have 50 samples for cooperation decisions and 9 samples for moving decisions per subject. From the first 25 samples for cooperation decisions per subject, we calculated an index of cooperation for each subject. With the last 4 samples for moving decisions, we estimate moving behavior.

Our results are as follows. First, the absolute cooperation rate of others in one's own group have a negative effect on decisions to move. Second, the difference between the index of cooperation for each subject and the absolute cooperation rate of others in one's group has a positive effect on decisions to move. From this result it follows that

[1] Concerning sorting effects, see also Orbell and Dawes (1993) and Bohnet and Kubler (2005), Hayashi (1993).

[2] The exception is Ehrhart and Keser (1999).

the higher the index of cooperation of an individual, the higher is the probability that this individual will move, given the same cooperation rate of others. Third, Information about other groups is not important.

Ehrhart and Keser (1999) is a key work for examining cooperation and exit behavior. However, they use the Spearman rank correlation coefficient. With this technique, an environment that subjects face are not sufficiently controlled. Here, we use several variables in estimation formula in order to control an environment faced by subjects.[3]

There is a drawback with the index of cooperation used by Ehrhart and Keser (1999), in which the ratio of decisions to cooperate to all decisions is calculated. The marginal benefit from cooperation changes with the size of group, and this should be taken into account. We use two different indexes in our estimations. One index is the same as that of Ehrhart and Keser (1999). Another is that with an appropriate adjustment. It turns out that the adjustment is small in practice, and does not improve pseudo-R^2 of the estimation. Also, If we use all rounds to assemble the Ehrhart and Keser (1999)'s cooperation index, its exogeneity is not assured. We therefore construct the cooperative index from the first five rounds, after which the estimation period begins. Hence the cooperative index is predetermined. Also, if we interpret our index as a proxy of cooperativeness of subjects, the errors-in-variables problem arises and the exogeneity of the index is not assured. Hence our examination focuses on the effect of an individual's previous experience. Our index is adequate because there is a correlation between our cooperation index and the cooperation rate in the previous five rounds. The index is good information to predict the cooperation behavior in the future.

In section 2 we outline the experimental design. Section 3 reports the estimations and

[3]Under a traditional experimental methodology, an environment are controlled rigorously by a experimental design. On the other hand, it is important to reproduce exact situation examined, in this paper, it is repetition of the social dilemma with intergroup mobility.

the results for exit behavior. Section 4 presents conclusions.

2 Experimental Design

Our experiment consisted of ten sessions, utilizing 170 students in 4 Japanese universities in or near Tokyo. There are 17 subjects in a session. Seats were assigned to them by lottery in a large room with no partitions. They were connected by computers on a local area network, and made decisions by clicking their mouse anonymously. All information about the game was shown on a laptop computer display to each subject.

Structure of the game: The game was designed as follows:

1. at the start, subjects were assigned randomly to one of four groups by computer. Each group had four or five subjects.
2. at a single stage, they played a social dilemma game within their groups.
3. in a round, they repeated five stages and then had an option to move to another group.
4. in a session, ten rounds were repeated.

In total, subjects played the social dilemma game for 50 stages, with nine chances to exit (Figure 1). It took about 45 minutes to complete 50 stages. Subjects did not know when the session would finish.

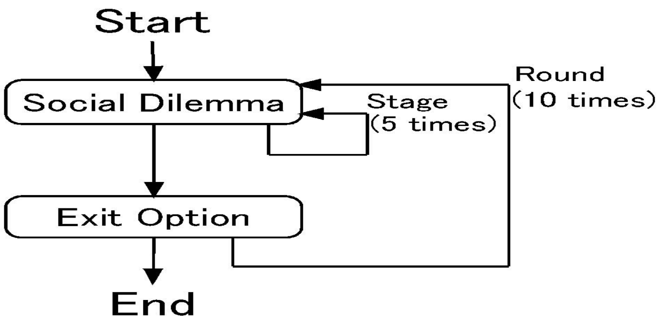

Figure 1: Structure of Experiment

Social Dilemma Game at Each Stage: At each stage, subjects received 20 yen as a resource.[4] They decided whether to provide it to their group as an investment ("cooperation" or "C") or to keep it ("non-cooperation" or "N").

The rate of return depended on group size. Let n denote the number of all members in a group and let m be the number of providers in the group.

In multiple-player groups ($n \geq 3$), the investment was multiplied by 2. The payoff function, $U(\cdot)$, is defined as follows:

$$U(C) = 40\frac{m}{n}, \qquad U(N) = 40\frac{m}{n} + 20. \tag{1}$$

In two-player groups ($n = 2$), the investment was multiplied by 1.5:

$$U(C) = 30\frac{m}{2} = 15m, \qquad U(N) = 30\frac{m}{2} + 20 = 15m + 20. \tag{2}$$

In single-player groups ($n = 1$), the return was equal to the investment because there

[4] 110 yen was about one U.S. dollar at the time of the experiment.

were no "social" effects:

$$U(C) = U(N) = 20. \tag{3}$$

These payoff functions satisfy Dawes (1980)'s conditions of social dilemmas, apart from the single-player groups.[5]

Subjects were given an instruction and informed of this structure before the game. They were also asked to complete two confirmation tests to verify that they understood the structure. Solutions were also provided by an instructor after the tests.

At the beginning of each stage, each subject saw on his/her computer display: all of his/her past decisions and payoffs in the current round; each group's size; each group's average payoffs at the previous stage and those in the current round; his/her total payoff.

After making each decision, a subject was given the following information: the number of providers in his/her group, his/her own decision, and payoff at that stage.

Exit Options in the Round: After five stages, the subjects were simultaneously offered an exit option. The subjects decided which group to join in the next round; they could choose to stay in the same group (Figure 2).

[5]Dawes (1980) gives a formal definition of social dilemmas. In a social dilemma,

1. persons have options of "cooperation" (voluntary contribution to the group) or "non-cooperation" (non-contribution);
2. non-cooperation always provides higher payoff than cooperation
3. but if everyone defects, they receive less payoff than if everyone cooperates.

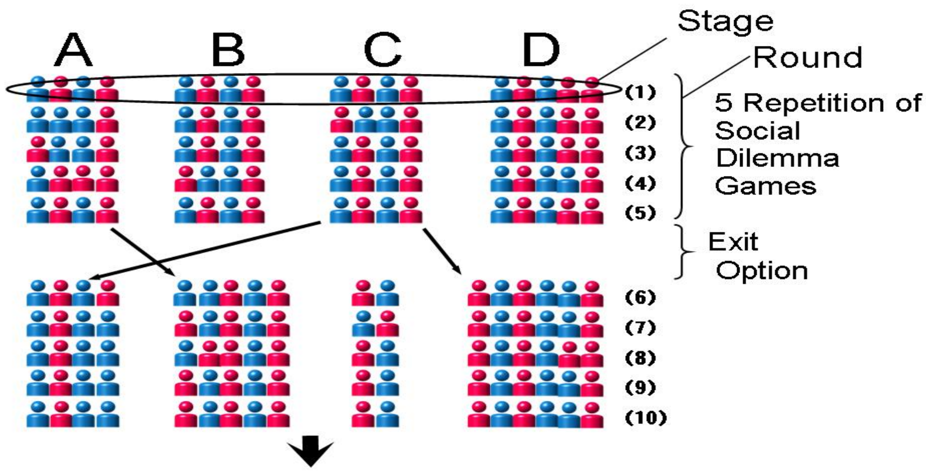

Figure 2: Diagram of Game Structure

Subjects who chose another group had to pay moving costs. We considered three distinct conditions: high moving costs, low costs, and no costs. The cost function, $Cost(\cdot)$, is defined as follows:

$$Cost(E) = 50, \qquad Cost(S) = 0 \qquad \text{in high cost condition,} \tag{4}$$

$$Cost(E) = 20, \qquad Cost(S) = 0 \qquad \text{in low cost condition,} \tag{5}$$

$$Cost(E) = Cost(S) = 0 \qquad \text{in no cost condition,} \tag{6}$$

where E denotes "Exiting", and S "Staying".

At the decision making to exit (or not), each subject saw on the computer display: all group's average payoffs at each stage in the current round, each group's size and his/her total payoff earned in the current round, all group's average payoffs in the current and all past rounds.

Total Payoffs: In summary, each subject earned a payoff in the session as follows:

$$\sum_{t=1}^{50} U(a_t) - \sum_{s=1}^{9} Cost(b_s), \tag{7}$$

where $a_t \in \{C, N\}$ and $b_s \in \{E, S\}$ in each period $t \in \{1, \ldots, 50\}$, and $s \in \{1, \ldots, 9\}$.

Subjects knew that they would receive a monetary reward (in yen) equal to the payoff they earned in their session.[6]

3 Differences in Exit behavior

3.1 Descriptive statistics of sessions

Table 1 sets out descriptive statistics of sessions. At the macro level, we confirm that the mobility rates differ significantly with differing moving costs.[7] The cooperation rates does not show such significant differences, however. A parallel paper, Kobayashi, Koyama, Fujiyama and Oura (2005), investigates the macro behavior more closely. Below, we focus on individual behavior patterns (micro level analysis).

3.2 Data and Variables

A player has fifty chances to cooperate or not, and nine chances to exit from a group (or not) in a session.

To define an index of cooperation, we divide a sequence of data into two periods. This is done in order to generate a predetermined variable for cooperation. We also change

[6]In fact they would receive 1,000 yen as a minimum reward, even if their earnings are less than 1000 yen. They did not know this in advance.

[7]According to the Kruskal-Wallis test, there are differences between the three conditions at the 5 % significance level. The test value is 7.875 (> 5.991).

session	moving cost	Cooperation Rate		Mobility Rate		Payoffs (yen)	
		Mean	(S.D.)	Mean	(S.D.)	Mean	(S.D.)
1	50	0.349	(0.209)	0.203	(0.180)	1236.5	(171.9)
2	50	0.360	(0.184)	0.203	(0.116)	1228.2	(113.8)
3	50	0.256	(0.181)	0.209	(0.201)	1145.0	(181.7)
4	50	0.268	(0.178)	0.131	(0.116)	1203.9	(142.4)
5	20	0.295	(0.161)	0.327	(0.145)	1217.1	(111.8)
6	20	0.296	(0.207)	0.216	(0.210)	1223.7	(102.5)
7	20	0.395	(0.224)	0.281	(0.162)	1331.8	(199.3)
8	20	0.286	(0.163)	0.268	(0.166)	1218.8	(88.1)
9	0	0.288	(0.231)	0.693	(0.181)	1261.8	(100.1)
10	0	0.416	(0.186)	0.654	(0.178)	1381.2	(138.3)
All sessions		0.320		0.318		1244.8	

The unit is the individual subject.

Table 1: Descriptive Statistics of Sessions

the length of the first and second periods and estimate the exit behavior; the results are shown in Appendix 2.

The first period consists of the first 5 rounds in which there are 25 opportunities to cooperate and five opportunities to exit. We then calculate the ratio of the number of choices of cooperation to all 25 decisions. If the subject belongs to a one-subject group then decisions are excluded, since choice is indifferent between cooperation and non-cooperation. This index is based on actual behavior rather than potential attitudes about cooperation.[8] We call this measure an "individual cooperation index." Of course, if the group size is different, the marginal benefit from cooperation is different. We also set up an adjusted cooperation index. Adjustment proceeds by taking into account that for lower marginal benefit, the index about cooperation is more weighted; details are given in Appendix 1.

The second period is the last 5 rounds in which there are 25 opportunities to cooperate

[8]This kind of measurement is used in Ehrhart and Keser (1999).

and 4 opportunities to exit.[9] With this data, we estimate the exit behavior of individuals. There are ten sessions in which 17 subjects are included, so that the sample size for estimation is $4 \times 17 \times 10 = 680$. We construct an "exit variable" which takes value one if a subject exits a group, and is otherwise 0.

We also construct other variables. The first is a "cooperation rate of others in the group," which is the group's mean cooperation rate excluding the subject concerned in the round under consideration. Suppose, for example, that there are four subjects in a group, and the cooperation rate of Subject 1 is 0.4, the cooperation rate of Subject 2 is 0.6, the cooperation rate of Subject 3 is 0.2 and the cooperation rate of Subject 4 is 0.3. For Subject 2, the "cooperation rate of others in the group" is $\{0.4 + 0.2 + 0.3\}/3 = 0.3$.

A second variable is the payoffs of the other groups in the current round.[10] We call this variable "other groups' payoffs".

Using these variables, we consider three hypotheses:

H1: The low "cooperation rate of others in the group" induces subjects to exit.

H2: The high difference between the "individual cooperation index" and the "cooperation rate of others in the group" induces subjects to exit.

H3: The other groups' information is a significant factor in exiting behavior.

These hypotheses can be paraphrased as follows. First, subjects care about the *absolute* level of cooperation of their group members. If the level of cooperation is low, a subject wishes to leave the group. Second, if one can obtain data about individual cooperation actions, this is significant information. The difference between an individual's own previous cooperation level and the current realized cooperation level of others has an effect

[9]In the last round, there is no opportunity to exit.

[10]If there is an empty group in a current round (no subject is in the group), we take 20 yen as the predicted payoff for the group. This is because 20 yen is the neutral value in our experimental design.

on exit behavior. This is because the individual cannot tolerate the gap between his/her intended cooperation level and the realized cooperation level. People care about their *relative* cooperation level, compared to others. Third, people care about information from other groups. This is because such information is important for choosing a group in exit optioins.

Under these hypotheses, we take the "exit variable" as a dependent variable. Explanatory variables are the "cooperation rate of others in the group", the differences between the "individual cooperation index" and the "cooperation rate of others in the group", and "other groups' payoffs"

Finally, we comment on the data set. We first add the dummy variables for the 50-yen-cost and 0-yen-cost conditions. Second, we omit the "exit variable" for the exits from single and two subject groups, because the formula for payoffs in single and two subject groups are different and the "cooperation rate of others in the group" cannot be calculated in a single-subject group.

3.3 Estimation and Results

In our models, the dependent variable is the "exit variable," which is binary data, and there are individual effects. To estimate parameters we use the probit model with random effects specification for panel data.

To compare different formulae, we consider three different models. In model 1, the absolute cooperation level of others (the "cooperation rate of others in the group") and the relative cooperation level (the difference between the "individual cooperation index" and the "cooperation rate of others in the group") are included. In models 2 and 3, each one of these two is included.

Estimated results are summarized in Table 2. In this table we use abbreviations as follows:

- Dif(five): The difference between the "individual cooperation index" and the "cooperation rate of others in the group" (the Number of rounds used to construct the "individual cooperation index")
- CRO: Cooperation Rate of Others in one's group
- OGP: Other Group's Payoff
- D50: Dummy for 50 yen Moving Cost
- D0: Dummy for 0 yen Moving Cost

Dependent Variable:	Exit Variable				(random effects probit regression)	
	Model 1		Model 2		Model 3	
Independent Variables	Coefficients	(p-value)	Coefficients	(p-value)	Coefficients	(p-value)
Constant	−2.457	(0.002)**	−2.201	(0.005)**	−2.721	(0.000)**
Dif (five)	0.794	(0.022)*			1.244	(0.000)**
CRO	−1.022	(0.047)*	−1.812	(0.000)**		
OGP (Max)	0.013	(0.469)	0.012	(0.533)	0.019	(0.293)
OGP (Mid)	0.041	(0.110)	0.041	(0.121)	0.042	(0.099)+
OGP (Min)	0.022	(0.534)	−0.026	(0.472)	0.011	(0.748)
D50	−0.471	(0.006)**	−0.477	(0.007)**	−0.436	(0.010)**
D0	1.449	(0.000)**	1.496	(0.000)**	1.395	(0.000)**
LR test (zero slope)		0.000**		0.000**		0.000**
LR test (no rand. eff.)		0.007**		0.003**		0.012*
Pseudo R^2		0.167		0.160		0.161

Number of observations= 620, Number of groups = 169
$**$ significant at 1 % level, $*$ at 5 % level, + at 10 % level

Table 2: Decision on Exits

In addition to this, we use the adjusted cooperation index in which the marginal benefit of the cooperation is considered (see Appendix 1). In this case,

- aDif(five) =The definition is same as Dif(five) but the adjusted "individual cooperation index" is used.

Table 3 summarizes the estimated results. In this estimation, we consider the same three distinct models as in previous estimations.

Dependent Variable:	Exit Variable				(random effects probit regression)	
	Model 1		Model 2		Model 3	
Independent Variables	Coefficients	(p-value)	Coefficients	(p-value)	Coefficients	(p-value)
Constant	−2.382	(0.002)**	−2.201	(0.005)**	−2.679	(0.001)**
aDif (five)	0.603	(0.061)+			1.095	(0.000)**
CRO	−1.217	(0.015)*	−1.812	(0.000)**		
OGP (Max)	0.013	(0.499)	0.012	(0.533)	0.019	(0.292)
OGP (Mid)	0.039	(0.132)	0.041	(0.121)	0.039	(0.131)
OGP (Min)	0.025	(0.480)	−0.026	(0.472)	−0.013	(0.704)
D50	−0.489	(0.005)**	−0.477	(0.007)**	−0.460	(0.007)**
D0	1.438	(0.000)**	1.496	(0.000)**	1.356	(0.000)**
LR test (zero slope)		0.000**		0.000**		0.000**
LR test (no rand. eff.)		0.005**		0.003**		0.009**
Pseudo R^2		0.165		0.160		0.156

Number of observations= 620, Number of groups = 169
$**$ significant at 1 % level, $*$ at 5 % level, + at 10 % level

Table 3: Decision on Exits (adjusted cooperation index)

From Table 2 and 3, we obtain the following results:

Result 1: Hypothesis 1 (H1) is accepted because "CRO" is negative and significant.

Result 2: Hypothesis 2 (H2) is accepted because "Dif(five)" is positive and significant.

Result 3: Hypothesis 3 (H3) is rejected because none of "OGP(Max, Mid, Min)" is significant.

From these results, subjects care about the information concerning their own group mainly. One of the reasons is that the information concerning other groups is less reliable than the information concerning their own group.

Result 4 Adjusted cooperation index is not better for our estimation because significance is at the 10 % level and Pseudo R^2 decreases.

For robustness of thsese results, from Appendix 2, the same results are obtained; although in some cases the significance level is at the 10 % level. For Result 4, we found that the adjusted "individual cooperation index" is as good as the "individual cooperation index" in regard to statistical significance and Pseudo R^2. The results are nevertheless the same. We can therefore assert that the "individual cooperation index" does not need to be adjusted.

The "individual cooperation index" is assembled from the first five rounds. We can calculate the same index in the last five rounds. For these two indexes, we have the following result:[11]

Result 5 There is a positive correlation between the "individual cooperation index" and the same index in the last five rounds; the correlation coefficient is 0.689.[12]

Hence, the "individual cooperation index" comprises useful information for predicting future cooperation behavior.

4 Conclusion

We have investigated the factors that influence the decision to exit. Our estimated results are summarized as follows. Subjects care about the absolute level of cooperation of others. If this is low, subjects tend to exit (Result 1). Also, past experience about cooperation comprises useful information for exit behavior. The greater is the difference between one's own past cooperation level and the current cooperation level of others,

[11]The correlation coefficient between the "individual cooperation index" in the first one round and in the last 9 rounds is 0.621. The correlation coefficient between the "individual cooperation index" in the first two round and in the last 8 rounds is 0.683. The correlation coefficient between the "individual cooperation index" in the first three round and in the last 7 rounds is 0.674. The correlation coefficient between the "individual cooperation index" in the first four round and in the last 6 rounds is 0.691. In all cases, a high correlation is found.

[12]This relation is statistically significant at 1% level.

the higher is the probability that subjects exit to other groups (Result 2). Furthermore, one's own past cooperation level and subsequent cooperation level show high correlation (Result 5). It can be interpreted that subjects with high previous cooperation level are cooperators. Given these results, cooperators tend to exit to other groups given the same cooperative level of others. This is because Result 1's effect is same to both cooperators and non-cooperators but Result 2's effect is larger in cooperators than in non-cooperators.

We can draw an important practical lesson from these observations. The cooperators exit from the groups before the groups' cooperation rates decrease very much. After the cooperators have left, the non-cooperators begin to exit. Therefore, to achieve higher cooperation rates, it is important to create new groups and enclose the cooperators in the early stages.

Appendix 1

Given the group size, the marginal benefit from cooperation is

$$r(n) = \begin{cases} 0.75 & \text{if } n = 2 \\ 2/n & \text{if } n \geq 3. \end{cases} \tag{8}$$

which is drawn in Figure 3. If the group size is one, we do not calculate the cooperation index from this data.

Consequently, we adjust values using the formula:

$$ac(n) = \begin{cases} 0.5 & \text{if } n = 2 \\ 2(1 - 2/n) & \text{if } n \geq 3. \end{cases} \tag{9}$$

which is drawn in Figure 4.

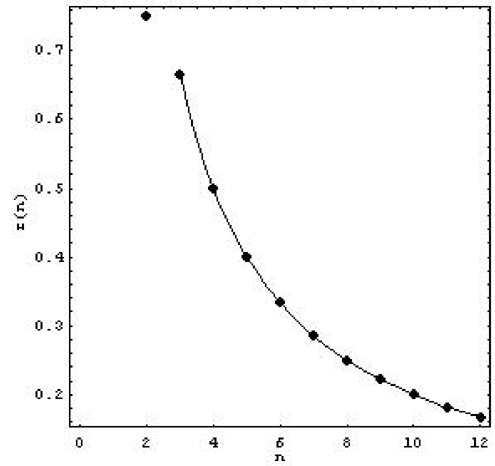

Figure 3: Marginal benefit from cooperation

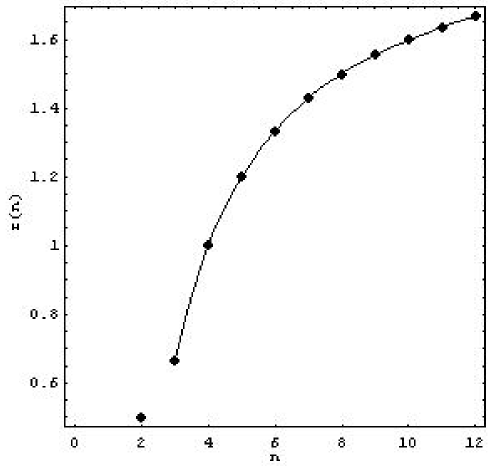

Figure 4: Formula for adjusting cooperation index

For example: (Case 1) In the first round of our experiment, a subject belongs to a group of size 3 and makes 3 times cooperation decisions to all five decisions. In the next round, he/she belongs to a group whose size is 6 and makes 3 times cooperation decisions to all five decisions.

By a straightforward calculation, this individual's cooperation index is

$$0.6 = \frac{3+3}{10}. \tag{10}$$

According to the adjusted method, this individual's cooperation index is

$$0.76 = \frac{3 \times 2\left(1 - \frac{2}{5}\right) + 3 \times 2\left(1 - \frac{2}{6}\right)}{10}. \tag{11}$$

(Case 2) In the first round of our experiment, a subject belongs to a group of size 2 and makes 3 times cooperation decisions to all five decisions. In the next round, this subject is part of a group of size 4 and makes 3 times cooperation decisions to all five decisions. By a straightforward calculation, this individual's cooperation index is

$$0.6 = \frac{3+3}{10}. \tag{12}$$

On the other hand, under the adjusted method, his/her cooperation index is

$$0.45 = \frac{3 \times 0.5 + 3 \times 2\left(1 - \frac{2}{4}\right)}{10}. \tag{13}$$

These 2 examples confirm that, under lower marginal benefit, the cooperation index emerges higher, and conversely.

Appendix 2

In this appendix, we list all estimated results in which the period for making "individual cooperation index" is different. "Dif (one)" means that the first round, in which there are 5 chances to cooperate, is used for assembling the index. "Dif (two)" means that the first and second rounds, in which there are 10 chances to cooperate, is used for assembling it, and so on.

If we extend the period, so as to consider "Dif (six)" and "Dif (seven)", then the random effects of subjects is not significant even at the 10 % level. Hence our results are listed only as far as "Dif (four)" in this appendix. Note that the case of "Dif (five)" is listed in the body of this paper.

Dependent Variable:	Exit Variable				(random effects probit regression)	
	Model 1		Model 2		Model 3	
Independent Variables	Coefficients	(p-value)	Coefficients	(p-value)	Coefficients	(p-value)
Constant	−1.376	(0.004)**	−1.197	(0.013)*	−1.630	(0.001)**
Dif (one)	0.594	(0.002)**			0.927	(0.000)**
CRO	−0.866	(0.005)**	−1.456	(0.000)**		
OGP (Max)	0.010	(0.376)	0.008	(0.469)	0.162	(0.180)
OGP (Mid)	0.044	(0.014)*	0.042	(0.018)*	0.049	(0.005)**
OGP (Min)	−0.020	(0.368)	−0.016	(0.465)	−0.034	(0.128)
D50	−0.378	(0.001)**	−0.373	(0.002)**	−0.358	(0.002)**
D0	1.134	(0.000)**	1.219	(0.000)**	1.069	(0.000)**
LR test (zero slope)		0.000**		0.000**		0.000**
LR test (no rand. eff.)		0.000**		0.000**		0.000**
Pseudo R^2		0.109		0.103		0.104

Number of observations= 1255, Number of groups = 170
$**$ significant at 1 % level, $*$ at 5 % level, + at 10 % level

Table 4: Decision on Exits, one

Dependent Variable:	Exit Variable				(random effects probit regression)	
	Model 1		Model 2		Model 3	
Independent Variables	Coefficients	(p-value)	Coefficients	(p-value)	Coefficients	(p-value)
Constant	−1.378	(0.004)**	−1.197	(0.013)*	−1.635	(0.001)**
aDif (one)	0.587	(0.001)**			0.897	(0.000)**
CRO	−0.871	(0.004)**	−1.456	(0.000)**		
OGP (Max)	0.011	(0.368)	0.008	(0.469)	0.166	(0.169)
OGP (Mid)	0.044	(0.014)*	0.042	(0.018)*	0.050	(0.005)**
OGP (Min)	−0.021	(0.357)	−0.016	(0.465)	−0.035	(0.115)
D50	−0.384	(0.001)**	−0.373	(0.002)**	−0.367	(0.002)**
D0	1.131	(0.000)**	1.219	(0.000)**	1.066	(0.000)**
LR test (zero slope)		0.000**		0.000**		0.000**
LR test (no rand. eff.)		0.000**		0.000**		0.000**
Pseudo R^2		0.110		0.103		0.104

Number of observations= 1255, Number of groups = 170
$**$ significant at 1 % level, $*$ at 5 % level, + at 10 % level

Table 5: Decision on Exits, one (adjusted cooperation index)

Dependent Variable:	Exit Variable					(random effects probit regression)
	Model 1		Model 2		Model 3	
Independent Variables	Coefficients	(p-value)	Coefficients	(p-value)	Coefficients	(p-value)
Constant	−1.607	(0.003)**	−1.382	(0.010)**	−1.933	(0.000)**
Dif (two)	0.550	(0.027)*			1.005	(0.000)**
CRO	−0.958	(0.008)**	−1.506	(0.000)**		
OGP (Max)	0.008	(0.521)	0.006	(0.635)	0.014	(0.256)
OGP (Mid)	0.041	(0.026)*	0.040	(0.032)*	0.045	(0.014)*
OGP (Min)	−0.003	(0.898)	−0.001	(0.966)	−0.015	(0.558)
D50	−0.375	(0.003)**	−0.377	(0.004)**	−0.357	(0.005)**
D0	1.212	(0.000)**	1.275	(0.000)**	1.139	(0.000)**
LR test (zero slope)		0.000**		0.000**		0.000**
LR test (no rand. eff.)		0.000**		0.000**		0.000**
Pseudo R^2		0.112		0.108		0.107

Number of observations= 1097, Number of groups = 170
$**$ significant at 1 % level, $*$ at 5 % level, + at 10 % level

Table 6: Decision on Exits, two

Dependent Variable:	Exit Variable					(random effects probit regression)
	Model 1		Model 2		Model 3	
Independent Variables	Coefficients	(p-value)	Coefficients	(p-value)	Coefficients	(p-value)
Constant	−1.587	(0.003)**	−1.382	(0.010)**	−1.914	(0.000)**
aDif (two)	0.515	(0.022)*			0.934	(0.000)**
CRO	−0.996	(0.004)**	−1.506	(0.000)**		
OGP (Max)	0.008	(0.532)	0.006	(0.635)	0.014	(0.249)
OGP (Mid)	0.041	(0.027)*	0.040	(0.032)*	0.045	(0.013)*
OGP (Min)	−0.003	(0.894)	−0.001	(0.966)	−0.016	(0.513)
D50	−0.380	(0.003)**	−0.377	(0.004)**	−0.364	(0.004)**
D0	1.203	(0.000)**	1.275	(0.000)**	1.119	(0.000)**
LR test (zero slope)		0.000**		0.000**		0.000**
LR test (no rand. eff.)		0.000**		0.000**		0.000**
Pseudo R^2		0.112		0.108		0.106

Number of observations= 1097, Number of groups = 170
$**$ significant at 1 % level, $*$ at 5 % level, + at 10 % level

Table 7: Decision on Exits, two (adjusted cooperation index)

Dependent Variable:	Exit Variable				(random effects probit regression)	
	Model 1		Model 2		Model 3	
Independent Variables	Coefficients	(p-value)	Coefficients	(p-value)	Coefficients	(p-value)
Constant	−2.031	(0.001)**	−1.810	(0.002)**	−2.363	(0.000)**
Dif (three)	0.482	(0.072)+			0.915	(0.000)**
CRO	−0.895	(0.022)*	−1.381	(0.000)**		
OGP (Max)	0.016	(0.237)	0.014	(0.297)	0.022	(0.107)
OGP (Mid)	0.041	(0.040)*	0.039	(0.048)*	0.046	(0.021)*
OGP (Min)	0.001	(0.949)	0.003	(0.906)	−0.008	(0.758)
D50	−0.326	(0.015)*	−0.325	(0.015)*	−0.312	(0.020)*
D0	1.297	(0.000)**	1.342	(0.000)**	1.246	(0.000)**
LR test (zero slope)		0.000**		0.000**		0.000**
LR test (no rand. eff.)		0.000**		0.000**		0.000**
Pseudo R^2		0.121		0.118		0.116

Number of observations= 947, Number of groups = 170
$**$ significant at 1 % level, $*$ at 5 % level, + at 10 % level

Table 8: Decision on Exits, three

Dependent Variable:	Exit Variable				(random effects probit regression)	
	Model 1		Model 2		Model 3	
Independent Variables	Coefficients	(p-value)	Coefficients	(p-value)	Coefficients	(p-value)
Constant	−2.008	(0.001)**	−1.810	(0.002)**	−2.371	(0.000)**
aDif (three)	0.406	(0.094)+			0.829	(0.000)**
CRO	−0.976	(0.009)**	−1.381	(0.000)**		
OGP (Max)	0.016	(0.247)	0.014	(0.297)	0.022	(0.102)
OGP (Mid)	0.040	(0.042)*	0.039	(0.048)*	0.045	(0.022)*
OGP (Min)	0.002	(0.921)	0.003	(0.906)	−0.008	(0.753)
D50	−0.334	(0.012)*	−0.325	(0.015)*	−0.326	(0.015)*
D0	1.295	(0.000)**	1.342	(0.000)**	1.232	(0.000)**
LR test (zero slope)		0.000**		0.000**		0.000**
LR test (no rand. eff.)		0.000**		0.000**		0.000**
Pseudo R^2		0.121		0.118		0.114

Number of observations= 947, Number of groups = 170
$**$ significant at 1 % level, $*$ at 5 % level, + at 10 % level

Table 9: Decision on Exits, three (adjusted cooperation index)

Dependent Variable:	Exit Variable				(random effects probit regression)	
	Model 1		Model 2		Model 3	
Independent Variables	Coefficients	(p-value)	Coefficients	(p-value)	Coefficients	(p-value)
Constant	−1.872	(0.004)**	−1.656	(0.009)**	−2.200	(0.000)**
Dif (four)	0.553	(0.057)+			1.017	(0.000)**
CRO	−1.003	(0.019)*	−1.550	(0.000)**		
OGP (Max)	0.018	(0.241)	0.016	(0.299)	0.024	(0.111)
OGP (Mid)	0.034	(0.112)	0.033	(0.124)	0.036	(0.084)+
OGP (Min)	0.000	(0.990)	0.002	(0.934)	−0.010	(0.736)
D50	−0.363	(0.012)*	−0.360	(0.013)*	−0.335	(0.019)*
D0	1.368	(0.000)**	1.402	(0.000)**	1.326	(0.000)**
LR test (zero slope)		0.000**		0.000**		0.000**
LR test (no rand. eff.)		0.007**		0.005**		0.009**
Pseudo R^2		0.143		0.139		0.137

Number of observations= 787, Number of groups = 169
∗∗ significant at 1 % level, ∗ at 5 % level, + at 10 % level

Table 10: Decision on Exits, four

Dependent Variable:	Exit Variable				(random effects probit regression)	
	Model 1		Model 2		Model 3	
Independent Variables	Coefficients	(p-value)	Coefficients	(p-value)	Coefficients	(p-value)
Constant	−1.837	(0.004)**	−1.656	(0.009)**	−2.189	(0.001)**
aDif (four)	0.462	(0.081)+			0.919	(0.000)**
CRO	−1.097	(0.007)**	−1.550	(0.000)**		
OGP (Max)	0.017	(0.257)	0.016	(0.299)	0.024	(0.113)
OGP (Mid)	0.033	(0.124)	0.033	(0.124)	0.035	(0.098)+
OGP (Min)	0.001	(0.950)	0.002	(0.934)	−0.009	(0.759)
D50	−0.373	(0.010)**	−0.360	(0.013)*	−0.350	(0.015)*
D0	1.365	(0.000)**	1.402	(0.000)**	1.312	(0.000)**
LR test (zero slope)		0.000**		0.000**		0.000**
LR test (no rand. eff.)		0.007**		0.005**		0.009**
Pseudo R^2		0.143		0.139		0.134

Number of observations= 787, Number of groups = 169
∗∗ significant at 1 % level, ∗ at 5 % level, + at 10 % level

Table 11: Decision on Exits, four (adjusted cooperation index)

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