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Altruism, Cooperation and Trust: Other-regarding Behavior and Collective Actions in Thailand

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Front cover photo: Bamboo dikes put up through collective action to deal with coastal erosion in Kok Kham sub-district, Samut Sakorn province, courtesy of Rawadee Jarungrattapong

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February, 2014

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ALTRUISM, COOPERATION, AND TRUST: OTHER-REGARDING BEHAVIOR AND COLLECTIVE ACTIONS IN THAILAND

Rawadee Jarungrattapong
Suparee Boonmanunt

EXECUTIVE SUMMARY

Everyday observation reveals seemingly unselfish behavior among friends, family, and even strangers or so called “other-regarding behavior”. In the neoclassical economic theory, people often act prosocially, not because of any enforcement or reward mechanism, but partly because of social norms. However, if other-regarding preferences influence how people behave, the rational actor model of economics needs to be modified.

This study tried to answer how well experiment measures for other-regarding behavior could generalize real behavior or enable it to be called “the external validity”. The study combined the results of the three experiments (i.e., the dictator game, the trust game, and the public good game) as proxies of other-regarding behavior and actual collective behavior of villagers in coastal conservation activities, and the results derived from the survey questions of attitudinal trust measures as used in the General Social Survey (GSS) and from past behavioral trust measures used by Glaeser et al. (2000).

The Kok Kham sub-district in Samut Sakhon province served as the study site because villagers in this area have acted collectively to conserve the coastal area; this is a behavior rarely found in other neighboring areas. The actual voluntary contributions to the three collective actions (i.e., bamboo dike building, mangrove afforestation, and coastal surveillance) were used as the proxy of cooperative behavior. A total of 96 villagers were recruited from the villagers in the study site to serve as participants.

Results showed positive correlations among the results of the three games, implying that people with more trust behavior tended to be more altruistic and cooperative and vice-versa. There was limited evidence of an order effect in the dictator game and in the public good game; however, game order seemed to have an effect on the result of the trust game. There was a large variation in the number of contributions for collective action between self-reported responses from the survey questions and actual contributions. Results of the three games were not significantly correlated with actual collective actions, and answers to the attitudinal trust from GSS and past trust behaviors used by Glaeser et al. (2000) did not appear to predict participation rates for actual contribution. These results suggest that the context-free standard game as manifested in the three games used in this study may not be able to generalize cooperative behavior in real life.

1.0 INTRODUCTION

1.1 Problem Statement

Researchers are becoming more interested in how people consider other persons' interests into their decision or actions. In daily life, people often act prosocially, not because of any enforcement or reward mechanism, but partly because of social norms. If this is the case, then the rational actor model of economics needs to be modified (Persico and Silverman 2006). Observation and common sense show that many seemingly unselfish behaviors among friends, family, and even strangers are regularly common; these behaviors can be called "other-regarding behaviors" (Frohlich et al. 2004; Persico and Silverman 2006).

There has recently been a growing interest in testing and measuring people's other-regarding behavior, i.e., unselfish behavior among friends, family, and even strangers, using various games. These games include the dictator game, the trust game, the public good game, the ultimatum game, and the envelope drop game. The dictator game examines the extent to which individuals will sacrifice portions of their own entitlements for the direct benefit of others. The trust game or investment game extends the dictator game one step further by making the receivers decide on how much of their own entitlement they want to send back to the first mover. The public good game determines the extent to which individuals will contribute from their initial endowment to a public account (which will benefit everyone), and how much they will keep for themselves.

Most researches have tried using one or more of these games to measure other-regarding behavior by focusing on their outcomes. Although each game has been recognized as a measurement of people's regard for others, all of these have been taken to measure other-regarding attitudes that motivate people's actions. One of these games (e.g., the dictator game, the trust game, or the public good game) has commonly been taken as a proxy measure for altruism, trust, and cooperation or regard for others. However, it is still an open question how consistent people are when they play several games. In addition, there have been very few attempts to test whether various game measures are correlated or not, and to what extent one can explain or predict actual behavior based on the outcomes of these games. Moreover, the existing studies show mixed results.

For example, Glaeser et al. (2000) combined two experiments, the trust game and the envelope drop game, with attitudinal trust questions from the General Social Survey (GSS) to measure trust and trustworthiness. They found that attitudinal measures of trust used in the GSS were not significantly related to the results obtained with the trust game. In contrast, Anderson et al. (2004) found that all attitudinal measures of trust were associated with contributions in a public good game. Furthermore, Bouma et al. (2008) found that individual trust behavior in the game was not related to participation in community resource management of Indian rural villagers. In addition, Voors et al. (2012) found no evidence that cooperative behavior measured by a public good game was correlated with real contribution to community works in the village in rural Sierra Leone. On the other hand, Carpenter and Myers (2010) found that the mean donations in the dictator game of firefighters and volunteer community members in the United States (when they donated to their 13 chosen charities) were significantly different from non-volunteer members.

The inconsistency of findings shows the need to better understand other factors that can explain the variability of people's other-regarding behaviors in the experiments. Also, since most of the works on other-regarding behaviors have been done in developed countries, it would be interesting to find evidences of such behaviors in developing countries such as Thailand. The main contribution of this study, however, is an exploration of the external validity (artefactual) of field experiments. Some earlier studies show that the game results may or may not predict real behavior depending on the conditions of each case (e.g., Bouma et al. 2008; Carpenter and Seki 2005). Hence, results of this study can provide important inputs for policymakers about which communities to target if they want to promote voluntary contributions for cooperative activities. For example, under a budget constraint, policymakers can target communities with other-regarding behavior (as demonstrated by the games) to have better success in implementing mitigation measures for coastal erosion.

In Thailand, villagers in some areas such as Kok Kham sub-district in Samut Sakhon province contribute to building bamboo dikes (see cover photo) (Pongpleesal, forthcoming), mangrove afforestation, and coast surveillance. These kinds of collective action for coastal conservation are rarely found in other

neighboring areas. It is therefore interesting to ask: *What influences or encourages people to work collectively in conserving coastal areas?*

This study combines the results of three games (i.e., the trust game, the dictator game, and the public good game) and actual collective behavior of households in coastal conservation. Hence, it tries to link experimental plays, which serve as a proxy of other-regarding behavior, with real behavior. The attitudinal trust questions from the GSS and questions about past trust behaviors used by Glaeser et al. (2000) were tested to see if they could predict the villagers' other-regarding behavior.

In addition, this research provides a more extensive testing of various methods for the three games and the survey question, whereas other past studies applied only one game. Unlike earlier studies, this study also tested whether the game order affected the game results. Further, the study participants are composed of villagers who live in the Kok Kham sub-district, Samut Sakhon province, rather than students. The villagers acted collectively to promote coastal conservation through bamboo dike construction, mangrove afforestation, and coastal surveillance.

1.2 Research Objectives

The general objective of this study was to determine how other-regarding behaviors of individuals, as measured by their responses in the dictator game, the public good game, and the trust game, can be used to generalize their real decisions in contributing to collective actions. Specifically, the study aimed to:

1. Test the correlation between the results of the three games, which served as measures of the three dimensions of other-regarding behaviors, and the actual collective actions of the households;
2. Test the correlation between the games;
3. Test whether the order of the games influenced the game results;
4. Compare the results of each game with that of previous studies; and
5. Test the correlation between the results of the games and the survey questions.

1.3 Study Area

Samut Sakhon, Samut Prakarn, and Bangkok (Bang Khun Thian district) share the same coastline. These are considered "hot spot" areas because they are the most severely eroded coastal areas in Thailand (Jarupongsakul 2006; World Bank 2006) (Figure 1).



Figure 1. Coastal erosion levels in the Gulf of Thailand
 Note: The star indicates the study area: Kok-Kham, Samut Sakhon province
 Source: World Bank (2006)

Among all the sub-districts in Samut Sakhon province, the Kok Kham sub-district ranks first in terms of annual coastal erosion rate during 2002-2007 (Table 1). Some Kok Kham villagers have been shown to cooperate with each other in conserving the coastal areas. Due to budgetary and time constraints, this study focused on two Kok Kham villages, namely: Village Nos. 3 and 8 (Figure 2). In 2009, Village Nos. 3 and 8 had 195 households and 453 households, respectively. The major economic activities in the study sites are aquaculture and small-scale fisheries (Pongpleesal, forthcoming).

Table 1. Annual rate of coastal erosion in Samut Sakhon province

Sub-district	Year			
	1952-1974	1974-1995	1995-2002	2002-2007
Ban Bo	2.56	2.26	7.64	0.78
Pantai Norasing	2.13	NI	5.01	1.88
KokKham	4.82	4.51	4.75	2.48
Na Kok	NI	1.30	5.91	1.01
Bang To Rut	NI	1.67	5.80	0.95
Ka Long	NI	0.94	5.44	NI
Bang Ya Phraek	NI	1.27	5.87	1.54
Bang Krachao	NI	5.46	10.52	0.92

Source: Pongpleesal (forthcoming)

NI = no information



Figure 2. Aerial photograph of the study area

Source: Google Earth, 8 April 2014

1.4 Literature Reviews

There is growing empirical evidence that other-regarding behavior is correlated to collective actions. For example, Glaeser et al. (2000) measured trust and trustworthiness by combining two experiments (the trust game and envelope drop) and attitudinal trust questions from the GSS such as: *“Would you say that most people can be trusted or that you cannot be too careful in dealing with people?”* Participants were Harvard students. The amount sent and the return ratio¹ were used as measures of trust and trustworthiness in the trust game, respectively.

¹ Return ratio = amount returned/amount available to return

Glaeser et al. (2000) found that attitudinal measures of trust used in GSS were not significantly related to trust behavior, nor were common measures of participation in voluntary activities (e.g., membership in voluntary groups). Such evidence raised growing concern that survey-based measures of trust behavior were not meaningful. However, past trusting behavior from attitudinal survey questions was correlated with trusting behavior in the experiments. Trustworthiness could be predicted by attitudinal survey questions about trust. Further, trustworthiness declined when partners had racial and national differences.

Anderson et al. (2004) tested whether social capital measures could predict contributions in a public goods experiment by combining data from the experiment and survey. The social capital measures included attitudinal trust measures as used in the GSS; behavioral trust measures as used in Glaeser et al. (2000) (e.g., whether participants leave their doors purposely, loan money to friends or strangers); and participation in voluntary activities. The findings contradicted that of Glaeser et al.'s (2000). This study found that most measures of individual other-regarding behavior (both attitudinal trust and behavioral trust measures) and membership in voluntary contribution were strongly correlated with higher contributions to the public goods experiment.

Bouma et al. (2008) combined trust experiment data with household survey to analyze how other-regarding behavior, as measured by the amount sent in the trust game, affected community resource management in rural India in the form of real voluntary contributions to investment in soil and water conservation. The study found that the average amount sent by the village in the trust game, not the individual amount sent by the participants, was correlated with participation in community resource management if activities were not subsidized by NGOs or the government. Average play in the trust game was correlated with social homogeneity as measured by caste membership. The risk preference, as measured by debt per acre, was positively correlated with the amount sent in the trust game.

Carlsson et al. (2011) analyzed the role of two kinds of other-regarding behavior: i) conditional cooperation, where people may be more willing to cooperate if others do; and ii) the effects of the default alternative, where people may be influenced by the default alternative. The study analyzed a field experiment on how households in rural Vietnam made real contributions to the building of the bridge as the proxy of a public good. The study found that the effects of both conditional cooperation and default alternative were significant on voluntary contributions for a real local public good. For example, people tended to contribute less compared to if nothing is said about others' contributions. Also, a zero default contribution reduced the contribution compared to a no default contribution.

1.5 Data Collection

Data on past collective actions for coastal conservation were obtained from the official record of the upper Gulf of Thailand Conservation Network (UGTCN)². Further, the results of the three games (the dictator game, the public good game, and the trust game) were used to predict participation in collective actions on coastal conservation.

2.0 RESEARCH METHODS

2.1 The Experiment

As mentioned earlier, the study investigated how altruism, trust, and cooperation affected individuals' decisions on collective action by using economic experiments. Altruism, trust, and cooperation were measured using the dictator game, the trust game, and the public good game, respectively. The actual voluntary contribution to collective actions covered at least one of these three activities: bamboo dike construction, mangrove afforestation, and coastal surveillance. These activities were used as proxies of cooperative behavior for the collective action in the communities.

² Founded in 1992, the UGTCN is a network of community organizations, which are all located in the coast of the upper Gulf of Thailand. Its mission is to conserve and rehabilitate the marine and coastal resources in the upper Gulf of Thailand.

The following hypotheses were tested:

Hypothesis 1: The order of the games does not affect the outcome of the games.

Hypothesis 2: If an individual shows other-regarding behavior in one of the games, s/he is more likely to show other-regarding behaviors in the other games.

Hypothesis 3: An individual who shows more other-regarding behaviors is more likely to participate in community cooperative activities.

Hypothesis 4: Results of the attitudinal trust questions and of the questions on past trust behavior are correlated with the results of the trust game.

To test these hypotheses, the study experimented with the three economic games combined with survey questions to elicit the other-regarding behavior of each participant. Actual participation in conservation activities were also used as proxies of cooperative behavior.

2.1.1 Experimental design

To determine whether the order in which the games were played affected decision making, six game sessions, of 16 participants each, were prepared with each session having a different order of games (Table 2). All 16 participants per session participated in all of the three games of that session.

Table 2. Order of the games in each session

Session	Game 1	Game 2	Game 3
1	Dictator	Trust	Public goods (4)
2	Dictator	Public goods (5)	Trust
3	Trust	Dictator	Public goods (4)
4	Trust	Public goods (5)	Dictator
5	Public goods (5)	Dictator	Trust
6	Public goods (4)	Trust	Dictator

Note: In parenthesis is the number of rounds played in the public good game.

The experimental design of all three games and the research procedure are explained below:

(i) Dictator game. The proxy of altruism comes from a field experiment based on the standard dictator game (e.g., Forsythe et al. 1994). The participants (senders) were asked to decide how much of a THB100 (USD3.33) endowment would be transferred to their pairs (receivers), who were randomly assigned by the experimenter before the round started. The receivers were then informed how much money their senders have sent to them. At the end of the first round, a receiver earns the amount the sender has sent, whereas a sender earns the amount that is kept.

When the second round is played, the roles of sender and receiver are exchanged. This is announced after the participants have already played the first round. However, because it is not the same pair (stranger design), the researcher can use the amount sent as a proxy of altruism for every participant or individual. The game-theoretical prediction for this game is that if the sender is completely rational, s/he will keep all the THB100 for himself or herself and send nothing to the receiver.

(ii) Trust game. The standard trust game (e.g., Berg et al. 1995) is used to measure trust behavior. The trust game extends the dictator game one step further as the receivers can decide how much of their own entitlement will be sent back to the first mover. After the first movers make a decision about how much of the THB100 endowment will be transferred to their pairs (receivers), the experimenters will triple whatever amount the senders decide to transfer. Each receiver then has to decide how much is to be returned to the sender and how much he/she will keep. At the end of this round, senders are informed about the amount returned to them. In the second round, the game rule remains unchanged, the role of the

participants is reversed, and the participants are paired with a different person. This is announced after the first round has been played.

From the game setting, the payoffs for both sender and receiver are maximized. If the sender sends the total endowment to a receiver, then the total payoff for the receiver will be THB300. With completely rational players, the receiver will not return any money to the sender. The sender will anticipate this and will not send anything from the beginning. Therefore, the amount sent can be seen as the level of trust.

(iii) Public good game. Participants play the standard public good game (e.g., Ledyard 1995) in groups of eight participants, who do not know (and will never know) the member composition of their group. The members stay in the same group for all rounds of the game (partner design). Each of the eight participants decides how to spend the endowment of THB50 (USD1.67) – either to keep all the endowment for himself/herself or invest this fund into the “public goods account”. The sum of this account is doubled and divided equally among the eight group members of each group. Individual rationality would dictate that the individuals keep all endowment for themselves, whereas collective rationality would dictate that they contribute all endowment to the public account.

The number of rounds is either four or five (as shown in Table 2), where participants never know the total number of rounds in advance. The reason for this is to avoid the end-game effect on participants in later sessions as they anticipate the total rounds of the game. Besides, it represents reality; in real life, people do not really know when their contributions to public good (e.g., cooperative activities for the community) will end. However, only the first four rounds are used in analysing the comparison among the sessions. At the end of each round, participants are publicly informed about the level of each group’s contribution. Thus, the contributed amount represents the cooperation level of the individuals.

2.1.2 The survey questions

After the participants have played all the three games, each was asked to fill out the survey questions privately. The questions cover demographic characteristics, trust attitudes/past trust behavior, risk preference of the participants, and the collective actions they are participating in. The trust questions include questions on trusting attitudes (from the GSS) and past trusting behavior (adapted from Glaser et al. 2000) to measure trust behavior using self-report responses. To see whether the results of different instruments measuring trust behavior (self-reported responses and the behavioral game) provide consistent outcomes, the answers to these trust questions and the individual decisions in the trust game are compared.

Moreover, a question for risk preference was also asked to test the argument that the amount sent by the first mover in the trust game did not only reflect social preferences, but also the relative risk preference. For instance, a first mover who is a risk-lover may send more to the receiver than one who is not (Bouma et al. 2008). Therefore, the individual’s risk preference may affect the amount sent in the trust game. The risk preference question, the attitudinal trust questions and the past trusting behavior questions are labelled in the survey questionnaire (translated) in Appendix 1.

2.1.3 Procedure

The pretest was first conducted with undergraduate students at Khon Kaen University on 5-7 December 2011 to help improve or revise the artefactual field experiments with households in Samut Sakhon province. A USB flash drive served as a show-up fee for the students.

The field experiments gathered information on villagers’ contributions to actual collective actions in the area. The experiments were conducted from the 30 January to the 1 February 2012 in a seminar room at the Co-operative of the Farm-Product Marketing Society Limited located in the Kok Kham sub-district. Based on the experimental design described, the research needed 16 participants for each session, hence a total of 96 in all. Most of the participants were recruited from households in Village Nos. 3 and 8, while some of them were from Village Nos. 4, 9, and 10 in the Kok Kham sub-district, Samut Sakhon province.

These villagers have experienced coastal erosion, and some of them have acted collectively to lessen this by building bamboo dikes as well as afforesting mangroves. Moreover, some villagers have participated in coastal surveillance to prevent illegal fishery.

The UGTCN staff helped the research team make the appointment with local villagers by managing to mix the individuals who contributed as well as those who did not contribute to the community collective actions. The UGTCN staff invited the villagers to participate in the experiments on a voluntary basis. T-shirts were given to each participant as a show-up fee.

When all participants in the session arrived at the experimental room, they drew lots to determine their seat number. The participants were paired and grouped for every game session using the number they drew (Table 3) before the conduct of the experiment. They signed consent forms before the first experiment began.

Table 3. How to make a pair or group in each game

Player	Round no.	Seat no.							
Dictator game									
Sender	1	1	2	3	4	5	6	7	8
Receiver		9	10	11	12	13	14	15	16
Sender	2	9	10	11	12	13	14	15	16
Receiver		8	7	6	5	4	3	2	1
Trust game									
Sender	1	2	4	6	8	10	12	14	16
Receiver		1	3	5	7	9	11	13	15
Sender	2	1	3	5	7	9	11	13	15
Receiver		4	6	8	10	12	14	16	2
Public good game									
Group 1		1	2	3	4	5	6	7	8
Group 2		9	10	11	12	13	14	15	16

At the beginning of each game, the participants were provided with written instructions for the game, which they read for about five minutes. Then the experimenter explained the game to all the participants using a diagram, after which they were allowed to ask questions. The diagram and written (translated) instructions of each game is in Appendix 2.

Participants can also ask questions throughout the experiments by raising their hands. The experimenter answered the questions privately by going to the participant who asked the question. All 16 seats were placed abreast and divided from each other with the foam plates so that the participants could not see what the other participants were doing. All seats were marked with seat numbers 1 to 16. After the participants have played all three games, they were asked to answer the questionnaires. When the participants finished answering their questionnaires, they received their payoff for all the games in the form of cash placed inside an envelope.

2.2 Cooperative Activities

The participants were also asked to answer whether they have participated in collective actions for coastal conservation in the past. Contributions to these activities were chosen to be the proxies for cooperative behavior. First, cooperation was needed to run these activities, and it was led by the community itself, not by any government agency. Second, all these activities happened in areas where it was known who contributed to these activities or not.

Nevertheless, there may be some drawbacks in using these activities as a proxy. Some people did not participate because of political reasons; they may be supporters of another political party from that of the current leader of UGTCN and non-participation does not necessarily mean low other-regarding behavior.

Some may have been affected by coastal erosion, hence their decision to contribute to these activities and not necessarily because they were showing other-regarding behavior. Hence, the benefits from participating in conservation activities and other-regarding behaviors may be mixed. However, even if the study participants could benefit directly from taking part in these conservation activities, the choice of free riding on the work of others was still present. Hence, if they participated in these activities, they were at least foregoing the opportunity to take advantage of others by free riding. Hence, to some extent, the proxy measure could be an indication of cooperative behavior.

In the study, there was a large variation in the number of contributions for collective action between self-reported responses from the survey questions and from their actual contributions. Of the 96 study participants, majority (87.5%) reported that they contributed to at least one cooperative activity. This figure was considerably higher than the actual contribution based on official UGTCN records (31.2%). However, 46 participants (48%) reported that they did not contribute to the construction of the bamboo dike. Many (22%) did not contribute to mangrove afforestation, and more than half (58%) did not contribute to coastal surveillance.

From the survey questions, the respondents' reasons for not contributing to the collective actions could be categorized into four: 1) they were not affected by coastal erosion; 2) there was negative externality from such measure; 3) they thought that these methods were ineffective; and 4) they had no time or they thought that someone was already taking care of such measures. The second reason of negative externality showed that some villagers did not join in the collective actions for a bamboo dike because the latter prevented them from catching fishes. The fourth reason implied the incidence of free riding or the presence of a political problem in the area.

There is growing evidence that the survey-based technique for social behavioral studies may lead to problematic results (Carpenter 2002). Self-reported responses to behavioral questions may not have actually been done or were overestimated. Carpenter et al. (2004) conducted the voluntary contribution game with urban slum residents in Vietnam and Thailand. They found that almost all the participants in both countries reported participating in the community projects to clean up or improve the conditions in their communities. However, the community leaders argued that these self-reported responses were not consistent with the residents' actual contributions. A similar result was found by Carpenter and Myers (2010) when 99% of the firefighters in their study overestimated their training hours compared to their actual training hours.

Carpenter and Myers (2010) said that self-reported contributions tended to be biased and overestimated. Carpenter (2002) suggested three concerns when using survey data for behavioral questions: a) the *hypothetical bias* (people tended to overstate in hypothetical situations); b) the *idealized persona bias* (people tended to behave as how they would like to be or how the researcher wanted them to be); and c) the *incentive compatibility* (people may not have paid attention seriously while responding if there was no incentive). The idealized persona bias may be the reason for many cases of over reporting. People may be afraid that researchers or other persons would consider them to be "bad" if they did not participate in collective actions. Hence, this study secured official records of actual contributions by the villagers as these would be more appropriate proxies of cooperative behavior.

3.0 RESULTS AND DISCUSSIONS

The 96 study participants were recruited from the villagers in the Kok Kham sub-district in Samut Sakhon province. Table 4 summarizes their general demographic and socio-economic characteristics.

There were slightly more female participants (57%) than male participants. Half of the participants were wage workers and almost one-fourth (22%) were self-employed (Table 4). Some participants had more than one occupation (e.g., fisherman and also a wage worker). Average participant age was 43 years, with the oldest being 75 years old and the youngest being 18 years old. Average monthly income was approximately THB9,089 (USD303) with average residency in the villages being 35 years.

Table 4. Demographic and socio-economic profiles of the participants

Characteristics	Number (person)	%
Gender	96	100
Female	55	57
Male	41	43
Occupation*		
Wage worker	48	50
Self employment	21	22
Aquaculture farmer	11	11
Housewife	7	7
Fisherman	5	5
Student	4	4
Government employment	3	3
Retired	2	2
Salt farmer	1	1

Note: Multiple response as a participant may have more than one occupation (n = 96).

Table 5. Descriptive data of the participants

Characteristics	No.	Mean	Max.	Min.	S.D.
Age (years)	96	43.4	75	18	13.9
Monthly income (THB)	96	9,089 (USD303)	57,500 (USD1,917)	5,000 (USD167)	7,301 (USD243)
No. of years in the village	96	34.9	67	2	16.6

Note: USD 1 = THB 30

3.1 Results of Each Game

In general, the participants did not behave according to the game's theoretical predictions. Nevertheless, this was consistent with the results of many earlier studies (e.g., Forsythe et al. 1994; Berg et al. 1995; Henrich et al. 2001). The detailed comparison for the games is in the following sections.

3.1.1 Dictator game

The amount sent in the dictator game was used as the proxy of altruism. Table 6 shows the rates of the amounts sent and contributed in each game for the whole data (96 participants) and the game when it was the first one played³ (32 participants). The average amount sent for the whole data was 35.7%, and the average amount sent for the first game was 36.2% as against the maximum amount that could be sent (THB100 or USD3.3). Clearly, the amounts sent for the whole data and for the first game are similar. This was

³ The study wanted to compare between the results of the whole data and the data when it is the game first played to assess the effect of the game order in the trust game. Details of the order effect are described in the next section.

consistent with the study's results that did not find any strong evidence that the order of the game affected the results of the dictator game or the public good game. For the whole data, four of the 96 participants sent nothing, whereas four participants sent the entire THB100 (Table 7). When considering only the dictator game as the first game played, no one sent either the maximum and minimum amount that could be sent.

Table 6. Amount sent/contributed for each game by contributors and non-contributors in collective actions

Games	No. of participants		% of maximum amount that could be sent/contributed			
			Average		Median	
	Whole sample	First game only	Whole sample	First game only	Whole sample	First game only
Dictator						
Non-contributors	66	24	36.2	37.0	40.0	40.0
Contributors	30	8	34.5	33.8	30.0	35.0
Total	96	32	35.7	36.2	40.0	40.0
Trust						
Non-contributors	66	21	36.0	47.1	30.0	50.0
Contributors	30	11	47.8	53.2	40.0	50.0
Total	96	32	39.7	49.2	30.0	50.0
Public good						
Non-contributors	66	21	54.4	51.1	50.5	47.5
Contributors	30	11	62.1	63.5	65.0	70.0
Total	96	32	56.8	55.3	55.0	60.0

Note: The endowment was THB100 for the dictator game and the trust game, and THB50 for the public good game.

Table 7. Percentage of participants who sent/contributed the maximum and minimum amount for each game

Experiments	Sent/contributed maximum amount					Sent/contributed minimum amount				
	Amt (THB)	No. of participants		%		Amt (THB)	No. of participants		%	
		Whole sample	First game only	Whole sample	First game only		Whole sample	First game only	Whole sample	First game only
Dictator	100	4	0	4.2	0	0	4	0	4.2	0
Trust										
Amount sent	100	9	6	9.4	18.8	0	0	0	-	0
Return ratio, %	1	5	4	5.2	12.5	0	4	3	4.0	9.4
Public good	50	7	1	7.3	3.1	0	1	0	1.0	0

The result of the whole data in the dictator game was higher than the results of selected earlier studies (Table 8). The average amount sent for other studies was about 25% (Andreoni and Vesterlund 2001). However, the average gift in Hoffman et al. (1994) was only 10%, since the anonymity and confidentiality was extremely high. It should be noted that the participants in these studies were students. Nevertheless, Henrich et al.'s (2001) experiments with local people from the 15 small-scale societies around the world showed different results. For example, the average rate of amount sent by the Orma people in Kenya was 32%, which was slightly lower than the result of this experiment. The proportion of participants sending nothing (THB 0) in our experiment was only 4%, which was far lower than the results from previous studies with students but higher than with the Orma people.

While no participant sent the maximum amount that could be sent to the receiver in selected previous studies, 4% of the participants in this experiment did. The proportion of participants sending equal share in this experiment was about the same rate as in most previous studies, which was about 20-25%. This shows that the participants in this experiment, similar to the Orma people, gave an average amount more than the students in earlier studies. This suggests that rural villagers maybe more motivated to give than students. Henrich et al. (2001) concluded that the real economic and social interactions of everyday life influence the results of the games. The participants also interacted with people in their communities to know each other, even though their decisions were anonymous.

Table 8. Comparison of the results of the dictator game with the results from selected previous studies

Participants	This study	Forsythe et al. (1994)		Hoffman et al. (1994)	Bohnet and Frey (1999)	Henrich et al. (2001)
	Thai rural villagers	US students		US students	Swiss students	Orma people (Kenya)
No. of observations	96	45	24	41	39	NI
Initial endowment	THB 100 (USD3.3)	USD 5	USD 10	USD 10	CHF13 (USD10)	NI
Rate of amount sent, %	35.7	23.33	23	10	26	32
Proportion of the first mover sending zero, %	4	36	21	62	28	0
Proportion of the first mover sending maximum amount that could be sent, %	4	0	0	0	0	NI
Proportion of the first mover sending equal share, %	21	22	21	1	25	NI

Source: Adapted from Forsythe et al. (1994), Hoffman et al. (1994), Bohnet and Frey (1999), and Henrich et al. (2001)

NI = no information

3.1.2 Trust game

In this study, the amount sent in the trust game (Table 6), which represented trusting behavior for the whole data and for the first game only, were 39.7% and 49.2% of the maximum amount that could be sent (THB100 or USD3.3). The difference in the amount sent between these two data sets was about 10%. This difference may be because of the effect of the game order, which is described in Section 3.2. For those that played the trust game first, none of the 32 participants sent THB 0, whereas six sent the THB 100 (Table 7). Further, three returned THB 0 and four returned the entire amount received. The average percentage of return ratio⁴ in the trust game as the first game played was 37.7%.

This study's results for the whole data were slightly lower than that of previous studies (Table 9). For example, Glaeser et al. (2000) found that rate of amount sent was 83%, which was quite high compared to other studies. This may be because the participants in the latter's study met their pairs before the games leading to the high rates of amount sent. In other studies, some people showed no trust at all by sending nothing. In this study, no one sent nothing, suggesting that every participant had some degree of trust in the other participants. In addition, the proportion of the first mover sending the maximum amount that could be sent in the present study was aligned with the results from Zimbabwean farmers (Barr 2003). The return ratio (amount returned/amount received) in this study was about the average of other studies, showing reciprocity and some other-regarding preferences, which will be discussed later.

⁴ Return ratio is the amount returned/amount available to return

Table 9. Comparison of the results of the trust game with the results from selected previous studies

Participants	This study	Bouma et al. (2008)	Barr (2003)	Berg et al. (1995)	Glaeser et al. (2000)
	Thai rural villagers	Indian rural villagers	Zimbabwean farmers	US students	US students
No. of total participants	96	92	141	32	96
Initial endowment	THB100 (USD3.3)	INR50 (USD1.15)	ZWD20 (USD0.8)	USD10	USD15
Rate of amount sent, %	39.7*	49	43	51.6	83
Proportion of the first mover sending zero, %	0	13	9	6	NI
Proportion of the first mover sending maximum amount that could be sent, %	9	NI	7	16	71
Return ratio (amt returned/ sent), %	36.1 (108.3)	29 (87)	42.6 (128)	29.6 (89)	45.5 (91)

Source: Adapted from Bouma et al. (2008), Barr (2003), Berg et al. (1995), and Glaeser et al. (2000)

*36 for non-contributors and 47.8 for contributors

NI = no information

3.1.3 Public good game

In the public good game, the contribution rate of students varied between 40 to 60% (e.g., Ledyard 1995, p. 113). This study also replicated these findings with a contribution rate of 56.8% for the whole data and 55.3% of first game played vis-à-vis the maximum amount that could be sent (THB 50 or USD1.7) (Table 6). Table 6 shows that the results of the amount contributed between these two sets of data were not different, which was consistent with the result of order effect as mentioned earlier. For the whole data, only one of the 96 participants contributed nothing, whereas seven participants contributed all the initial endowment (Table 7). As for the first game played, only one participant contributed all the initial endowment but no one contributed nothing.

Results for the whole data in this study were in line with the results of previous studies. Henrich et al. (2001) found that the Orma people contributed an average of 58% in the public good game, but only 22% from the Machiguenga people in a small-scale society (Table 10). This result was consistent with everyday realities of both societies. Machiguenga people are known to rarely cooperate, exchange, or share. The Orma people, on the other hand, have plenty of institutions that support village-level voluntary contributions for public good projects such as voluntary contributions for school works or road construction. In addition, Carpenter et al. (2004) found that the contribution rate of the voluntary contribution game (as four-person generalization of the prisoner's dilemma) played by urban slum dwellers in Bangkok was 67.2%, which was quite high and even higher than the contribution rate in this experiment. This may be because Carpenter et al. (2004) allowed the participants to sanction each other by showing disapproval of free riding.

Table 10. Comparison of the results of the public good game with the results from selected previous studies

Participants	This study	Andreoni (1988)	Henrich et al. (2001)		Carpenter et al. (2004)
	Thai rural villagers	US students	Machiguenga people (Peru)	Orma people (Kenya)	Slum people (Bangkok)
No. of participants (persons)	96	20	NI	NI	120
Initial endowment (per round)	THB100 (USD3.3)	50 token	NI	NI	THB10 (USD0.33)
Contribution rate, %	56.8	33.2	22	58	67.2
Proportion of the participants sending zero, %	1	34	NI	NI	NI
Proportion of participants sending maximum amount that could be sent, %	7	NI	0	NI	NI

Source: Adapted from Andreoni (1988), Henrich et al. (2001), and Carpenter et al. (2004)

NI = no information

This study did not find any correlation between demographic characteristics (i.e., age, gender, and income) and the results of the trust game or the public good game. In the dictator game, the amount sent was significantly correlated with gender (male) at 1% (Spearman's rank-order correlation coefficient (r_s) = 0.367 and $p < 0.01$). Earlier studies showed mixed results; whereas some showed that the males were more cooperative and generous (e.g., Kahn et al. 1971), others showed that women gave more (e.g., Eckel and Grossman 1998). Some studies even showed that males and females were equally altruistic (e.g., Andreoni and Miller 2002; Bolton and Katok 1995). Interestingly, Andreoni and Vesterlund (2001) found that when it was relatively expensive to give, females were more generous than males. In contrast, when the price was low, males were more altruistic. The participants in this study may have considered the price of giving as low, hence, on the average, the male participants gave more than the females.

3.2 Order Effects

The first hypothesis tested was whether the order of the games, as described in Table 2, affected the results. The average and median of the amount sent/contributed in each combination of the games are shown in Table 11. To determine significant differences in the results of the games between these sessions, an independent sample t-test and a Mann Whitney-U test were applied when the data in each session were normally and not normally distributed, respectively (Table 12).

Table 11. Rate of amount sent/contributed in each session

Session	Game 1		Game 2		Game 3	
	Average (%)	Median (%)	Average (%)	Median (%)	Average (%)	Median (%)
1	Dictator		Trust		Public goods	
	42.4	45.0	34.4	35.0	48.9	45.0
2	Dictator		Public goods		Trust	
	30.0	30.0	45.9	38.8	21.9	20.0
3	Trust		Dictator		Public goods	
	48.4	45.0	35.9	40.0	66.7	70.0
4	Trust		Public goods		Dictator	
	50.0	50.0	68.7	65.0	43.3	50.0
5	Public goods		Dictator		Trust	
	52.4	53.8	30.1	20.0	25.7	20.0
6	Public goods		Trust		Dictator	
	58.3	62.5	57.8	50.0	32.5	20.0

Note: The endowment of the dictator game, trust game, and public good game was THB100, THB100, and THB50, respectively.

Table 12. Significant differences in mean ranks of the results of the games in each session

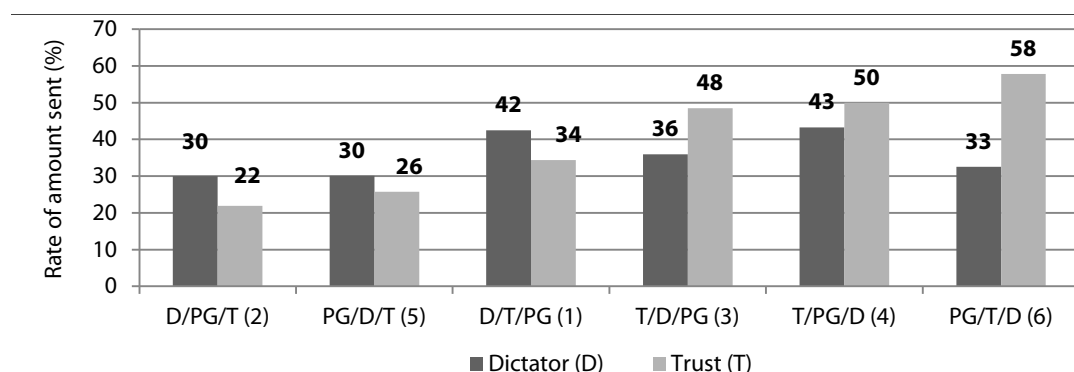
Session	Dictator		Trust		Public goods	
1 and 2	U = 71.00	p = 0.032**	U=62.00	p = 0.012**	U=102.50	p = 0.341
1 and 3	U = 95.00	p = 0.224	U=106.50	p = 0.423	U=63.00	p = 0.014**
1 and 4	U =123.00	p = 0.867	U=93.00	p = 0.196	U=64.00	p = 0.015**
1 and 5	U=74.00	p = 0.043**	U=87.00	p = 0.128	U=119.50	p = 0.752
1 and 6	U=79.50	p = 0.067	U=74.00	p = 0.043**	U=100.00	p = 0.305
2 and 3	U=113.00	p = 0.590	U=64.00	p = 0.015**	t= -2.946	p = 0.006***
2 and 4	U=96.00	p = 0.239	U=53.50	p = 0.004***	t= -2.885	p = 0.007***
2 and 5	U=123.5	p = 0.867	U=113.50	p = 0.590	t= -0.740	p = 0.465
2 and 6	U=118.50	p = 0.724	U=36.00	p = 0.000***	t= -1.601	p = 0.120
3 and 4	t= -0.724	p = 0.475	U=120.00	p = 0.780	t= -0.251	p = 0.804
3 and 5	t= 0.729	p = 0.472	U=77.00	p = 0.056	t=1.634	p = 0.113
3 and 6	U=110.00	p = 0.515	U=105.50	p = 0.402	t=1.077	p = 0.290
4 and 5	t=1.378	p = 0.179	t=2.777	p = 0.009***	t=1.726	p = 0.095
4 and 6	U=98.00	p = 0.270	U=112.00	p = 0.564	t=1.214	p = 0.234
5 and 6	U=122.50	p = 0.838	U=50.50	p = 0.003***	t=-0.636	p = 0.530

Notes: 1. ** and *** indicate significance at 5% and 1% level respectively; 2. U = a Mann Whitney-U test, t = t-test

Statistical tests showed very little evidence of any important order effect in the dictator game and the public good game. Differences in the amount sent/contributed in the dictator game and in the public good game were significant in only a minority of cases. It was too weak to indicate that the order of games affected the sending/contribution behavior of people. Only two pairs in the dictator game and four pairs in the public good game of all possible 15 comparisons were different at a 5% significance level. These results gave limited evidence of any important order effect for the dictator game and the public good game.

Moreover, the study found that the order of the game might have affected the amount sent in the trust game. Statistical tests demonstrated that seven pairs of all possible 15 comparisons were statistically different at 5% significance level (Table 12). The amount sent in the trust game was observed to be lower (27.3%) when the trust game came after the dictator game. However, when the ordering was reversed, the amount sent in the trust game was higher (52.0%).

Figure 3 illustrates the game allocation in the different game combinations, sorted by ascending order of amount sent in the trust game. There seemed to be no clear reason for individuals sending significantly less amounts in the trust games when these were preceded by the dictator games (and more when the ordering was reversed). One possible reason may be that in the dictator game, people did little or nothing to earn their endowments but just kept an average of THB66 of their THB100 windfall. Observing this may have prompted them to be reluctant to give up much of their own money in the trust game that followed. This was because in the trust game, it was more risky to get the amount back from one of these same people; it was also harder to decide.



Note: 1. Figures in parenthesis are the number of the session; 2. Rate of amount sent in the trust game is sorted by ascending order of amount.

Figure 3. Average rate of amount sent in the dictator game and the trust game in different game combinations

3.3 Correlation between the Games

To test the second hypothesis, correlation was examined between the games on whether the individuals who sent/contributed more in one game were likely to send/contribute higher amounts in other games. It should be noted that different games did not measure the same other-regarding behavior, but each measure was related to other-regarding behavior. Spearman's rank-order correlation coefficients (r_s) were calculated to see if the associations were statistically significant.

Positive correlations between the amounts sent/contributed by an individual across all games were found at 1% significance level ($p < 0.01$). This means that participants who sent/contributed a higher amount in one game were likely to have also sent/contributed a higher amount in other games. Therefore, people with more altruistic behavior tended to be more trusting and cooperative and vice-versa.

Several studies have tried to explore evidences of other-regarding behaviors (e.g., altruism, trust, and cooperation) between different games or treatments (e.g., Andreoni 1995; Goeree et al. 2002; Croson 2006; Cox 2004). Table 13 shows previous studies that found a positive relationship between other-regarding behaviors such as altruism, trust, and cooperation in the experiments.

Table 13. Studies with evidence of altruism, trust, and cooperative behavior in different games/treatments

Participants	Andreoni (1995)	Goeree et al. (2002)	Croson (2006)	Cox (2004)
	US students	US students	US students	US students
No. of total participants	8 groups of 5 participants	32 participants (groups of 2 or 4 participants)	6 groups of 4 participants	32 pairs of participants
Type of experiment	The two treatments of the PG game to separate the kindness (altruism) and confusion	The modified PG game varies an internal return and external return across 10 treatments.	The two stages of the standard PG (the “guessing” and “decision” stages) distinguish among the three competing theories: commitment, altruism, and reciprocity.	The three treatments of the trust game and the modified dictator game
Results	There is evidence of altruism in the PG game.	The contributions to PG are growing with external return, suggesting that altruism exists in the PG game.	There is a positive relationship between a participant’s PG contribution and his/her guess of other group members’ contribution, supporting reciprocity theories.	The amount sent and amount returned are correlated in the trust game. Also, a positive amount sent is not evidence of trusting behavior only but also of altruistic behavior.

Source: Adapted from Andreoni (1995), Goeree et al. (2002), Croson (2006), and Cox (2004)

This study’s correlation results between the games support the evidences found by previous studies. Andreoni (1995) found that both kindness (altruism) and confusion effected cooperation in the public good game, and about half of all cooperative decisions could be classified as kindness. Goeree et al. (2002) investigated how the giving cost affected the contribution to public goods, in which they varied an “internal return”⁵ for oneself and an “external return”⁶ to someone else across the 10 treatments in a one-shot linear public good setting. They found that contributions grew with external return, suggesting that altruistic preferences for others’ earnings, or altruism, existed in the setting of the public good game. Goeree et al.’s finding was similar to this study’s finding on the correlation between the results of the dictator and public good game.

In addition, Croson (2006) tried to distinguish between the three competing theories of commitment, altruism, and reciprocity by testing their comparative static predictions in a linear public good setting. Participants played the public good game for two rounds of identical 10 periods. The game was different from the standard public good game; instead, the Croson study version consisted of two stages: the “guessing” and the “decision” stages. In the guessing stage, participants estimated the total contribution of other group members in the upcoming decision stage. In the decision stage, participants decided on their contribution to the public good account, which was the same as in the standard public good game. The relationship between a participant’s contribution and the estimated contribution of the other group members was then investigated. In this relationship, the commitment theory predicts a zero correlation; the altruism theory predicts a negative correlation; and the reciprocity theory predicts a positive correlation. Croson (2006) showed a significant and positive relationship between a participant’s contribution and his/her guess of other group members’ contribution, hence supporting reciprocity theories over traditional free-riding theories. Also, he suggested that reciprocity affected decisions in the public good game (more than commitment and altruism). The positive relationship between cooperation and altruistic behavior was also supported in the study.

Additionally, Cox (2004) distinguished between the return of the second mover being motivated by reciprocity and the return resulting from unconditional other-regarding behaviors (or altruism) in the trust

⁵ Internal return is one’s private return from his/her contribution to the public account in the public good game (Asher et al. 2009).

⁶ External return is the return to others according to one’s contribution to the public account in the public good game (Asher et al. 2009).

game. He explained that a first mover with altruistic behavior might prefer to give the second mover some money even if s/he knew that s/he might get nothing back. Therefore, sending a positive amount of money was not only evidence for trusting behavior but also a result of unconditional other-regarding behaviors (altruism). In addition, when the first mover sends the second mover some money, the second mover may be motivated by a social norm of reciprocity to return the generous action with a generous response. Cox (2004) found evidence that the amount sent from the first mover was composed of both trusting and altruism behaviors, and the amount returned from the second mover was composed of both reciprocity and altruism. If this was the case, it could also explain why the amount sent in the dictator game and in the trust game in this study was significantly correlated. Furthermore, based on Andreoni et al.'s (2007) review of the evidences on altruism in several experiments, both warm-glow and altruism were evident in the public good game. This evidence supported the result of this study that the amount contributed in the public good game was correlated to the amount sent in the dictator game and the trust game.

3.4 Actual Contributors to Cooperative Activities and Behavior in the Games

To avoid the effect of game order, the study tested the third hypothesis by using only the results of the first game played. The study recognized that individual play in all three games did not seem to predict the decision to participate in actual cooperative activities for coastal conservation. The Mann-Whitney U test (U) showed no statistically significant difference in the means of the amount sent in the dictator game ($U = 87.5$, $p = 0.717$) and in the trust game ($U = 110.0$, $p = 0.845$) between contributors and non-contributors in cooperative activities. In addition, t-test showed that the mean of the amount contributed in the public good game was also statistically insignificant between the two groups ($t = 1.299$, $p = 0.204$).

There were some reasons why other-regarding behavior could not be used to generalize individual behavior on participation in activities for coastal conservation. First, the activities on coastal conservation may not be purely for public good since some villagers may get direct benefits from such activities. Second, some villagers may have thought that such cooperative activities were ineffective for coastal conservation. Third, cooperation to work collectively in a community may have depended on the history of that community (e.g., how good was the relationship among the people). Lastly, the size of the sample would have been too small since the study analyzed only the results of the first game.

Other studies have tried to answer the questions posed by this study (e.g., Carpenter and Myers 2010; Fehr and Leibbrandt 2008; Carpenter and Seki 2005; Bouma et al. 2008). Carpenter and Myers (2010) conducted a dictator game where the participants were firefighters, volunteer community members, and non-volunteer community members. Researchers asked the participants to decide on how much of their USD100 endowment to donate to their chosen charity organization. The chosen receivers of the funds were 13 charity organizations. Findings indicated that the mean of donations to charity was highest for the firefighters (USD77.35), followed by the volunteer community members (USD76.20). These higher amounts of donations were significantly different from the allocation of non-volunteers (USD67.92). The contribution rates in Carpenter and Myer's study were quite high compared to the results in this study. It may be because in this study, the participants were asked to transfer their endowment to other participants whom they did not know, while those of Carpenter and Myer's donated their endowment to their chosen charities.

Fehr and Leibbrandt (2008) conducted a laboratory public good experiment and time preference experiment with fishermen in Brazil. They found that fishermen who contributed more in the public good game exploited the fishing grounds less. Fishermen who were impatient in receiving the mineral water in a time preference experiment exploited the fishing grounds more. More precisely, the researchers found that an increase of one unit in average contribution during all the five periods led to an increase of 0.121 cm in mesh size.

However, the result of this study was more in line with Bouma et al.'s (2008) results, which found that the results of the game may not be a good predictor of actual individual behavior or may not be used to generalize individual behavior in the field. Bouma et al. conducted an experiment in six villages in rural India using the trust game and combined the results with that of the household surveys. The surveys asked the villagers about their contribution in maintaining the existing conservation structure in the villages. They found a significant correlation between the average amount sent in the village as a proxy for social capital, but not with the individual amount sent, and not with the contribution in those maintenance activities.

Carpenter and Seki (2005) conducted the modified public goods game with fishermen in Japan, specifically between the poolers who showed cooperative behavior by pooling their catch (or income) and the non-poolers. In this modified game, the first five rounds replicated the standard public good game, then social disapproval was introduced in the last five rounds. Here, the participants could pay to show their disapproval of the contribution behavior of the other groups of fishermen. The researchers found no significant difference between poolers and non-poolers in their contribution in the public good game when there was no social disapproval ($p_t = 0.25$). However, there was a highly significant difference of contribution in the post-disapproval contribution ($p_t < 0.01$). In sum, without a social disapproval protocol, Carpenter and Seki (2005) did not find a significant difference of contributions between poolers and non-poolers; likewise, this study did not find a significant difference in the actual collective actions between the contributors and the non-contributors.

3.5 Self-Reported Questions on Contributions in Collective Actions

The fourth hypothesis tested was whether the survey questions on attitudinal trust and past trust behavior could predict the results of the trust game. Glaeser et al. (2000) found that the questions on the standard trust did not appear to measure trust behavior, whereas questions on past trusting behavior did predict trust. There were also other studies very much aligned with these results (e.g., Karlan 2005; Johansson-Stenman et al. 2011; Lazzarni et al. 2004). In this study, the correlations between the amounts sent in trust games and the responses to the trust questions were not statistically significant for all trust questions from GSS and for all questions on past trusting behavior used by Glaeser et al. (2000).

However, some studies have found a significant correlation between the return ratio (trustworthiness) and some trust questions (e.g., Karlan 2005; Glaeser et al. 2000; Ashraf et al. 2006; Johansson-Stenman et al. 2011; Lazzarni et al. 2004). This study also did not find any evidence to show this relationship.

In addition, some studies suggested that the trust game measure depended on trust behavior as well as on the levels of risk aversion (e.g., Shechter 2007; Bouma et al. 2008). This study also tried to test this argument by using a simple risk question as a proxy of risk preference. However, the correlation between the amount sent in a trust game and a proxy of risk preference was not significant ($r_s = -0.006$, $p = 0.957$).

4.0 CONCLUSIONS

Everyday observation reveals numerous events of seemingly unselfish behavior among friends, family, and even strangers or the so called “other-regarding behavior”. In neoclassical economic theory, an individual’s preferences are his/her own characteristics that are not dependent on other’s actions that help or harm him/her. However, if other-regarding preferences influence how people behave, the rational actor model of economics needs to be modified.

This study tried to answer how well experiment measures for other-regarding behavior could generalize real behavior or enable it to be called “the external validity”. The study combined the results of the three experiments (i.e., the dictator game, the trust game, and the public good game) as proxies of other-regarding behavior and actual collective behavior of villagers in coastal conservation activities. Results were derived from the survey questions of attitudinal trust measures in the General Social Survey (GSS) and from past behavioral trust measures as used by Glaeser et al. (2000).

Unlike many earlier studies that used students as a participant pool, this study used data from a sample of “non-students” or “villagers” in rural Thailand to represent actual behavior. The Kok Kham sub-district in Samut Sakhon province served as the study site because villagers in this area have acted collectively to conserve the coastal area; this is a behavior rarely found in other neighboring areas. The actual voluntary contributions to the three collective actions (i.e., bamboo dike building, mangrove afforestation, and coastal surveillance) were used as the proxy of cooperative behavior. A total of 96 villagers were recruited from the villagers in the study site to serve as participants.

The participants in the dictator game gave an average amount more than the students in earlier studies. This suggests that rural villagers might be more motivated to give than students or because the participants interacted with people in their communities and knew each other, even though their decisions were anonymous.

The contribution rates in the public good game were not different from that of earlier studies. However, the rate of amount sent in the trust game was slightly lower than that of previous studies. The contrasting high rate of amount sent by the participants in Glaeser et al.'s (2000) study may probably be because they had the opportunity to meet their pairs before playing the games.

Interestingly, this study found positive correlations among the results of the three games, implying that people with more trust behavior tended to be more altruistic and cooperative and vice-versa. This finding was supported by earlier studies that found that each experiment did not predict only one other-regarding behavior (e.g., Goeree et al. 2002; Andreoni 1995; Croson 2006; Cox 2004).

There was limited evidence of an order effect in the dictator game and the public good game. However, the game order seemed to have an effect on the result of the trust game.

Moreover, there was a large variation in the number of contributions for collective action that were self-reported from the survey questions vis-à-vis their actual contributions as based from reports gathered. This problem was also reflected in several studies (e.g., Carpenter et al. 2004; Carpenter and Myer 2010). Carpenter (2002) concluded that people tended to behave as they would like to be or as the researcher wanted them to be (idealized persona bias).

Results of the three games were not significantly correlated with actual collective actions. Answers to the attitudinal trust from the GSS questions and past trust behaviors used by Glaeser et al. (2000) did not appear to measure trust. Also, individual behavior in an artefactual field experiment might not seem to predict the cooperative behavior in the field as found in previous studies (e.g., Bouma et al. 2008; Carpenter and Seki 2005; Voors et al. 2012). These results suggest that the context-free games used in this study may not be able to generalize cooperative behavior in real life. However, further evidence of behavior and games, and perhaps the high correlations among the results of the three games may help in understanding such decisions. Further research providing more empirical evidences on the relationships between the games and behavioral choices appear necessary.

REFERENCES

- Anderson, L. R; J.M. Mellor; and J. Milyo. 2004. "Social capital and contributions in a public-goods experiment", *AEA papers and proceedings*. 94(2): 373-376.
- Andreoni, J. 1995. "Cooperation in public-goods experiments: Kindness or confusion?" *The American Economic Review*, 85(4): 891-904.
- Andreoni, J. and J. Miller. 2002. "Giving According to GARP: An Experimental Test of the Consistency of Preferences for Altruism", *Econometrica*. 70(2): 737-753.
- Andreoni, J. and L. Vesterlund. 2001. "Which is the fair sex? Gender differences in altruism", *Quarterly Journal of Economics*, 116(1): 293-312.
- Andreoni, J.; W. T. Harbaugh; and L. Vesterlund. 2007. Altruism in Experiments, Paper prepared for the New Palgrave Dictionary of Economics, 2nd Edition, 2007. (<http://econ.ucsd.edu/~jandreoni/Publications/PalgraveAltruism.pdf>, 19 March 2012).
- Asher, S.; L. Casaburi; P. Nikolov; and Maoliang Ye. 2009. One Step at a Time: Do Threshold Patterns Matter in Public Good Provision? Discussion Paper No. 2009-5, The Open-Access, Open-Assessment E-journal. (<http://www.economics-ejournal.org/economics/discussionpapers/>, 4 May 2012).
- Ashraf, N; I. Bohnet; and N. Piankov. 2006. "Decomposing trust and trustworthiness", *Experiment Economics*, 9: 193-208.
- Barr, A. 2003. "Trust and expected trustworthiness: Experimental evidence form Zimbabwean villages", *The Economic Journal*. 113: 614-630.
- Berg, J.; J. Dickhaut; and K. McCabe. 1995. "Trust, reciprocity, and social history", *Game and Economic Behavior*. 10: 122-142.
- Bolton, G. E. and E. Katok. 1995. "An experimental test for gender differences in beneficent behavior", *Economic Letters*. 48: 287-292.
- Bouma, J.; E.Bulte; and D. van Soest. 2008. "Trust and cooperation: Social capital and community resource management", *Journal of Environmental Economics and Management*. 56: 155-166.
- Carlsson, F.; O. Johansson; and Pham Khanh Nam. 2011. "Funding a new bridge in rural Vietnam: A field experiment on conditional cooperation and default contributions", in *Cooperative Behavior, Social Capital and Development: Evidence from the Mekong River Delta in Vietnam*, EEPSEA research report. Singapore: EEPSEA.
- Carpenter, J. 2002. "Measuring social capital: Adding field experimental methods to the analytical toolbox. In: Isham, J., Kelly, T., Ramaswamy, S. (Ed.), *Social Capital and Economic Development: Well-Being in Developing Countries*. Northampton: Edward Elgar, pp.119-137.
- Carpenter, J. P.; A. G. Danieri; and L. M. Takahashi. 2004. "Cooperation, trust and social capital in Southeast Asia urban slums", *Journal of Economic Behavior & Organization*. 55: 533-551.
- Carpenter, J. and C.K. Myers. 2010. "Why volunteer? Evidence on the role of altruism, image, and incentives", *Journal of Public Economics*. 94: 911-920.
- Carpenter, J. and E. Seki. 2005. Do social preferences increase productivity? Field experimental evidence from fishermen in Toyama Bay. IZA Discussion Paper No. 1697. Bonn, Germany: The Institute of the Study of Labor (IZA).
- Cox, J. C. 2004. "How to identify trust and reciprocity", *Games and Economic Behavior*. 46: 260-281.
- Cox, J. C.; D. Friedman; and V. Sadiraj. 2007. "Revealed Altruism", *Econometrica*. 76(1): 31-69.
- Croson, R. T. A. 2006. "Theories of commitment, altruism and reciprocity: Evidence from linear public goods games" *Economic Inquiry*, 45(2): 199-216.

- Eckel, C. C. and P. J. Grossman. 1998. "Are women less selfish than men?: Evidence from dictator experiments", *The Economic Journal*. 108: 726-735.
- Fehr, E. and A. Leibbrandt. 2008. Cooperativeness and impatience in the tragedy of the commons. IZA Discussion Paper Series No. 3625. Bonn, Germany: The Institute of the Study of Labor (IZA).
- Forsythe, R.; J. Horowitz; N. Savin; and M. Sefton. 1994. "Fairness in simple bargaining experiments", *Game and Economic Behavior*, 6: 347-369.
- Frohlich, N.; J. Oppenheimer; and A. Kurki. 2004. "Modeling other-regarding preferences and an experimental test", *Public Choice*, 119: 91-117.
- Glaeser, E. L.; D. I. Laibson; J. A. Scheinkman; and C. L. Soutter. 2000. "Measuring trust", *The Quarterly Journal of Economics*. 115(3): 811-846.
- Goeree, J. K.; C. A. Holt; and S. K. Laury. 2002. "Private costs and public benefits: unraveling the effects of altruism and noisy behavior", *Journal of Public Economics*. 83: 255-276.
- Henrich, J.; R. Boyd; S. Bowles; C. Camerer; E. Fehr; H. Gintis; and R. McElreath. 2001. "In Search of Homo Economicus: Behavioral Experiments in 15 Small-Scale Societies", *American Economic Review*, 91(2): 73-78.
- Hoffman, E.; K. McCabe; K. Shachat; and V. L. Smith. 1994. "Preferences, property rights and anonymity in bargaining games", *Games and Economic Behavior*. 7(3): 346-380.
- Jarupongsakul, T. 2006. Coastal Erosion in Thailand: Causes and Management. Research Paper (in Thai). Bangkok, Thailand: Department of Geology, Chulalongkorn University.
- Johansson-Stenman, O.; M. Mahmud; and P. Martinsson. 2011. "Trust, trust games and stated trust: Evidence from rural Bangladesh", *Journal of Economic Behavior & Organization*. 95: 286-298.
- Kahn, A.; J. Hottel; and W. L. Davis. 1971. "Cooperation and optimal responding in the prisoner's dilemma game: effects of sex and physical attractiveness", *Journal of Personality and Social Psychology*. 17: 267-279.
- Karlan, D. 2005. "Using experimental economics to measure social capital and predict financial decisions", *American Economic Review*. 95(5): 1688-1699.
- Lazzari, S. G.; R. Madalozzo; R. Artes; and J. de Oliveira Siqueira. 2004. Measuring trust: An experiment in Brazil. Sao Paulo, Brasil. Insper Working Paper WPE: 049/2004.
- Ledyard, J. 1995. Public goods: a survey of experimental research, pp 111-194 in: J.H. Kagel, A.E. Roth (Ed.). *Handbook of Experimental Economics*. NJ: Princeton University Press.
- Persico, N. and D. Silverman. 2006. Other-Regarding Behavior: Theories and Evidence. <https://economics.sas.upenn.edu/system/.../Empirical100520060.pdf> (retrieved 20 March 2012).
- Pongpleesal, Y. forthcoming. "Community Network Building for Coastal Erosion Protection Using Indigenous Knowledge: A Case Study of Bamboo Revetments by Inner Gulf of Thailand Conservation Network." M.Sc. thesis Proposal, Technology of Environmental Management, Graduate Studies, Mahidol University.
- Schechter, L. 2007. "Traditional trust measurement and the risk confound: An experiment in rural Paraguay", *Journal of Economic Behavior & Organization*. 62: 272-292.
- Voors, M.; T. Turley; A. Kontoleon; E. Bulte; and J. A. List. 2012. Exploring whether behavior in context-free experiments is predictive of behavior in the field: Evidence from lab and field experiments in rural Sierra Leone, *Economic Letters*. 114: 308-311.
- World Bank. 2006. Thailand Environment Monitor 2006. Bangkok, Thailand.

Appendix 1. Questionnaire (translated)

Attitudinal trust questions:

1. Generally, would you say that most people can be trusted or that you can't be too careful in dealing with people?
☐ Yes ☐ No
2. Do you agree with the statement "you can't trust strangers anymore"? ☐ Yes ☐ No
3. Do you agree with the statement "*when dealing with strangers, one is better off using caution before trusting them*"?
☐ Yes ☐ No
4. "Do you think most people would try to take advantage of you if they got the chance, or would they try to be fair?"
☐ I think most people would try to take advantage of me if they got the chance
☐ I think they try to be fair
5. "Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?"
☐ I think most of the time people try to be helpful
☐ I think they are mostly just looking out for themselves

Past trusting behavior questions:

6. "How often do you lend your money to your friends?" ☐ Never ☐ Yes, please specify ____ times/year
7. "How often do you lend personal possessions to your friends (e.g., cars, motorbike, clothes, boats etc.)?"
☐ Never ☐ Yes, please specify ____ times/year
8. "How often do you intentionally leave your house's door unlocked (when nobody is home)?"
☐ Never ☐ Yes, please specify ____ times/year

Risk preference question:

9. Which one you prefer: (a) Certain (100%) THB100 or (b) 50% chance of THB220 and 50% chance of THB0?
☐ Choice A ☐ Choice B

Questions on the collective actions participants participate/d in:

10. Have you ever participated in **the bamboo dike construction**?
 1. ☐ Yes
 2. ☐ Never because I... (***you may tick more than one box***)
 1. ☐ Do not think that the bamboo dike is effective.
 2. ☐ Do not think that I will be affected by coastal erosion.
 3. ☐ Think that the bamboo dike prevents me from catching fishes.
 4. ☐ Others (specify) _____
11. Have you ever participated in **mangrove afforestation/mangrove seedling nursery**?
 1. ☐ Yes
 2. ☐ Never because I... (***you may tick more than one box***)
 1. ☐ Do not think that mangroves will survive.
 2. ☐ Do not think that mangrove afforestation is a solution for coastal erosion.
 3. ☐ Others (specify) _____

12. Have you ever participated in **coastal surveillance**?

1. ☐ Yes

2. ☐ Never because.... **(you may tick more than one box)**

1. ☐ I am not a fisherman.

2. ☐ I do not think that coastal surveillance is effective.

3. ☐ Others (specify) _____

Demographic characteristics:

13. Gender: 1. ☐ Female 2. ☐ Male

14. Age: ____ years old

15. How long have you been in this village?

1. ☐ Since I was born

2. ☐ I have been here aboutyears

16. Address: Village no __, Kok-Kham sub-district, Muang district, Samutsakorn

17. Do you have your own land? **(you may tick more than one box)**

☐ 1.No, I do not have any land.

☐ 2.Yes, I have a house in my own land.

☐ 3.Yes, I have a shrimp farm approximately ____ rai.

☐ 4.Yes, I have a salt farm approximately ____ rai.

☐ 5.Others (specify) _____

18. Occupation:

☐ 1. Aquaculture farmer

☐ 2.Salt farmer

☐ 3. Fisherman

☐ 4.Wage worker

☐ 5.Self-employment

☐ 6.Government employment/Civil servant

☐ 7. Others (specify) _____

19. Monthly income:

☐ 1.<5,000baht

☐ 2. 5,001 – 10,000baht

☐ 3.10,001 – 15,000baht

☐ 4. 15,001 – 20,000baht

☐ 5.20,001 – 25,000baht

☐ 6. 25,001 – 30,000baht

☐ 7.30,001 – 35,000baht

☐ 8. 35,001 – 40,000baht

☐ 9.40,001 – 45,000baht

☐ 10. 45,001 – 50,000baht

☐ 11.50,001 – 55,000baht

☐ 12. 55,001 – 60,000baht

☐ 13.60,001 – 65,000baht

☐ 14. 65,001 – 70,000baht

☐ 15.70,001 – 75,000baht

☐ 16. 75,001 – 80,000baht

☐ 17.> 80,000 baht

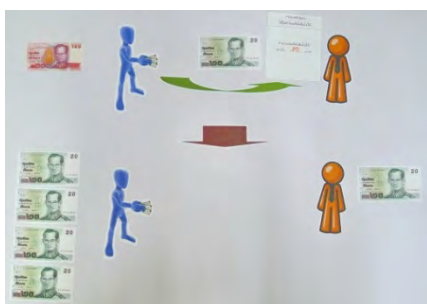
Appendix 2. Written and diagram instructions used for the three games

General Instruction

Welcome everyone. Many thanks for your participation in our experiment today. Everyone will receive a t-shirt as a show-up fee for your time. However, we have some general rules during the experiment as follows:

- You are not allowed to communicate with each other through the experiment.
- If you have any question, please raise your hand. The experimenter will go to you and explain.
- You will play all three games. You will receive payment, which depends on how you made decisions in all three games. You will receive the payment by cash after you have finished all the three games and filled up the short questionnaire (2 pages).
- We will explain the rules and materials used before you start playing each game. Please listen carefully because the rule of each game is different. If you have any questions during the experiment, raise your hand and we will come to you.

Dictator Game

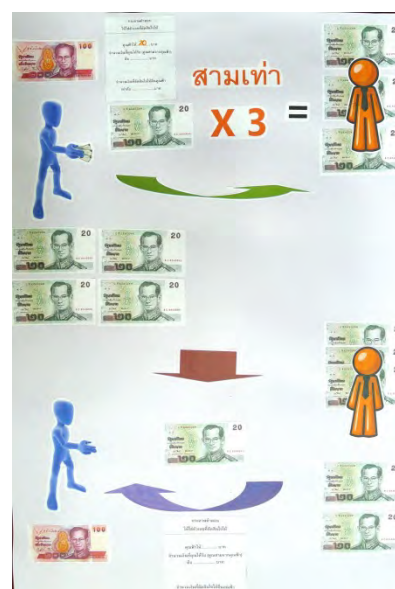


- We randomly match you anonymously into pairs. Throughout the experiment, you and the experimenters will not know who your partner is.
- In each pair, one participant is assigned to be the sender ("Blue") and the other is assigned to be the receiver ("Orange"). If you are "Blue", you will receive the white envelope with the answer sheet. If you are "Orange", you will receive the white envelope without the answer sheet. "Blue" is given the endowment of THB100 (USD3.33).
- "Blue" has to decide how much he/she sends to "Orange". The rest of the endowment that "Blue" does not send to "Orange" is the amount that "Blue" will get. For example, if "Blue" makes a decision to send THB20 to "Orange", then "Orange" will get THB20 and "Blue" will earn the rest -- THB80.
- To make sure that the game is played anonymously, "Blue" will write the amount sent on the answer sheet, which is in the white envelope.
- After "Blue" writes the amount sent on the answer sheet, please put it back into the white envelope and place it on the table. Experimenter 1 will collect and carry envelopes to another room for experimenter 2 who will record the amount sent. The reason for having two experimenters to carry the envelopes and record the amount sent is to make sure that the experimenters will not know who "Blue" or "Orange" are.
- After experimenter 2 finishes recording the amount sent, s/he will give the envelope back to experimenter 1. Experimenter 1 then gives the envelopes to "Orange" who is already paired with "Blue". Therefore, "Orange" will know how much s/he receives from "Blue". At this stage, the first round of the game is finished.
- Please do not reveal your decision to the other participants. With the above procedure, no one will know your decision but yourself.

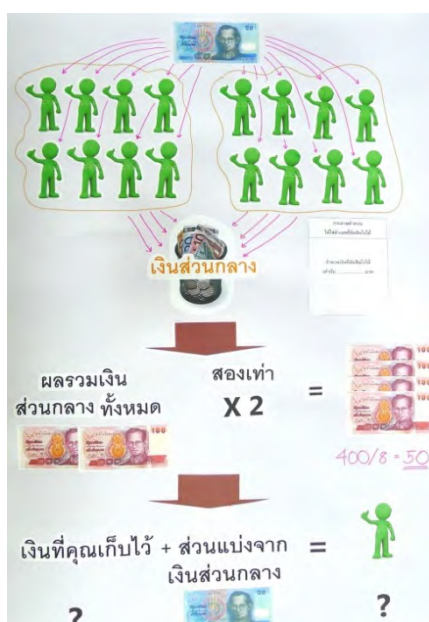
Trust Game

- We randomly match you anonymously into pairs. Through the experiment, you and the experimenters will not know who your partner is.
- In each pair, one participant is assigned to be the sender ("Blue") and the other is assigned to be the receiver ("Orange"). If you are "Blue", you will receive the pink envelope with the answer sheet. If you are "Orange", you will receive the pink envelope without the answer sheet. "Blue" is given the endowment of THB100 (USD3.33).
- "Blue" has to decide how much s/he sends to "Orange". The rest of the endowment that "Blue" does not send to "Orange" is the amount that "Blue" will get. The amount that "Blue" decides to give to "Orange" will be tripled before being given to "Orange". For example, if "Blue" gives THB20 to "Orange", then "Orange" will earn THB60. "Blue" will keep the rest of the THB80 for himself or herself.

- To make sure that the game is played anonymously, "Blue" will write the amount sent on the answer sheet in the pink envelope.
- After "Blue" writes the amount sent on the answer sheet, please put it back into the pink envelope and place it on the table. Experimenter 1 will collect and carry envelopes to another room for experimenter 2 who will record the amount sent. The reason for having two experimenters to carry the envelopes and record the amount sent is to make sure that the experimenters will not know who "Blue" and "Orange" are.
- After experimenter 2 finishes recording the amount sent, s/he gives the envelope back to experimenter 1. Experimenter 1 then gives envelopes to "Orange" who is already paired with "Blue". Therefore, "Orange" will know how much "Blue" sent her/him and how much s/he receives.
- At this stage, "Orange" has to decide how much s/he will return to "Blue" by writing down the amount in an answer sheet, and putting it back into the pink envelope. Experimenter 1 will collect and carry the envelopes to another room for experimenter 2 who will record the amount returned by "Orange".
- After experimenter 2 finishes recording the amount returned by "Orange", s/he gives the envelope back to experimenter 1. Experimenter 1 then distributes envelopes back to "Blue". Therefore, "Blue" will know how much s/he receives from "Orange".
- Please do not reveal your decision to other participants. With the above procedure, no one will know your decision but yourself.



Public Good Game



- Participants will play this game in groups of eight people.
- Each participant is given the endowment of THB 50 (USD1.67) and has to decide how much of this s/he will contribute to the "Group account". The rest of the money that is not contributes and will be kept for by the participant in his/her "Private account".
- After every group member has decided on the group investment, we sum up all the contributions. We then double the sum of the contributions and divide it equally among all eight group members. For example, if the sum of the group account is equal to THB200, we will double it to be THB400 (THB200 x 2). Therefore, every participant will receive THB50 (THB400 ÷ 8) from the group account. Each participant also earns from what is kept in the private account.
- The experimenter will declare the sum of the public account, and then you can calculate your return from your investment from the provided table.
- To make sure that the game is played anonymously, you will write the amount contributed on the answer sheet in the yellow envelope. When you finished writing, please put it back into the envelope and then place it on the table. Experimenter 1 will collect and carry the envelopes to another room for experimenter 2 who will record the amount contributed. The reason for having two experimenters to carry the envelopes and record the amount sent is to make sure that the experimenters will not know how much you contributed to the public account.
- The experimenter announces the sum of the public account then you can calculate your return from the public account by checking from the table provided. However, you will not know how much other participants contributed to the public account, and other participants will not know your contribution as well.
- We will play more than one round of this game. Your return in each round is the sum of your private account and the return from your public account: $private\ account + ((the\ sum\ of\ the\ group\ account \times 2) \div 8)$

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