Comparing Measures of Social Capital Using Data From Southeast Asian Slums

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Abstract

We analyze behavioral measures of social capital gathered over three years in Thai and Vietnamese urban slums to see if results from surveys are consistent with those generated using experiments. While many of the associations between the measures are weak, we find that in both countries survey measures of social integration correlate with more cooperation and more punishment of free riding in a social dilemma experiment. We also find an anomalous result. Higher levels of surveyed trust, measured generally and as it relates to specific groups of individuals correlates with less cooperation and less punishment in both countries although more robustly so in Thailand. Lastly, a number of other demographic variables predict behavior, but of special interest is the fact that cooperation and punishment are both concave in age.

Keywords: Social Capital, Cooperation, Trust, Punishment, Social Dilemma, Survey, Experiment, Thailand, Vietnam

1 Introduction[1]

A current trend in the economic development literature is to identify and understand how the more social aspects of individual and community behavior contribute to (or detract from) economic performance.[2] Much of this literature

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[2] Examples include Desdoigts (1999), Knack and Keefer (1997), and Woolcock (1995). The near exponential growth of such research is documented in Isham et al. (2002).

has been grouped under a poorly defined term – *social capital*. The term is poorly defined because, to one set of researchers, social capital is defined as the propensities of individuals to trust, cooperate, and punish other individuals that act to establish and maintain prosocial norms of behavior (e.g. Fukuyama (1995) or Sampson et al. (1997)). At the same time, however, to other researchers social capital means the community level networks among individuals that lead to efficient outcomes when contracts are hard to enforce (e.g. Putnam (2000) or Glaeser and Sacerdote (1999)). Despite an outpouring of research using both of these definitions of social capital, there remains significant conceptual confusion regarding the aspects of communities and individuals that demonstrate social capital.

Further confounding social capital research, empirical measurement remains problematic (Durlauf (2002)). Specifically, the different definitions of social capital lead to different strategies for measuring its effects. At the individual level, researchers look for behavioral measures of trust, trustworthiness, and cooperation all in the (implied) context of social dilemmas where individual incentives are at odds with collective efficiency. These measures typically come from surveyed self-reports. A representative question from the general social survey (GSS) is, "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?" Research that focuses on the network definition of social capital, while also typically based on self-reports from surveys, asks less hypothetical and more factual questions such as, "How many volunteer organizations do you belong to?"

It is not news that surveys are an imperfect way to gather information about individual behavior, but their practical advantages (i.e., they are comparatively cheap to conduct and often provide a large sample) continue to make them popular research tools. The benefits of surveys, however, may be outweighed in the case of "propensity research." While there surely exists measurement error in the more factual network questions, if for no other reason than because respondents are careless, hypothetical questions about behavior add other biases that may be more worrisome because they tend to be systematic. As

just one example, who wants to think of themself as untrustworthy?[3]

Glaeser et al. (2000) conducted both a trust survey and a commonly known trust experiment (based on Berg et al. (1995)) with college students. For our purposes, the important finding of this research is that survey measures of trust predict actual trusting behavior very poorly. We hypothesize that experiments provide more accurate measures of behavior because they are incentive compatible – that is, participants who trust must risk material payoffs to do so. The empirical evidence suggests that this "less noisy" measure of behavioral social capital cannot be proxied by survey responses. Thus, it is reasonable to conclude that surveys may be less reliable sources of information about individual propensities than experiments.

In this paper we expand on Glaeser et al. (2000) by comparing survey-based measures of trust and cooperation with experimental measures of cooperation and punishment. Our study is unique for three reasons. First, while much of the work on social capital is focused on residents of the industrialized west, our participants are from Southeast Asia. Second, instead of using students, our participants live and work in urban slums (5 communities in Bangkok and 5 communities in Ho Chi Minh City). If we hypothesize that people in the developing world act, for institutional and cultural reasons, differently than students in Cambridge Massachusetts, then we have data that is more directly relevant for studies of poverty and development. Third, we have data from three sources gathered over three years. Our data consists of an extensive household survey with 1000 individuals (500 in each city) conducted in 2000, a voluntary contribution experiment conducted with 240 participants from the same communities in 2002, and a more limited follow-up survey conducted with our experimental participants also in 2002.

While we have gathered a lot of data, the purpose of this paper is very focused. Specifically, we intend to analyze the correlation between our survey measures of behavioral social capital and our experimental measures to provide more evidence on whether we should rethink our use of survey measures of social

[3] See Carpenter (2002) and Bertrand and Mullainathan (2001) for an expanded discussion of the difficulties of using surveys to elicit behavioral data.

propensities or, at least, recalibrate them to experimental data. We begin in the next section by describing the communities which are home to our respondents. In section 3 we describe our methodology. In section 4 we define our measurements of social capital. In sections 5 through 8 we analyze the correlations between our indices of social capital first at the community level and then at the individual level. Section 9 provides a few concluding thoughts.

2 Background and Community Descriptions

We conducted surveys and experiments in ten urban slums in Southeast Asia. Our primary interest in these slums, the cities of Bangkok and Ho Chi Minh and in this region in general, is that while the area is experiencing rapid growth and urbanization, a significant portion of the population is increasingly marginalized. The resulting increase in inequality, specifically, is the source of serious concern for policy makers in the region (Fritzen (2002); Kakwani and Krongkaew (2000)). We are interested in the evolution of social capital and community governance (see Bowles and Gintis (2002)) under these circumstances.

Southeast Asia is a region composed of several economic tigers surrounded by a few countries where little has changed or improved in the past half century (Cambodia, Laos and Myamar/Burma).[4] Thailand and Vietnam, however, represent relative success stories in this rapidly industrializing part of the developing world although their paths to success could not, at least until recently, have been more different. Aside from the basic similarities of religion, size of population, geographic endowments, etc., the political economy of the two nations differ in many, if not all, respects.

Thailand, and specifically Bangkok, has adopted a generally *laissez faire* approach to economic development in the last thirty years. As such, the government of Thailand has permitted and, some argue, even encouraged the

[4] There is increasing debate regarding the actual level of success of so-called tiger economies of Thailand, Indonesia and Malaysia given the relatively limited growth these countries are still experiencing six years after the beginning of the Asian crisis (Singh and Freeman (2001)).

extreme concentration of industrial, manufacturing, commercial and service sectors within the Bangkok Metropolitan Region. While several steps have been taken since the early 1990s to support the deconcentration of economic activities to smaller cities within 100 or so miles of Bangkok, these efforts have had relatively little effect on Bangkok's rate of growth.

Bangkok has expanded exponentially since the end of Vietnam War era and now encompasses 12 million people (out of a total population of 64 million Thais). The land mass occupied by these residents and their places of employment extends far beyond the traditional city core and into vast suburban and even rural landscapes. The city itself is extremely dense, congested and dirty although Bangkok's Metropolitan Authority (the local government) has attempted, with the support of the central government, to ease traffic, improve sanitation, and deliver cleaner water. The lack of an effective means of enforcement of environmental and economic regulations, however, as well as a reluctance on the part of the Thai government in invest in physical and social infrastructure on a major scale, has contributed to the relatively unfortunate situation of hundreds of thousands of slum dwellers.

Thailand, while nominally a democratic country that holds regular and free elections, nonetheless experiences frequent coups d'etat and is well known for the control on many important aspects of governance by military and a small circle of ruling elite. Thus, industrial firms, owned and operated by many of these same elite, commonly ignore Thai regulations regarding environmental protection. However, recent media accounts have indicated a growing public dissatisfaction with environmental conditions, expressed through public protests focused on air and water pollution. Local mobilization such as urban squatter associations, loosely organized through NGOs and/or community groups, can in specific circumstances, particularly with the assistance of well-placed contacts in the Bangkok Metropolitan Authority or one of the national level ministries, achieve substantial improvements in local quality of life. Squatter settlements have obtained piped water connections, structural upgrades or day care centers as well as improved land tenure arrangements through local organization and lobbying of key bureaucrats. Thus, social capital within communities could

potentially be of great value to slum dwellers in terms of the potential of networks and trust to encourage economic and community development (Daniere et al. (2002)).

Vietnam, on the other hand, has been seen as a monolithic one party state. While democracy as practiced in some of its neighbors has not replaced the strong control of the Vietnamese state over macroeconomic policies, the political economy of the country has been transformed since 1986 and the introduction of *doi moi* (a word meaning renovation but actually describing the liberalization process). The center of economic growth in Vietnam is Ho Chi Minh City. Although slightly more than one-third the size of Bangkok, Ho Chi Minh City has experienced extremely rapid expansion, leading to its characterization as the world's next "Bangkok" (Drakakis-Smith and Dixon (1997)). There has been widespread expansion in the urban area and many additional households have moved to the city to be closer to opportunities even without the correct paperwork that allows them to dwell inside the metropolis.

While the Vietnamese communist party tolerates neither any public advocacy of ideological or political pluralism nor any citizen's criticism of its foreign policies, the relationship between the state and society in Vietnam is considerably more dynamic and is changing much more rapidly than is generally perceived. In particular, non-registered locally based voluntary associations have sprung up all over the country in the last fifteen years. They include same-village or same-province associations in the large cities to alumni, same-military-service, rotating credit associations, and so on. While none of these new associations are political in their orientation, the ties formed through them have been mobilized for collective action and for a concerted voice for better local governance (Luong (2003)). As such, community groups and ward-level People's Committees are beginning to have a say in how their budgets are allocated within their boundaries. Hence, social capital and the ability to organize and work together to initiate local change is very much part of the urban landscape in Vietnam.

While there are many differences in the politics, economics and cultures between the two cities, the challenges faced are somewhat similar because of two

factors: Vietnam will likely continue to depend on *doi moi* to help jump start its economy; and both Thailand and Vietnam are increasingly exposed to foreign investment and the consumer culture of the West apparent in most globalizing cities (Kim et al. (1997)). Consequently, poor urban communities are likely to find themselves without many options and both national and urban governments will be looking to discover new and cost-effective strategies to sustain economic growth. Community participation and the role played by social capital remain key factors believed by international donor agencies, NGOs, and government agencies to be vital to the potential success of urban environmental policies.

To measure the level of social capital and trust in poor urban communities of Bangkok and Ho Chi Minh City, we conducted household surveys and experimental games in five low-income communities in each city. The names, locations and brief descriptions of the different communities can be found in Appendix A.

In Bangkok, the communities were selected through the use of a sampling frame developed from a study of Bangkok slums (Setchell (1992)) and the local expertise of the project team and their contacts. The communities were not selected randomly but are generally representative of the broad range of slums and squatter areas in terms of size, history, location and environmental conditions that one might see in the Bangkok Metropolitan Region. The selection criteria included low average per capita or household income and disparate locations in order to ensure that there would be some variation in terms of access to services (see Daniere et al. (2002)). We contacted the neighborhood organization or community leaders in each of the neighborhoods to request permission to work with the community. It was understood that we hoped to return to the communities for the next three years to gather information about social relations and networks, environmental management, water and sanitation practices and some socio-economic data. Each of the five communities we approached agreed to work with us. In terms of the household surveys, we only surveyed households and individuals who, when randomly selected, agreed to participate. In the case of experimental games, potential participants were told about the opportunity through leaflets and community

announcements. Participants were asked to meet at a central location, generally the local community center or day care, if they wanted to volunteer for the games. The players were randomly selected from among the volunteers gathered at the site.

To select communities in Ho Chi Minh City, we needed to rely to a greater degree on local knowledge and connections. The slum communities could not be selected from a sampling frame but were proposed by the People's Committees responsible for specific city districts instead. We approached five different districts and asked them to nominate one or two of their most impoverished wards or communities for inclusion in the project. The Committees were generally quite cooperative and were very knowledgeable about the most impoverished communities within their geographic boundaries. We normally followed the suggestions of the People's Committees. Since the research project has the support of the Vietnamese government and one of our project team members is a government employee at the Institute for Social Sciences, we were able to obtain permission to work in a variety of wards within the city and to conduct the household surveys relatively free of control or interference. It is possible, of course, that we were directed to showpiece communities although given our extensive travels throughout the city, this seems unlikely to us and to our Vietnamese colleagues.

Playing or conducting experimental games in Ho Chi Minh City was somewhat more complicated than in the Bangkok communities. We chose to conduct the games in one or two of the meeting rooms within the Institute for Social Sciences as it proved to be the least disruptive to communities, as well as the most free of party (or People's Committee) monitoring. Participants from the different communities who volunteered for the experiment were transported by van or taxi to the center, played the game and were then provided transportation back to their communities. As in Bangkok, potential participants were informed that the game would result in immediate earnings; there was no lack of volunteers.

3 Our Survey and Experimental Protocols

During 2000 we designed and translated two almost identical survey instruments (one in Thai and the other in Vietnamese) to implement in each of the ten neighborhoods. While very similar, the surveys used in each country nonetheless reflected differences in culture and practice between the two cities.[5] Some questions differed in tone or exact translation because native speakers felt that the language used or the approach taken in English or the other language was not appropriate for a given context. Graduate students or staff recruited from local universities or research institutes administered the surveys. These enumerators were provided intensive training by the principal investigators and relied on procedures used in two previous household surveys conducted with high levels of success in Asian slum communities (Daniere and Takahashi (1999); Crane and Daniere (1996)).

Approximately 15% of all households within each community for a total of 1000 household representatives (500 per city) were surveyed during the summer of 2000. In each household, the individual most responsible for water, sanitation, and solid waste management was asked to participate in the survey. In many cases, the respondent was female, as women are generally responsible for these household decisions (Daniere and Takahashi (1997)). The surveys were designed to assess social networks, trust, health behaviors, and environmental practices.[6] The results that we report in this paper focus on responses to questions regarding

[5] Details regarding the survey and implementation procedures can be found in Daniere et al. (2002).

[6] Following the United Nations (1987), we defined households to mean any group of people who lived together and pooled their resources to manage their day-to-day existence. The final survey primarily consisted of three sections: (1) household environmental attitudes and practices, including questions about the time spent in water and sanitation related activities, the type of facilities used, and monthly expenditures; (2) household health behaviors such as frequency of illness and visits to medical facilities as well as knowledge regarding the relationship between the environment and health; and (3) the form and function of the household's social networks, such as the number and type of people who the household rely on for daily assistance, the connections of household members to others outside of the household, the existence of and participation in community or local organizations, and trust in various external agencies, community members, and levels of government.

how much trust individuals felt toward various members of their social networks, propensity to cooperate in group projects, social dynamics and socio-economic information.

The field experiments were conducted during the summer of 2002 with members of the same ten communities where the household surveys were conducted two years earlier. The experiment consisted of a hand-run version of the voluntary contribution mechanism (Isaac et al. (1984)) in which players are organized into groups and individually decide how much to contribute to a public good.

We gathered data from 240 participants (120 from each city). Our 240 participants were split into 60 four-person groups and the composition of the groups remained the same for the entire experiment. This is known as the *partners* protocol. There were six groups from each of the ten communities. Our procedures are interesting from an experimental point of view because, unlike most other experiments, we controlled for the gender composition of our groups. In each community, we formed two all-male groups, two all-female groups, and two half male half female groups.

The experiment typically lasted less than two hours including instructions, payment, and an exit survey. We were concerned about the size of the potential earnings, so we calibrated the payoffs at the social optimum to be between one-half and slightly more than one weeks wages (based on local industrial wages which were approximately \$44 in Thailand and \$12 in Vietnam). In practice, our Thai players earned \$21.62 and our Vietnamese players earned \$12.42, on average.

The experiment consisted of two treatments and a total of ten rounds. In the first five rounds, participants played a standard voluntary contribution game and in the second five rounds, the game was modified to allow players to socially sanction free riders. This game is interesting because it allows us to assess how cooperative and trusting players are by how much they contribute to the public good. Additionally, the game allows us to assess players willingness to punish people who do not contribute.

The details of our experimental procedure are as follows (see Appendix B for the Thai instructions). During the first five rounds each player was endowed

with ten monetary units: ten 1000 Dong bills in Vietnam or ten 5 Bhat coins in Thailand.[7] One at a time, each member of a group walked behind a blind set up to make decisions as anonymous as possible. Once behind the blind each group member contributed as many of her ten unit endowment as she wanted to a "group project." Each player then placed the rest of her endowment in an opaque, color-coded envelope and returned to her seat.

Once all the group members made their contributions, the experimenter wrote each of the four contributions on a slip of paper in random order (to keep them anonymous) and calculated the sum. One at a time, the players then returned behind the blind to see how much had been contributed individually and collectively to the group project. At this point each person in the group received her payoff from the group project which was an equal share of the sum of the group contributions doubled. Each person put her share of the group project in her envelope and then returned to her seat. This process was repeated five times.

Our procedures create a social dilemma for the subjects because everyone has a material incentive to free ride on the contributions of others. The per period payoff to player i who contributes x_i is:

$$(10-x_i)+\frac{2\sum x_i}{4}$$

which implies that every monetary unit contributed returns only half a unit to the contributor and therefore contributing zero is the dominant strategy. However, what makes this a dilemma is the fact that if everyone contributes fully, everyone in the group receives 20 monetary units instead of the 10 they receive when everyone uses the dominant strategy. Hence, x_i is a behavioral measure of a person's propensity to cooperate in the face of the material incentive to not cooperate.

Rounds six through ten were run exactly like rounds one through five accept for one change in the procedures.[8] Now, when players returned behind the

[7] At the time of the experiment the Dollar – Dong exchange rate was approximately \$1=15,000 VND and the Dollar – Bhat exchange rate was approximately \$1=40 Bhat.

[8] The players did not know that the rules would change until after round 5 was completed. We did this to prevent any confounds associated with players anticipating the rule change.

blind to see what everyone had contributed and to pick up their share of the group project, they were given the opportunity to sanction the rest of the group if they did not like the group's contribution profile. Specifically, each player was asked whether or not she wanted to have a picture displayed that meant she was unhappy with what the others had contributed. The picture was meant to be easy to interpret. We chose the following.

It was costly to have the picture displayed so that, like contributing, sanctioning was dominated by not sanctioning. It cost 200 Dong in Vietnam and 1 Bhat in Thailand to display a picture. Any purchased pictures were displayed at the beginning of the next round so that the sources of the pictures were anonymous. This procedure means that players saw between zero and four pictures when they made their next contribution decisions.

Because it was costly to sanction the other players in one's group, individuals could always do better by free riding on the sanctioning done by others. By backward induction, knowing that sanctioning is dominated, free riders should not fear sanctions, so the only equilibrium of this finitely repeated game is to continue to free ride.[9] Despite the subgame perfect prediction, if players do sanction it is a behavioral measure of their willingness to incur a cost to punish free riders.

After ten rounds were completed, each participant was interviewed using a survey that was much smaller than the earlier household survey but included a number of the same questions (see Appendix C). While the survey was being completed, experimenters counted the earnings of the players (i.e. the money that was placed in the envelopes) and had them fill out a receipt that included another small payment for taking the time for the survey.

[9] Alternatively, notice that sanctions impose no material harm on free riders so they should be ignored by payoff maximizing players.

4 Indices of Social Capital From Surveys and Experiments

We created indices of social capital based on our survey data and our experimental behavior. In this section we describe our participants and the processes we used to construct these indices. To stay on topic we will not, however, spend much time discussing specific analyses we have conducted on the survey or the experiment. These details can be found in Daniere et al. (2002) or Carpenter et al. (2002b).

Table 1 summarizes some of the demographic aspects of our participants. The table is broken down by location and method of collecting the data. Because the initial 2000 survey was targeted at the person in the family that "ran the household" and because these people are most often female, the survey sampled mostly women in each location (74% women in Bangkok and 81% women in Ho Chi Minh City). In comparison, the gender mix in the experimental data is half male and half female by design.

In Bangkok the average age of our participants was similar in both the initial household survey and in the experiment. In Ho Chi Minh City, however, our survey participants are noticeably older than our experimental participants ($p<0.01$). Furthermore, the subjects in the Ho Chi Minh City experiment had significantly more schooling than their survey counterparts ($p<0.01$), while the differences in schooling are not large between the two groups of participants in Bangkok.

In the survey that followed the experiment we collected other relevant demographics that we did not collect in the initial survey. In both locations our participants were from families of approximately 5 people and, on average, our participants were long time residents of their communities. Given our representative participant was approximately 40 years old and her length of residence in the community was approximately 20 years, she had spent half her life in the community.

There are also two interesting differences between the cities. First, our Thai participants report living in ethnically more homogeneous communities than our Vietnamese participants ($p<0.01$). Second, on questions taken from two

standard psychological scales used to measure cooperative predispositions, the AB5C: II+/I- and the NEO: A4, our Thai participants scored significantly higher than our Vietnamese participants ($p<0.01$).[10]

We included the psychological scale, but broke it into two sub-scales, *Cooperation Scale* and *Punishment Scale*, to account for possible selection problems driven by cooperative personalities that might be distributed non-ramdomly. As it turns out, the Thais seem to have slightly more cooperative and punishing predispositions according to these scales. Because we needed to keep the post-experiment survey brief, the scales were composed of the following six items (+ means the item was scored positively for agreeing and – means the opposite):

Cooperation Scale:

- It is better to cooperate than compete. (+)
- People should listen to their conscience when making decisions. (+)
- It is amusing to play tricks on other people. (-)

Punishment Scale:

- People should forgive others when they are angry. (-)
- People should revenge wrongs that are done to them. (+)
- Confrontations should be avoided. (-)

We constructed 12 indices of trust and cooperation based on our three sources of data. Table 2 summarizes how we constructed these indices. We used a number of different methods so that our analysis is as exhaustive as possible. Our simplest indices are self reports from single survey questions. The four indices based on the survey that followed our experiment are constructed this way. *Chat* is a likert scale response to the question: "How often do you chat or spend time together with other people in your community?" *Describe*, also measured on a likert scale, is the response to the question: How do you describe your neighbors who are not relatives? The responses to this question could vary

[10] Each of these two psychological scales have high Cornbach alpha values (0.73 for both) which measure the extent to which the scales capture a single unidimensional latent construct – cooperativeness in this case.

from (1) like family to (3) like strangers. *Public Good* or *Project* asked whether a voluntary community project had been organized in the community within the last year. *Participate* equals one if the respondent or someone in the respondent's family participated in the project. These last two questions illustrate part of the problem with survey measures of behavior - 95% of the respondents said there was a project in the community in the last year and 92% said that they, or someone in their family, participated. From these two pieces of data one would have to conclude that there are no free riders in any of these communities.

We constructed 3 indices based on the aggregation of survey questions from the initial household survey. *Social Integration* is an additive index of three survey questions: Q25 - "How often do you chat or spend time together with other people in your community," Q26 – "How often do you meet socially with other people in your community," and Q27a – "If you had a serious problem, could you talk with someone in your community about it." *General Trust* is an additive index of the following four questions: Q28a – "If your household was very short of money and food, could you ask people in this community beyond your relatives for help," Q29 – "Generally speaking, do you think most people in this community try to be helpful to their neighbors," Q30 – "If you had to leave for a couple of days, would you ask your neighbors to keep an eye on your house for you," and Q31 – "How would you describe your next door neighbors." Finally, *Specific Trust* is based on the addition of 6 or 8 responses (depending on location) to the question of whether the respondent felt she could generally trust a variety of people with increasing social distance. The trustees ranged from family to government officials.[11]

Finally we constructed five indices based on the behavior in our experiment. *Initial Contribution* is the amount a player contributed on the first

[11] To take maximal advantage of the information in our survey questions, we also constructed indices that were not additive. To account for the fact that some other linear combination of the information from the questions is a better index of cooperation or trust we constructed first principal factors for each subset of questions. However, the principal factor indices did not perform significantly better than the additive indices because the scoring coefficients were typically close to equal.

round of the game. *Average Contribution* is simply the average amount of one's endowment that one contributed to the group project over the course of the entire experiment. We include both the initial and the average contributions based on the argument made by Loewenstein (1999) that it is not obvious what effect stationary replication has on behavior. That is, people's initial instincts might be just as informative as what they have learned over the course of the experiment.

As an overview of how our participants behave in the experiment, the left panel of Figure 1 presents average contribution levels in the experiments pooled at the country level. In contrast to other similar experiments conducted in the west with students (see Ledyard (1995) for a survey), contribution rates among slum dwellers are high and tend to increase over time, even in the absence of punishment. It is hard to say whether punishment increases contributions or they simply continue to increase from periods 6 to 10. Interestingly, the Thais contribute significantly less initially, but converge on the Vietnamese contribution rate by the fifth round of the experiment.

Total Punishment is the number of times each player socially sanctioned the other members of her group. To control, to some degree, for the fact that cooperative groups deserved less sanctioning than uncooperative groups, we developed a measure of our participants' propensity to punish others as a function of how much the other group members contributed. *Punishment Propensity* is the coefficient in a linear probability regression of whether or not a participant punished on the total contribution of the other three group members. While there are only four observations for each participant, by definition there is no better, un-biased, method to calculate a player's reaction to how much the group contributed. As one can see from table 2, on average, Thai players are 21% less likely to punish when the group total increases by one unit and Vietnamese players are 7% less likely. Hence, the Vietnamese are less responsive than the Thais to changes in the group contribution level.

The propensity to punish is useful because it summarizes player reactions to what others choose and because it can differentiate between players who are less likely to punish as contributions increase and those few people who are

actually more likely to punish as contributions increase. However, the propensity is uninformative when we look at those people at the extremes. For example, both the person who always punishes and the person who never punishes will have the same propensity, 0, but clearly their behavior is different. To account for these differences, we construct *Prob(Punish)* which is the fitted value from the propensity regression at the country average contribution level. That is, Prob(Punish) is the estimated likelihood that a player will punish when the other members of her group contribute the average amount.

To summarize punishing behavior in the experiment, the right panel of figure 1 graphs the fraction of individuals who socially sanction the group in periods 6 through 9. Close to 40% of Thais sanction and 30% of Vietnamese sanction despite it being costly and inflicting no material harm on the other group members. Punishment rates due fall over time but so does free riding so this trends is better explained by the lessened need for punishment than by learning that punishment should have no effect. Another piece of evidence that supports this view of punishment is that the Vietnamese punish less in each period that the Thais, but they also suffer less from free riding than the Thais in every period.

5 Comparisons at the Community Level

Before analyzing our data we will be specific about the hypotheses that we have concerning the relationships between our indices. On one hand, those people who are more socially integrated will find prosocial group norms more salient and therefore contribute and punish more in the experiment. On the other hand, while it is not obvious why more socially integrated individuals would contribute less, one could hypothesize that more socially integrated people would punish less because such people are more dependent on others (perhaps emotionally or materially) and therefore have more to loose from alienating others.

Our trust indices are designed to measure how trustworthy people perceive their neighbors. We might expect people who trust in anticipation of their counterparts being trustworthy are more likely to be cooperative in our social

dilemma game. Hence, the correlation between trust and cooperation should be positive. We might also expect that those people who expect their neighbors to be more trustworthy might be more offended and more likely to punish when this trust is broken. This implies that the correlation between trust and punishment should also be positive.

We begin our analysis of the correlations between our survey measures of behavioral social capital from the large household survey in 2000 and our experimental measures gathered in 2002 by looking at community aggregates. For each community, we calculated the mean value of each additive survey index and the five summary statistics of play in our experiment and report the correlation between these measures by country in Tables 3a and 3b.

Beginning with our data from Bangkok, Table 3a, we see that, as we expected, social integration is positively associated with contributions in the game and positively associated with our three punishment indices. Not controlling for how much the rest of the group contributes, more socially integrated communities punish more, in total, and they are more likely to punish at the average contribution level. The correlation is negative for the propensity to punish because these coefficients are mostly negative (i.e. the more the others contribute the less likely one is to punish) and therefore more socially integrated communities are associated with people who are more responsive to what the other group members contribute.

Considering trust, we see that our two indices conflict to some degree. In concert with our prior expectations, General Trust is positively associated with contributing and punishing, but there are a few anomalies associated with Specific Trust. First, those communities that generally trust family, neighbors, and officials contribute less on average. Second, those communities with higher average specific trust scores are associated with being less responsive to free riding when it comes to punishing although their punishing probability is higher.

While most of the correlations in the Thai data have the sign that we expected, only two are significant at the 10% level and therefore we must question the relationship between experimental and survey data at the community level. Further, when we consider the Vietnamese data, table 3b,

there are many more anomalous correlations, but only two are significant at the 10% level.

Analyzing the community level correlations between behavior in our experiment and responses to our earlier survey, we find that in Thailand the associations are weak although they are mostly as we would expect while, in Vietnam, many of the correlations are the opposite of what we would expect.[12] Given that the relationships are weak at the community level, we must wonder to what degree these weak associations are due to the fact that we are looking at community averages (with correspondingly small sample sizes) and we are comparing across samples. In the next section, we address these issues by comparing our experimental behavior to survey responses that we gathered from the same people who had taken part in the experiment.

6 Comparisons at the Individual Level

There were four behavioral questions that were replicated in the second survey: how often participants chat with other people in the community (*Chat*), how close people are to their neighbors (*Describe*), whether or not the community has sponsored a volunteer project in the last year (*PG Project*), and whether or not someone from the respondent's family participated (*Participate*). Table 4a and 4b report the correlations between responses to these questions and our indices of behavior in the experiment.

The correlations in these table are in the same spirit of Glaeser et al. (2000) because we are comparing "within" subjects. While there are a few significant correlations, it is surprising how few fall into this category. There are only two associations that are significant at the 10% level in the Thai data. Being more "chatty" with neighbors is associated with contributing less initially and people who report that someone in their family participated in a community project in the last year are significantly more cooperative in the experiment.

[12] Further, using principal factor indices instead of the equally weighted additive indices does not improve the correlations nor does looking at rank order instead of parametric correlations.

Many of the correlations have the opposite sign in the Vietnamese data, however most of these associations are also not significantly different from zero. Limiting attention to those that are significant, we see that chatting more with one's neighbors is associated with higher average contributions and less total punishment in the experiment; people who describe their neighbors as more like strangers are more likely to punish; people in communities that have organized group projects react less to differences in free riding and punish free riders with higher probability; but those who report a family member participating in a community project contribute less. The last of these correlations is particularly counter-intuitive – it is not obvious why having family members who participating in a community project would be associated with more free riding unless these projects, on average, were disappointing.

While we find more evidence of links between our survey measures of social capital and behavior at the individual level, the results are still rather weak and in this analysis we do not take advantage of the information from the more comprehensive survey conducted in 2000. In section 7 we offer a method for preserving the individual level comparison that also extracts information from the earlier household survey.

7 Another Comparison at the Individual Level

Part of the reason why the correlations between our 2000 indices of social capital and the behavior in our experiment are low may be due to selection problems. As mentioned above, most respondents to the initial survey were women while the sex mix in the experiment was even. As a result, the correlations may be weak because we oversampled women in the initial survey who behave differently than men in the experiment (see Carpenter et al. (2002b)). This is perhaps the largest sampling problem between the two data sets, but other differences seen in table 1 such as age and schooling may also reduce the correlations discussed in section 5.

To correct for the possible selection problems and to take advantage of the information in our initial survey, we identified the demographic characteristics of

our participants that were common to both surveys, regressed our three survey indices on these characteristics using the initial survey, and then used the coefficients from the resulting econometric model to create predicted values of the indices for our experimental participants. Because the survey and experiment took part in exactly the same communities, this method allows us to partially correct for any selection issues and examine the correlations between the predicted indices for our experimental participants and play in the experiment at the individual level.

Table 5 reports our first stage regressions for the two locations. The regressions are ordered logit models and include a male dummy variable, dummy variables for each community, whether or not a respondent had recently had health problems, *Public Good* and *Participate* which are defined above, the respondent's number of years of schooling, age and age-squared, and an expenditure variable which is the sum of a respondent's monthly expenditures on food, transportation, rent, and entertainment.

While a number of regressors are significant at the 10% level or better in the Thai data, fewer variables are significant in the Vietnamese data. In addition, the p-values for the χ^2-tests of joint significance are high in many of the regressions while the pseudo R^2s are rather low. Essentially, this means that the demographics are noisy predictors of the three social capital indices and, although the predicted indices should suffer less from selection issues, we may introduce so much noise that using the resulting predictions does not improve on the original comparisons done at the community level. At a minimum, however, we can now conduct the analysis within subject and at the individual level.

In tables 6a and 6b we report the correlations between the predicted values of the initial survey indices for our experimental subjects and play in the experiment. We start with the Thai data in table 6a. There are many differences between the correlations in table 6 and those in table 3. Many of the signs flip, and although many of the significances of the correlations improve, most still fail to meet the 10% critical value. Most of the "action," however, is in the correlations between the total amount of punishment a player doles out and the trust indices. Specifically, we see that people who generally trust more punish

less, in total and are less responsive to free riding. Contrary to our prior hypothesis that trust and punishment would be positively associated, this might indicate some sort of self-fulfilling prophecy – "See, I did not trust the others for good reason and now I am going to teach them a lesson." However, we also see that specific trust is associated with lower likelihoods of punishing which confounds the relationship between trust and punishment further.

The Vietnamese correlations (Table 6b) are similarly weak, however two associations are noteworthy. The correlation between the general trust index and the average contribution is now significant and suggests that more trusting people in Vietnam contribute less which is contrary to previous experimental studies of social dilemmas (Gueth et al. (1997) and Parks et al. (1996)). Second, we see that Vietnamese punishers who trust the authorities among others punish less. This could make sense if this indicates that people who believe in the capabilities of the public sector to govern effectively do not feel the need to take things in their own hands.

In sum, we find more overall significance in the associations among our predicted survey indices and play in the game and, therefore, there may be some benefit to this method of extracting information from the original survey, but few of the relationships are strong. Notice, that these results are based on pair-wise correlations and therefore do not control for (nor allow for) covariation among the indices. As one final test of the relationships among survey and experimental measure of social capital in section 8 we regress play in the experiment on our predicted survey indices and other controls.

8 Do Survey Indices Predict Behavior?

We end our analysis by adding controls and isolating the relationship between our predicted survey indices and behavior in the experiment. In one set of equations, table 7, we regress each player's average contribution on her predicted survey indices and other variables which might also correlate with behavior. In a second set of regressions, table 8, we look at the relationship between the predicted survey indices and each player's probability of punishing at the average

contribution level. For each set of regressions we use ordinary least squares but cluster errors by community to partially control for the fact that observations may not be independent within neighborhoods.

The control variables we add were introduced in our discussion of table 1. *Own* is a dummy variable that takes the value of one for people who own their homes. We expect people who own their own homes will be more vested in the community and therefore more cooperative and more likely to punish free riders (Sampson et al. (1997)). *Household* is the number of family members that live in the respondent's home. We have no explicit expectation of what the effect of family size should be, but we add is as a demographic control. *Residence* measures how long people have lived in their communities. We expect that tenure in the community correlates positively with cooperation and punishment (Sampson et al. (1997)). We expect that people from more *Homogeneous* communities will be more cooperative and more likely to punish other members of the "ingroup" (Cardenas and Carpenter (2001)). We expect people who score highly on the cooperation personality scale will cooperate more in the experiment and those that score high on the punishment scale will be more sensitive to (and more likely to punish) free riders. We also look for differences in experimental behavior associated with sex, whether or not the player said she had a family member who participated in a community project, education attainment, and age. Lastly, in our punishment regressions we test whether people who contribute more also punish more.[13]

In our first cooperation regressions we examine the effect of our control variables in the two countries. In Bangkok we see that most of the correlations have the predicted sign: home owners contribute less, players from larger households contribute less, people who have lived longer in the community contribute less, people from more homogeneous communities contribute more, those with more cooperative predispositions contribute more, men contribute more, people contribute more if they say a family member had recently

[13] Notice that we do not include all our demographic controls because the predicted indices are linear combinations of these variables. Adding them would cause multicolinearity in the regression model.

participated in a community project, more schooling reduces contributions, and older people contribute less. However, none of the demographic coefficients are significant. In Ho Chi Minh City we find five significant coefficients: players who come from more homogeneous communities contribute less ($p<0.10$), players who score higher on the cooperation scale cooperate more in the experiment ($p<0.10$), ironically, players who said that a family member recently volunteered for a community project contribute less ($p<0.05$) and player's contributions are concave in age. This last result mimics the age profile of social capital talked about in Glaeser et al. (2002).

We next add each predicted survey index, one at a time. Adding the Siindex variable does little to improve our cooperation predictions. More socially integrated individuals cooperate less in Thailand and more in Vietnam, but the coefficients are tiny and insignificant. The only results of note is that the addition of the social integration index in the Thai regression improves the estimate with respect to family participation in a community project. Now we have opposing and significant coefficients in the two countries – Thais contribute more if family participation is high ($p<0.10$) but Vietnamese contribute less ($p<0.01$).

Adding the general trust index has a large impact on the Thai regression, but essentially no effect on the Vietnamese results. Conforming to our priors, adding general trust on its own to the model indicates that more trust results in more cooperation, however looking further to the right one sees this effect is not robust. In this regression we also see a significant effect of schooling and sex: Men contribute more in Bangkok ($p<0.10$) and those with more schooling contribute less ($p<0.01$).

Including the specific trust index by itself improves the Thai regression substantially. We now see a significant relationship between living in the community longer and contributing less ($p<0.01$), the coefficient increases and the significance level improves on the sex dummy, however, the age effect is weakened. We also see that the anomalous relationship between specific trust and cooperation persists in the controlled analysis – those in Bangkok who trust individuals more, cooperate less. In Vietnam the sign of the specific trust

coefficient is as we would expect but it is not statistically significant and as in each previous case, contributions are robustly predicted by community homogeneity, cooperative predispositions, family participation, and age.[14]

Although the predicted indices are correlated with each other, they are not correlated on a level such that adding them all simultaneously to the analysis produces too much colinearity ($|rho|<0.55$). In fact, as the last set of regressions shows, when we add just one at a time, it appears that we may suffer from omitted variable bias in the Thai case. It appears that each index by itself acts as a noisy signal of the combined effect of all three. When all the indices are added in the last Thai regression, the fit of the model improves and all three indices become significant. A standard deviation increase in social integration increases the average contribution by 5.58 coins or by 27.92 Bhat. At the same time, a standard deviation increase in the general trust index reduces the average contribution by 5.55 coins and a standard deviation increase in the specific trust index reduces contributions by 4.64 coins. As noted above, the addition of the predicted indices does not improve the fit of the model in the Vietnamese case and this remains true when all three are added simultaneously.

As above, our first punishment regressions (table 8) test for relationships between our controls and the probability that players sanction free riders. The coefficients in these regressions conform, to some degree, to our priors. In both countries players who contribute more, punish more, but the effect is stronger in Bangkok. People who own their own homes are more likely to punish as are people who come from larger families, although the first effect is much larger. We see that people loose the willingness to punish the longer they live in communities (possibly because they are older and feel more vulnerable to retaliation). As in the cooperation regression, Thais and Vietnamese behave oppositely with respect to the homogeneity of their communities. Thais are less likely to punish in homogeneous communities while Vietnamese are more likely. The punishment scale has no power in either country. Men are less likely to punish in Bangkok and more likely in Ho Chi Minh City, but the effects are not

[14] The fact that demographics are robust predictors of behavior, especially age, is corroborated by Carpenter et al. (2002a) who look at the bargaining behavior of students and workers.

significant. As in table 7, the two groups also behave oppositely with respect whether a family member volunteered. Thais from volunteering families punish less while for Vietnamese families the relationship works in the opposite direction. Schooling has no effect on punishment in either country but we see that punishment is also concave in age in both locations but only significantly so in Thailand.

In the second set of regressions we add the social integration index and find that social interaction has a relatively large coefficient in Vietnam only. The controlled coefficient tells the same story as in table 6: more socially integrated people are more likely to punish. Adding the two trust indices by themselves, however, adds nothing to the analysis.

In our last set of regressions we include all three indices simultaneously. With the punishment data there seem to be synergies between the indices in both cities. In Bangkok all three indices become significant and mimic the results of the cooperation regressions. A standard deviation increase in each index results in more than a more than 200% increase in the likelihood of punishment in the social integration case, a reduction of more than 300% in the probability in the general trust case, and a reduction of more than 100% in the specific trust case. In Ho Chi Minh City, a standard deviation increase in social integration results in and increase of 60% in the likelihood of punishment and a standard deviation increase in general trust reduces the chances of punishment by more than 100%.

There are two important results of our regression analysis. First, the econometric model fits the Thai data better than the Vietnamese data. Our controls and indices explain more of the variation in behavior in the Thai data, however, this may be due, partially, to the fact that our first stage regressions (table 5) are also stronger in the Thai case.

Second, and most important for our current purposes, people who are predicted to be more socially integrated cooperated and punished more and this result is strong in the Thai case, while not negligible in the Vietnamese case. However, what appears to be a mystery is the fact that more trust leads to less cooperation and less punishment of free riders. We thought that this result might be related to up the fact that those people who are more trusting of the police

and government officials might be less likely to punish because they feel that this is the job of the police. It might also be associated with the well-documented Thai propensity to defer to authority and their reluctance to challenge officials or employers through direct confrontation.

To examine this idea further, we re-ran the last cooperation and punishment regressions with the predicted value of each individual component (the predicted value, that is) of the specific trust index to test whether the results of tables 7 and 8 are driven by trusting one or two specific groups. The results of this analysis, however, shed only a few rays of light on this anomaly. In Vietnam, only trust in non-governmental organizations, on it's own, had an effect on the punishment probability only. Here people who trust NGOs more punish less. In Thailand, however, none of the individual trust scores correlate with punishment but more trust in one's relatives, one's community members, the police, government officials, and NGOs are all associated with lower contributions. Unfortunately, this could represent that fact that the Thais understand the dominant nature of free riding in social dilemmas.

9 Concluding Remarks

Over three years of field work we have gathered measurements of social capital from three sources: A household survey, an experiment, and a post-experiment survey. Our purpose in this paper is to examine the correlations between our survey measures and our experimental measures. From a practical point of view, we expect that, with the correct framing, experiments are less noisy measures of social propensities because there is a material cost to engage in a prosocial act whereas in surveys the cost is zero. Therefore, we would like to know how well survey measures correlate with experimental measures because experiments are extremely time consuming and expensive to conduct while surveys are relatively cheap. If the correlations between the two measures are high, then surveys should be appropriate substitutes for experiments. From a governance point of view, we are interested in these correlations because policy makers have started to pay attention to the notion of social capital, particularly in terms of its role in

community and economic development. If policies based on survey research are implemented, but the survey-based measures of social capital are noisier than previously thought, efforts may be misdirected.

Summarizing our findings is not easy, but we try to provide an overview in table 9 where we collapse tables 3, 6, 7 and 8 and just list the sign of the correlations between our two methods for measuring social propensities. To highlight just the potentially important associations, we circle the signs of the correlations that are significant at the 10% level or better. We can discuss these correlations on three levels: consistency, significance, and control. Consistency means that the sign of a correlation is the same across all three tables. Thirteen of the thirty series are consistent. Perhaps the most consistent results we have found are that 1) social integration is correlated with punishing more in the Thai experiment and with contributing more in Vietnam, 2) general trust is associated with less punishment in Vietnam, and 3) specific trust is associated with lower contributions in Thailand.

In terms of significance, 26% of the correlations (19 of the 72) are significant at the 10% level. Perhaps the most important significant results are those that change when we change the method or level of analysis. For example, the fact that when moving from the *between* subject analysis of table 3 to the *within* subject analysis of table 6 twice as any off the associations become more significant than become less significant indicates that selection problems may be a dampening and important link between our methods.

Lastly, the results we feel are most robust are those from tables 7 and 8 that are significant because in this analysis we controlled for other possible determinants of behavior in the experiment. Specifically, because the results are robust and similar across cultures, we feel most confident in asserting that survey measures of social integration and general trust predict cooperation and punishment. Notice, our trust results are both anomalous and contrary to the result found by Glaeser et al. (2000) who show that, although most survey measures are not robust predictors of behavior, the simple question of whether people trust strangers and an index of past trusting behavior predict how much

people trust others in the investment experiment. We find the opposite result, though in a different experiment

Our conclusions with respect to the use of surveys to measure behavioral propensities are guarded despite finding a few provocative links between survey measures of social integration and trust on one hand and cooperative and punishing behavior on the other. Considering all the correlations, not many survey indices are strongly associated with actual behavior. However, we have evidence that demographic characteristics of individual may be solid predictors of behavior. This result is important because in the more ambitious program of attributing causation to these correlations, one is always in need of a good instrument for behavioral social capital. We think a consensus is starting to build around the idea that age may be just such an instrument. Our results show that cooperation and punishment are concave in age, just as Glaeser et al. (2002) show that network measures of social capital are concave in age and Carpenter et al. (2002a) show that altruism is increasing in age (although further analysis shows that the relationship is actually concave).

On the basis of this observation, we feel that the both planning and policy professionals as well as economists should be suspicious of survey measures of behavioral social capital. To be fair, however, we should also point out that our estimated survey indices are rather noisy and therefore it is remarkable that they predict behavior as well as they do. Differences in this noise might, for example, explain why our econometric model fits the Vietnamese data poorly compared to the Thai data. This implies that another large scale study using non students is warranted.

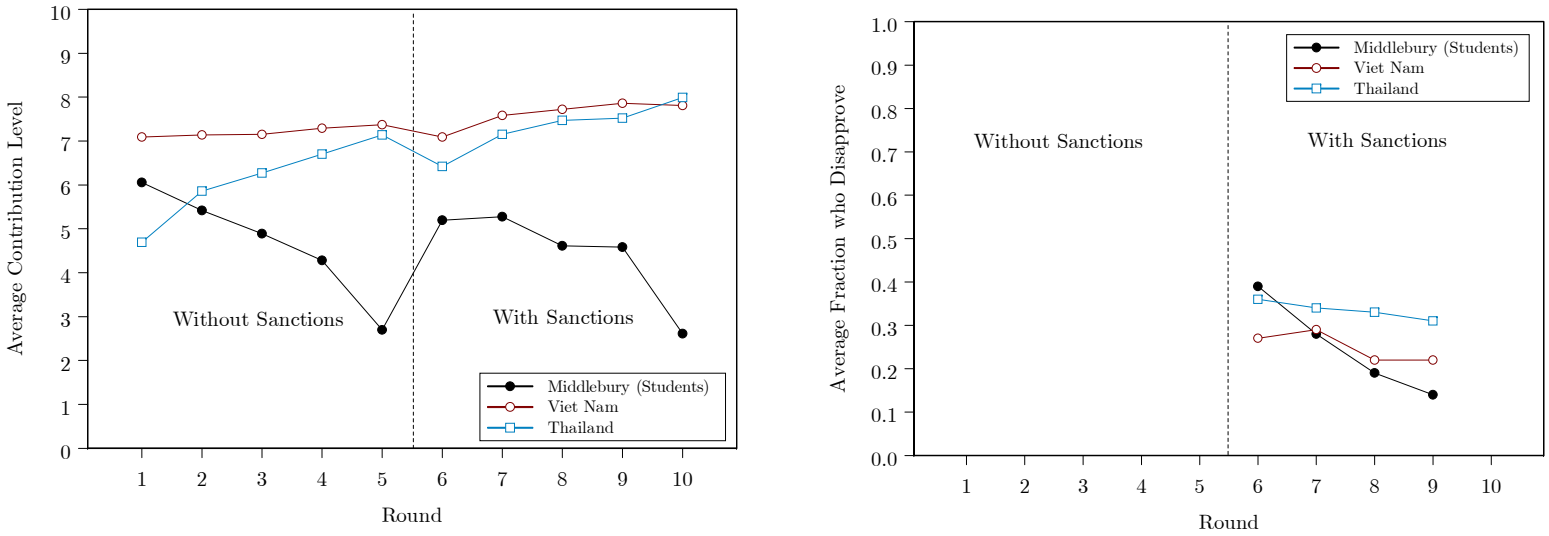

Figure 1 – Average Behavior at the Country Level in the Experiment

Table 1 – Demographic Summary Statistics of the Participants

	Bangkok						Ho Chi Minh City					
	2000 Survey			2002 Experiment			2000 Survey			2002 Experiment		
	obs.	mean	s.d.	obs.	mean	s.d.	obs.	mean	s.d.	obs.	mean	s.d.
Participant Sex (1=male)	500	0.26	0.44	120	0.50	0.50	500	0.19	0.39	120	0.50	0.50
Participant Age	500	42.09	13.28	120	40.98	13.71	500	44.94	13.38	120	35.1	13.69
Participant Years of Schooling	500	6.08	5.08	120	6.92	1.14	500	5.49	3.97	120	9.67	3.42
Household Size				119	4.97	2.43				120	5.43	2.44
Years of Residence				119	18.24	13.2				118	21.82	13.73
Homogeneity of the community (1=high)				118	0.21	0.41				102	0.05	0.22
Cooperation Scale (additive index 3 (high) to -3 (low))				120	2.80	0.56				120	2.34	0.97
Punishment Scale (additive index -3 (high) to 3 (low))				120	-2.20	1.06				120	-2.04	1.21

Table 2 – Behavioral Social Capital Indices

			Bangkok			Ho Chi Minh City	
Index	**Construction**	**obs.**	**mean**	**s.d.**	**obs.**	**mean**	**s.d.**
	Based on Initial Survey Responses						
Social Integration	+1 if Q25<3, +1 if Q26<3, +1 if Q27a=1	500	2.06	0.80	500	0.53	0.81
General Trust	+1 if Q28a=1, +1 if Q29=1, +1 if Q30=1, +1 if Q31<2	500	2.27	0.98	500	1.04	1.37
Specific Trust	Sum of Q32a-Q32h (BKK), Sum of Q32a-Q32f (HCMC)	209	9.51	4.11	217	10.33	3.24
	Based on Experiment Survey (replicated from initial survey)						
Chat	Likert scale 1 (high) to 4 (low)	119	1.64	0.72	120	1.19	0.51
Describe	Likert scale 1 (high) to 3 (low)	119	1.56	0.50	120	1.54	0.53
Public Good Project	Yes = 1, No = 0	120	0.95	0.22	120	0.95	0.22
Participate	Yes = 1, No = 0	116	0.92	0.27	114	0.93	0.26
	Based on Experimental Behavior						
Initial Contribution	Number of bills or coins contributed in round 1	120	4.69	2.66	120	7.09	2.76
Average Contribution	Average number of bills or coins contributed in 10 rounds	120	6.72	2.41	120	7.41	2.10
Total Punishment	Sum of 4 punishment dummies for rounds 6 through 9	120	1.34	1.61	120	1.00	1.26
Punishment Propensity	Individual beta in $Punish_i = \alpha+\beta Total\ Contribution_{-i}+\varepsilon$	120	-0.21	0.41	120	-0.07	0.25
Prob(Punish)	Predicted Probability of Punishing at the Average Contribution	120	0.30	1.74	120	0.20	2.10

Table 3a - Bangkok community level correlations (p-value)

Survey Indices → / Experiment Behavior ↓	Social Integration	General Trust	Specific Trust
Initial Contribution	0.85	0.49	0.26
	(0.07)	(0.40)	(0.67)
Average Contribution	0.29	0.28	-0.89
	(0.63)	(0.65)	(0.04)
Total Punishment	0.17	0.12	0.28
	(0.78)	(0.85)	(0.65)
Punishment Propensity	-0.27	-0.28	0.66
	(0.66)	(0.65)	(0.22)
Prob(Punish)	0.64	0.49	0.46
	(0.24)	(0.40)	(0.44)

Table 3b – Ho Chi Minh City community level correlations (p-value)

Survey Indices → / Experiment Behavior ↓	Social Integration	General Trust	Specific Trust
Initial Contribution	0.57	0.45	0.59
	(0.31)	(0.44)	(0.29)
Average Contribution	0.22	0.14	-0.40
	(0.72)	(0.82)	(0.51)
Total Punishment	-0.85	-0.53	-0.51
	(0.07)	(0.36)	(0.37)
Punishment Propensity	0.06	-0.61	-0.54
	(0.92)	(0.27)	(0.35)
Prob(Punish)	-0.66	-0.84	-0.07
	(0.22)	(0.07)	(0.91)

Table 4a - Bangkok individual level correlations with survey replication (p-value)

Survey Indices → Experiment Behavior ↓	Chat	Describe	PG Project	Participate
Initial Contribution	-0.15	-0.06	-0.13	0.04
	(0.09)	(0.50)	(0.16)	(0.67)
Average Contribution	-0.08	0.07	-0.12	0.21
	(0.37)	(0.46)	(0.20)	(0.02)
Total Punishment	-0.03	-0.08	-0.12	-0.15
	(0.70)	(0.39)	(0.20)	(0.11)
Punishment Propensity	-0.004	0.10	0.06	-0.04
	(0.97)	(0.28)	(0.53)	(0.63)
Prob(Punish)	-0.09	-0.09	-0.09	-0.04
	(0.30)	(0.32)	(0.34)	(0.64)

Table 4b – Ho Chi Minh City individual level correlations with survey replication (p-value)

Survey Indices → Experiment Behavior ↓	Chat	Describe	PG Project	Participate
Initial Contribution	0.08	0.05	-0.03	-0.13
	(0.40)	(0.62)	(0.71)	(0.17)
Average Contribution	0.17	0.08	0.04	-0.24
	(0.06)	(0.39)	(0.62)	(0.01)
Total Punishment	-0.20	-0.01	-0.09	0.07
	(0.03)	(0.89)	(0.32)	(0.42)
Punishment Propensity	0.05	0.04	0.28	0.07
	(0.56)	(0.65)	(0.002)	(0.42)
Prob(Punish)	0.04	0.17	0.34	0.01
	(0.65)	(0.07)	(0.0002)	(0.90)

Table 5 - The Correlates of the Social Capital Indices

(all results are ordered logit)

	Bangkok			Ho Chi Minh CIty		
	Social Int.	Gen. Trust	Spec. Trust	Social Int.	Gen. Trust	Spec. Trust
Male	-0.49**	-0.32	0.70**	0.32	-0.04	0.03
	(0.24)	(0.24)	(0.31)	(0.29)	(0.30)	(0.36)
Slum 2	0.61	0.03	0.47	-0.46	-0.29	0.74
	(0.42)	(0.42)	(0.62)	(0.48)	(0.43)	(0.51)
Slum 3	0.4	-0.01	1.60***	0.04	-0.08	1.41***
	(0.34)	(0.34)	(0.49)	(0.41)	(0.38)	(0.49)
Slum 4	0.24	-0.41	1.22***	0.62	-0.58	1.02*
	(0.27)	(0.27)	(0.34)	(0.45)	(0.46)	(0.55)
Slum 5	0.40	0.39	0.06	0.49	-0.03	0.40
	(0.34)	(0.37)	(0.59)	(0.44)	(0.43)	(0.56)
Ill	0.05	0.08*	0.04	0.11	0.35	0.12
	(0.04)	(0.04)	(0.04)	(0.30)	(0.27)	(0.36)
Public Good	-0.009	-0.09	0.01	-0.11	-0.01	-0.11
	(0.07)	(0.07)	(0.08)	(0.10)	(0.10)	(0.13)
Participate	0.38*	0.71***	0.14	0.07	0.17	0.75**
	(0.23)	(0.23)	(0.33)	(0.26)	(0.26)	(0.34)
Schooling	0.02	0.04*	0.05*	-0.00005	0.005	-0.02
	(0.02)	(0.02)	(0.03)	(0.04)	(0.03)	(0.05)
Age	-0.01	0.001	-0.06	-0.07	0.05	0.05
	(0.05)	(0.05)	(0.06)	(0.05)	(0.05)	(0.06)
Age^2	0.0002	0.00003	0.0005	0.0008	-0.0005	-0.0003
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Monthly	0.000009	0.000005	0.00003**	0.0002	0.00004	0.0003
Expenditures	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
obs.	345	345	177	311	311	153
pseudo R^2	0.02	0.03	0.04	0.03	0.01	0.02
Prob>χ^2	0.27	0.04	<0.01	0.09	0.90	0.11

(Notes: Standard errors reported in parentheses. * indicates significant at 10%, ** at 5%, and *** at 1%.)

Table 6a - Bangkok individual level correlations with predicted survey indices (p-value)

Survey Indices → / Experiment Behavior ↓	Predicted Social Integration	Predicted General Trust	Predicted Specific Trust
Initial Contribution	-0.08	0.03	-0.08
	(0.37)	(0.72)	(0.38)
Average Contribution	-0.10	0.15	-0.18
	(0.28)	(0.11)	(0.05)
Total Punishment	-0.04	-0.17	-0.10
	(0.64)	(0.07)	(0.29)
Punishment Propensity	0.07	0.17	0.19
	(0.44)	(0.05)	(0.04)
Prob(Punish)	0.03	0.03	-0.21
	(0.75)	(0.75)	(0.02)

Table 6b – Ho Chi Minh City individual level correlations with predicted survey indices (p-value)

Survey Indices → / Experiment Behavior ↓	Predicted Social Integration	Predicted General Trust	Predicted Specific Trust
Initial Contribution	0.01	0.10	-0.13
	(0.88)	(0.29)	(0.16)
Average Contribution	0.10	0.18	0.01
	(0.31)	(0.06)	(0.88)
Total Punishment	-0.03	0.02	-0.20
	(0.73)	(0.79)	(0.03)
Punishment Propensity	0.02	-0.14	-0.03
	(0.81)	(0.15)	(0.78)
Prob(Punish)	0.15	-0.03	0.07
	(0.12)	(0.77)	(0.47)

Table 7 – Dependent Variable is an Individual's Average Contribution

(all results are OLS with errors clustered by community)

	BKK	HCM	BKK	HCM	BKK	HCM	BKK	HCM	BKK	HCM
Own	-0.89	-0.05	-0.88	-0.17	-0.89	-0.11	-0.85	-0.22	-0.89	-0.27
	(0.64)	(0.44)	(0.60)	(0.43)	(0.67)	(0.54)	(0.65)	(0.52)	(0.66)	(0.61)
Household	-0.14	-0.04	-0.14	-0.05	-0.15	-0.05	-0.05	-0.06	-0.02	-0.06
	(0.08)	(0.11)	(0.07)	(0.11)	(0.08)	(0.11)	(0.08)	(0.11)	(0.08)	(0.11)
Residence	-0.04	-0.005	-0.04	-0.002	-0.04	-0.008	-0.03***	-0.007	-0.005	-0.004
	(0.02)	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Homogeneous	1.09	-1.92*	1.10	-1.54*	0.68	-1.85*	-0.48	-1.90*	0.54	-1.64**
	(0.55)	(0.80)	(0.62)	(0.63)	(0.52)	(0.77)	(0.45)	(0.72)	(0.30)	(0.56)
Cooperation	0.04	0.34*	0.05	0.33**	-0.14	0.32**	-0.08	0.34**	-0.04	0.34**
Scale	(0.29)	(0.13)	(0.29)	(0.12)	(0.29)	(0.11)	(0.26)	(0.11)	(0.22)	(0.12)
Male	0.96	-0.73	0.76	-1.05	1.68*	-0.86	2.43***	-0.79	3.60***	-1.00*
	(0.64)	(0.66)	(1.55)	(0.54)	(0.66)	(0.71)	(0.44)	(0.62)	(0.08)	(0.61)
Participate	2.04	-3.47**	2.24*	-3.39***	0.22	-3.45**	2.04*	-3.87**	2.70	-3.65**
	(1.12)	(0.87)	(0.98)	(0.74)	(1.45)	(0.88)	(0.88)	(1.18)	(1.54)	(1.04)
Schooling	-0.08	0.13	-0.08	0.10	-0.21***	0.13	-0.08	0.12	0.04	0.10
	(0.04)	(0.08)	(0.05)	(0.10)	(0.05)	(0.09)	(0.05)	(0.08)	(0.07)	(0.10)
Age	-0.01	0.29**	-0.01	0.28**	-0.03	0.29**	-0.12*	0.24**	-0.13**	0.29***
	(0.07)	(0.08)	(0.07)	(0.07)	(0.05)	(0.07)	(0.05)	(0.06)	(0.04)	(0.01)
Age^2	-0.00002	-0.003**	-0.00003	-0.003**	-1E-06	-0.003**	0.0008	-0.003**	0.0008	-0.003***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Social Integr.			-1.03	1.10					6.98***	0.90
(pred)			(5.27)	(0.62)					(1.64)	(0.52)
General Trust					5.26*	-0.38			-5.66*	-0.29
(pred)					(2.24)	(1.12)			(2.74)	(1.25)
Specific Trust							-0.80***	0.24	-1.13***	0.14
(pred)							(0.19)	(0.24)	(0.19)	(0.15)
Constant	7.08***	4.23	9.19	3.81	-3.03	4.73	17.08***	3.16	17.75**	3.07
	(0.97)	(2.62)	(11.70)	(2.94)	(5.22)	(2.58)	(2.57)	(2.42)	(6.54)	(2.40)
obs.	112	98	112	96	112	96	112	96	112	96
R^2	0.29	0.31	0.29	0.33	0.32	0.31	0.46	0.32	0.49	0.33

(Notes: Robust standard errors reported in parentheses. * indicates significant at 10%, ** at 5%, and *** at 1%.)

Table 8 – Dependent Variable is an Individual's Prob(Punish)

(all results are OLS with errors clustered by community)

	BKK	HCM	BKK	HCM	BKK	HCM	BKK	HCM	BKK	HCM
Avg Cooperation	0.34**	0.11	0.34**	0.12	0.34*	0.13	0.31*	0.13	0.28*	0.12
	(0.13)	(0.07)	(0.13)	(0.07)	(0.14)	(0.08)	(0.13)	(0.08)	(0.13)	(0.08)
Own	1.19	0.84	1.19	0.78	1.20	0.75	1.17	0.84	1.14	0.74
	(0.69)	(0.75)	(0.71)	(0.72)	(0.71)	(0.67)	(0.66)	(0.76)	(0.68)	(0.71)
Household	0.10*	0.02	0.10*	0.02	0.10*	0.02	0.11*	0.02	0.13*	0.02
	(0.05)	(0.02)	(0.05)	(0.02)	(0.05)	(0.03)	(0.05)	(0.02)	(0.05)	(0.02)
Residence	-0.009	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.0008	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Homogeneous	-0.51***	0.21	-0.51***	0.36	-0.47**	0.20	-0.57***	0.22	-0.46*	-0.41
	(0.07)	(0.45)	(0.10)	(0.41)	(0.16)	(0.39)	(0.08)	(0.42)	(0.18)	(0.38)
Punishment Scale	-0.004	0.13	-0.003	0.10	-0.002	0.11	-0.0002	0.10	0.008	0.11
	(0.11)	(0.12)	(0.11)	(0.12)	(0.11)	(0.11)	(0.10)	(0.11)	(0.09)	(0.11)
Male	-0.39	0.23	-0.41	0.22	-0.47	0.28	-0.12	0.34	-0.33	-0.10
	(0.34)	(0.16)	(0.76)	(0.25)	(0.40)	(0.27)	(0.28)	(0.23)	(0.67)	(0.24)
Participate	-1.06	0.1	-1.04	0.11	-0.88	0.07	-0.99	0.12	-0.23	0.27
	(0.58)	(0.29)	(0.67)	(0.27)	(0.70)	(0.23)	(0.55)	(0.29)	(0.42)	(0.35)
Schooling	0.05	0.04	0.05	0.03	0.06	0.05	0.04	0.04	0.12	0.02
	(0.04)	(0.03)	(0.03)	(0.03)	(0.05)	(0.03)	(0.05)	(0.03)	(0.07)	(0.03)
Age	0.07**	0.01	0.07**	0.04	0.08**	0.09	0.06	0.03	0.05	0.11
	(0.02)	(0.04)	(0.03)	(0.04)	(0.02)	(0.08)	(0.03)	(0.03)	(0.03)	(0.08)
Age^2	-0.0007***	0.0001	-0.0007***	-0.0003	-0.0007***	-0.0008	-0.0006**	-0.0002	-0.0005**	-0.0001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Social Integr. (pred)			-0.12	0.61**					2.87*	0.75***
			(2.32)	(0.19)					(1.86)	(0.15)
General Trust (pred)					-0.56	-0.81			-3.58**	-0.86*
					(1.42)	(0.58)			(0.95)	(0.44)
Specific Trust (pred)							-0.12	-0.001	-0.33**	-0.11
							(0.09)	(0.11)	(0.12)	(0.09)
Constant	-3.95**	-1.82	-3.69	-3.07*	-2.87	-2.56	-2.16	-2.59*	1.64	-2.44**
	(1.38)	(1.19)	(5.52)	(1.19)	(2.13)	(1.35)	(2.66)	(1.22)	(2.81)	(0.69)
obs.	112	98	112	96	112	96	112	96	112	96
R^2	0.22	0.11	0.22	0.15	0.22	0.16	0.22	0.14	0.24	0.18

(Notes: Robust standard errors reported in parentheses. * indicates significant at 10%, ** at 5%, and *** at 1%.)

Table 9 – Summary of the Correlations Between Survey and Experimental Indices of Social Capital

	Social Integration						General Trust						Specific Trust					
	Bangkok			HCM City			Bangkok			HCM City			Bangkok			HCM City		
table →	3	6	7/8	3	6	7/8	3	6	7/8	3	6	7/8	3	6	7/8	3	6	7/8
Initial Contribution	⊕	-		+	+		+	+		+	+		+	-		+	-	
Average Contribution	+	-	⊕	+	+	+	+	+	⊖	+	⊕	-	⊖	⊖	⊖	-	+	+
Total Punishment	+	-		⊖	-		+	⊖		-	+		+	-		-	⊖	
Punishment Propensity	-	+		+	+		-	⊕		-	-		+	⊕		-	-	
Prob(Punish)	+	+	⊕	-	+	⊕	+	+	⊖	⊖	-	⊖	+	⊖	⊖	-	+	-

(Note: + indicates positive correlation, - indicates negative correlation, ⊕ indicates positive correlation that is significant at the 10% level or better, and ⊖ indicates negative correlation that is significant at the 10% level or better

10 Appendix A – Community Details

Communities in Bangkok

Community 1: geographically distinct section of famous Klong Toey slum located on a huge swath of land surrounding the Port of Thailand. The area has a large number of neighborhood-based NGOs including the Duang Prateep Foundation (founded by a Magsaysay Prize recipient living in the community) working to improve the physical conditions and community residents.

Community 2 (Ruam Samakkhi): located in a newly (last five years) urbanized section of inner Bangkok, along a small very contaminated klong (or canal). The entire community sits about six feet above the surface of a canal, a position that is maintained through the use of concrete stilts; brackish water sits below the housing structures, emanating odors into and around dwellings.

Community 3 (Trak Tan): located outside of central Bangkok in the adjoining province of Samut Prakan but the area around Trak Nan is entirely urban. Most of the land is owned by a variety of entities including a nearby Buddhist temple and private landlords but wealthy households have begun to build large, impressive homes in the midst of the crowded lanes. Solid waste is a major issue and garbage is everywhere; rats appear to be the most aggressive, problematic form of vermin in this community. This community is the wealthiest slum and has the largest average household size of all five slums.

Community 4: located on the north and south of a major road (soi) running through downtown Bangkok. The housing stock is particularly poor in quality, and mostly composed of wood. Standing water and garbage is clearly common beneath the houses. The community's central location in Bangkok means that the value of real estate is quite high, therefore, the likelihood of eviction seems greater than at the other four locations.

Community 5 (Sin Samut/Prachatipat): located in suburban Pathum Thani province. Residents are dispersed in an almost rural environment along the banks of a large klong full of plants and animals. Within the slum there are at least two distinct areas, differentiated by age and land ownership although both groups are very poor and earn significantly less than households from the other four settlements. The first settlement, which resides upon land owned by the Irrigation Department, is about 20 years old. The second settlement, existing for around thirty years, occupies land that was recently transferred from a member of the royal family to an insurance company. Both communities are actively being threatened with eviction. Intervention on the part of the Department of the Interior has given slum members the opportunity to purchase property through their savings groups. They are in the process of trying to assemble the required down payment. Unfortunately, there is not enough space to accommodate all the households even if all of the members of both communities were interested in moving there. Specific households – those living on land owned by the Irrigation Department – have been given the option of moving to other sites owned by the Housing Authority. There is considerable resistance within the community to this second option, because the land is distant, the residents must pay for the land, and they would need to find jobs in the new

area, which would likely be difficult to do. In fact, a group has formed to resist attempts to move the community from along the edges of the canal.

Communities in Ho Chi Minh City

Community A (Tan Dinh): located in the central district (ancient Saigon) in a single triangular-shaped city block. The community is close to the Tan Dinh Market, a scene of much economic activity both day and night. Some residents have lived there since prior to the war but others (mostly recent migrants) live around the market without any permanent dwelling. The housing pattern is extremely dense; a mix of materials including plaster, brick, tile and cement with the occasional tin roof or siding. Quality of housing structures seems high (many consist of two stories) but conditions are extremely crowded with little floor area available per household. Despite high density, communal alleys and walkways are kept clean and most residents appear to have toilets/septic tanks as well as daily access to garbage collection.

Community B (District 2): bounded on one side by the Saigon River and on the others by rice fields, District 2 was recently rezoned by the City's People's Committee as urban land. The area remains relatively isolated and rural with no current access by car; work is underway on a highway that cuts through rice fields owned by community members that will allow quick passage into the city across the river. While most households are very poor rice farmers and own simple wooden homes with roofs made of palm fronds, some community members have sold land near the planned highway and are constructing very large, modern plastered houses. Public services within the community are quite limited, even for the wealthier households. Most houses have piped water and electricity but there few indoor toilets and garbage collection is unavailable. The community relies on public outdoor toilets that release waste into swampland; each household has a garbage pit in which to dispose of solid wastes.

Community C (District 8): located on one side of a small island that is formed by the meeting of three canals. Community uses a deteriorated wooden bridge to cross the canal; very poor housing conditions. The structures are predominantly one story and few improvements have been made to the wooden and corrugated tin exteriors. Community resembles Bangkok because it is very urban in character, dilapidated in terms of built structures, has narrow pathways, and borders a canal full of garbage. Interesting array of small industry, including an industrial laundry, cottage shoe production and a small open-air market where merchants sell goods under thatched umbrellas. Little garbage collection.

Community D: situated at the periphery in southwest Ho Chi Minh City in the portlands of the city where many migrants have moved to the city over different time periods. Streets and alleys are extremely old and narrow amid high-density warehouses. Appears homogeneous (primarily two stories high, plaster coated with many shared walls) with little evidence of any new construction. The People's Council suggested this slum because the basic infrastructure of the community is in terrible condition. There are two lively street markets located on either end of the community selling primarily processed and unprocessed foods, some of which are made and sold by women of the community. Many of the men from this community find more or less regular employment in the port or nearby harbor.

Community E (Taan Binh): situated in the northeast area of Ho Chi Minh City - a peripheral zone that until 8 years ago included agricultural land and activities. Most of the residents migrated from rural areas, and constructed their houses upon land that used to be a cemetery. There is great variety in housing styles and quality and differing access to piped water, electricity and drainage/sewage connections. Two canals flow through this community and, while regularly dredged, are full of garbage and black water. Area is urbanizing very quickly and is rapidly becoming very polluted. The causes of deterioration include construction of dwellings without adequate planning, lack of a drainage system, and the direct disposal of garbage into canals as well as the operation of small-scale industry (especially in terms of dust, smoke and chemical agents).

11 Appendix B – Experiment Instructions (Thailand)

Thank you for participating in our study today. There will be three parts to the study: exercise 1, exercise 2, and an interview. For your participation you will be paid. The amount you will get paid depends on the decisions you and everyone else make during the exercises. You will be paid an additional 20 baht ($0.50 US) for the interview at the end of the study. The money to conduct this study has been provided by a social research institution in the United States.

Any decisions you make in the exercises or responses you give during the interview will be strictly confidential. We will never tell anyone your responses or choices. To assure your responses are confidential, we ask you to not speak to each other until the entire study is completed.

Instructions for Exercise 1

To understand exercise 1, think about how you allocate your time. You spend part of your time doing things that benefit you or your family only. You spend another part of your time doing things that help everyone in your community. For example, you spend part of your time doing things that only benefit you or your family and another part of your time doing things that benefit the entire community.

Specifically, you might spend part of your time hauling or purifying water for your family and you may spend part of your time cleaning or maintaining the community water supply which benefits everyone including you. Another example is that you spend part of your time working for pay or fixing your house. This activity only benefits your family. However, you might spend part of the time cleaning up the neighborhood which benefits everyone.

Exercise 1 is meant to be similar to this sort of situation where you must decide between doing something that benefits you only and something that benefits everyone in a group. There will be five decision making rounds. There are three other people in the group with you.

At the beginning of exercise 1 we will give you an envelope to keep your money in. Keep this envelope with you at all times. At the beginning of each round everyone in the group will be given 10, 5 Baht coins. Each person in the group will then decide how many of these 10 coins to allocate to a group project and how many to keep from himself or herself. Everyone in the group benefits equally from the money allocated to the group project, but only you benefit from the money you keep.

We have designed both exercises so that you can make your decisions privately and so that no one else will ever know your choices. One at a time, you will come to a private location with your envelope and your 10 coins. Once there, you will allocate as many coins as you want to the group project. You will keep the remaining coins and put them in your envelope.

When all four members of the group have decided how many of the 10 coins to allocate to the group project, we will add up all the money. When we know the total, we will double it. Each person will then receive an equal share of the doubled amount. To distribute the proceeds from the group project for the round each person, one at a time, will return to the private location. When you are at the private location we will show you a card. On this card we will write how much each person in the group allocated to the group project but you will not know how much any specific person allocated to the group project.

We will also give each of you your share of the group project. Put your share in your envelope; it is for you to keep. Each person receives an equal share of the doubled amount regardless of how much money he or she contributed to the group project.

Here is an example to illustrate how the exercise works. Each person decides how much to allocate to the group project privately, so you will not know what anyone else has decided when you make your choice. Imagine that on the first round everyone in your group, including you, allocate 5 coins to the group project. In total there are 5+5+5+5=20 coins in the group project. This is equal to 100 Baht. We will double this amount which makes the total 200 Baht. Each of you then receives an equal share of the 200 Baht. We would give you each 50 Baht. At the end of round one you will have 50 Baht from the group project and 25 Baht that you kept. You will have a total of 75 Baht in your envelope.

To continue the example, now say that it is the second round. Everyone in the group receives another 10 coins at the beginning of the round. Imagine that this time you allocate no money to the group project. Imagine that the other three people in your group allocate 5 coins to the group project. In total there are 0+5+5+5=15 coins in the group project. We double this amount which makes the total 30 coins or 150 Baht. Each person receives an equal share of the 150 Baht.

Because we will only use 5 Baht coins, we will always round up to the next highest number that can be divided by 4. 4 can not divide 30 evenly so we will round up to 32 coins or 160 Baht. This means you each would receive 8 coins or 40 Baht from the group project. At the end of round two you will have 40 Baht from the group project and 50 Baht that you kept. You will add another 40+50=90 Baht to your envelope. In total you will have 75+90=165 Baht in your envelope.

The rest of the group will also receive 40 Baht from the group project. In total, each of the other three group members will add 40+25=65 Baht to their envelopes. They receive 40 Baht from the group project and have 25 Baht that they kept.

Let's continue the example for one more round. Everyone receives 10 coins at the start of the third round. Now say that you and two other players allocate everything to the group project and keep nothing. Say that the fourth group member allocates nothing to the group project. The group project will have a total of 0+10+10+10=30 coins in it. We double this amount which makes the total 60 or 300 Baht. Each person receives an equal share of the 60 coins. Each person receives 15 coins or 75 Baht from the group project.

At the end of round three, you and the other two group members who allocated all 10 coins to the group project receive 15 coins from the group project. The fourth group member who kept all 10 coins adds the 10 coins she kept to the 15 coins she receives from the group project. In total she receives 25 coins or 125 Baht.

In total you have 75 from round 1 + 90 from round 2 + 75 from round 3 = 240 Baht in your envelope at the end of round 3.

This is only an example. You will play 5 rounds and each of you will decide, on your own, how to allocate the 50 Baht you start each round with. Any money in your envelope at the end of the fifth round is yours to keep.

It is important that you understand how the exercise works. Are there any questions about how the exercise will proceed?

Instructions for Exercise 2 (only to be handed out after exercise 1 has been completed)

Exercise 2 is very similar to exercise 1, but there will be one difference in the procedures. The first part of each decision making round will be exactly the same as exercise 1. There will be 5 decision making rounds and you will each receive 10, 5 Baht coins at the beginning of every round. You will each go to a private location and decide how much money to allocate to the group project and how much to keep. When everyone in the group has made this decision, we will calculate the total contribution. We will then double the total contribution. Each person will receive an equal share of the doubled amount.

The only difference between exercise 1 and exercise 2 happens when you return to the private location to receive your share of the group project. We will let you see the card that shows how much each person in the group allocated to the group project and we will give you your share of the group project as in exercise 1. However, exercise 2 is different because you will also be given the chance to send a message to the rest of your group.

If you give us 1 Baht you can send a message to the rest of the group. You may send this message if you are unhappy with how many slips of paper the other people in your group are allocating to the group project. The message will be this picture (show the picture that is below). When you see this picture, you know that one of the group members has spent 1 Baht to tell the rest of the group that she is unhappy with the number of slips that were contributed by the other group members.

We will display any messages at the beginning of the next decision making round. When you come to the private location to choose how much to allocate to the group project, you will see any messages sent from someone at the end of the previous round.

At most you will see four messages if everyone sent a message. Here is an example. Imagine at the end of round 6 you go to the private location to pick up your share of the group project and you see that everyone else in your group allocated more or less than you did to the group project. If you do not like this, you can spend 1 Baht to have the picture displayed at the beginning of the next round. When you go to the private location to decide how much to allocate to the group project during round 7, you, and everyone else in the group will see the picture that you spent money to display.

Anyone who decides to send this message will do so anonymously. Nobody will know who the person was that sent the message. After everyone has seen the messages, we will take them down. You will have to spend 1 Baht at the end of each round if you want to continue to send a message to the group.

This is only an example; you will make the decision to spend 1 Baht to send a message to the group.

The rest of exercise 2 is identical to exercise 1. After each group member receives her share of the group project and decides whether or not to send a message to the group, she will return to her seat. When everyone has made this decision the decision making round is be finished.

Are there any questions about how the exercise will proceed?

12 Appendix C – Experiment Survey

Experiment Date:
Community:
Group Number:
Player Color:

Record the participant's sex. Male or Female

1. What year were you born? 19_ _
2. How many years of schooling have you completed? _____ years
3. Does your family own its own house?

Yes	No	No answer
1	0	-9

4. How many people are there in your household (including you)? _____
5. How long have you lived in this community? _____ years
6. When new people come to your community, do they mostly come from the same village or region or do they come from many different places?

Same	Different	No answer
1	0	-9

7. Please tell me how much of a problem each of these issues is to you on a daily basis.

Issue	Not a problem	A small problem	A big problem	No Answer
a. Poor Health	0	1	2	-9
b. Clean Water	0	1	2	-9
c. Uncooperative Neighbors	0	1	2	-9
d. Mosquitoes, Flies, Rats, Vermin	0	1	2	-9
e. Garbage	0	1	2	-9
f. other (specify) _____	0	1	2	-9

8. Have you had a problem with one of your neighbors in the last year?

Yes	No	No answer
1	0	-9

8a. [If yes] which one of the following describes how you reacted to your neighbor:

0 I ignored this person.
1 I gave this person a critical look.
2 I verbally expressed my dissatisfaction to this person.
3 I threatened this person.
4 Other (specify)
-9 No answer

9. Do you have piped water in your home?

Yes	No	No answer
1	0	-9

10. Do you Boil or Filter your drinking water?

Yes	No	No answer

	1	0	-9
11. Do you have a toilet in your house?	Yes	No	No answer

	1	0	-9
12. Does your community have any sort of garbage collection service?	Yes	No	No answer

			1	0	-9
13. How often have you been ill in the past year?	Not at all	Not Often	Often	No answer	
	0	1	2	-9	

14. Please tell me the last time you suffered from the following illnesses.

Illness	Never	More than One Year	Within One Year	Within Six Months	Within One Month	No Answer
a. Gastroenteritis or Diarrhea	0	1	2	3	4	-9
b. Asthma or Breathing problems	0	1	2	3	4	-9
c. Malaria	0	1	2	3	4	-9
e. Other (specify) _____	0	1	2	3	4	-9

15. How much does your household spend on transportation each day? _____

16. How much does your household spend on food each day? _____

17. How much does your household spend on rent or mortgage each month? _____

18. How much does your household spend for entertainment, including drinking, and the legal (or black market) lotteries each month? _____

19. Tell me a little bit about yourself. Do you agree with or disagree with the following statements?

Statement	Agree	Neutral	Disagree	No Answer
a. It is better to cooperate than compete. (+)	1	0	-1	-9
b. People should listen to their conscience when making decisions. (+)	1	0	-1	-9
c. People should forgive others when they are angry. (+)	-1	0	1	-9
d. It is amusing to play tricks on other people. (-)	-1	0	1	-9
e. People should revenge wrongs that are done to them. (-)	-1	0	1	-9
f. Confrontations should be avoided. (+)	1	0	-1	-9

Note: These statements come from internationally validated personality scales on cooperation. They are available at http://ipip.ori.org/ipip/new_home.htm.

20. How often do you chat (talk informally) or spend time together with other people in your community?

1 A few times each week
2 A few times each month
3 A few times each year
4 Never
-9 No answer

21. How do you describe your immediate neighbors?

1 Like Family

2 Like Friends

3 Like Strangers

-9 No answer

22. In some communities, neighbors will work on projects to help everybody in the community (for example: community clean-ups, developing drainage systems, or building a community hall).

22a. Do you remember such a project happening in your community in the past year?

Yes	No	No answer
1	0	-9

If yes, ask:

22b. Did you or someone in your household participate in those activities?

Yes	No	No answer
1	0	-9

22c. What kind of project was this?

1 Building/repairing houses for neighbors

2 Building/repairing a road/walkway

3 Building/repairing a wastewater drainage system

4 Collecting trash/cleaning community

5 Other (please specify_____)

-9 No answer

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