

# Funding a new bridge in rural Vietnam: a field experiment on social influence and default contributions

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## Abstract

Public goods provision is essential for economic development. Yet there is limited evidence regarding contributions to local public goods in developing countries. This article analyses a field experiment where all 200 households in a village in rural Vietnam make real contributions to a public good that is very important for them in daily life—a bridge. We study the role of social influence (that people may be more willing to co-operate if others do) and the effects of the default alternative in the choice situation. We find significant and substantial (in the order of magnitude of 15–25%) effects of both social influence and defaults but only when providing low reference or default contributions.

**JEL classifications:** C93, H41, Q50

## 1. Introduction

The ability to handle social dilemma-type situations, such as providing an adequate amount of public goods and the corresponding free-rider problems, is crucial for economic and social development (Hall and Jones, 1999; La Porta *et al.*, 1999; Banerjee and Somanathan, 2007; Ostrom, 2009). In the present article, we analyse experimentally the role of social influence, in terms of modified information about others' contribution and provision of default alternatives, for real contributions to an archetypal public good, a bridge (see Dupuit, 1844), in rural Vietnam. The field experiment was designed as a threshold public good experiment where the subjects, consisting of the household heads of all households in the village, were asked to make voluntary contributions for the construction of a bridge in their village. If the village members contributed a sufficient amount of money, the bridge would be built.

Most poor countries have weak or badly functioning governments, meaning that a large share of public goods have to be provided privately and with the help of local institutions and mechanisms.<sup>1</sup> Olken and Singhal (2011) provide extensive empirical evidence that private contributions for the construction and maintenance of local public goods are widespread in rural areas in developing countries. Ostrom and co-authors have carefully analysed the effects of different institutional settings for the abilities of local societies, in particular in developing countries, to effectively handle social dilemma-type situations; see, for example, Dietz *et al.* (2003), Ostrom (1990, 2009), and Ostrom *et al.* (1992). Yet little has been done in this area regarding the direct effects of social influence and default options on individuals' behaviour. Social influence effects have instead been carefully analysed in the rapidly growing literature on charitable giving (see, e.g., List and Lucking-Reiley, 2002; Soetevent, 2005, 2011; Landry *et al.*, 2006; Martin and Randal, 2008; Andreoni and Bernheim, 2009; Shang and Croson, 2009; DellaVigna *et al.*, 2012). Default options have been analysed in several areas, including organ donations (Johnson and Goldstein, 2003) and savings (Madrian and Shea, 2001; Cronqvist and Thaler, 2004). However, the extent to which these insights are transferable to the issue of contributions to real public goods in a developing country context is far from obvious. First, the literature has primarily focussed on relatively rich people's contributions or choices, implying for example that the contributions have typically been small relative to the subjects' income. Second, in the charitable giving literature, the subjects' direct benefit of the good provided by the charity has typically been negligible, except for the warm glow effects of contributing to a good cause (see Andreoni, 1989, 1990).

In the present article, we focus on the following two institutional factors: (i) social influence, that is, that people's behaviour is influenced by what other people do, for example, that they may be more willing to co-operate if others co-operate (see, e.g., Gächter, 2007); and (ii) the effects of a default alternative, that is, that people are often found to be influenced by a default alternative presented to them in the choice situation (see, e.g., Thaler and Sunstein, 2008). It is important from a policy perspective to find out whether and to what extent these two factors matter for people's voluntary contributions to local public goods. For example, such knowledge may help organizations, non-governmental organizations (NGOs), and local decision makers at the village level optimize the choice of frame for a particular policy implementation. Note that both factors could be seen as providing information to people about how they should act. With social influence they receive information about what others are doing and, implicitly, indications on what they themselves should do, whilst with defaults they receive information from the institution itself, which may be interpreted as a signal on how they should act.

Voluntary contributions in experiments have often been interpreted in terms of conditional co-operation. For example, Fischbacher *et al.* (2001) found, based on the strategy method, that about 50% of the subjects increase their contribution in a one-shot public good game if others do so as well. Fischbacher and Gächter (2010) concluded that conditional co-operation appears to be the main reason behind the typically observed pattern of decreasing co-operation rates in repeated public good games. Gächter *et al.* (2012) found in three-person gift-exchange games that when an employer pays equal and generous wages to

1 There is also a recent trend in developing countries towards increased local participation in government decision making (e.g., Faguet, 2014) and also some evidence that direct local participation in political decision making can increase satisfaction and legitimacy (Olken, 2010).

two employees, these employees become more willing to put forth high effort when their co-worker does so.

Evidence on social influence from the field is particularly interesting from our perspective. Frey and Meier (2004) analysed the behaviour of students in Zurich who had the opportunity to contribute to two social funds every semester. The contributions were higher when they were informed that many other students were contributing, although the effect was not statistically significant. Alpizar *et al.* (2008) investigated people's voluntary contribution to a natural park. When the subjects were told that the typical contribution of others was \$2 (a small contribution), the probability of a contribution increased and the conditional contribution decreased compared with no provision of reference information. Providing a high reference level (\$10) increased the conditional contribution, whereas the probability of contribution remained unaffected. The overall effects of the reference information were quite modest. Alpizar and Martinsson (2013) analysed contributions to a natural park and found that donations are more frequent for park visitors who are members of a group, and moreover that when a third party is present, total donations are higher by individuals who are part of a group than by lone travelers. Shang and Croson (2009) investigated how information about a typical contribution to a radio station affects subject contributions and found that the highest reference amount (\$300) yielded a significantly higher contribution than no provision of any information. The direction for smaller amounts (\$75 and \$180) was the same, although not statistically significant.

There is also much empirical evidence that a default alternative matters for actual choices in many areas, such as pension savings (Madrian and Shea, 2001; Cronqvist and Thaler, 2004), car insurance (Johnson *et al.*, 1993), and health clubs (DellaVigna and Malmendier, 2006). With respect to pro-social behaviour, Johnson and Goldstein (2003) compared countries with different organ donation rules and found that countries where people by default are not donors, that is, people have to opt in to become donors, had a significantly and substantially lower fraction of people donating compared with countries where people by default are donors, even though they had the same freedom of choice in both cases.<sup>2</sup> Pichert and Katsikopoulou (2008) showed that 'green' defaults could have significant effects on the choice of green electricity; when customers had to opt out to buy non-green electricity, many more customers bought green electricity. By contrast, Löfgren *et al.* (2012) did not find any default effects on the choice of CO<sub>2</sub> offsets for air transport using a sample of experienced subjects.

Our study contributes to the literature in two major ways. First, whilst much of the work on social influence has been based on laboratory experiments or charitable giving, and most work on default contributions is based on private goods, we develop a field experiment in which subjects contribute to a real public good. Contributions to build a bridge were made in a naturally occurring setting. This mixture of control and realism allows stronger inference than what can be achieved from a lab experiment (Levitt and List, 2009). Instead of using charitable giving, which is more appropriate for relatively rich people, we employ a local public good that fits the developing context. Second, whilst many other studies use seed money and refund mechanisms in a charitable giving context, to our knowledge we are the first to devise a threshold public good experiment in the field. The seed money and refunds are thus embedded in contributions to a real public good context.

2 However, it should be noted that the causality is not clear here, for example, since the rules may in part reflect different donation attitudes amongst the countries.

The rest of the article is organized as follows: Section 2 provides the background of the Giong Trom village in rural Vietnam and its need for a new bridge, Section 3 presents the theoretical model and the field experimental design, and Section 4 presents the corresponding results. Finally, Section 5 concludes the article.

## 2. The village and the need for a new bridge

The field experiment was undertaken in the Giong Trom village in the Mekong River delta in Vietnam in 2009.<sup>3</sup> Most households in the village are engaged in rice cultivation activities. The village suffers one of the problems typical of the Mekong River delta: lack of a basic infrastructure such as rural roads, bridges, and irrigation canals. The government provides only larger public goods such as roads between villages, whilst small-scale infrastructure is considered to be the responsibility of the village.

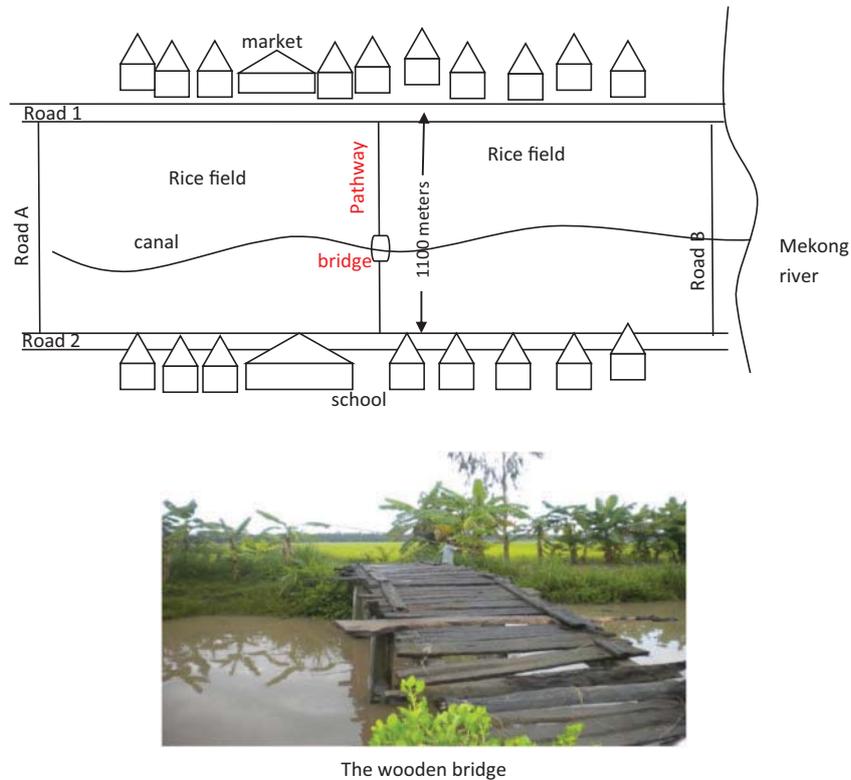
The field experiment concerns the funding of a bridge for the village. At the time of the experiment, there was a wooden bridge about 2 meters wide and 14 meters long. The bridge was built in 2005 based on voluntary contributions from households in the village. This means that before the experiment the villagers were already accustomed to the idea of financing a bridge based on voluntary contributions. This is actually a very common way of funding local public goods in Vietnam. In a recent study, *Olken and Singhal (2011)* report that in Vietnam, 62% of the rural households had made contributions to local public goods in the previous year. However, since the contributions obtained in 2005 were not enough for a concrete bridge, a wooden one was built. People living along the two roads in the village used the pathway and the bridge to go through the rice fields (see *Fig. 1*). In addition, most villagers often used the bridge when it was still in good condition to go to the market, get to school, or visit friends. However, over time the bridge had degraded, and was at the time of this study in poor condition, implying that it could not be used by tractors or motorbikes; see *Fig. 1*. When people do not use the bridge, they have to use alternative routes, either road A or road B, which are located parallel to and about 1,200 meters from the bridge's pathway; see the map in *Fig. 1*. The roughly 200 households living on both sides of the bridge would clearly benefit from a concrete bridge and all village households were included in the experiment.<sup>4</sup>

To build a new bridge, a sufficient amount of money had to be collected from the villagers. This is where the experiment comes in. We devised a threshold public good game where villagers received an endowment from us and had the option to either keep the money themselves or contribute some or everything to funding the bridge. The concrete bridge is a public good in the sense that regardless of whether the participants contribute to the public account, they would have the right to use the bridge free of charge.

*Table 1* reports background statistics of the households. The mean monthly income of about 1.8 million dong corresponds to about US\$95, which is less than US\$1 per household member and day. The average household in the study is thus poor and the average education level is low. The average size of the land a family is currently cultivating rice on is also rather small, approximately half a hectare. Although the current bridge is degraded, it is

3 A village is a small commune or part of a commune and usually consists of 100–300 households.

4 There are slightly more than 200 households that administratively belong to the hamlet. However, a small group of households live separated from the rest and have no use of the bridge and were not included in the experiment.



**Fig. 1.** Map and picture of the field situation

still used by almost half of the households at least twice a month, and almost 20% use it every day. It is reasonable to assume that the current use of the bridge for most households is also an indicator of the use of a new bridge.<sup>5</sup>

The large average amount spent on social events, around 200,000 dong per month or 13% of the total monthly household expenditure, reflects the importance of such events, including weddings and funerals. This cost may perhaps also reflect the social coherence of the family with the community (Rao, 2001; Fafchamps and Lund, 2003; Fafchamps and Guber, 2007). Around 10% of subjects are members of the Communist Party and approximately half of the families are members of at least one local association such as the Farmers', Women's, or Veteran's Associations or the Youth Union. Organization membership is often used as a measure of social capital (Putnam, 2000; Glaeser *et al.*, 2002). These

- 5 The reason for asking only about the use of the current bridge was that the survey was done separately from the experiment and we did not want the subjects to pose questions that were obviously linked to the experiment. We also have a measure on the distance from the household home to the bridge. However, this measure never contributed significantly to the explanation of household contributions to the bridge. There are several potential reasons for this. For example, some farmers live on the same side of the bridge as their rice field whilst others live on the opposite side, and the same applies for the location of households with kids in relation to the school. Hence, we do not include that variable in the analysis.

**Table 1.** Household characteristics

Variables	Definition	Mean	SD
Household size	Number of household members	3.84	1.61
Age	Age of household head; in years	49.0	13.8
Male	= 1 if male household head	0.62	
Education	1 = No schooling (5%); 2 = Grades 1–5 (53%); 3 = Grades 6–9 (32%); 4 = Grades 10–12 (9%); 5 = Vocational school (1%) for household head	2.47	0.77
Monthly income	Monthly household monetary income in hundred thousand dong	18.13	12.78
Uses the bridge daily*	= 1 if uses bridge every day	0.19	
Uses the bridge weekly	= 1 if uses bridge around 1–3 times a week	0.10	
Uses the bridge twice a month	= 1 if uses bridge around 2 times a month	0.17	
Uses the bridge once a month	= 1 if uses bridge around 1 time a month	0.30	
Cost of social events	Monthly expenditures for ‘social events,’ e.g., weddings, and different kinds of ceremonies in hundred thousand dong	1.96	1.38
Member of the Communist Party	= 1 if at least one household member is a member of the Communist Party	0.10	
Association	= 1 if at least one household member is a member of a local association	0.49	
Punish	How likely is it that people who do not participate in community activities will be criticized or sanctioned? = 1 very unlikely... = 5 very likely	2.41	1.51
Rice land	Total size of rice land currently being cultivated; in congs (1 cong = 1/10 hectare)	4.54	3.23
Saturday	= 1 if experiment was conducted on Saturday afternoon (first session)	0.57	0.49

*Notes:* \* The options for the question regarding the current use of the bridge were: 1 = every day, 2 = around two to three times a week, 3 = around once a week, 4 = around twice a month, 5 = around once a month or less, 6 = currently do not use the bridge at all. Since relatively few answered options 2 and 3, we merged them in the descriptive statistics and the analysis.

variables are included in our analysis to test for possible associated social capital effects of belonging to these organizations on voluntary contributions. Social norms regarding free-riding in the village could potentially affect actual contributions. In the survey we therefore asked, ‘How likely is it that people who do not participate in community activities will be criticized or sanctioned?’

### 3. Experimental design and predicted effects of social influence and defaults

Our experimental design includes two stages. First, we conducted the field experiment with the 200 households in the Giong Trom village and then four weeks after the experiment a team of experimenters visited the same households to collect socio-economic data and other information that can help explain the experimental results.

### 3.1 The threshold public good game with a refund policy and proportional rebate rule

The experiment is based on a threshold public good game<sup>6</sup> (Isaac *et al.*, 1989; Bagnoli and McKee, 1991; Cadsby and Maynes, 1999; Croson and Marks, 2000; Rondeau *et al.*, 2005) with a refund policy and proportional rebate rule framework (e.g., Marks and Croson, 1998). In a threshold public good game, an identical endowment  $E$  is provided to each of  $N$  subjects; in our case  $E = 400,000$  dong and  $N = 200$ . Each subject  $i$  decides privately how much  $x_i$  of the endowment to contribute to the public good. When the total contribution  $X = \sum_{j=1}^N x_j$  is larger than the threshold  $T$ , the public good will be provided.

In our case, the bridge would be built if the total contributions exceeded 40,000,000 dong, corresponding to an average contribution of 200,000 dong. In this case, subject  $i$ 's net payoff would equal the sum of the net private consumption after contributing  $x_i$ , which hence equals  $E - x_i$ , the own benefit from the public good  $G_i$ , and a share of the excess contributions in proportion to the magnitude of the own contribution relative to the total contributions. Individual  $i$ 's payoff function  $\pi_i$  is then given by the first line on the right-hand side below:

$$\pi_i = \begin{cases} E - x_i + G_i + \frac{x_i}{X}(X - T) & \text{if } X > T \\ E & \text{if } X \leq T \end{cases}$$

If, on the other hand, the total contributions fall below the threshold  $T$ , the public good would not be provided; in our case, the bridge would not be built. Then all contributions would be returned to the subjects and the payoff for each household would simply equal the initial endowment  $E$ , as given by the second line on the right-hand side.

It is clear that there are an infinite number of Nash equilibria in this game. In addition to the ones where no bridge is built and where each individual does not contribute anything, we have a continuum of Nash equilibria where the total contributions exactly equal the threshold level. Note that this is of course true regardless of whether the actual distribution of contributions is symmetric; for further details see Palfrey and Rosenthal (1984) and Bagnoli and Lipman (1989).

However, in our case we have that  $N$  is rather large (200),<sup>7</sup> implying that the probability that the individual contribution decision will be decisive for whether the bridge will be built is small. First, if others' total contribution plus the individual's whole endowment is lower than the threshold level, such that  $(N - 1)x_{-i} + E < T$ , the bridge will clearly not be built regardless of how much the individual contributes. Similarly, if others' contribution is

6 This framework relates closely to the lump-sum matching setting discussed in several papers (e.g., Baker *et al.*, 2009), where total contributions often are greater than with a standard voluntary contribution mechanism. However, if, in the matching setting, the contributions to the public goods do not meet the minimum requirement, those contributions still generate earnings for the subjects. In this threshold public good game setting, if the threshold cannot be reached, the refund policy is applied. There are also several field experiments using seed money and refunds (see, e.g., List and Lucking-Reiley, 2000; Karlan and List, 2007).

7 In our case, it is realistic to assume that the group size is known and certain for the subjects because it was stated explicitly in the contribution agreement signed by the subjects, and they are well aware that most households in the village use the bridge; see de Kwaadsteniet *et al.* (2008) for discussions on uncertain group size impacts on co-operation.

higher than the threshold level, such that  $(N - 1)x_{-i} > T$ , the bridge will be built regardless of the individual contribution choice. In our case, where  $N = 200$  and  $T = 40,000,000$  dong, an individual can then only influence the decision of whether to build the bridge in the narrow range where  $198,995 < x_{-i} < 201,005$ . Moreover, in the case when others' contributions are sufficiently large such that the bridge will always be built, the unique best response of a purely selfish individual is to contribute nothing, that is, to free-ride.

However, in reality  $x_{-i}$  is of course unknown to individual  $i$ , who will instead have to form a subjective probability distribution of different outcomes. This is clearly a non-trivial task, and we cannot rule out that cognitive limitations may play a role. Most laboratory experiments on threshold public good games have been conducted based on complete information (e.g., Bagnoli and McKee, 1991; Suleiman and Rapoport, 1992). In contrast, Marks and Croson (1999) conduct a laboratory experiment using a threshold public good game with incomplete information. They find no significant differences in the rate of successful provisions of the public good or level of group contributions when information is complete or incomplete. Nevertheless, one could argue that the unique symmetric efficient equilibrium where each household contributes 200,000 dong could serve as a focal point for the subject due to cognitive reasons (see Schelling, 1960) or to maintain a self-image as fair-minded (see Andreoni and Bernheim, 2009). We return to this issue in the results section.

### 3.2 A simple model with social preferences

Given the very narrow range where the individual contribution matters for the decision of whether to build the bridge, and given the large range where the unique optimal response, based on conventional self-interested preferences, is to contribute nothing, we believe it is reasonable to interpret the individual contribution primarily as a measure of the strength of social preferences, or co-operative behaviour. Consider therefore a highly stylized model where the utility of an individual depends on own money,  $E - \frac{T}{X}x_i$ , the individual benefit of the bridge,  $G_i$ , and three measures of social preferences. The first of these measures reflects the disutility from deviating from the expected average contribution of others, that is, the individual wants to minimize  $x_i - E(x_{-i})$  *ceteris paribus*, where  $E(x_{-i})$  is the expected contribution of others. This is thus reflecting social influence or conditional co-operation. The second measure is also related to conditional co-operation, but also reflects fairness with respect to the benefit of using the bridge. We assume that the individual gets disutility from deviating from the ratio of others' expected contributions and expected benefits from the public good, that is, the individual wants to minimize  $\frac{x_i}{G_i} - \frac{E(x_{-i})}{E(G_{-i})}$  *ceteris paribus*, where  $E(G_{-i})$  is the expected benefit of the public good for others. This implies that people are influenced by a norm to contribute more if they themselves benefit more from the bridge (compared with others), consistent with well-established principles of fairness (see, e.g., Konow, 2003). The third measure reflects the disutility from deviating from an externally expressed norm of what the appropriate contribution is, that is, the individual wants to minimize  $x_i - \hat{x}_i$  *ceteris paribus*, where  $\hat{x}_i$  is  $i$ 's perception of this external contribution norm.

We can then write the utility function as follows:

$$U_i = E - \frac{T}{X}x_i + G_i - \alpha(x_i - E(x_{-i}))^2 - \beta\left(\frac{x_i}{G_i} - \frac{E(x_{-i})}{E(G_{-i})}\right)^2 - \gamma(x_i - \hat{x}_i)^2$$

Assuming a unique interior optimum, it is then straightforward to obtain the optimal contribution for the individual as:

$$x_i = \frac{G_i}{\alpha G_i + \beta} \left( -0.5 \frac{T}{X} + \alpha E(x_{-i}) + \beta \frac{E(x_{-i})}{E(G_{-i})} + \gamma \hat{x}_i \right)$$

From this then follows that

$$\frac{\partial x_i}{\partial E(x_{-i})} = \frac{G_i}{\alpha G_i + \beta} \left( \alpha + \frac{\beta}{E(G_{-i})} \right)$$

where consequently  $\frac{\partial x_i}{\partial E(x_{-i})} > 0$  given that  $\alpha$  and  $\beta$  are both non-negative and at least one of them is positive, and that  $G_i > 0$  and  $E(G_{-i}) > 0$ . We also have that

$$\frac{\partial x_i}{\partial G_i} = \frac{\beta}{(\alpha G_i + \beta)^2} \left( -0.5 \frac{T}{X} + \alpha E(x_{-i}) + \beta \frac{E(x_{-i})}{E(G_{-i})} + \gamma \hat{x}_i \right)$$

where thus  $\frac{\partial x_i}{\partial G_i} > 0$  provided that in addition  $\beta > 0$  and  $x_i > 0$ . Finally we also have that

$$\frac{\partial x_i}{\partial \hat{x}_i} = \frac{\gamma G_i}{(\alpha G_i + \beta)^2}$$

where clearly  $\frac{\partial x_i}{\partial \hat{x}_i} > 0$  for  $\gamma > 0$ . Thus, our stylized model predicts, under reasonable assumptions, that the optimal contribution for the individual increases with:

- i. The perceived expected value of others' contributions.
- ii. The individual's own benefit of the new bridge.
- iii. The individual's perception of the size of the external contribution norm.

### 3.3 Social influence and defaults: the five experimental treatments

In the field experiment, households were asked if they wanted to make a contribution, from an endowment provided by us, to the construction of a new bridge in the village (described in more detail later). The experiment involved five treatments, which were randomly distributed amongst the households: (1) a standard treatment with no reference contribution level and no default option, (2) a treatment with a high reference contribution level (300,000 dong) and no default option, (3) a treatment with a low reference contribution level (100,000 dong) and no default option, (4) a treatment with no reference contribution level and a default option at zero contribution, and (5) a treatment with no reference contribution level and a default option at full contribution of the endowment. In all treatments, the contributions were anonymous to everybody except the experimenter. For ethical and practical reasons, the endowment of 400,000 dong was, following standard practice, a windfall gain for the subjects.<sup>8</sup>

Following [Alpizar et al. \(2008\)](#), the treatments with different reference contribution levels were conducted by providing the subjects with information about a typical previous

<sup>8</sup> The empirical evidence on windfall gains in public good games is not clear. [Clark \(2002\)](#) and [Cherry et al. \(2005\)](#) find no evidence of a windfall-gain effect on contributions, whilst [Kroll et al. \(2007\)](#) find significant differences in a public good experiment with heterogeneous endowment. Although it is certainly possible that windfall gains affect behaviour in a non-negligible way, our main interest is in the comparison between treatments and not in the absolute values, and we have no particular reason to believe that windfall gains would affect behaviour differently amongst the treatments.

contribution of others. The typical contribution levels were obtained from the first no reference contribution treatment during the first part of the first day, that is, from the baseline treatment where we did not tell the subjects anything regarding others' contributions. Subjects were told that 'we have interviewed other households in this village and one of the most common contributions has been 300,000 [100,000] dong.' This statement reveals information about the typical behaviour and not about any individual contributions. Thus, it conveys more information about the social norm than just stating the contribution of one other person.

The default option treatments were conducted using a metal card with different contribution levels. Zero dong was at the bottom of the card, 400,000 dong was at the top, and there were in total nine amounts listed. A magnetic token was put at the 0 dong level or at the 400,000 dong level. Subjects in the corresponding treatments were asked to move the token to the amount that they wanted to contribute to the public good. Our preferred interpretation of the mechanisms underlying why default alternatives affect the subjects' choices is through external norms. The default alternative then provides signals of what the experimenters consider to be appropriate contributions.<sup>9</sup> Yet we cannot rule out that a default alternative could also generate a simple anchoring effect.

### 3.4 Experimental procedures

*3.4.1 Making the public good familiar* The field experiment was conducted in collaboration with a local NGO, for practical reasons and to make the whole situation more 'real' and less academically artificial. For the decision situation to be as realistic as possible, it is also important that the subjects are reasonably well informed about the possibilities of providing the actual public good and that they have reflected on such possibilities beforehand. Therefore, we felt it was necessary to provide some information about the possibility of building a bridge before the actual experiment took place. Specifically, we asked local officials to ask villagers about alternatives for the bridge and whether they wanted a new bridge. One week before the experiment, we held a meeting with local officials and some representative households where we went into more detail about funding options for the establishment of the bridge. One of the options mentioned at the meeting was the possibility of a matching fund mechanism, in which villagers would contribute some proportion of the bridge costs and external donors would contribute the rest. At the meeting, we also discussed that a project team would visit households in the village in the next few weeks to ask about the 'demand for the bridge' for the donors to collect information that would help them to decide whether to invest in a new a bridge. Thus, the targeted group was given the possibility to systematically absorb the information about a potential new bridge over a relatively long time so that they would not be surprised when someone approached their home asking about contributions to the bridge.

However, they did not know the details regarding funding and their own role until this information was given to them as part of the experiment instructions. Furthermore, it was in no way decided that the bridge would be built. The information was not detailed enough

<sup>9</sup> We did not try to measure the extent to which households contribute due to social pressure with respect to the experimenter. DellaVigna *et al.* (2012) recently found this motive to be substantial in a door-to-door charity field experiment. Yet our conjecture is that this motive is relatively less important here, since the amount of money involved is very large for the households and since the bridge is important for the living conditions of most households.

to enable the households to agree on a response before the experiment. These pre-experimental tasks also helped us achieve a 100% participation rate and ensure credibility of the experiment. It should again be noted that local public goods are funded in a similar fashion from time to time in the area and that the old bridge was actually funded by voluntary contributions by households in the village.

*3.4.2 Experimenter recruitment and training* The set-up of the experiment (discussed further below) required the 15 experimenters to each make 13 to 14 visits. Each visit took 20 minutes on average. Due to the challenge of experimenter bias, we took great care in the process of recruitment and training. The experimenters were recruited via advertisements at the University of Economics in Ho Chi Minh City. We selected only those who met our requirements regarding personality and ability to talk with farmers, for example, those with the appropriate dialect. The selected persons went through extensive training in the classroom and in the field. They spent nearly one week practicing the experiment in role-play pairs and for pilot interviews with farmers. Moreover, before the experiment, the experimenters spent more than one month in a similar rural area in connection with another survey, so they well understood what to do and what not to do when visiting a household. We also prepared a list of questions and answers related to the project, and to the establishment of the bridge in particular, so that the experimenters would have similar answers to common questions. During the training and practice sessions, the experimenters were repeatedly told about the importance of using the exact prescribed wording of the experiment scenarios. They were also required to repeat the scenario until the subject understood it without any further explanation.

*3.4.3 The experiment conducted at the subjects' home* With the help of local officials, we were able to set up a list of household subjects representing each of the 200 households. We then randomly allocated these to our 15 experimenters. The five different treatments were then also randomly allocated amongst the households.<sup>10</sup> To make the subjects feel as accustomed as possible to the situation, we did not conduct the experiment in a common venue where participants came to make decisions, as seen in standard public good games. Instead, the subjects made contribution decisions in their own homes. This approach created an environment similar to other investment decisions that the families make in daily life and helped limit communication amongst subjects. Another advantage of this approach was that in most cases it facilitated joint family decisions,<sup>11</sup> rather than decisions made by a single family representative.

10 Based on *t*-tests, proportion tests, and chi-square tests, we cannot reject the hypothesis of equal distributions of household characteristics amongst the five different treatments, with one important exception: Although the five treatments (defined below) were randomly assigned to the households, the share of subjects who used the bridge often is significantly higher in the third treatment than in the other treatments. Since this turns out to be an important explanatory variable for actual contributions, it is important to supplement the direct comparisons between treatments with regression analysis where between-sample differences are accounted for.

11 One story told by an experimenter was that after listening to the context and reading the agreement, the husband told us that his family would like to contribute 300,000 dong to the bridge. Then the experimenter saw the wife kick her husband's leg under the table, and finally they decided to contribute 100,000 dong.

Several considerations were made when deciding the size of the endowment and the threshold. The endowment could not be higher than the cost of building the bridge. Furthermore, a too high endowment could make subjects feel coerced to contribute some money and a too low endowment could seem unrealistic, making us unable to observe sufficient variation in contribution levels.

In the experiment, the experimenter initially introduced him- or herself as a member of the bridge project team who would like to know more about the demand for the bridge to make a final decision on the construction of it. The experimenter proceeded by reading the experimental instructions and showing the subject the example cards (see Online Appendix 2). The threshold was explained with the following sentences.

The concrete bridge will be established if all families together contribute at least 40 million dong. This means that if the total contribution is equal to or above 40 million dong, the project will use this money, add more funding in order to meet the costs of the bridge, and take the responsibility to build the bridge. If the total amount of money collected exceeds 40 million dong, the excess amount will be returned to your family according to the proportion you contributed. If the families are unable to contribute a total of 40 million dong, your contribution will be returned to you, and the concrete bridge will not be built.

The actual cost of building the bridge was around 80 million dong, but we did not have an exact cost estimate at the time of the experiment. Therefore the amount of matching funds was not stated explicitly. Instead, the subjects were simply informed that more funds would be added to cover the total costs of building the bridge. Moreover, although there is always a non-negligible degree of uncertainty regarding the actual cost in a decision such as the present one, the supporting money meant that we could specify exact conditions for when the bridge would and would not be built.

After this part, the experimenter presented the agreement. The agreement stated that the endowment of 400,000 dong would belong to the household. It also summarized the rules for the contribution framework,<sup>12</sup> stated a date of payment, and had spaces for the signatures of the household and project representatives. Once the household had decided about its contribution, the amount was written on two photocopies of the agreement, which were then signed by the household representative. Each party kept one copy of the agreement. We could not pay them the cash directly, since the payment depended on the behaviour of others. At the end of the experiment, the subjects were asked to guess how much they believed other households would contribute. This question was not incentivized, since we wanted to avoid them thinking of the visit as part of a research study.<sup>13</sup>

Conducting the experiment in the homes of the individual households presented two major challenges. First, we faced the risk that the information would spread amongst villagers before all subjects had made their decisions. Such a spread of information could take place mainly through two channels: villager to villager and local officials to villagers.

- 12 The agreement made clear that the project and not the local government would be responsible for building the new bridge if the threshold could be reached. This helped avoid possible problems with distrust in the government.
- 13 There are potential problems with eliciting beliefs, although the major problem of learning through belief elicitation does not concern our experiment since it is a one-shot game (see, e.g., [Rutström and Wilcox, 2010](#)). In addition, [Gächter and Renner \(2010\)](#) show that incentivized beliefs increase belief accuracy in a 10-period public good game, whereas beliefs in the first periods in incentivized and non-incentivized treatments are not affected.

We were more concerned about the latter since local officials naturally wanted the bridge and could choose to visit the villagers and pressure them to contribute at least the level of the symmetric threshold efficient equilibrium, that is, 200,000 dong. To reduce the risk of information spread, we had to use a larger number of experimenters than in a standard experiment. After balancing several factors such as number of experimenters, time requirement for a decision, and risk of information spread, we decided to conduct the experiment on a Saturday afternoon and on the following Sunday morning using 15 experimenters. Another purpose of choosing Saturday and Sunday was to limit the monitoring and intervention by other local government officials since they were off work. Using 15 experimenters meant that we could conduct the experiment at 15 households at a time. Note that all five treatments were conducted on both Saturday and Sunday. Furthermore, for each round the treatments were randomized amongst the experimenters to avoid confounding between experiment and treatment effects. The experiments were conducted in such a way that each household's closest neighbours completed the experiment at the same time to reduce the risk of information spread. Finally, we took advantage of the fact that the bridge was severely degraded and conducted the experiment on one side of the bridge on Saturday and on the other side on Sunday.

*3.4.4 The household survey* Four weeks after the experiment, all the households were visited by a group of experimenters (not the same ones as we used in the experiment). The experimenters said that they came from the university to collect data for research purposes. This survey was part of a larger research project concerning villagers' adaptation to climate change. The part of the questionnaire that relates to this project includes a socio-economic demography section (e.g., income, assets, age, and education) and a section with social capital questions. There were also two crucial questions regarding the household's current use of the bridge. The purpose of these questions was to find out how much the different households use the bridge. Since the survey was conducted almost a month after the experiment and was not related to the bridge at all, we do not think there is a serious risk that their response to the question on the use of the bridge is affected by their behaviour in the experiment.

## 4. Results

In total, 200 households participated in the experiment. We first present and discuss the contribution levels and compare our results with previous studies, and then investigate the links between contributions and expectations of others' contributions. This is followed by an analysis of contributions for the different treatments; first we investigate the raw results and then use an econometric model where subject characteristics are accounted for.

### 4.1 Overall contribution levels

The overall average contribution was substantial, 270,000 dong (out of 400,000 dong), and a large majority, 78% of the subjects, contributed the equal cost share amount of 200,000 dong or more. Consequently, the bridge was actually built; see Fig. 2 for a picture of the new bridge. These are very high contribution levels compared with most contribution levels observed in threshold public good games; see Croson and Marks (2000) for a review.



Fig. 2. The new bridge

The levels are particularly striking as there is evidence that thresholds, if anything, tend to reduce contributions (Rondeau and List, 2008; Rauchdobler *et al.*, 2010).

Yet the results are consistent with previous findings on contribution levels amongst poor Vietnamese households; Carpenter *et al.* (2004a,b) found average contribution levels of around 70% of the endowment in a public good game conducted with this group of people. Moreover, Cardenas and Carpenter (2008) found high co-operation rates more generally in various kinds of field experiments conducted in developing countries. It is also possible that conducting the experiments in the subjects' homes amplified their contributions, for example, through less anonymity in relation to the experimenters (see Andreoni and Rao, 2011).

The fact that parts of the cost of constructing the bridge were funded by the NGO and not the villagers, and that this was known by the subject, could also have increased contributions. Note that the contribution by an outsider in the present experiment is not exactly the same as either the use of seed money (Andreoni, 1998) or matching funds (Karlan and List, 2007), but is still fairly similar. The existing empirical evidence from charity field experiments on the effect of seed money and matching funds is, however, mixed. For example, List and Lucking-Reiley (2002) found substantial and significant effects of seed money on contributions, and Karlan and List (2007) found a substantial positive effect of matching contributions, but only on some groups of potential donors, whereas Huck and Rasul (2011) and Karlan *et al.* (2011) found much weaker evidence of positive effects of matching contributions. Meier (2007) found a positive short-run effect but an off-setting long run effect.

Finally, the refund policy could also explain the high contribution levels since the subjects knew that they would be refunded the money if the bridge would not be built or if more than the required amount of money would be collected (Bagnoli and Lipman, 1989; List and Lucking-Reiley, 2002). Yet it should be emphasized that our main interest in the present article is not to analyse the contribution levels per se but to compare contribution differences amongst treatments.

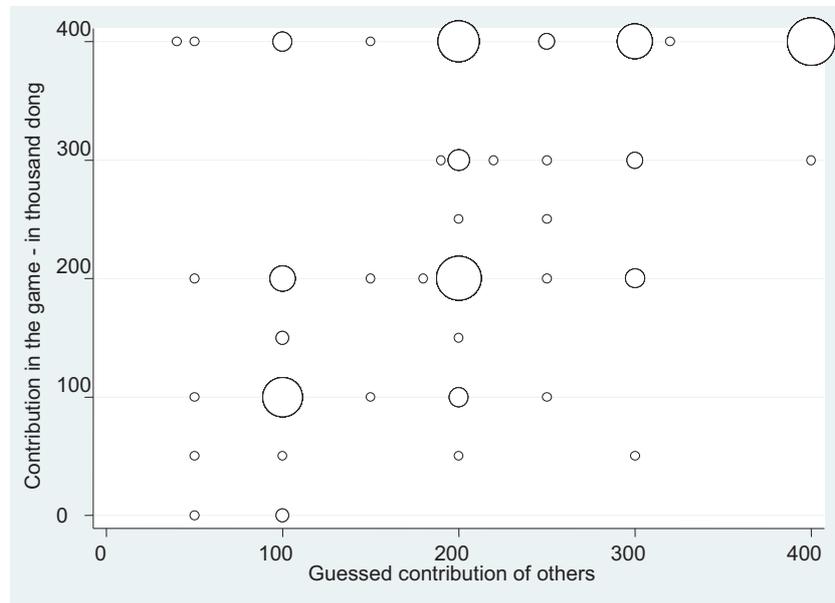


Fig. 3. Plot of own contribution and gessed contribution of others

As discussed in Section 3, the threshold public good game has a unique symmetric efficient equilibrium (recall that there are an infinite number of non-symmetric efficient equilibria), where each household believed that all other households would contribute 200,000 dong, and thus they should also contribute 200,000 dong. However, although a contribution of 200,000 dong is common in all treatments, it is not even the most common one, and there are never more than 30% of the subjects who contribute exactly 200,000 dong.

It is also likely that many of the households would greatly benefit from a new bridge, although each household would of course financially benefit even more from free-riding. In all five treatments, the average contribution is above the equal cost share amount of 200,000 dong.

As described earlier, subjects were also asked to guess how much they believed other households would contribute. Twenty-two percent of the subjects said they could not make a guess, and they were not forced to do so either.<sup>14</sup> Figure 3 presents own contribution and the gessed contribution of others; we include all observations from all five treatments and the size of a bubble corresponds to number of subjects.

14 There could be a number of reasons for someone not to make a guess, ranging from simply not having any idea about what others are responding to wanting to avoid an explicit comparison with own contribution. We estimated a binary probit model where the dependent variable is 1 if the subject did not make a guess. None of the treatment effects are significant. The only significant effects we find are that older subjects were more likely not to make a guess and that subjects were more likely to make a guess on the first day of the experiment. (Subjects on one side of bridge were interviewed on the first day and subjects on the other side of the bridge were interviewed on the second day. It is likely that the location of the subjects' homes plays a role in not guessing, and not the time sequence of the experiment per se.)

There is a strong correlation between own contribution and the guessed contribution of others; the correlation coefficient is 0.62. A large proportion of subjects who donated 400,000 believed that others would contribute 300,000 or 400,000 dong, and a large proportion of subjects who donated 100,000 dong believed that others would contribute 100,000 or 200,000 dong.<sup>15</sup> The graph suggests that there are three main categories of subjects, where the categories are not exclusive: (i) conditional co-operators, that is, those who contribute the same amount as they guess that others on average would contribute. This group can be illustrated in Fig. 3 as a 45-degree line through the origin; 45% of the subjects are consistent with conditional co-operation according to this definition. (ii) Those who contributed the full amount irrespective of how much they thought others would contribute. This group can thus be seen as a horizontal line at the top of the graph; 45 percent are consistent with this contribution pattern. (iii) Those who contributed their fair share regardless of their expectation about others' contribution. This group can be illustrated by a horizontal line at the contribution level 200; 25% are consistent with this pattern. In some of the treatments, subjects received information about others' behaviour. This might affect not only their behaviour but also the expectations about others' behaviour. However, the treatment effects on the guesses regarding others' contribution behaviour are surprisingly small, and in all cases, the average guess is lower than in the baseline treatment. The Online Appendix presents the results of a simple regression model with the guessed contribution of others as the dependent variable. All coefficients of the treatments are negative, but only one is significant at the 10% level.<sup>16</sup>

As discussed in Section 3, a public good game has a unique symmetric efficient equilibrium, where each household believes that all other households would contribute 200,000 dong, implying that they would themselves also contribute 200,000 dong. However, Fig. 3 shows that although a substantial fraction (34%) of the subject believed that others would contribute 200,000 dong, this is still a minority. Moreover, many of those who expected others to on average contribute 200,000 dong did not contribute this amount themselves. Overall, only 14% both contributed 200,000 dong and expected others to on average contribute this amount.

#### 4.2 Direct comparisons between treatments

Table 2 presents the most fundamental results of the experiment. As can be observed, the contribution differences between treatments generally follow expectations: the mean contribution level is substantially higher, or about 15%, in the high reference contribution treatment than in the low reference contribution treatment, and about 17.5% higher in the full contribution default treatment than in the zero contribution default treatment.

Moreover, the average contributions in the low reference and zero default treatments are lower than in the baseline treatment; in both cases the difference is around 40,000 dong. Yet there are small differences between the baseline treatment and the high reference and full default treatments, respectively. This may in part be explained by high general

15 There are no statistically significant differences in the share of subjects who guess the reference levels 100,000 and 300,000 dong between the baseline, low reference, and high reference contribution treatments, respectively.

16 This result is roughly in line with Altmann and Falk (2009), who found that the differences in beliefs between two default treatments and the base case were not significant.

**Table 2.** Mean contributions in 1,000 dong and distribution of contributions for different treatments of the field experiment

	Baseline	Low reference contribution [100]	High reference contribution [300]	Default zero contribution	Default full contribution
Contribution level	Distribution of contributions				
0	0	1	0	0	3
20	0	0	0	1	0
50	1	1	0	3	0
100	5	10	5	5	5
150	0	0	0	2	2
200	11	11	11	10	7
250	1	0	0	1	0
300	3	3	8	3	1
400	19	15	15	13	24
Total	40	41	39	38	42
Mean (SD)	287.5 (119.7)	247.6 (132.3)	284.6 (108.9)	245.3 (130.4)	288.1 (141.3)

expectations about others' contributions, which is also revealed by high general contribution levels. However, the differences obtained are not statistically significant using two-sided  $t$ -tests. Furthermore, using Wilcoxon Mann Whitney tests, we cannot reject the hypothesis of equal distributions across treatments. Table 2 also presents the full distribution of contributions across treatments. To begin with, we can see that contributions are concentrated at certain levels, in particular 100,000, 200,000, and 400,000 dong. Moreover, in three out of four treatments, the fraction that chose to contribute exactly the same amount as was provided as a reference or default level in that treatment is higher than for the other treatments. The exception is the zero default treatment and very few chose not to contribute anything regardless of treatment.

Since, as mentioned, the randomization procedure unfortunately did not result in similar distributions amongst the sub-samples with respect to a key explanatory variable, that is, the use of the bridge, we focus most of our analysis on the differences between treatments from regression analyses in the next sub-section. Before we proceed we present the mean contributions in each treatment for households with different intensities of bridge usage in Table 3.

The importance of controlling for bridge usage is most apparent if we compare contributions from households that use the bridge daily with those that use the bridge once a month. For the first group mean contribution ranges from 300,000 to 400,000 dong, whilst for the second group mean contribution ranges from 221,000 to 318,000 dong.

### 4.3 Econometric analysis

In this sub-section we correct for various differences between the samples, including use of the bridge and socio-economic characteristics. The first model is a standard OLS model where the dependent variable is the level of contribution; we also estimated a tobit model with censoring at 0 and 400,000, and the results are very similar to those of the

**Table 3.** Mean contributions in 1000 dong in each treatment for households with different intensities of bridge usage; standard deviation in parentheses

	Baseline	Low reference contribution [100]	High reference contribution [300]	Default zero contribution	Default full contribution
Uses the bridge daily	320 (109)	321 (119)	300 (89)	328 (125)	400 (0)
Uses the bridge weekly	350 (71)	300 (0)	325 (96)	267 (152)	325 (117)
Uses the bridge twice a month	317 (98)	225 (140)	340 (54)	240 (96)	342 (98)
Uses the bridge once a month	318 (125)	243 (151)	231 (125)	221 (147)	259 (150)

OLS model.<sup>17</sup> In addition, we estimate three probit models. In the first model, the dependent variable is equal to 1 if the contribution was 100,000 or less, in the second model the dependent variable is equal to 1 if the contribution was 300,000 or more, and in the third model the dependent variable is equal to 1 if the contribution was 400,000. Thus, these probit regressions reflect the determinants of contributing a small amount equal to or smaller than the low reference level, a large amount equal to or larger than the high reference level, and the maximum amount, respectively.

For each case we estimate four models. In the first we only include treatment dummy variables and the bridge use variables. In the second we also include socio-economic characteristics of the household head and of the household, and experimenter dummy variables.<sup>18</sup> In the third we only include the use of the bridge, experimenter dummy variables, and expectations regarding others' contributions. Finally, in the fourth we include both socio-economic characteristics and the variables that could be correlated with the socio-economic characteristics: (i) the variable measuring whether they think it is likely that people who do not participate in community activities will be punished, that is, criticized or sanctioned; (ii) number of associations they are a member of; (iii) the cost of social events; and (iv) the expectation regarding others' contributions.<sup>19</sup>

The results are presented in Tables 4 and 5. As can be seen, the size and significance of the treatment dummy variables are not very sensitive to model specification; we therefore focus our discussion on model 1 for each case. The regression results are largely consistent with the predictions of our theoretical model. First, individual contributions are strongly related to the own use of the bridge. Moreover, when controlling for the use of the bridge, there is a significantly lower average contribution in the treatment with a low reference contribution than in the treatment without any reference information. At the bottom of the table, we report *F*-tests of the hypothesis of equal treatment coefficients, and these reveal

17 These results are available from the authors on request.

18 We include characteristics of the household head because this is usually the main decision maker in the setting of rural households, given we do not know the bargaining power in the joint family decision in the experiment.

19 It could be argued that the variable measuring whether they think it is likely that people who do not participate in community activities will be punished is correlated with socio-economic characteristics. However, we have estimated all models without this variable and the results are robust.

**Table 4.** OLS regressions on contributions to the public good

	Model 1	Model 2	Model 3	Model 4
High reference contribution	-4.43 (27.19)	-15.45 (27.99)	1.81 (23.49)	3.35 (21.99)
Low reference contribution	-60.48** (27.52)	-65.93** (28.58)	-41.27* (23.11)	-54.08** (22.80)
Default at full contribution	-2.35 (26.85)	-18.76 (27.84)	11.58 (23.19)	-7.25 (22.10)
Default at zero contribution	-50.59* (27.48)	-54.20* (28.57)	-48.72** (23.64)	-55.73** (22.43)
Use the bridge daily	120.34*** (26.30)	120.23*** (27.88)	98.50*** (23.29)	80.58*** (22.22)
Use the bridge weekly	91.39*** (32.67)	84.45** (35.61)	70.30** (29.12)	78.43** (28.19)
Use the bridge twice a month	71.02*** (27.16)	64.41** (28.28)	31.42 (20.60)	34.36 (22.37)
Use the bridge once a month	28.64 (23.27)	32.32 (24.94)	31.43* (20.60)	35.25* (19.56)
Household size		4.89 (5.91)		2.96 (4.71)
Age		0.25 (0.74)		-0.29 (0.61)
Male		-8.53 (18.86)		-12.82 (14.87)
Education		16.42 (13.88)		-2.30 (11.07)
Income		0.84 (0.78)		0.71 (0.65)
Rice land		1.04 (3.08)		-0.49 (2.43)
Communist Party member		35.943 (31.554)		45.33 (25.32)
Saturday		-17.68 (19.01)		-21.46 (15.53)
Association				13.66 (15.60)
Social events				20.77*** (5.82)
Punish				20.56*** (4.96)
Guess			0.72*** (0.08)	0.72*** (0.08)
No provided guess			141.57*** (27.42)	151.75*** (26.50)
Constant	242.50*** (23.29)	108.99*** (72.44)	38.21 (38.71)	-35.85 (58.65)
	<i>F</i> -test ( <i>p</i> -value)			
H <sub>0</sub> : High ref. = low ref. contribution	4.12 (0.043)	3.10 (0.080)	3.23 (0.07)	6.32 (0.012)
H <sub>0</sub> : Default full = default zero contribution	3.12 (0.080)	1.54 (0.216)	6.56 (0.011)	4.61 (0.033)
Experimenter dummy var.	No	Yes	Yes	Yes
No. of obs.	200	200	200	200
Adj. R <sup>2</sup>	0.10	0.10	0.35	0.45

Notes: Standard errors in parentheses. \*, \*\*, and \*\*\* denote that the coefficient is statistically significant at the 10%, 5%, and 1% levels, respectively.

that there is a significantly lower average contribution in the treatment with a low reference contribution than in the treatment with a high reference contribution. On average, subjects contributed 60,500 dong less—from an endowment of 400,000 dong—in the low-reference contribution treatment than in the treatment without any reference information (in the first regression model). However, there is no significant difference between the standard treatment and the high reference contribution treatment. Note also that if the respondents were to act strategically based on pure self-interest, we would if anything be observing that people contributed less if they believed that others were going to contribute more. Consequently, to the extent that such a strategic effect exists, the measured effects of social influence are under-estimated. If people are informed that one of the most common contributions by others is 100,000 dong, they tend to contribute around 60,500 dong less themselves, whereas if they are told that one of the most common contributions by others is 300,000 dong, there is no difference compared with not saying anything about others' contribution. Given that the overall average contribution in the experiment (270,900 dong) is not very far from 300,000 dong, this result is not surprising.

Table 5. Probit models on low and high contributions, marginal effects at sample mean

	Probit = 1 if contribution ≤ 100,000				Probit = 1 if contribution ≥ 300,000				Probit = 1 if contribution = 400,000			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
High reference contribution	-0.034 (0.085)	0.002 (0.087)	-0.016 (0.043)	0.001 (0.028)	0.038 (0.116)	-0.009 (0.124)	0.102 (0.134)	0.106 (0.158)	-0.101 (0.108)	-0.135 (0.110)	-0.121 (0.125)	-0.039 (0.149)
Low reference contribution	0.238** (0.118)	0.280*** (0.131)	0.235* (0.124)	0.302* (0.156)	-0.209* (0.115)	-0.237* (0.122)	-0.124 (0.147)	-0.277* (0.166)	-0.188* (0.106)	-0.240** (0.106)	-0.151 (0.130)	-0.249* (0.142)
Default at full contribution	0.032 (0.094)	0.024 (0.091)	0.010 (0.052)	0.012 (0.036)	0.031 (0.116)	-0.045 (0.125)	0.174 (0.131)	0.062 (0.173)	0.088 (0.113)	-0.006 (0.119)	0.189 (0.136)	0.106 (0.186)
Default at zero contribution	0.119 (0.107)	0.125 (0.111)	0.135 (0.102)	0.151 (0.119)	-0.176 (0.115)	-0.198* (0.121)	-0.203 (0.137)	-0.284* (0.155)	-0.174* (0.105)	-0.215** (0.107)	-0.222* (0.119)	-0.313** (0.128)
Use the bridge daily	-0.179*** (0.046)	-0.161*** (0.041)	-0.086** (0.034)	-0.037 (0.026)	0.455*** (0.075)	0.489*** (0.078)	0.481*** (0.080)	0.535*** (0.088)	0.427*** (0.093)	0.493*** (0.099)	0.456*** (0.109)	0.604*** (0.127)
Use the bridge weekly	-0.151*** (0.052)	-0.090 (0.067)	-0.058** (0.028)	-0.014 (0.020)	0.377*** (0.090)	0.399*** (0.097)	0.405*** (0.087)	0.460*** (0.086)	0.248* (0.131)	0.315** (0.142)	0.252* (0.143)	0.512*** (0.152)
Use the bridge twice a month	-0.136*** (0.053)	-0.117*** (0.047)	-0.045 (0.029)	-0.018 (0.017)	0.304*** (0.096)	0.299*** (0.106)	0.194 (0.126)	0.244* (0.145)	0.196* (0.116)	0.247* (0.127)	0.083 (0.143)	0.231 (0.189)
Use the bridge once a month	0.064 (0.071)	0.096 (0.076)	0.042 (0.046)	0.039 (0.039)	0.180* (0.096)	0.229** (0.105)	0.264*** (0.110)	0.386*** (0.129)	0.166* (0.100)	0.244** (0.111)	0.247** (0.119)	0.508*** (0.154)
Household size		-0.010 (0.016)		-0.002 (0.005)		0.024 (0.026)		0.020 (0.038)		0.027 (0.026)		0.005 (0.041)
Age		-0.002 (0.002)		-0.001 (0.001)		0.002 (0.003)		0.003 (0.005)		-0.003 (0.003)		-0.007 (0.041)
Male		0.012 (0.052)		-0.008 (0.017)		-0.051 (0.085)		-0.089 (0.114)		-0.080 (0.083)		-0.216* (0.117)
Education		-0.039 (0.042)		-0.008 (0.013)		0.094 (0.067)		0.060 (0.095)		0.053 (0.063)		-0.039 (0.090)
Income		-0.003 (0.002)		-0.001 (0.001)		0.004 (0.004)		0.004 (0.005)		0.003 (0.003)		0.004 (0.090)

(continued)

Table 5. Continued

	Probit: = 1 if contribution ≤ 100,000				Probit: = 1 if contribution ≥ 300,000				Probit: = 1 if contribution = 400,000			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Rice land	-0.017* (0.010)			-0.003 (0.003)		0.001 (0.014)		-0.008 (0.020)		-0.008 (0.014)		-0.025 (0.019)
Communist Party member	-0.008 (0.103)			-0.013 (0.018)		0.156 (0.136)		0.244 (0.155)		0.259 (0.133)		0.460*** (0.161)
Saturday	-0.026 (0.054)			-0.003 (0.017)		-0.151* (0.136)		-0.240** (0.188)		-0.143 (0.08)		-0.218* (0.123)
Association				0.002 (0.017)				0.150 (0.119)				0.163 (0.120)
Social events				-0.009 (0.009)				0.150*** (0.044)				0.184*** (0.045)
Punish				-0.009 (0.008)				0.138*** (0.042)				-0.189*** (0.044)
Guess				-0.001 (0.001)				0.005*** (0.001)				0.006*** (0.001)
No provided guess				-0.140 (0.044)				0.625*** (0.069)				0.824*** (0.103)
	F-test (p-value)	F-test (p-value)	F-test (p-value)	F-test (p-value)	F-test (p-value)	F-test (p-value)	F-test (p-value)	F-test (p-value)	F-test (p-value)	F-test (p-value)	F-test (p-value)	F-test (p-value)
H <sub>0</sub> : High ref = low ref contribution	6.59 (0.010)	5.86 (0.016)	8.06 (0.005)	8.76 (0.003)	4.22 (0.040)	3.10 (0.078)	2.50 (0.114)	4.84 (0.028)	0.64 (0.425)	0.88 (0.349)	0.06 (0.810)	2.02 (0.155)
H <sub>0</sub> : Default full = default zero contribution	0.80 (0.372)	0.98 (0.321)	2.89 (0.089)	3.66 (0.056)	3.07 (0.080)	1.46 (0.227)	6.4 (0.001)	3.85 (0.049)	5.27 (0.022)	3.18 (0.074)	9.13 (0.003)	6.45 (0.011)
Experimenter dummy var.	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
No. of obs.	200	200	200	200	200	200	200	200	200	200	200	200
Pseudo R <sup>2</sup>	0.12	0.22	0.40	0.50	0.11	0.19	0.37	0.51	0.08	0.17	0.33	0.54

Notes: Standard errors in parentheses. \*, \*\*, and \*\*\* denote that the coefficient is statistically significant at the 10%, 5%, and 1% levels, respectively.

Similarly, the two probit models reveal that it is (around 24 percentage points) more likely that subjects give 100,000 dong or less and (around 20 percentage points) less likely that they give 300,000 dong or more when they are told that a common contribution is 100,000 dong; both of these effects are significant. However, just as in the OLS model on the level of contribution, there are no significant effects of the high reference contribution treatment.

For the default treatments, we find, again consistent with theoretical predictions, that the zero-contribution default has a rather large negative effect on contributions. This negative effect is larger in magnitude than the corresponding effect of the full-contribution default. Yet similar to the reasoning regarding the effect of reference contribution levels, this need not mean that a full-contribution default does not have an effect in general, since in our experiment the contribution levels are on average very high. Compared with no default, a zero-contribution default reduces the contribution by about 51,000 dong, which is a substantial amount that corresponds to about 20% of the average contribution. A comparison of the full-contribution and zero-contribution defaults reveals that the difference in contributions is only significant in the first and third models. Moreover, the probit regressions reveal that it is less likely (around 20–29 percentage points less) that subjects give 300,000 dong or more with the zero-contribution default than with the no default contribution. There is however no significant effect on the likelihood of giving 100,000 dong or less. It is also interesting to note that the effect on contributions in the zero-contribution default is similar to the one in the low reference contribution treatment.

Amongst the household characteristics, how much the household used the bridge is, as mentioned and consistent with theoretical predictions, an important determinant of the amount of money contributed to the bridge. Households that used the bridge every day contributed, on average, around 120,000 dong more than households that did not use the bridge (the reference category) in the first regression model. There are no significant effects of age, sex of the household head, level of education, size of land, or household income on contribution.

Amongst the variables intended to measure social capital, only the effect of social events is significant, with households with high monthly expenditures for social events contributing significantly more than other families. Our conjecture is that households with a large network in terms of relatives and friends have a higher cost of social events. One interpretation of this is that these households have a larger number of households in the village that they care about and that they believe would benefit from the construction of the bridge. Subjects who thought they would be more likely to be punished if they did not contribute to local public goods (in general) gave significantly more to the public good in our experiment, which follows intuition. Those who consider it very likely (coded as 5) ‘that people who do not participate in community activities will be criticized or sanctioned’ contribute almost 100,000 dong more than households who consider this very unlikely (coded as 1). Finally, there is also a strong positive correlation between own contribution and the expected contribution of others. In the regression model with the level of contribution, the coefficient is 0.72, meaning that a one dong increase in others’ expected contribution increases one’s own contribution by 0.72 dong. This is fairly consistent with what others have found; for example Gächter and Renner (2010) found in a repeated public good game that a one-unit increase in beliefs of others’ average contribution increases own contribution by 0.54 token in the last period of the game (when there are no strategic motives to act as a conditional co-operator). Subjects who did not provide a guess contributed around

150,000 dong more than other subjects. In Model 3 we only include expectations of others' contribution, in addition to use of the bridge and experimenter dummy variables. The reason for estimating this model is that if reference information about others' contributions affects a person's contribution because of conditional co-operation, then when including expectations about others' contributions, these two treatment dummy variables should be insignificant. What we find is that the magnitude of the low reference dummy variable decreases, and it is now only significant at the 10% level.<sup>20</sup> Thus, expectations about others' contributions seem to be an important part of the explanation of the behaviour in the reference contribution treatment, although not the only factor.

One should be careful not to draw too strong causal conclusions from the results regarding the link between guesses and contributions. As mentioned, the question about others' contributions was not incentivized, and it is not clear that subjects were able to separate their own preferences from what they thought others were doing. Moreover, the causality may in part go from own contribution to stated expectations, rather than the other way around.<sup>21</sup> However, it is interesting that the expectations about others' behaviour do not affect the other parameter estimates to any large extent, with the exception that the impact of the current use of the bridge is reduced somewhat. In particular, the coefficients for the various treatments are still of the same order of magnitude and remain significant. Consequently, if the guessed contribution of others captures conditional co-operation, then the effects of, say, a zero default contribution or a low reference contribution level capture at least in part something different than conditional co-operation.

## 5. Conclusions

In this article we analyse a field experiment with real contributions to an archetypal public good, a bridge, in rural Vietnam. In particular, we study the role of (i) social influence in terms of conditional co-operation, that is, that people may be more willing to co-operate if others do; and (ii) the effects of the default alternative, that is, that people are often found to be influenced by the default alternative presented to them in the choice situation. Numerous studies have analysed the role of conditional co-operation in laboratory experiments (see, e.g., [Fischbacher \*et al.\*, 2001](#); [Fischbacher and Gächter, 2010](#)) and for charitable giving (see, e.g., [Alpizar \*et al.\*, 2008](#); [Shang and Croson, 2009](#)) as well as the effects of defaults for the choice of private goods (see, e.g., [DellaVigna and Malmendier, 2006](#)). Yet as far as we know, no previous studies have tried to quantify the treatment effects of social influence and default alternatives on the voluntary contributions to a real local public good, let alone a public good in a developing country.<sup>22</sup>

Based on our regression analysis we find in some cases significant and substantial effects of provision of reference information about what others are doing as well as of default

<sup>20</sup> This model was suggested to us by an anonymous reviewer.

<sup>21</sup> There are at least two plausible psychological mechanisms behind such reverse causality: the false consensus effect, that is, the tendency of people to over-estimate the degree of agreement that others have with them ([Ross \*et al.\*, 1977](#)), and simple cognitive anchoring effects ([Tversky and Kahneman, 1974](#)).

<sup>22</sup> Yet parts of the data from the present study are used in a follow-up study by [Carlsson \*et al.\* \(2014\)](#) as one out of five sequential events, where the aim is to test the stability of social preferences over time.

alternatives, which is in line with previous findings in laboratory experiments and for charitable giving. For example, if people were informed that one of the most common contributions made by others was 100,000 dong (a relatively low contribution), they tended to contribute around 60,500 dong (or about 25%) less than when we did not say anything about others' contributions. Similarly, a zero default contribution, compared with a treatment with no default contribution, reduced the contribution by about 51,000 dong, which is a substantial amount that corresponds to almost 20% of the average contribution. At the same time, there are hardly any effects from providing a high reference amount about the most common contribution made by others or from providing a high contribution default. The primary reason for this is the already strong willingness to contribute to the public good without any social influence or defaults. Thus, even in a case with a relatively large number of subjects, people do make contributions. As discussed, there are several potential explanations for this, some of which are related to the experimental design.

More generally, the results tell us that it might not be straightforward to provide reference information or defaults without good prior information about the underlying preferences. This calls into question the view that defaults, nudges, and social influences are always straightforward to use to influence behaviour in the socially preferred direction. Thus, one needs to carefully analyse what the baseline behaviour looks like before setting defaults or reference points. Indeed, setting them based on incorrect conjectures on the baseline behaviour might actually cause more harm than good. These findings are important as they contribute to our general understanding of the determinants of contributions to a real public good in general and in developing countries in particular. This is important since there is much evidence that the ability to provide an adequate amount of public goods is crucial for economic and social development. The results are also potentially important from a more direct policy perspective at different levels. In Vietnam, many local public goods are funded by the villages themselves. Our experiment suggests that a voluntary contribution mechanism with matching funds could be a useful instrument. As such, it provides a modest piece of knowledge that can be useful in the overall task of understanding how to reduce world poverty. Yet from the perspective of the 200 households in the Giong Trom village, the most important result of this study is of course that they now have a new and well-functioning concrete bridge in place.

### Supplementary material

[Supplementary material](#) is available online at the OUP website.

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