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## Anonymity, Reciprocity, and Conformity

*Evidence from Voluntary Contributions to a  
National Park in Costa Rica*

**Francisco Alpizar, Fredrik Carlsson, and Olof Johansson-Stenman**



# Environment for Development

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## **Anonymity, Reciprocity, and Conformity: Evidence from Voluntary Contributions to a National Park in Costa Rica**

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### **Abstract**

We investigated the role of anonymity, reciprocity, and conformity for voluntary contributions, based on a natural field experiment conducted at a national park in Costa Rica. Contributions made in public in front of the solicitor were 25 percent higher than contributions made in private. Giving subjects a small gift before requesting a contribution increased the likelihood of a positive contribution. At the same time, however, the conditional contribution decreased. The total effect of giving a gift was positive but small, and taking the cost of the gift into account, it was far from profitable. 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 to providing no reference information. Providing a high reference level (\$10) increased the conditional contributions. Overall, the total effects have the expected signs, although the magnitudes are smaller than what one might have expected based on existing evidence from laboratory experiments.

**Key Words:** Voluntary contributions, anonymity, reciprocity, conformity, natural field experiment

**JEL Classification Numbers:** C93, Q50

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## **Anonymity, Reciprocity, and Conformity: Evidence from Voluntary Contributions to a National Park in Costa Rica**

Francisco Alpizar, Fredrik Carlsson, and Olof Johansson-Stenman\*

### **Introduction**

Although a large part of economic theory assumes a narrow definition of selfishness, much evidence suggests that people are often *not* motivated solely by material payoffs. In addition to straightforward observations of charity (see Andreoni 2004; and Vesterlund 2006 for excellent overviews), there is an overwhelming amount of recent experimental evidence (see, for example, Ledyard 1995; and Camerer 2003). Moreover, unlike the atomistic and amoral *Homo Economicus*, people often do not act independently of private and social norms. Most of us consider it important to be regarded positively by others (Brennan and Petti, 2004; Kuran 1995), but we also seem to prefer to have a positive view of ourselves independent of the view of others (Akerlof and Kranton 2000; Benabou and Tirole 2002, 2006). As expressed by Adam Smith in 1759: “The most sincere praise can give little pleasure when it cannot be considered as some sort of proof of praise-worthiness.” However, clear empirical evidence outside the lab of what influences altruistic or charitable behavior is still scarce. Using the terminology of Harrison and List (2004), this paper presents the results of a natural field experiment in Costa Rica, where the importance of anonymity, reciprocity, and conformity for people’s voluntary contributions to a national park were investigated.

Laboratory experiments have many advantages, particularly with respect to the possibility of holding other possible influences than the one under investigation fixed. Levitt and List (2006) argued that lab experiments, therefore, are useful in generating qualitative insights. Obviously, laboratory experiments also have drawbacks. Levitt and List also argued that one needs to be very careful when generalizing quantitative findings outside the lab environment.

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They conclude that laboratory experiments and data generated in the field are complements rather than substitutes. We concur with this view.

In broad terms, several potential reasons for non-selfish behavior have been identified in the experimental literature, including the following: (1) People prefer to conform to what others do. Thus, people behave more unselfishly if they observe that others act unselfishly. (2) People reciprocate; that is, if others have been nice to you, you tend to be nice to them. (3) People are motivated both by their own view of themselves as well as by how other people view them. This implies that people tend to act less altruistically if no one observes their actions.

The purpose of this paper is to test the absolute as well as the relative importance of these three reasons for non-selfish behavior. This was done by conducting a natural field experiment on voluntary contributions to a national park in Costa Rica, where international tourists were asked if they would like to contribute to the park. The effect of anonymity was tested by letting the subjects contribute their money either openly in the presence of the interviewer, or in a sealed envelope.

The effect of reciprocity was investigated by handing over a small gift (a refrigerator magnet) to a sub-sample of subjects, prior to their contribution decision. By reciprocity, we mean that people are reciprocal if they reward kind actions and punish unkind actions *towards them* (cf. Falk and Fischbacher 2006; and Rabin 1993). In principle, the kindness of the action can be evaluated both in terms of the consequences and in terms of intentions (Dufwenberg and Kirchsteiger 2004; Rabin 1993). Simply put, kind actions appreciated for their good consequences can trigger punishing behavior if the intentions are regarded as bad.

We investigated the effect of conformity by providing the subjects with information about the contributions of previous subjects. The information was varied among subjects and we included the case of providing no information as well. By conformity, we mean that people care about their own contribution relative to the contributions of others; see Bernheim (1994) for an example of a model of conformity where people care about their status in terms of their relative contribution to a public good.

An attractive feature of our design was that it allowed us to separate reciprocity from conformity, which is not possible in most studies of conditional cooperation. For example, if people contribute more when others contribute more in public-good games, this may in part reflect reciprocity and in part conformity. Another attractive feature was that we were able to separately analyze the effects on the probability that a person contributes and on the magnitude of the contribution conditional on a positive contribution.

Just looking at the raw data, our findings can be summarized as follows. Anonymity decreased contributions by about 25 percent. Giving a small gift (reciprocity) increased contributions by about 5 percent. However, this effect was not at all sufficient to cover the cost of the gift given to the subjects. A reference level of \$10 increased contributions by about 4 percent, compared to not providing any reference contribution information. However, providing a lower reference level of \$2 decreased contributions by 23 percent, compared to the baseline of no reference level. The effects of anonymity, reciprocity, and providing social reference points were similar in a regression analysis. There were also some interesting asymmetric effects on the probability of contributing anything at all and on the contribution conditional on a positive contribution. In the reciprocity treatment, more people contributed, even though the average conditional contribution was lower. Increasing the reference level decreased the probability of a positive contribution, but increased the conditional contribution.

The remainder of this paper is organized into four additional sections. Section 2 provides a brief literature review of earlier studies with an emphasis on field experiments, section 3 presents our field-experimental design, section 4 the corresponding results, and section 5 concludes the paper.

## 2. Previous Studies

There are several public good laboratory experiments that look at the role of anonymity (see, e.g., Laury et al. 1995; Masclet et al. 2003; and Rege and Telle 2004). For example, Rege and Telle (2004) considered a standard public-good game with 10 subjects in each group. In one sub-sample, the subjects had to reveal their contribution to the whole group after making the contribution decision. The average contribution almost doubled when made in public. Of more relevance to this study is List et al. (2004), who analyzed charitable contributions to the Center for Environmental Policy Analysis at the University of Central Florida. They used three different information treatments: (1) the responses were anonymous, (2) the experimenter knew the response, and (3) the whole group knew the response. The largest share of “yes” responses was obtained when the whole group was informed of the response, followed by the case when only the experimenter knew the response. We found only one field experiment that looked at the role of anonymity. Soetevent (2005) investigated the role of anonymity in Dutch churches, using closed and open collection bags. The use of open baskets, where close neighbors in the church could identify a donor’s contribution, increased overall contributions by about 10 percent in the second offering of the services.

There is much evidence from laboratory experiments consistent with reciprocity (see, for example, Fehr and Gächter 2000; Hoffman et al. 1996; and Roth 1995). Cialdini (2001) provided a number of real world examples from fundraising to politics where the principle of reciprocity plays an important role. Falk (2005) is the only field experiment we are aware of that studied reciprocity directly, i.e., how people respond to someone after a gift has been given to them. He found a strong and significant effect when including a gift with the donation letter. Participation increased by 2 percentage points if a small gift (one post card) was included and by 9 percentage points if a large gift (four post cards) was included.<sup>1</sup>

Many experimental results can be interpreted in terms of conditional cooperation. Some public good studies can be questioned based on unclear causality, since contributions may affect the expectation of others' contributions rather than the other way around. However, Fischbacher et al. (2001) provided clear evidence based on the strategy method. They found that about 50 percent of their subjects increased their contribution in a one shot–public good game if others did so as well. This is also consistent with the field evidence of Andreoni and Scholz (1998), who, based on a consumer expenditure survey, found that donors responded positively to an increase in contributions by others in their reference group, which was defined in terms of socio-economic variables. Bohnet and Zeckhauser (2004) found that informing respondents about the average offer in an ultimatum bargaining game significantly increased offers and offer-specific rejection probabilities. Potters et al. (2005) found that sequential moves in a public-good game resulted in a larger provision of the good, because the follower mimicked the action of the leader.

We are aware of four field experiments that analyze the effect of conformity or conditional cooperation. Frey and Meier (2004) analyzed the behavior 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. Shang and Croson (2006) investigated how information about a typical contribution to a radio station affects subject contributions. They found that the highest reference amount (\$300) resulted in a significantly higher contribution than giving no information at all. The direction for smaller amounts (\$75 and \$180) was the same, although not statistically significant. Heldt (2005) found that Swedish cross-country skiers were more likely to contribute to the track maintenance if many others contributed. Martin and Randal (2005) found

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<sup>1</sup> The motives of the postcards were painted by kids together with the text, “Our benefits lie in children’s smiles.” One may imagine that they were much more effective than what most other motives would have been.



that visitors to a museum put more money into a transparent box, thereby donating money to the museum, when there was money in the box compared to when the box was empty.

### 3. Design of the Field Experiment

The natural field experiment concerned contributions of visiting international tourists to the Poas National Park (PNP) in Costa Rica in 2006. Much effort was spent on ensuring that the situation was realistic and credible, and that there was nothing indicating that this was a university study with the aim of analyzing people's behavior. This is potentially very important since, as noted by Levitt and List (2006), a perceived experimental situation may highlight people's sense of identity or self-image to a larger extent than outside the experimental situation (cf. Akerlof and Kranton 2000).

Our five chosen interviewers were officially registered interviewers of the Costa Rican Tourism Board. We initially sent invitations via email inviting them to an initial screening meeting where we evaluated their personalities and abilities to speak fluently in both Spanish and English. Of ten potential candidates considered, we chose five who fulfilled all our requirements. The five interviewers participated randomly in all parts of the experiment, except for one person who could not participate in the reciprocity treatments; in the regression analysis, therefore, we controlled for interviewer effects. The interviewers underwent extensive, paid training sessions both in the classroom and in the field. Once they were ready to start, we dedicated a whole week to testing their performance and to making small adjustments in the survey instrument. In addition, there were daily debriefing questions and regular meetings with the whole team to make sure that all interviewers were using the exact wording of the scenarios.

Interviewers approached international tourists after they had visited the volcano crater, which is the main attraction of the park. They were approached at a "station" outside the restaurant and souvenir shop, which was decorated with the logos of the PNP, the National System of Protected Areas (SINAC), and the Tropical Agricultural and Higher Education Center (CATIE).<sup>2</sup> The interviewers wore uniforms with the logos of the PNP and CATIE and also carried formal identification cards that included their photo and signatures of the park authorities. The uniforms were very similar to those used by the park rangers at PNP. A formal letter authorizing the collection of contributions was also clearly visible.

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<sup>2</sup> Spanish acronym for the Tropical Agricultural Research and Higher Education Center, which had the main responsibility for data collection.

Only international tourists who could speak either Spanish or English participated in the experiment. The subjects were approached randomly, with the exception that two people in the same group of visitors were never approached. The selection was one of the key elements of the training sessions, and we checked for biases in the selection of subjects daily. No corrections were required after the pilot sessions.

Initially, subjects were asked if they were willing to participate in an interview about their visit to the PNP. No mention of voluntary contributions took place at this stage, so we expect that participation was not affected by monetary considerations. Overall participation rates were very high (above 85 percent each day). Once we established that they were international tourists and that they had already visited the crater, the interviewers proceeded with the interview. Before the actual experiment, subjects were asked a few questions regarding their visit to Costa Rica and to the national park. The interviewers were provided with standardized replies to the most common questions regarding the survey, the experiment, the institutions involved, etc. For further information, the participants were advised to talk to the main supervisor of the contribution campaign.

The experiment involved three different treatments: (1) an examination of the role of anonymity for individual contributions, (2) an exploration of the effect of giving a small gift before asking for a contribution to the national park, and (3) a study on the effect of providing a changing social reference point on individual contributions. Each treatment required slight modifications of the interview script, but we were very careful to limit the differences among the treatments. Subjects also received a card where they could read the scenario and the instructions for the voluntary contribution. The actual experiment began with the following sentence:

I will now read to you some information about the funding of national parks in Costa Rica. Here is a paper with the information I will read.

In the reciprocity treatment, the solicitor then gave the gift to the participant and said:

Also, this is a little gift in appreciation of your time.

The treatments without reciprocity simply did not include any gift or the associated information. The gift was a colorful, handcrafted refrigerator magnet, depicting the main attractions of the PNP: the lagoon, the crater, and the forest. The retail value of the gift was US\$ 3.00 and its cost to the park administration was approximately \$1.50. In order to avoid confusion and cross-contamination between the treatments with and without gifts, they were done sequentially. After this, the participants were told about the main purpose of the request for a contribution:

The system of national parks in Costa Rica is now suffering from the lack of funds to achieve a good management of the parks, both for biodiversity conservation and tourism. Available funds are simply not enough and national parks are trying to obtain new funds. We are now testing a system at Poas National Park where visitors can make donations to the park. The entrance fee remains the same, seven dollars, but people have the possibility to make voluntary donations to the park in addition to the fee. Contributions will be used to improve the standard of living of park rangers, to provide for better trails, and to make sure that this beautiful and unique ecosystem is well taken care of.

The effect of a social reference point is analyzed by providing the subjects with information about a typical previous contribution of others. If a reference point was provided, the following sentence was read:

We have interviewed tourists from many different countries and one of the most common donations has been 2 / 5 / 10 US dollars.

The monetary reference values used were obtained from a pilot study conducted at the same park right before the main experiment. In the treatments with no mentioned reference amount, the above sentence was simply omitted.

Finally, the actual request for a contribution differed depending on whether the contribution was to be anonymous or not. In the anonymous case, subjects were asked to go into a private area that was part of our interviewing station and put their contribution, if any, in a sealed envelope and into a small ballot box, making the contribution completely anonymous to the interviewer.<sup>3</sup> In this case, the following text was read:

How much are you willing to donate to this fund? Please go to the booth and put the amount of money you would like to donate in the envelope. Remember that donations will be used exclusively to maintain and improve the Poas National Park, as described before. When you are done, please seal the envelope and put it in this box. Do not show it to me because your donation should be completely anonymous. Please put the envelope in the box even if you do not wish to donate anything.

We provided a locked ballot box into which the contributions were put. This box was actually part of the interviewing station where the subject and the solicitor would sit for the experimental session. In the non-anonymous setting, the following text was read:

How much are you willing to donate to this fund? Remember that donations will be used exclusively to maintain and improve the Poas National Park, as described before. When

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<sup>3</sup> In order for us to identify the contributions and link them to the questions in the questionnaire, an ID number was written on the envelope. The subjects were informed about the ID number and the reason for using it. The important point here is that the solicitors were not able to observe the contributions, not even afterwards.

you are done reading, please give the envelope and your contribution to me so that I can count and register your donation before sealing the envelope. Please return the envelope even if you do not wish to donate anything.

Thus, in this treatment the subjects were well aware that the solicitor was observing each contribution.

Table 1 summarizes the experimental design for all three treatments. In total, 997 subjects participated in the experiment. The different treatments were conducted at the same time, and they were randomly distributed both in terms of time of day and among solicitors. The only exception is that we did not conduct interviews with and without gifts at the same time.

**Table 1 Experimental Design for All Treatment Combinations**

	No reciprocity		Reciprocity		Total
	<i>Anonymous</i>	<i>Non-anonymous</i>	<i>Anonymous</i>	<i>Non-anonymous</i>	
No reference donation	62 observations	63 observations	62 observations	63 observations	250
Reference donation: \$2	61 observations	63 observations	62 observations	63 observations	249
Reference donation: \$5	62 observations	62 observations	62 observations	63 observations	249
Reference donation: \$10	62 observations	62 observations	62 observations	63 observations	249
<b>Total</b>	<b>247 observations</b>	<b>250 observations</b>	<b>248 observations</b>	<b>252 observations</b>	<b>997</b>

In addition to the differences described above, everything else was identical in all interviews, and the typical variations of a field experiment (weather, type of tourist, etc.) were expected to randomly affect our results.

#### 4. Results

Table 2 presents the basic results from the field experiments. As can be observed, in total, 52 percent of the subjects chose to contribute and the average contribution was US\$ 2.49 for the whole sample. In total, 997 subjects were approached, and \$2,775 was raised for PNP.

**Table 2** Descriptive Field Experiment Results

	Observations	Share pos. contribution	Conditional average contribution (std)	Sample average contribution (std)
No reciprocity	497	0.48	5.09 (5.74)	2.43 (4.70)
Reciprocity	500	0.56	4.56 (6.97)	2.56 (5.69)
Anonymous	495	0.51	4.36 (4.79)	2.21 (4.05)
Non-anonymous	502	0.53	5.21 (7.65)	2.77 (6.15)
No reference	250	0.47	6.00 (10.49)	2.84 (7.79)
Reference: \$2	249	0.61	3.61 (3.99)	2.20 (3.58)
Reference: \$5	249	0.50	3.95 (2.84)	1.98 (2.82)
Reference: \$10	249	0.49	5.97 (6.06)	2.95 (5.20)
<b>Total</b>	<b>997</b>	<b>0.52</b>	<b>4.80 (6.43)</b>	<b>2.49 (5.22)</b>

The distribution of the contributions is skewed, with a large fraction of zero contributions and a few very large contributions. (The largest contribution was \$100.) The first histogram in figure 1 below shows the distribution of conditional contributions for the whole experiment. (Note that the rightmost bar is contributions larger than \$10.)

We also present the results from a regression analysis. As argued by Botelho et al. (2005), it is important to correct for possible differences when using subjects who typically have a larger variation in terms of socio-economic characteristics than students have. Another advantage of the regression analysis is that it allows us to handle extreme responses in a systematic way.

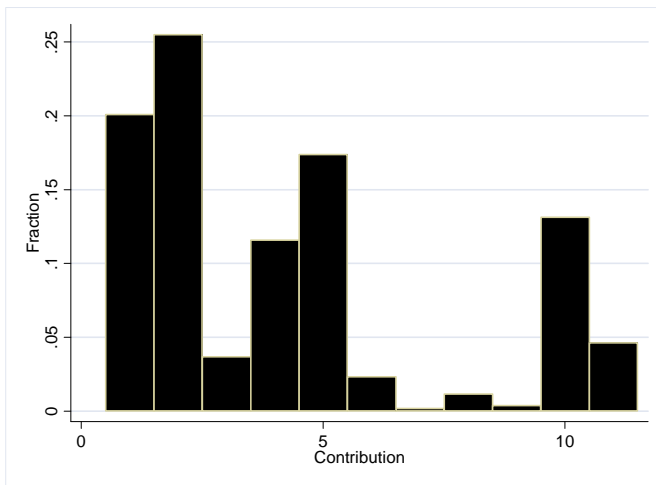
The dependent variable, contributions, was censored since it equaled zero for a substantial fraction of the subjects. In addition, there were two issues of interest here: whether to contribute anything at all, and how much to contribute, given a positive contribution. Since there are good reasons to consider these as two different decisions, a basic Tobit model would be inappropriate. Therefore, we used a simple two-stage model instead. The decision whether to contribute anything or not was modeled with a standard probit model. The decision on how much to

contribute, given a positive contribution, was modeled with a regression model using only subjects with a positive contribution.<sup>4</sup> However, the contribution distribution was skewed due to

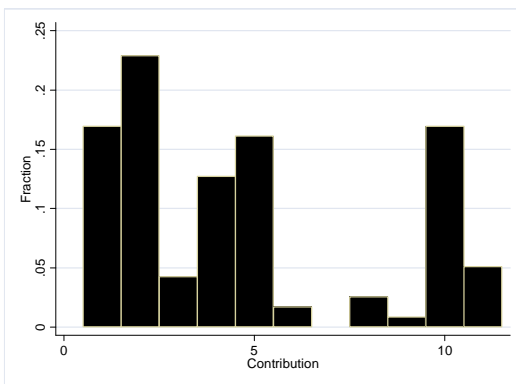
**Figure 1 Distribution of Contributions for Reference Contribution Treatments**

The rightmost bar is contributions larger than US\$10.

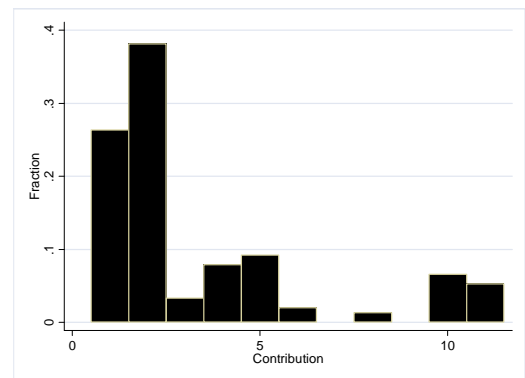
**All treatments**



**No reference contribution**



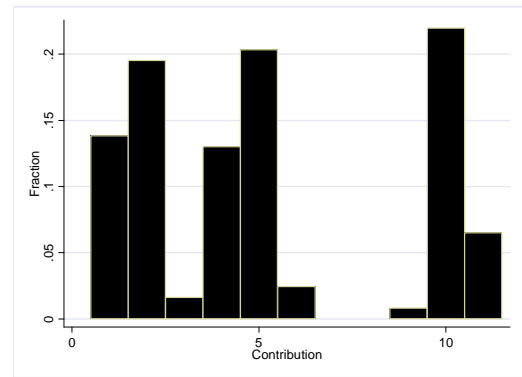
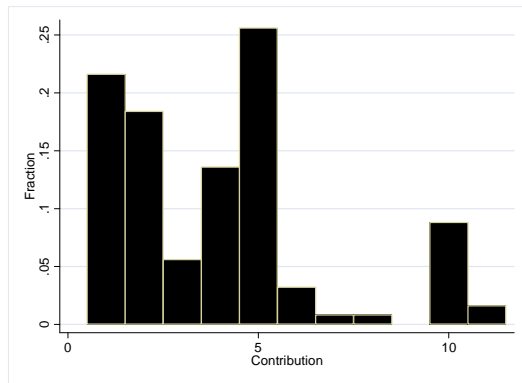
**\$2 reference contribution**



**\$5 reference contribution**

**\$10 reference contribution**

<sup>4</sup> We also estimated a sample selection model allowing for a correlation between the probit and the regression models. However, we could never reject the hypothesis of no sample selection.



a few outliers. A standard, ordinary least squares model would, therefore, put an inappropriately large weight on the outliers. In order to deal with this problem, we applied a robust regression.<sup>5</sup>

The base case in the regression models was the anonymous treatment without reciprocity and no mention of a reference contribution. Table 3 presents the marginal effects for the two estimated models together with the total marginal effect, i.e., including the effects of the probit stage; all marginal effects are calculated at sample means.<sup>6</sup> The total marginal effect is calculated as

$$\frac{\partial E[C_i]}{\partial x_i} = \frac{\partial P[C_i > 0]}{\partial x_i} E[C_i | C_i > 0] + \frac{\partial E[C_i | C_i > 0]}{\partial x_i} P[C_i > 0],$$

where  $E[C_i]$  is the expected contribution of individual  $i$ ,  $P[C_i > 0]$  is the probability that individual  $i$  contributes anything at all, and  $x_i$  is a covariate. Both the probit model and the

<sup>5</sup> We use the `rreg` command in STATA. First, a standard regression was estimated, and observations with a Cook's distance larger than 1 are excluded. In our case, 19 observations were excluded. After that, the model was estimated iteratively: it performed a regression, calculated weights based on absolute residuals, and regressed again using those weights (STATA, 2005). See Rousseeuw and Leroy (1987) for a description of the robust regression model.

<sup>6</sup> For the probit model, the marginal effect for dummy variables is for a discrete change of the variable from zero to one.

regression models included a constant, solicitor dummy variables, and a few individual socio-economic characteristics.<sup>7</sup>

#### **4.1 Anonymity**

From table 2, we see that the share of subjects contributing is higher in the non-anonymous treatment, but using the chi-square test of equal proportions contributing, we cannot reject the hypothesis of equal proportions ( $p = 0.433$ ). The average contribution is 25 percent higher compared to the anonymous treatment, but using the Wilcoxon-Mann-Whitney test of equal contribution distributions, we cannot reject the hypothesis of equal distributions ( $p = 0.166$ ). We do find that the average conditional contribution was 19 percent higher in the non-anonymous treatment and, using the Wilcoxon-Mann-Whitney test, we can reject the hypothesis of equal distributions ( $p = 0.09$ ). The results can be compared to List et al. (2004), who found that the proportion of subjects voting in favor of a proposal of financing a public good was significantly lower in a treatment where subjects are completely anonymous (20 percent), compared to a treatment where the solicitor observed the behavior (38 percent).

However, if we next look at the results of the regression models, we see that anonymity only played a role in the reciprocity treatment. In the models with interaction effects, the dummy variable for the non-anonymous treatment was insignificant. However, the interaction variable between the non-anonymous and the reciprocity treatments was significant in both the probit model and the robust regression. Thus, in the case of reciprocity, non-anonymity increased the probability of contributing, but decreased the conditional contribution. This difference between reciprocity and no-reciprocity treatments was also confirmed using the Wilcoxon-Mann-Whitney

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<sup>7</sup> The individual characteristics included in the regressions were gender and age of the subjects, whether they were members of an environmental organization, whether they saw the volcano, a dummy variable for US subjects, and a dummy variable for European subjects. Among other things, we found that male subjects are more likely to contribute, but that there is no difference in the conditional contribution. One explanation for this could be that four of our five interviewers were female. As shown by Landry et al. (2006), contributions are positively correlated with the physical attractiveness of female solicitors for male contributors. We also find that older subjects are more likely to contribute and that they on average contribute more, possibly indicating that there is a positive relationship between age and non-selfish preferences (cf. List 2004). However, since we cannot accurately control for income, another possible reason is simply that older people have higher incomes. We also find that members of an environmental organization are more likely to contribute, but on average they do not contribute more. Finally, we tested for differences among subjects from Europe, the United States, and South America without finding any statistically significant differences.



test. It is only for the reciprocity treatments that there was a significant difference in contribution distributions between the anonymous and non-anonymous treatments.

**Table 3 Regression Analysis of Contributions to the National Park**

The coefficients reflect marginal effects evaluated at sample means. All models include an intercept, solicitor dummy variables, and subject characteristics variables. P-values are in parentheses.

	2-Stage robust regression (main effects)			2-Stage robust regression (with interaction effects for anonymity and reciprocity)			Robust regression of conditional contribution (main effects)	Robust regression of conditional contribution (interaction effects)
	<i>Probit</i> <i>P(Contrib. &gt;0)</i>	<i>Robust regression of conditional contribution</i>	<i>Total effect</i>	<i>Probit</i> <i>P(Contrib. &gt;0)</i>	<i>Robust regression of conditional contribution</i>	<i>Total effect</i>		
Non-anonymous treatment	0.023 (0.480)	0.232 (0.356)	0.230 (0.256)	0.018 (0.687)	-0.127 (0.736)	0.022 (0.940)	0.281 (0.238)	0.013 (0.970)
Reciprocity treatment	0.100 (0.003)	-0.484 (0.070)	0.228 (0.283)				-0.496 (0.050)	
Reciprocity treatment * Anonymous treatment				0.005 (0.935)	0.658 (0.201)	0.367 (0.369)		0.474 (0.326)
Reciprocity treatment * Non-anonym. treatment				0.089 (0.057)	-0.810 (0.036)	0.007 (0.982)		-0.726 (0.045)
Treatment with \$2 reference contribution	0.152 (0.001)	-1.123 (0.002)	0.147 (0.600)	0.148 (0.001)	-1.154 (0.001)	0.110 (0.697)	-1.174 (0.009)	-1.186 (0.009)
Treatment with \$5 reference contribution	0.049 (0.280)	0.035 (0.924)	0.254 (0.384)	0.046 (0.314)	-0.006 (0.986)	0.216 (0.461)	-0.116 (0.810)	-0.137 (0.780)
Treatment with \$10 reference contribution	0.028 (0.539)	0.711 (0.055)	0.503 (0.083)	0.018 (0.687)	0.664 (0.078)	0.458 (0.118)	-0.566 (0.258)	-0.604 (0.234)
Made contribution in dollars only							0.578 (0.249)	0.557 (0.271)
Contribution in dollar * \$2 reference contribution							0.049 (0.941)	0.056 (0.933)
Contribution in dollar * \$5 reference contribution							0.205 (0.769)	0.233 (0.740)
Contribution in dollar * \$10 reference contribution							2.379 (0.001)	2.399 (0.001)
Solicitor dummy variables	Included	Included	Included	Included	Included	Included	Included	Included
Subject characteristics variables	Included	Included	Included	Included	Included	Included	Included	Included

## 4.2 Reciprocity

Comparing the treatments with and without reciprocity in table 2, we see that the share of subjects contributing a positive amount was 8 percentage points higher in the reciprocity treatment. This is somewhat smaller than in Falk (2005), where participation increased by 17 percentage points when a small gift was included. However, the conditional average contribution was smaller in the treatment with reciprocity. Still, the first effect dominated, resulting in a slightly higher average sample contribution, i.e., the average contribution in the whole sample was a little bit more than 5 percentage points higher in the reciprocity treatment. All of these effects are significant: using the Wilcoxon-Mann-Whitney test of equal distributions, we can reject the hypothesis of equal distributions both for the conditional sample ( $p = 0.040$ ) and for the whole sample ( $p = 0.096$ ); and using the chi-square test of equal proportions contributing, we can also reject the hypothesis of equal proportions ( $p = 0.007$ ). The total effect of reciprocity is an increase in average contributions by \$0.13. This can be compared to the cost of the \$1.50 gift. Thus, not considering any other effects, giving a gift before subjects are asked to contribute is far from profitable. This is consistent with the casual observations that most organizations that raise money in similar ways do not use gifts to invoke reciprocity.<sup>8</sup>

An exception sometimes mentioned is Hare Krishna. According to Cialdini (2001), its strategy of handing over a small gift, such as a book or a flower, was initially very successful in invoking reciprocity and thus increasing contributions. However, over time this strategy became less efficient when people became aware that this was, in fact, just a strategy to raise more money. We believe that this points to something fundamentally important that also concerns the results in our experiment, namely, that not only the consequences of an action matter but also the intentions (cf. Dufwenberg and Kirchsteiger, 2004; Rabin, 1993). In our case, a reason for the somewhat small degree of reciprocity may well be that many subjects felt that the intention of giving the gift was to increase contributions.

The regression analysis revealed that giving a small gift to the subject increased the probability that the subject contributed anything at all by around 10 percentage points. At the same time, the average conditional contribution was around \$0.80 lower than when the

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<sup>8</sup> There could, of course, be other positive effects of giving a small gift, either before or after a contribution. Subjects may feel more attached to the organization and may support it in other instances. It can also result in increased contributions over time.

contribution was anonymous. The net effect was quite small and insignificant. When we interacted anonymity with reciprocity, we could see that basically all of the probability effect was obtained in the non-anonymous treatment, and that this effect was more or less completely off-set by a decrease in conditional contribution. Thus, it seems that the effects of reciprocity are much larger in a non-anonymous context, which is also intuitively reasonable.

### **4.3 Conformity**

For reference contributions, we can make a number of comparisons. Compared to not giving any information about other people's contributions, it can be observed from table 2 that the share of subjects contributing was higher if a \$2-reference contribution was communicated, and that the difference was significant ( $p = 0.002$ ). However, where the average contribution and the conditional average contribution are lower, it is only the difference in distribution for the latter that is significant ( $p = 0.001$ ). If we then compare the different treatments with a reference contribution, the share of subjects contributing decreased as the reference level increased, although the difference in shares between \$5 and \$10 was not significant. At the same time, the average conditional contribution increased, and the difference in the distributions was significant in all cases. To gain additional insights on the differences among the treatments, figure 1 presents histograms for the conditional contribution for all treatments. (Again, the rightmost bar is contributions greater than \$10.) One clear difference is that the \$2-reference contribution resulted in fewer larger contributions. As expected, the most common contribution was \$2 if a reference point of \$2 was given. Similarly, \$5 was the most common if a \$5-reference was given, and \$10 was the most common if a \$10-reference was given.

The results from the regression analysis largely confirmed the results from the non-parametric analysis. The likelihood of contributing anything at all was significantly higher in the \$2-reference contribution treatment compared to all other treatments. At the same time, the average conditional contribution decreased by \$1.10, compared to the treatment without a reference contribution: these two opposite effects resulted in an insignificant total effect. Since the total effect was insignificant, some of those who would have contributed anyway ended up contributing less than without the reference contribution. This may be because subjects without any information tended to believe that a typical contribution was higher than \$2, which is correct according to table 1 since others contributed on average around \$5 in the no-treatment case. This new knowledge created two effects. On one hand, when faced with a typical average contribution of only \$2, those who would have contributed anyway responded by on average lowering their contributions. On the other hand, the other subjects realized that it is rather cheap to adhere to the

typical practice and hence agreed to a positive contribution. In this way, the result was an increased participation but lower conditional contributions.

The \$10-reference contribution resulted in an average conditional contribution that was around \$0.70 higher compared to not giving any reference information. The total effect was almost \$0.50; thus, presenting a \$10-reference contribution increased average contributions by 50 cents, compared to not giving any information at all.<sup>9</sup> This difference was somewhat larger than what the simple comparison between average contributions revealed in table 2.

In order to compare our results with Shang and Croson (2006), we needed to focus on average conditional contributions, since by the nature of their experiment they were able to look only at positive contributions. If we take the average conditional contribution for the no-reference treatment (\$6) as given, providing a reference contribution of \$10 resulted in an increase of almost 12 percent. This can be directly compared to Shang and Croson (2006) who also found a 12 percent increase in contributions for their highest reference contribution. However, they found increasing conditional contributions for reference contributions that were below the average contribution in the baseline case as well, whereas we found negative or insignificant effects for our two such reference levels (i.e., the \$2- and \$5-reference treatments, respectively).

It is also interesting to test whether the social reference contribution has a stronger effect if it is expressed in the same currency as the subjects are used to. The reference contributions were expressed solely in US dollars, but the subjects were free to contribute in any currency, and some subjects actually contributed in several currencies—51 percent, contributed only in dollars and 45 percent contributed only in colones.<sup>10</sup> To test if the behavior differed between these two groups, we estimated an additional robust regression for the conditional contribution. This regression included a dummy variable equal to 1 if the contribution was made only in dollars. This dummy variable was also interacted with the reference contribution dummy variables. The results of the regression are in the last two columns of table 3. We found that people who

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<sup>9</sup> The effect compared, for example, to a \$2-reference contribution is, of course, even larger.

<sup>10</sup> \$1 = 500 Costa Rican colones. Note that only international tourists participated in the experiment. Fifty-seven percent of those who contributed only in dollars and 53 percent of those who contributed only in colones were Americans. There was no significant difference with respect to gender or age between these two groups. Finally, those who only contributed in dollars, contributed on average \$1.10 more than the other subjects.

contributed in dollars on average contributed more.<sup>11</sup> More importantly, we found that it was mostly these subjects who “reacted” to the \$10 reference contribution. Thus, our result that a \$10-reference contribution resulted in a large average contribution was driven by this sub-sample. We did not find any significant interaction effect for the other reference levels. A possible explanation is that a subject who contributed in a currency other than dollars had to calculate how much the reference contribution was worth in that currency. A subject would thus face the choice of whether it was worthwhile undertaking this calculation exercise. Suppose that the subject had a very rough perception of the order of magnitude of the reference amount. If the reference level is a low amount, the subject would know that others have contributed a rather small amount. The subject may then be tempted to calculate exactly how much others had contributed, since such information would not be potentially damaging to the subject’s self-image. If, on the other hand, others did contribute a larger sum, such as \$10, an exact calculation of how much this corresponded to would make the reference level more salient. This, in turn, might be damaging to the subject’s ego since it would likely mean that the subject too is willing to contribute less than others. Alternatively, saving one’s ego would be expensive to the subject.

## 5. Conclusions

Using a natural field experiment, we quantified the importance of anonymity, reciprocity, and conformity through the provision of social reference levels in order to explain voluntary contributions to a national park in Costa Rica. All total effects of the various treatments had the expected signs.

We found an effect of anonymity, even if it was not significant. Contributions made in front of the interviewer were on average 25 percent larger than contributions made in private. We also found that the reciprocity treatment induced more people to contribute, while decreasing the average conditional contribution. Something similar applied to the comparison between providing no reference information and providing a reference of \$2. These two treatments seemed to “force” contributions from subjects who would not otherwise contribute, but in line with their baseline preferences, they tended to contribute less than others. The net effect of providing a reference amount of a magnitude similar to the mean contribution in the base case (with no reference contribution) had virtually no effect on the conditional contribution. Providing

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<sup>11</sup> We attempted to correct this result by nationality, but the effect was not significant. The US dollar is the standard currency for tourists in Costa Rica. See previous footnote.

a smaller or larger reference amount decreased and increased the size of the contribution, respectively.

The overall effects were perhaps smaller than expected, compared to findings from laboratory experiments. One possible explanation is that decisions in the laboratory, to a larger extent than real world decisions, tend to influence people to ask themselves what type of person they are. Consequently, subjects may be affected more by different treatments in a lab environment. Although it is an important step to move outside the lab, the findings cannot, of course, be generalized to all possible real life situations. For example, the importance of being perceived by others as generous, and perhaps committed to a good cause, most likely depends on who is observing one's behavior. The interviewer was presumably not that important for the subjects and was only one person. Hence, we expected anonymity to be much more important in other contexts. In our setting, the effects of the various treatments were small. This suggests that the self-image, or identity, as an honorable person, irrespective of other people's opinions, could be an important explanation of contribution behavior. As expressed by Adam Smith almost 250 years ago (Smith, 1759, p. 170):

Nature, accordingly, has endowed him, not only with a desire of being approved of, but with a desire of being what ought to be approved of; or of being what he himself approves of in other men. The first desire could only have made him wish to appear to be fit for society. The second was necessary in order to render him anxious to be really fit. The first could only have prompted him to the affectation of virtue, and to the concealment of vice. The second was necessary in order to inspire him with the real love of virtue, and with the real abhorrence of vice. In every well-formed mind, this second desire seems to be the stronger of the two.

One may finally suggest that the results have practical implications for charitable organizations that would like to maximize revenues. However, we believe that one should be cautious in this respect. First, most quantitative effects are relatively small and sometimes not significant. Second, and more important, some of the results may change in the long run, in the same way as it appeared to have become unprofitable for Hare Krishna to hand out gifts to potential givers. For example, if it becomes well known that a certain organization tends to ask people to contribute money in a non-anonymous way, then people might avoid these organizations. Similarly, people may feel uneasy if they are told that others tend to give a certain specified amount. Consequently, the positive effects of reducing or eliminating anonymity and providing potential donors with the information that many others have contributed a lot may be

reduced over time and perhaps even become negative. The advice that we feel most confident about is that, in most cases, it appears unprofitable for charitable organizations to hand out costly gifts to potential donors.<sup>12</sup> Thus, in this respect, the only advice we can give is to continue with current practice. Overall, this study has not produced any clear evidence that the current practice of charitable organizations is inefficient. If anything, it seems rather that the charitable market works.

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<sup>12</sup> Still, there are limits to the extent to which this result can be generalized. For example, we do not suggest that it would necessarily be a bad idea for a charity organization to pay a dinner for Bill Gates.



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