



# Reputation and household recycling practices: Field experiments in Costa Rica



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## ABSTRACT

Pro-environmental behavior is the willingness to cooperate and contribute to environmental public goods. A good understanding of why individuals undertake pro-environmental actions is important in order to construct policies that are aligned with preferences and actual behavioral patterns, such as concern for social esteem and reputation. In this paper, we present the results of a framed field experiment that explores reputation formation as a driver in support of household recycling practices. We use a “shame” and a “pride” treatment to test which is more effective, if at all, in increasing recycling effort. We find that reputational concerns indeed play a role in shaping individual pro-environmental behavior. Surprisingly, subjects cooperate more if the situation is framed as avoiding shame (bad reputation) rather than as acquiring pride and gratitude (good reputation). The actual experiment is based on a real recycling program, with participants who are heads of urban households in Costa Rica.

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## 1. Introduction

In Costa Rica, insufficient attention is being paid to the country's rapid economic development and sprawling urbanization. The main consequences of these phenomena are urban pollution and congestion due to soaring traffic, and drastically inappropriate management of waste water and solid waste. San Jose, the most urbanized city in Costa Rica, is facing the problem of increasing waste generation which it is not prepared to handle. In fact, more than 60% of daily waste ends up in open landfills leading to increasing health and environmental risks to its residents. Moreover, a considerable amount of domestic waste is illegally disposed of. Although one third of households in San José claim to do some sort of recycling, on average less than 10% of the city's waste is recycled after suitable separation at the household (Census Costa Rica, 2011).

Current solid waste management practices in San Jose involve daily or weekly curbside collection by municipalities. The lack of infrastructure for recyclable materials, the absence of separation centers, and limited funding for the creation of proper landfills are some of the main obstacles to the further development of source separation and waste reduction. Recently, the government of Costa Rica passed a legislation aimed at reducing pollution by modifying how people dispose of

their waste and how much they recycle. ‘The Solid Waste Plan for Costa Rica’ (Presol, 2008) suggests improving waste management practices through technical innovation, increasing the number of landfill projects and promoting source separation to significantly reduce the volume going to final disposal. Nevertheless, until now there has been little organizational effort to facilitate waste recycling by private households. So far, only some community-run recycling and education centers have been initiated, including the set-up of information guides for households, the operation of collection trucks and the establishment of centralized separation centers. This may not be sufficient in scale to contribute significantly to environmental protection and conservation. To understand how to encourage participation in recycling activities, the current research investigates the role of public disclosure of individual behavior in promoting recycling.

The objective of this paper is to explore non-monetary incentives affecting the decision to engage in recycling activities at the household level, involving costly and time-consuming effort. This is motivated by broad anecdotal evidence from developing countries suggesting a key role for social sanctions and rewards in promoting prosociality in informal settings, like community organizations. In particular, we investigate the hypothesis that people can be motivated by feelings of pride, shame or both when their behavior is disclosed to their neighbors. Moreover, we also explore whether shame or pride is the more effective mechanism in enhancing pro-environmental behavior. Finally we also test whether an environmental regulation crowds recycling effort in or out, particularly for those already committed to the task.

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We use a modified public goods experiment to study the effect of exposing behavior that falls below a set threshold of acceptable effort. While the threshold for adequate behavior is oftentimes endogenous in real life, the threshold in our own experiment was determined ex-ante and set by the experimenter. The use of a threshold was motivated by the fact that a municipal solid waste management program based on separation at the source (household) requires a minimum level of effort by a significant number of households, as otherwise the high fixed costs associated with waste management might render the whole program financially unviable for the municipal government.

In our field experiment, people participated in a series of one-shot, modified threshold public goods games. In a typical threshold public goods game, participants are given a certain endowment that they may either contribute to a public good or keep to make up their personal payment. Only if a group of participants collects a pre-announced target is the public good provided, and its payoff is evenly divided among the group. However, if contributions are insufficient, the public good is not provided and any contributions are lost. In some variants of the game, the contributions are refunded if the target is not met (Marks and Croson, 1998). To our knowledge, only a few experimental studies have examined the determinants of local public goods provision in developing countries with a threshold involved. For example, De Hoop et al. (2010) shows that people are willing to contribute substantially to a health education program in Peru which is only realized if the cumulative investment surpasses a certain threshold value. Carlsson et al. (2010) study the impact of social influence on individual willingness to contribute to the funding of a bridge in a rural village in Vietnam and find significant and substantial effects when reference information on the behavior of others is provided. For example, if the reference level is zero contribution, this reduces average donations by almost 20%.

These previous field experiments focus on typical donations with the possibility of a refund, thus ignoring the fact that much individual pro-environmental behavior, in particular household recycling effort, is devoted to goals that exclude the possibility of refunding: once significant effort is spent sorting the household's waste, that effort cannot be undone if the municipal government fails to deliver on the promise of keeping waste separated for final disposal or reuse. In our experimental design, we implement a field experiment involving contributions to a real community project under different incentive structures. The situation was framed as a decision on how much effort (time) to dedicate to recycling, since time is likely to be the largest cost associated with sorting solid waste in a household. If a group of four participants reached a minimum total time dedicated to recycling, the monetary value of that time was then donated to fund an education program in the community aimed at encouraging solid waste management. If the threshold was not met, the value of the recycling effort was not donated, neither refunded, and hence was lost. In terms of our frame, if families do not support the program with their effort so that the threshold is met, then the municipal solid waste management program collapses and all the effort goes to waste. Our three treatments consisted of one designed to expose groups below the threshold (shame treatment) and a second one aimed at rewarding those above the threshold (pride treatment). Moreover, we compare these results to a treatment with an environmental regulation mandating a minimum contribution to the public good. In this way, the impact of an external intervention on intrinsic motivation can be examined. We also asked participants to fill out a questionnaire in order to assess the effect of individual characteristics and social context on experimental outcomes.

We find that disclosure of information leads to approximately 20–30% higher investments in conservation, demonstrating that both shame and pride can increase pro-environmental behavior. Surprisingly, we observe that negative information provision in the form of shame and disapproval results in higher average contributions to the public good compared to the pride treatment. We also find that a standard environmental regulation can crowd in pro-environmental behavior

(i.e. more recycling takes place above and beyond the minimum regulated mandate), probably as a result of eliminating the risk of not meeting the threshold. Our insights point the way toward effective communication strategies to increase recognition of pro-environmental behavior and motivate public support for environmental conservation policies.

The premise in these papers that efforts to design successful environmental policy instruments and regulations may want to consider the role of pro-social motivations underlying sustainable and unsustainable behaviors. Pro-sociality can be defined as a behavior that benefits others at a cost to oneself (Andreoni, 1989; Rabin, 1993; Fehr and Fischbacher, 2003; Bénabou and Tirole, 2006). Recent studies have investigated the important implications of pro-social behavior for environmental conservation, i.e. pro-environmental behavior (Stern, 2000; Biel and Thøgersen, 2007; Hage et al., 2009; Steg and Vlek, 2009). Experimental evidence affirms the significance of pro-social motivation in environmental conservation, such as sustainable harvest from common-pool resources or investments in climate change mitigation (Ostrom et al., 1994; Milinski et al., 2008).

There may be different motives for individuals to behave pro-environmentally. Deci (1972) argues that an individual's intrinsic motivation, a form of impure altruism (Andreoni, 1989), is the main motivator of individual behavior. Related social preferences like fairness or reciprocity are other explanations (Fehr and Schmidt, 1999; Gintis et al., 2003). Extrinsic motivations (taxes, charges, levies, subsidies) that alter cost-benefit ratios will also shape an individual's motivation to behave pro-environmentally, although not always as expected. A growing literature predicts that such external incentives can conflict with intrinsic motivation and could partially or wholly crowd out environmental preferences (Frey, 1997; Cardenas et al., 2000; Gneezy and Rustichini, 2000; Heyman and Ariely, 2004; Ariely et al., 2009).

Research in behavioral economics and social psychology suggests that social interaction shapes pro-social environmental behavior too. In fact, many people engage in pro-social behavior in order to improve their image and reputation, hoping to feel proud or trying to avoid feelings of shame (Gächter and Fehr, 1999; Rege and Telle, 2004; Semmann et al., 2005; Bénabou and Tirole, 2006). In this sense, pride and shame can be classified as moral emotions or sentiments able to promote prosociality (Goldberg, 1991; Haidt, 2003). Similar behavioral effects have been found for other (negative) emotions such as guilt. For example, Ketelaar and Au (2003) find that individuals are more likely to cooperate in social dilemmas when they experience guilt. These findings suggest that social interactions, including feelings of pride, shame and others, may be an effective strategy to foster more environmentally friendly behavior when such behavior is the social norm (Stern, 2000; Markowitz and Shariff, 2012).

Shame and pride are common forms of social sanctions and rewards to encourage desired behaviors. For example, the best and worst students in schools are often disclosed and singled out in front of their entire class. In Mexico, the worst-performing student has to wear "orejas de burro" (donkey ears) during class time to signal his/her negative evaluation by the teacher to others, while the best student is awarded with a crown to positively stand out from others. Such rules or "policy" is supposed to motivate students to learn and strive for better achievements. Another example from Latin America is that small shopkeepers in Costa Rica publish the name of the largest debtors on a list posted next to their cash counters. This reflects the assumption that feelings of shame and guilt are strong incentives to shape behavior, even when monetary incentives like fines or interest on the debt fail to do so.

Our study contributes to several strands of literature. First, there are a number of studies that employ information disclosure to motivate cooperative behavior and investigate its impact on public good provision in the laboratory as well as in the field. One prominent example is Rege and Telle (2004) who use a one-shot public goods game where all subjects' identities were revealed after contribution decisions were made. Contributions increased from 34.4% in the treatment without disclosure

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