Local leadership and the voluntary provision of public goods: Field evidence from Bolivia *

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May 21, 2013

Abstract

We conduct a controlled field experiment in 52 communities in rural Bolivia to investigate the effect that local authorities have on voluntary public good provision. In our study, community members pool resources to provide environmental education material for local schools. We find that voluntary contributions increase when democratically elected local authorities lead by example. The results are driven by two factors: (1) individuals give more when they are called upon to lead than when they give in private, and (2) high leader contributions increase the contributions of others. Both effects are stronger when authorities, as compared to randomly selected community members, lead by example. We explore two underlying channels of leadership influence. First, we show that leaders signal information about the quality of the public good through their contribution decisions. Second, we explore how leader characteristics affect the likelihood that others follow. Specifically, our study shows that randomly selected community members are more influential the more they resemble authorities on observable characteristics.

*We thank Fundación Natura, the Sustainability Science Program at Harvard University, and the Agricultural Technology Adoption Initiative for support. Nigel Asquith, María Teresa Vargas and the rest of the staff at Natura provided invaluable support and guidance. Nava Ashraf, Sarah Jacobson, Lee Benham, Mushfiq Mobarak, Mary Shirley, Lise Vesterlund, Randy Walsh and audience members at Harvard, University of Wisconsin - Madison, University of Pittsburgh, Yale, the AERE summer meeting, the SITE experimental workshop, ESA, NTA,NEUDC, and the CAGE Conference on Generosity and Wellbeing provided useful comments. We thank Blaine Pellicore and Filipe Miranda for research assistance.

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1 Introduction

Leaders play a central role in the resolution of collective action problems. Existing evidence demonstrates that leaders affect growth at the aggregate level (Jones & Olken 2005) and influence the choice of public goods provided at the local level (Chattopadhyay & Duflo 2004). Most studies of leadership and public good provision focus on public goods that are provided by the government.[1] Less is known about the effects that leaders have on the voluntary provision of public goods. Recent work has shown that leaders can affect voluntary contributions at the local level through informal taxation (Olken & Singhal 2011), sanction enforcement (Grossman & Baldassarri 2012), and reciprocity (Beekman *et al.* 2011). This paper examines another mechanism by which leaders may affect voluntary contributions to local public goods: leadership by example.

In a voluntary contribution setting, leadership by example arises when individuals make sequential decisions, and the choice made by the first mover (the leader) influences the contributions of others. A substantial theoretical and experimental literature has shown that leaders can affect voluntary contributions in sequential decision settings through free-riding (Varian 1994), information signaling (Hermalin 1998; Vesterlund 2003; Potters *et al.* 2005; Hermalin 2007), reciprocity (Andreoni *et al.* 2002; Meidinger & Villeval 2002; Potters *et al.* 2007; Gächter *et al.* 2010b; Bag & Roy 2011) and social status (Kumru & Vesterlund 2010; Eckel *et al.* 2010). Due perhaps to the challenges presented by the empirical identification of leadership influence in field settings, these findings have not been tested outside of the laboratory. No study has examined how the example set by actual leaders affects the voluntary contributions of the groups they lead. Our paper begins to fill this gap in the literature by conducting a randomized field experiment in rural Bolivia that investigates two questions: (1) Do local leaders (authorities) affect voluntary public good provision through their example?, and (2) If so, why? Our experiment examines the effect of leadership on the contributions of both leaders and followers, and empirically identifies information signaling about the quality of the public good as a causal mechanism explaining leadership influence.

Our study implements a controlled field experiment in 52 socially and politically independent communities, each of which has its own elected local authority.[2] In our experiment,

[1] Chattopadhyay & Duflo (2004) study the effect of female leadership on policy decisions in India; Reinikka & Svensson (2004) investigate the political capture of public education funds in Uganda; Humphreys et al. (2006) study leadership influence on public deliberations about future public resource use in São Tomé and Príncipe; and Besley et al.(2012) analyze political influence in public resource allocation decisions in India.

[2] We refer to the elected local leader as the "authority" to differentiate the leadership role assigned in the experiment from the formal authority position elected local leaders occupy at the community level.

a representative sample of community members pool resources to provide environmental education books for the local school.[3] We employ a between-subject design that solicits voluntary contributions in a natural decision setting and compare public good provision when an authority makes an initial public voluntary contribution and everyone else makes a private voluntary contribution after observing the authority's choice to two types of controls: one in which a randomly selected community member makes an initial public contribution and one in which all contributions are private. Two of the three treatments are implemented simultaneously in each community, which facilitates the use of fixed effects to address unobservable community-level confounds.

Our results show that local authorities increase average voluntary public good provision when they lead by example. The effect is unique to authorities; randomly selected individuals have little effect on overall giving when they lead. We decompose treatment effects into leader and follower responses to leadership. Our results show that authorities not only contribute more than non-authorities when they lead, they also have a significant influence on follower contributions. While high (low) authority contributions increase the probability that others make high (low) contributions relative to the simultaneous contribution setting, randomly selected leaders influence the contribution decisions of others only when their contributions are high. Since authority leaders make higher average contributions than do randomly selected community members, the positive influence they generate on the contribution decision of others is in part explained by the size of their contributions.

We offer two pieces of evidence on why leaders affect public good provisions in our setting. First, our design empirically identifies information signaling about the quality of the public good as a mechanism through which leaders influence followers. We exogenously vary whether or not participants receive information about the quality of the public good. Informed participants are less responsive than uninformed participants to the example set by randomly selected leaders, but not to the example set by community authorities. This result suggests that other mechanisms such as social status or reciprocity may also contribute to the observed authority leader effects. Second, we examine the relative importance of the authority's formal leadership position in the community and his or her observable characteristics. In our study, community members randomly selected to lead who are similar to local

[3]Environmental education books provided through the experiment are accessible to all community members (non-excludable), but exhibit rivalry. We believe that they approximate a pure public good due to the educational and environmental awareness benefits that the books provide, as well as the positive externalities that voluntary contributions generate on all those who care about the provision of environmental education material in the local school.

authorities on observable characteristics both make higher contributions to the public good and have a greater influence over the contribution decisions of others, i.e. they have the same effect on provision as authorities in a leadership role. This finding provides suggestive evidence that authorities are influential because of the types of individuals they are, not just the formal position they hold.

Our study is the first to examine how local authorities affect voluntary public good provision without the use of sanctions or coercion and thus makes several contributions to the literature on leadership and public good provision. First, we empirically identify leadership by example as a mechanism through which local authorities can affect the voluntary provision of real public goods in a development setting. Second, we show that the leadership influence of local authorities on aggregate public good provision is explained both by their own contribution and the effect that they have on the contribution decisions of others. Third, we offer novel support for one of the most studied channels underlying leadership by example – information signaling – but show that its empirical relevance depends on who is in the leadership role. Finally, we provide suggestive evidence that authorities are influential both because of the formal leadership position that they hold and because of their observable characteristics; traits such as education and wealth, which are correlated with several potential mechanisms of authority influence, matter.

Our study relates to a small but growing number of controlled field studies that examine the relationship between leaders and public good contributions in developing countries. Using public good games in the field, Grossman and Baldassari (2012) find that individuals elected within the experiment – who are not local authorities – are more effective at sanctioning low voluntary contributions to public goods, while Beekman et al. (2011) show that voluntary contributions are lower in communities that have corrupt officials. More similar to our study, d'Adda (2012) conducts an artefactual field experiment in 6 villages in rural Colombia that investigates how social information interacts with social status, defined endogenously along leadership dimensions, in a repeated voluntary contribution setting. Her results show that high status individuals (leaders elected within the experiment) are more likely to make high contributions and are less influenced by the contribution decisions of others. Our study is unique in this literature in that we study actual authorities, vary leadership exogenously, and use a one-shot setting in which voluntary contributions acquire an actual public good and in which both leaders and followers can react to leadership.

In trading off the the control of the laboratory for the realism of the field, our study

encounters some limitations. First, in order to investigate both leader and follower response to leadership we allow leader contributions to arise endogenously in our experiment. This design feature reveals whether or not authorities take advantage of leadership opportunities, but prevents us from cleanly separating the effect of leader contributions from leader type when analyzing follower responses. Second, a small number of communities could not comply with treatment randomization for idiosyncratic reasons. Our findings are robust to correcting for any resulting selection bias.

The paper proceeds as follows. Section 2 offers a conceptual framework for leadership in public goods provision. Section 3 describes the experimental context and design. Section 4 describes the main results and Section 5 concludes.

2 Conceptual framework

Early literature on sequential giving showed that leadership by example is weakly detrimental for voluntary public good provision when information is perfect and individuals are solely motivated by altruism (Varian 1994). This result emerges because the positive externalities generated by public goods introduce a free-riding incentive that induces first movers, leaders, to make low initial contributions that force followers to provide the public good. A number of subsequent studies have, nevertheless, shown that sequential giving can be beneficial for public good provision. The theoretical and experimental literature has identified three primary classes of mechanisms underlying these positive results: information signaling, social preferences, and social status. Although our study focuses specifically on information signaling, because several other mechanisms may be active when authorities lead by example, we provide an overview of all the channels by which actual leaders may influence the voluntary contributions of the groups they lead.

Within information signaling, sequential giving can have beneficial effects on voluntary public good provision when at least one of two types of uncertainty are present: (1) uncertainty about the common value or quality of the public good, and (2) uncertainty about private valuations of the public good. If the value of the public good is uncertain and the leader has an informational advantage over others, he or she may signal such information through his or her contribution decision (Hermalin 1998; Vesterlund 2003; Potters *et al.* 2005; Andreoni 2006; Hermalin 2007).[4] The leader can signal if a public good is of high

[4]Hermalin (1998) does not explicitly investigate information signaling in a voluntary contribution setting, he examines effort provision in teams. Information signaling has also been studied within the context of

(low) value by making a high (low) contribution that induces others to follow. Although level predictions are conditional on the underlying information in the hands of the leader, information signaling is always welfare enhancing in this setting. For any level of uncertainty regarding the quality of the public good, if individuals have independent private valuations for the public good and such information is not common knowledge, then leadership by example can positively affect public good provision through the resolution of the underlying strategic uncertainty (Bag & Roy 2011).

Within the second class of mechanisms, sequential giving can positively affect public good provision when individuals have social preferences that include reciprocity, equity, and fairness concerns (Meidinger & Villeval 2002; Huck & Rey-Biel 2006; Potters *et al.* 2005, 2007). Leaders who make high contributions crowd-in the contributions of subsequent movers. They cannot use their first mover advantage to free-ride (as in Varian 1994) because reciprocal followers punish free-riding at a cost.[5] Social preferences could even transform the social dilemma into a coordination problem (Bicchieri 2005). In such a case, sequential giving can be beneficial for coordination by improving equilibrium selection in groups.

Within the third class of mechanisms, social status can explain why leadership by example can be beneficial for public good provision when individuals with high social status lead and followers like to be associated with high status others (Kumru & Vesterlund 2010) or want to acquire status (Bracha *et al.* 2009).[6] Status can also be modeled as the location individuals occupy in a social network (center vs. periphery), and explain leadership influence on voluntary contribution decisions through the number of agents that observe the leader's choice (Eckel *et al.* 2010).[7]

What is the effect of leadership by example on public good provision in the field, when a local authority assumes the role of first mover? Do Varian's (1994) free-riding predictions

matching grants in charitable giving (Karlan & List 2012). The form of leadership we study requires that leaders set an example by making a costly and unrecoverable contribution before others.

[5]Andreoni *et al.* (2002) and Gächter *et al.* (2010a) compare simultaneous and sequential giving in the laboratory when information is perfect and show that although leaders try to free-ride off of followers, followers punish free-riding by giving less than their best response function predicts.

[6]Related to this literature is the work on prestige and visibility motives for giving. See Harbaugh (1998), Ariely *et al.* (2009) and Karlan & McConnell (2012).

[7]Several papers have investigated the importance of networks within the context of coordination games (Eckel & Wilson 2001, 2007) and have shown that high status leaders affect equilibrium selection. This is particularly true in the theoretical model of Bala & Goyal (1998), who examine learning in a setting in which agents do not know their payoffs but observe the actions of neighbors and members of a "royal family" that is observed by everyone.

hold or are effects consistent with one or more of the channels underlying positive leadership by example effects? Each of the mechanisms that allow leadership to positively influence public good provision may be active when any individual leads by example, but the existing literature suggests that effects should be amplified when a local authority leads.

For example, authorities may possess superior information about the value of the public good. They may have been elected precisely because of this informational advantage, or may have acquired such information through their formal leadership role.[8] Authorities may generate more reciprocity among community members due to their authority position and may even cause a reduction in strategic uncertainty when coordination incentives are present. Authorities may have higher social status than the average community member. They may be wealthier, more educated, and even possess higher social status as a direct result of the formal leadership position they occupy in the community. Finally, other factors such as legitimacy and motives unrelated to leadership influence, may also affect local authorities' influence when they lead.[9] These mechanisms are not mutually exclusive and our empirical identification of information signaling does not rule out the relevance of other drivers of leadership effects in the field.

3 Experimental design

We employ a between-subject design with three treatments that (a) identifies the effect authorities have on voluntary public good provision when they lead by example, (b) distinguishes the influence of the example set by authorities and non-authorities in the community, and (c) isolates the importance of one of the most studied mechanisms behind leadership by example: information signaling. Before turning to the details of the experiment and its implementation, we describe the study setting, which informs our design.

[8]Formal authorities attend workshops and meetings organized exclusively for local leaders and have experience making decisions on behalf of the community. Miller and Mobarak (2011) study this informational channel of leadership influence within the context of opinion leader influence on technology adoption decisions in Bangladesh. They show that when opinion leaders (including formal authorities) unanimously decide to adopt a new technology, the likelihood of adoption by other community members increases.

[9]A small number of papers have have shown that legitimacy increases leadership influence and voluntary public good provision in laboratory settings (see, for example, Baldassarri & Grossman 2011; Levy *et al.* 2011). Among motives that are unrelated to leadership, authorities could be more imaged concerned (Benabou & Tirole 2006) than non-authorities, could value the public good more by virtue of the position they occupy in the social network (Nielson & Wichmann 2012).

Study setting

The experiment was conducted in 52 communities located in the Rio Grande-Valles Cruceños region of Bolivia, in collaboration with a non-governmental organization, Fundación Natura. The setting is useful for the study of leadership by example in public good provision for three reasons. First, decentralization in Bolivia extends all the way to community level administrative units called Organizaciones Territoriales de Base (OTBs).[10] OTBs are independent social and political units; in our study setting they are small in size, meet regularly as a group, and are poorly integrated with outside markets. Each OTB has an elected representative (OTB president) who serves as the formal authority in the community. OTB presidents are elected in public meetings through majority vote. They are in charge of requesting funds from the municipal government, of developing local projects, of interacting with outsiders, and of organizing collective work. The fact that these authorities exist in all communities allows us to analyze the behavior of OTB presidents both in and out of a contribution leadership role.

Second, a detailed census of 130 communities was conducted in the area by Fundación Natura in 2010. The census includes household and community level information that facilitated the randomization of communities and households into treatment, and provides us with the controls used in our analysis of experimental results.

Third, political parties and organizations have little presence in the area.[11] Anecdotal evidence indicates that OTB presidents do not actively seek office and have no intention of pursuing a political career. They accept the authority position when selected by their peers, but find the responsibility costly in terms of the effort and time. We consider this beneficial for our study because it mitigates political factors that might confound our experimental design.[12]

The experimental design uses a naturally occurring decision setting – a community meet-

[10]We use the term OTB and community interchangeably in the remainder of the paper because each community in our study is considered a separate OTB. Communities in the study sample contained an average of 26 households.

[11]Sixty percent of households in our study (located in 51 communities) indicated in the 2010 census that political syndicates do not exists at the OTB level. Six out of 41 local authorities indicated that they attend political syndicate meetings, but none indicated that they have occupied authority positions at the syndicate level in the past. Only 4 out of the 580 individuals who participated in our study indicated that they had held authority positions at the syndicate level.

[12]It also may increase the likelihood of observing leadership by example effects in our setting. Given the lack of evidence on leadership by example in the field, establishing its empirical relevance is best done in a setting where it is likely to affect public good provision.

ing – to solicit contributions to environmental education books for the local school.[13] Environmental education books were chosen as the public good in our experiment for several reasons. First, all communities in our study have a local primary school, where any community member can access books. Second, 40 percent of households in our study site identified environmental protection as one of the top values that should be taught to children in the community. All communities are located inside a watershed that was declared protected in 2007 due to severe soil erosion caused by agricultural practices. Environmental issues such as trash, water pollution, and soil erosion are thus very salient in the area. Third, although environmental education books are not a pure public good, they exhibit several relevant characteristics: books are non-excludable, generate social spillovers,and impose a positive externality on anyone who cares about the provision of environmental education material in the local school.[14]

From a practical perspective, books made it possible for us to examine voluntary contributions to a local public good in a setting in which even small contributions could ensure positive levels of public good provision. They also minimized trust confounds by allowing us to deliver the public good on site at the end of the experiment. The books used in the experiment were purchased from a non-government organization that specializes in producing environmental education material in Bolivia. Seven different books were available, and were sold at a zero-profit price of 10 Bs. per book.[15]

Treatments

Our experiment employs a between-subject design with three treatments. In each treatment, subjects complete a survey in exchange for money and are subsequently given the opportunity to make a voluntary contribution to environmental education books for the local school.

The treatments vary the way in which community members make voluntary contribution decisions. In a **No Leader Treatment (NL**), individuals make private simultaneous con-

[13]Community meetings occur regularly in our study setting, and are organized through local authorities to address community business or at the request of outside individuals or organizations. We followed the standard approach to organizing a meeting, and therefore consider it a natural decision setting.

[14]All community members can have access to the education material available in the local school. Teachers are present in the school during weekdays and can grant school access. Community authorities and members of the parent-teacher association also have keys to grant school access when teachers or school administrators are not present.

[15]The books included colored images and text with questionnaires to check the reader's understanding. Qualitative evidence gathered through focus group discussions at the pilot stage indicates that most participants perceived the value of the public good to be high. They described the books as addressing an important topic, of high quality, and appealing to children.

tributions to the local public good. In a **Random Leader Treatment (RL)**, a randomly selected individual is asked to make his or her voluntary contribution publicly. In an **Authority Leader Treatment (AL)**, the formal community authority is asked to make his or her voluntary contribution publicly. In both the RL and AL treatments, everyone else makes a private voluntary contribution decision after observing the contribution leader's public choice.[16]

The NL treatment establishes a benchmark scenario that we use as control in our experiment. Comparison between NL and AL determines if local authorities affect voluntary public good provision through their example. Comparison between the RL and AL treatments determines whether AL treatment effects are specific to authority leaders or are a generic response to leadership. We conduct two simultaneous treatments per community and use fixed effects to control for community characteristics that may affect both leader and follower contribution decisions.

The design introduces an **information manipulation** in all treatments that gives half of all participants, and always the contribution leader, the opportunity to inspect the public good before making a voluntary contribution decision.[17] The information manipulation identifies the extent to which information signaling about the quality of the public good explains leadership influence in this setting. If the leader's contribution conveys information about the value or quality of the public good then uninformed follower contributions should move in the direction of the leader's contribution (Vesterlund 2003; Potters *et al.* 2005, 2007; Andreoni 2006). The effect should be muted or reversed for informed followers, who do not need to rely on the leader's contribution to update their beliefs about the quality of the public good.[18] Comparison of uninformed and informed follower decisions within treatment tell us whether information signaling drives the effect that leaders have on follower contributions. Comparison across leadership treatments informs us about the differential importance of information signaling for each type of contribution leader. While several mechanisms discussed in Section 2 look similar across leadership treatments, none other

[16]We use the term contribution leader to refer to the first mover: the randomly selected individual in the RL treatment and the authority in the AL treatment.

[17]The information manipulation was implemented in such a way that informed agents knew who else was able to inspect the public good, but uninformed agents had no knowledge of the informational advantages possessed by others.

[18]Of course, visual inspection may not resolve all uncertainty about the quality of the public good, in which case, informed followers will look more like uninformed followers in their response to leader contributions. A negative correlation between leader and follower contributions should arise when all informational assymmetries are eliminated, social preferences are absent, and free-riding incentives dominate (Varian 1994).

than information signaling result in a differential follower response by information condition.

Randomization

We used household and OTB level data from the 2010 census of study communities to balance treatment assignment. OTBs included in the census but missing OTB-level information or without a local primary school were excluded from our study, as were communities smaller than 15 or greater than 80 households in size. The final eligible sample consisted of 52 OTBs.

OTBs were randomly assigned to one of three possible pairwise combinations of the NL, RL and AL treatments and 12 households from within each community were randomly sampled for participation. The randomization balance for OTB and household variables was tested for each of 1000 draws and the draw with the minimum maximum t-statistic for any single variable was used as the final study sample (Bruhn & McKenzie 2009).[19] The largest resulting t-statistic associated with treatment assignment was 1.50, associated with balance by municipality. The randomization process delivered both balanced characteristics across treatment and a representative sample of households for participation in the study.

Implementation

The study team visited each community 4 to 7 days prior to the intervention. The team met with community leaders, scheduled the experiment, and delivered invitations to a "meeting organized by researchers from Universities in the United States."[20] Written invitations were delivered in person to the heads of the 12 households selected through the randomization process in each community, which always included the OTB president.[21] At the time of

[19]Randomization was balanced at the household level on: the number of rooms in a house, the education of the household head, the number of children under 16 per household, a stated preference for instilling environmental values in children, perceptions of community cooperation and decision-making, attitudes toward outsiders and participation in past community meetings. The distance to market, the number of households in the community, and the municipality were all balanced at the community level. We use the balancing variables as controls in most cases. In the analysis, a few variables are replaced with superior measures of the underlying characteristic of interest, such as the use of assets instead of number of rooms as a proxy for wealth.

[20]We did not use the word experiment and deliberately called sessions meetings in order to facilitate the understanding of the study and minimize potential experimenter demand effects. Community meetings in the study area are always organized with community leaders. We followed conventional protocol in setting up meetings.

[21]Attrition could occur at the invitation stage if a household selected through randomization could not be located for invitation delivery. A household selected for participation required a substitute at the invitation stage if it had moved from the community or if no adult representative was available. A list of randomly chosen substitute households was used to identify replacements.

invitation, individuals were told that they could earn up to 45 Bs. for attending the meeting and that only one person per household could attend.[22] On the day of the experiment, invited households were reminded of the time and location of the meeting. If households informed the study staff that they would not attend, a new household identified from the list of alternates generated through randomization was invited to participate.[23]

Two types of attrition affect the final study sample. First, selection into the study occured before the experimental session was conducted and thus does not affect the internal validity of our results. Appendix table A.1 provides a description of how the sample of households selected through randomization differs from the final sample of participants. Second, selection into treatment occurred in 6 communities assigned the authority leader treatment (AL), in which the authority was not present.[24] Authority absences were in large part idiosyncratic; they were not present the day of the experiment because they had to attend classes in the municipal capital, had to take care of medical emergencies, or were away harvesting crops. No systematic differences between sessions selected into and out of treatment are detected in our data (see Appendix table A.2). The resulting balance in the characteristics of participants is shown in Appendix table A.3. The Authority Leader treatment has fewer females and participants in the No Leader treatment have slightly fewer assets. These results persist when community fixed effects are included and are partly driven by the fact that authorities differ from other communities on a number of observable characteristics, which include assets and gender, and are more often present in the AL treatment (See Appendix table A.4).

Each experimental session consisted of three parts and took place at the local school or in another centrally located community building. Throughout the implementation, efforts were made to keep the process similar to a typical community meeting.

In **Part 1** of the meeting, individuals arrived to the designated meeting place, registered, received an envelope, an ID number, and consent forms. IDs ranging from 0 to 11 were distributed at random to participants with the exception of ID 0, which was always given to the OTB authority.[25] Subjects were then informed that they would earn 35 Bs. by com-

[22] 45 Bs. is approximately 6.50 US dollars and is equal to the daily wage for agricultural work in the study setting.

[23] In select cases, no alternates from the list were available and substitutions were based on convenience. Convenience replacements were made in 19 cases.

[24] In 5 communities the authority was not present in the community to participate in the experiment. In one community the authority refused to participate.

[25] The subject that was randomly assigned ID 6 acted as contribution leader in the RL treatment. Like the authority, the subject with ID 6 was not aware that he or she would have a special role in the experiment.

pleting a questionnaire and 10 Bs. by attending the full meeting. At the time of soliciting consent, subjects knew that they would be asked survey questions but were not aware that they would be asked to make a voluntary contribution decision. Part 1 of the experiment took approximately 20 minutes.

In **Part 2**, subjects were split into two groups based on their ID number, which allowed more seating space for each of the participants while also facilitating the implementation of two simultaneous treatments. The experimenter and assistant were rotated to ensure balance across treatments. In each group, subjects completed a survey containing questions unrelated to the study in exchange for their experimental earnings.[26] Questions were read out loud to participants, who answered using paper and pencil.

Regardless of the answers provided, all subjects were given 35 Bs. in 5 Bs. coins upon completion of the survey. Participants with even ID numbers were then asked to step out of the room; contribution leaders aways had even ID numbers. Even numbered subjects were shown the environmental education books and given the opportunity to inspect them, but were not told how the books would be used in the session. Subjects with odd ID numbers were not told the purpose of this interruption, but were asked to answer one additional survey question to pass the time.[27] Participants with even IDs returned to the room after 5 minutes.

Following the information manipulation, the contribution decision was presented to subjects. Subjects were told that the money earned by completing the survey was theirs to keep and that they could contribute as much or as little as they wanted to environmental education books for the local school. Books were displayed in front of the room and subjects were given general information about their cost and content. They were informed that for every 10 Bs. contributed by all community members (in both sessions of the experiment) the school would receive one book.[28] Participants knew that 7 different volumes of the books were available and that they would be delivered on-site at the end of the experiment.

To make their voluntary contributions, subjects were asked to place the money they wished to contribute in an envelope that had their ID number marked on the inside. Con-

[26]The 17 survey questions covered topics such as place of birth, places they visit to access markets, seek medical attention, and make legal transactions.

[27]The survey question asked participants to indicate the communities they had visited the previous year. None of the 580 participants questioned the purpose of the interruption.

[28]Participants were additionally informed that contributions would be rounded up if the total amount contributed by all participants was not a multiple of 10. This ensured that we never kept any of the contributions made by subjects.

tribution decisions were done in private behind a cardboard partition. If the session was assigned the Random Leader or the Authority Leader treatment, the contribution leader – referred to by his or her ID number – was asked to demonstrate the process to others and to publicly announce the amount of his or her contribution as it was placed in the envelope. All other participants were called one by one to make their private voluntary contribution in the back of the room.[29] The order by which subjects were called upon to make their contributions depended on the seating arrangement. No talking was allowed among participants while contribution decisions were being made.

After all participants made their contributions, subjects were asked to complete a survey with 6 questions on household socio-demographics and perceptions of teaching quality in the local school.[30] Once the final survey was completed, subjects received a 10 Bs. show up fee. This marked the conclusion of part 2, which took approximately 60 minutes.

Part 3 of the experiment started once both experimental sessions were over. All participants returned to the same room and the total amount contributed by subjects was announced. The environmental education books were counted in public and given to the community authority or school representative in front of all subjects. The final part of the experiment took approximately 10 minutes. The entire session lasted between 90 and 120 minutes.

4 Results

We observe the decisions of 580 subjects in 104 sessions of the experiment, which were conducted between May and July 2011. Each session included between 4 and 6 subjects; a total of 9 to 12 individuals participated in the experiment in each of the 52 communities included in our sample.

Figure 1 shows histograms of contribution decisions by participant type and leadership treatment.[31] The top panel of the figure suggests a pattern of first order stochastic domi-

[29] All subjects knew at the time they were making their contribution decisions that their contributions would not be revealed to anyone, including the local authority. This was done to ensure that contributions would not be affected by anticipated sanctioning.

[30] The purpose of these questions was to collect individual-level information that was not available through the census or was outdated. The census was conducted almost a year before the experiment and asked questions only to the household head.

[31] Contributions are classified in 5 Bs. bins that reflect the monetary unit used to pay subjects in the experiment. A small number of subjects made contributions using their own coins. These are rounded to

nance of contributions in the AL treatment over the RL treatment, which in turn dominates the NL treatment.[32] Breaking this down by participant type, authority contribution leaders appear to give more than individuals randomly selected to lead by example (Panel B), and contribution leaders appear to make higher contributions than followers (Panel B vs. C).[33]

Although the raw data suggests that public good provision increases in the presence of a leader, these results are informative only of aggregate outcomes. Observable and unobservable factors that may drive both leader and follower contributions are not accounted for. To estimate treatment effects we thus regress contributions on the leadership treatments and a vector of individual and session level controls, include community fixed effects, and cluster standard errors at the community level. Even after controlling for fixed effects, individual-level controls are potentially important in our parametric analysis of results given the selection into treatment discussed in Section 3.

We use both a continuous and a binary measure of individual contributions as the dependent variable and estimate treatment effects using OLS. The binary variable divides contributions at the median and allows for a non-linear response to leadership by example. The median contribution is 5 Bs., and giving is divided in 5 Bs. increments, so giving above the median also represents making the minimum contribution that has a direct impact on public good provision. To take into account the fact that payment was disbursed in 5 Bs. units, we also present estimates of treatment effects that use an ordered logit model with fixed effects. We follow Baetschmann *et al.* (2011) and let the ordinal measure of giving acquire values $k \in \{1, 2, 3, 4\}$ when contributions fall in $[0, 5)$, $[5, 10)$, $[10, 15)$, and $[15, 40]$ respectively.[34]

In our main analyses, we assume that the selection documented in the implementation section is idiosyncratic. Robustness checks that take into account selection into treatment, including an instrumental variables strategy or restriction to the compliant sub-sample of communities, are presented in Section 4.3 and are consistent with our main results.

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the closest 5 Bs. interval in Figure 1 but not in the remainder of the analysis.

[32] Wilcoxon Mann-Whitney rank sum tests reject the null hypothesis that the contributions of all participants in AL and NL or RL and NL were drawn from the same underlying distribution ($p < 0.01$ and $p = 0.09$ respectively). Differences between AL and RL are not statistically significant; the Wilcoxon Mann-Whitney rank sum test has a p-value $p < 0.15$.

[33] Wilcoxon Mann-Whitney rank sum tests provide p-values <0.05 and <0.01 respectively.

[34] Baetschmann et al. (2011) use "blow up and cluster" (BUC) approach to estimate the model using all possible dichotomizations of the dependent variable. They generate $K - 1$ copies of each observation, collapse the dependent variable along all possible dichotomizations, and jointly estimate the model under the restriction that the coefficients of the explanatory variables are constant across cutoffs.

4.1 Main results

We begin by analyzing the effect of leadership by example on total and individual contributions, then split the analysis to focus on the behavior of leaders and on the response of followers. We explore treatment heterogeneities that help to explain the mechanisms underlying the main results, including information signaling and leader characteristics. We conclude our analysis with a series of robustness checks. All tables show results with and without controls, though we discuss the specifications that include controls in the text.

Total contributions

Table 1 presents regressions of session level contribution outcomes on treatment indicators, with community fixed effects and standard errors clustered at the OTB level. Relative to simultaneous giving, having an authority lead by example increases the total contributions in an experimental session by 9.11 Bs. (s.e. 4.92), or approximately one environmental education book (column 2). This translates to an average individual-level increase of 1.07 Bs. (s.e. 0.74) (columns 34) and a 0.15 (s.e. 0.07) increase in the probability that individual contributions are greater than or equal to 10 Bs. (column 6). The ordered logit specification (column 8) shows that having an authority lead by example increases the log odds that individual contributions fall in the next 5 Bs. giving bin by 0.63 (s.e. 0.28).

Treatment effects differ by the type of contribution leader. Community members randomly selected to lead by example do not affect total contributions to the public good (columns 1 through 4). The coefficients on the RL treatment are negative and imprecisely estimated. Random leaders do, however, increase the probability that contributions exceed the median by approximately 9 percent (column 6). The ordered logit specification shows small and insignificant effects (column 8), which indicate that the increase is not present across the rest of the distribution. The RL and AL coefficients are statistically significantly different from each other in all but the linear probability model of giving 10 Bs. or more (column 6). Leadership by example has a consistent and positive impact on provision only when an elected local authority leads.

Having established that authorities increase public good provision when they lead by example, we turn next to the analysis of why authorities increase total public good provision. The effect could be driven by the leader's own contribution decision or by the leader's effect

on the contribution decisions of followers.

Leader contributions

To examine how authority and randomly selected contribution leaders adjust their own behavior when leading by example, we compare each type of leader's contribution behavior when they lead and when they give in private. We exclude followers in the RL and AL treatments from our analysis, since their decisions do not provide a good counterfactual for leader behavior, and regress contribution decisions on leadership treatment and authority status. The coefficients on RL and AL treatment indicators thus reflect the change in contribution behavior displayed by random individuals and authorities when they are given the opportunity to lead. The coefficient on the indicator for authority status captures any difference in contribution levels between authorities and other community members when they give in private.[35]

Table 2 shows that both authorities and non-authorities increase their contributions when they lead by example. Authorities give 6.07 Bs. (s.e. 2.35) more when they lead by example than the average individual in the NL treatment (Columns 1 and 2). Randomly selected contribution leaders, on the other hand, give an additional 1.63 Bs. (s.e. 1.39), which is not statistically significant when individual controls are included. The difference between authority and non-authority leader contributions is marginally significant (column 2), which suggests that part of the total increase in public good provision generated by the AL treatment is explained by the direct effect of the contribution of authorities who lead by example.

Results are similar for the nonlinear specifications (columns 3 to 6), but the difference between leader types is not statistically significant. Interestingly, the differences between authority and non-authority giving arise solely in response to leadership. The coefficient on the authority status indicator is small and imprecisely estimated, which implies that authority contributions are not different from the contributions of other community members when they contribute privately in the NL treatment.[36]

[35]The regression is analogous to a difference in difference set up that includes leadership position and authority status, where AL represents the total effect for an authority in a contribution leadership position. The regression does not describe differences in the contribution behavior of authorities across treatments because community fixed effects are used and an authority is never present in the NL treatment when the AL treatment is conducted in the same community.

[36]It is important to note that we only observe 8 authorities giving in the NL treatment, so the authority status indicator variable is identified off of a very small number of observations, resulting in large standard errors.

Follower contributions

Now we turn to the behavior of followers to test whether they respond to the contribution decisions of leaders, and whether the response differs by leader type. The effect of the different leader types cannot be completely separated from the fact that they also make different contribution decisions in our experimental setting (as shown in the preceding analysis). Thus, treatment effects on followers should be interpreted as the combined effect of the leader type and an endogenous leader contribution.[37]

Table 3 presents estimates from a regression of the individual contributions of followers on leadership treatment and the interaction of leadership treatment and leader contribution. Columns 1 and 2 show OLS estimates with a continuous measure of leader contribution on the right hand side. The linear effect of continuous leader contributions on follower giving is statistically insignificant for both authority leaders and randomly selected leaders, as are the level effects of the leadership treatments. Followers may respond differently to high and low leader contributions, so the remainder of the table tests for asymmetries in the response to leader contributions, split at the median.

We examine the effect of high and low leader contributions on continuous follower contributions in columns 3 and 4 and on the probability that followers give above the median ($\geq$10 Bs.) in columns 5 and 6. Authority leaders who give less than 10 Bs. (coefficient on AL) decrease follower giving by approximately 1.12 Bs. (s.e. 0.88, column 4), and decrease the probability that a follower gives at least 10 Bs. by 0.19 (s.e. 0.08, column 6), relative to the contribution of followers in the NL treatment. The ordered logit specification (column 8) also shows that low authority leader contributions reduce the log odds that follower contributions are 5 Bs. higher by 1.14 (s.e. 0.37). High authority contributions, on the other hand, have a generally positive effect on follower giving, as shown by the AL total effect, which combines the AL level effect with the differential impact of an authority leader who gives at least 10 Bs. The total effect is not precisely estimated for the continuous follower outcome (column 3 and 4). The probability that a follower gives above the median is 0.15 higher (s.e. 0.07) when an authority leader gives at least 10 Bs. (column 6). High authority leader contributions also generate a marginally statistically significant increase in the log odds that contributions move the next categorical value, with a precisely estimated differential effect

[37]We chose not to exogenously vary the amount authorities and non-authorities give when they lead by example because doing so would require letting subjects know that the leader is not freely choosing the amount they wish to contribute (in order to avoid using deception). This may generate a different response to leadership by example and would not be able to capture the leader response to leadership opportunities that we study in this experiment.

(interaction term, column 8).

Is the influence of authorities on followers different than that of randomly selected community members who lead by example? In general, the coefficients on the random leader treatment variables in Table 3 are of the same sign, smaller magnitude and less precisely estimated than the corresponding authority leader effects. Column 6 shows that a random leader who gives at least 10 Bs. increases the probability that followers give at least 10 Bs. by 12.1 percent (s.e. 0.06), which is the only specification in which random leaders can be seen to have a significant influence over follower contributions. In spite of the relatively more consistent influence of authority leaders, the differences between the random and authority leader effects are statistically indistinguishable; p-values from the relevant t-tests are reported in the table. In neither case is the response of followers consistent with free riding: both authority and random leaders show some evidence of crowding-in follower contributions. Taken together, the results suggest that the effect of authority influence when leading by example is larger in magnitude and, in many cases, more precisely estimated than that of a randomly selected members of the community.

4.2 Heterogeneous treatment effects

We turn next to question of why leadership affects voluntary contributions in our setting, by exploring treatment heterogeneities in both leader and follower contribution decisions. First, we test whether followers' response to the leader's example differs based on their exposure to information. Second, we examine heterogeneities in leader influence based on the observable characteristics of leaders.

Followers: Information signaling

Recall that the information manipulation generated exogenous variation in the information available to study participants about the quality of the public good in all treatments. If leadership by example serves as an information signal, then the contribution decision of session leaders should influence informed and uninformed followers differently. Specifically, the contributions of uninformed followers should demonstrate a more positive correlation with the contribution decisions of the leader, because uninformed followers depend more than do informed followers on the quality information conveyed by the leader's decision. Table 4 replicates the analysis conducted in columns 3 to 8 of Table 3, but adds an additional interaction to differentiate between followers who did and did not have the opportunity to inspect the public good. We break the results out by information condition and show effects

relative to the contribution decisions of uninformed followers in the No Leader treatment, whose contributions are statistically similar to those of informed followers in the same treatment.

Beginning with uninformed followers, the top panel of Table 4 shows that an authority leader who makes a low initial contribution (less than 10 Bs.) insignificantly decreases the average contributions made by uninformed followers by 1.04 Bs. (s.e. 1.17), significantly lowers the probability of giving at least 10 Bs. by 29.3 percent (s.e. 0.16), and significantly decreases the log odds that follower contributions are in a higher 5 Bs. category bin by 1.44 (s.e. 0.72). An authority who makes a high initial contribution, on the other hand, insignificantly increases average uninformed follower contributions by 0.62 Bs. (s.e. 0.90), significantly increases the probability of giving above the median by 14.4 percent (s.e. 0.08) and significantly increases the log odds that contributions are in a higher 5 Bs. category bin by 0.643 (s.e. 0.36). Authorities therefore influence uninformed follower contribution decisions, generating low (high) contributions when their own contributions are low (high). Random leaders do not affect the contributions of uninformed followers when they make low contributions, but are just as influential as authorities when they make initial contributions of 10 Bs. or more.

As shown in the lower panel, the effects on informed followers are rather different. Authorities continue to increase follower giving when they make high contributions, with a similar magnitude and statistical significance as in the case of uniformed followers. However, the negative influence of a low authority contribution is insignificant for informed followers, though the coefficient is not significantly different from the effect on uninformed followers. For random leaders, the results are reversed when their followers obtain information. While uninformed followers were unresponsive to low leader contributions, informed followers make significantly lower contributions.[38] High contributions from random leaders does not increase the contributions of informed followers, as it did for uninformed followers, though the difference in the coefficient is significant only in one specification.

Overall, the analysis of heterogeneous treatment effects on the basis of information shows three things. First, the leadership influence exerted by random leaders is consistent with information signaling: random leaders who make high contributions increase the contribu-

[38]The effect that random leaders who make low contributions have on informed followers is inconsistent with the predictions of information signaling about the quality of the public good, but could be explained by normative component of information signaling or non-information channels such as reciprocity and conformism.

tions of uninformed but not informed followers. Second, the influence of authority leaders suggests some information signaling, though it cannot fully explain the observed patterns. While the negative influence of a low authority contribution appears to be mitigated by exogenous information provision, high authority contributions increase the contributions of even informed followers.[39] The first two results can be seen in the t-tests for the difference in the effects on uninformed and informed followers, which are significant in a number of specifications for random leaders but never for authorities leaders. Third, random leaders can be just as influential as authority leaders in an environment where uncertainties are present if they contribute a sufficiently high amount, as shown by the t-test for RL = AL when contributions are high and followers are uninformed. Informed followers are not differentially responsive to leaders of different types, as shown by the corresponding t-tests for informed followers.

Leaders: Individual characteristics

As discussed in Section 2, authorities differ from the average community member on a number of dimensions, including gender, education, assets, and community participation (see Appendix table A.4). As a result, the additional influence of authority leaders may be driven not by the position that they hold but by their observable characteristics. Some relevant characteristics, such as education and wealth, may allow leaders to generate better information signals, trigger more reciprocity and have stronger social influence, regardless of their status as elected authorities. Holding an authority position may, on the other hand, convey an additional influence that extends beyond the observable characteristics of the leader.

Though our study is not designed to explicitly investigate how the observable characteristics of leaders explain leadership influence, we take advantage of the fact that randomly selected contribution leaders vary in the degree to which they resemble the average elected authority. We construct an "authority propensity score" using a probit regression of authority status on the five characteristics where authorities significantly differ from the rest of the community: gender, education, wealth, participation in community meetings and trust in NGOs.[40] Each contribution leader is assigned an authority propensity score between 0 and

[39]The persistent influence of authority leaders over even informed followers could be explained by a superior information signal, for which inspecting the books is not a good substitute. We therefore cannot rule out that information signaling fully explains the results, though the nature of the signal offered by random and authority leaders must be different.

[40]Note that authorities differ from the rest of the population on several participation-related characteristics, including participation in OTB meetings and projects, and agreement with OTB decisions. We focus on one

1, which describes the resemblance of each contribution leader to the average authority in the study. We present results for authority propensity scores between 0 and 0.6 only because past this threshold estimates are not statistically different across treatments.

The top panel of Figure 2 shows how leader contributions vary with leader characteristics and types by plotting the marginal effects from a regression of leader contributions on authority propensity score interacted with leader treatment that includes community fixed effects and standard errors clustered at the community level. The figure shows that random leaders give less than authority leaders in general, with contributions that are increasing in their authority propensity score. The slope of the random leader regression is positive but statistically insignificant. The giving gap between authority leaders and random leaders, however, narrows as the authority propensity scores increases, suggesting that the positive influence random leaders exert when their contributions are high (see Table 3) may be coming both from their observable characteristics and the amount they contribute as leaders. Since the authority propensity score was generated from the sample of authority leaders included in the regression, we plot the authority leader results only to provide a basis for comparison. Though the slope of the authority leader regression is negative, it is statistically insignificant.[41]

To explore the relationship between leader characteristics and leader influence, we construct a new outcome variable: the absolute difference between leader and follower contributions. The lower panel of Figure 2 shows the marginal effects from a regression of this measure of leader influence on an interaction of authority propensity score and leadership treatment, leader contribution, individual and session level controls, community fixed effects, and standard errors clustered at the community level. The figure shows that random leaders are more influential the more they look like the typical authority in the study. The slope on the coefficient for the authority propensity score among random leaders is marginally significant ($p = 0.102$). Together, the results in Figure 2 highlight two factors underlying leadership by example in our setting. First, random leaders are more influential if they resemble authorities, both because they give more as leaders and because of their characteristics. Second, at least some of the influence that authorities have when they lead by example is driven by their observable characteristics. This last point may indicate that communities

of these to avoid redundancy. Each of the covariates used in the probit regression is balanced after imposing common supports. We implement the propensity score matching using the algorithm developed by Becker & Ichino (2002).

[41] The negative and insignificant slope could indicate that authorities compensate for looking less like a leader by contributing more.

choose their leaders based, in part, on observable characteristics that are correlated with influential leadership.

4.3 Robustness checks

We use two types of robustness checks to address possible selection bias resulting from non-compliance with the assigned treatment in some communities, as mentioned in Section 4. First, we present two stage least square estimates of treatment effects that use treatment assignment to AL as an instrument for administered AL treatment.[42] Second, we restrict our analysis to the sample of communities that complied with treatment assignment and estimate treatment effects directly as in our main specifications.

Appendix table A.5 presents revised estimates of treatment effects on total contributions. Overall, the results look similar to the main specifications, and are slightly stronger under the instrumental variables specification in most cases. This strengthening of the results under the IV specification is due to the relatively low contributions among the four replacement authority leaders. The limited sample analysis sometimes lacks statistical power because of the loss of sample size. The same robustness specifications are carried out for the leader and follower results. These are presented in Appendix Tables A.6 and A.7 respectively, and are consistent with our main results.

5 Conclusion

Local authorities in developing countries often wield substantial power, and some evidence shows large authority fixed-effects in community development outcomes, including the provision of public goods (Chattopadhyay & Duflo 2004; Miguel & Gugerty 2005). What role do local authorities play? Do they help communities overcome collective action problems and sustain higher levels of voluntary public good provision? If so, how? A number of channels present themselves: sanctioning or rule enforcement, moral suasion, liaison with outside resources, reciprocity, and leadership by example. Our study offers novel evidence on the latter mechanism.

We implement small group experiments in 52 communities in rural Bolivia to examine the role that locally elected authorities play in the voluntary provision of public goods when

[42] We do not instrument for both AL and RL because selection was quasi-random in the second case. Doing so does not significantly change results.

they lead by example. In our setting, authorities exert a significant influence over voluntary public good provision even without the ability to monitor, sanction or coerce. On average, public good provision increases by approximately 20 percent when the group is led by an elected authority who makes an initial public contribution. In our setting, authorities significantly increase their contribution decisions when they lead by example relative to when they contribute in a private, simultaneous decision setting where their contributions do not differ from those of the average community member. Authorities also influence the contribution decisions of followers, to a marginally greater extent than do random individuals who lead by example.

Our design explores one of the best-studied mechanisms underlying a positive effect of leadership by example on public good provision: information signaling. We find that the predictions of information signaling match the influence that randomly selected contribution leaders have on their followers, but cannot fully explain the influence of elected authorities. The additional influence of local authorities who lead by example is consistent with a signal that goes above and beyond the information manipulation offered in the experiment, and with other channels such as reciprocity, legitimacy, and social influence. Further research is needed to identify other mechanisms by which leadership by example affects voluntary public good provision in field settings and to investigate how the observable characteristics of individuals correlate with channels of leadership influence. We generate suggestive evidence in this direction by showing that leader characteristics play an important role in determining their influence over followers.

Methodologically, our study offers an innovative approach to studying endogenously arising behavior within groups in field settings. The inclusion of community fixed effects allows us to address many of concerns associated with unobservable similarities between leaders and their followers within communities. We also employ best practices in a number of other design features, including precise measurement of selection in to the study, playing a voluntary contribution mechanism with earned money rather than house money, and making contributions to an actual public good. Combining the rigor and insights of laboratory studies with the complexities of social interactions in the field offers a promising direction for future research. Particularly where leadership is concerned, stepping outside of the laboratory can generate insights about how actual leaders influence their followers and how the characteristics of individuals and groups interact.

While taking the study of leadership by example to the field offers a number of benefits,

it also has some drawbacks. Most notably for our study, some communities were unable to comply with treatment assignment. The differences between the OLS results and the IV robustness checks suggest potential selection associated with the experimental treatments. We choose to lead with the OLS results given that treatment non-compliance appears idiosyncratic and the IV strategy strengthens our findings in most cases. Another area where the study gives up some control is the endogeneity of leader contributions. While the use of community fixed effects eliminates endogeneity concerns at the community level, they may still exist at the session level. We test for session level correlates of leader contributions and find only one significant explanatory variable out of 13 tested.[43]

Like all field studies, we generate evidence for a particular area of Bolivia at a particular point in time. By testing specific causal mechanisms, nevertheless, we identify what may be more generalizable support for the role of information signaling in shaping leader influence over public good provision. In other settings, with less decentralization or with more corrupt leaders, other actors within the community may be relatively more influential. Our results hold constant other means of influence that authorities have at their disposal, such as sanctioning power, which may be relatively more or less important than leadership by example in sustaining the voluntary provision of local public goods in different settings. Our setting is also relatively homogenous, such that many of the influential findings on local public goods provision are less relevant (e.g. Miguel & Gugerty 2005). Leader characteristics, which play a role in shaping influence in our setting, may be even more important in settings with greater heterogeneity.

[43]Specifically, we see that out of the full set of individual and session level controls, only average session-level assets is associated with leader contributions, which confirms that leaders are not systematically adjusting their behavior based on the random group of followers to which they were assigned. The full table of results is available on request.

References

Andreoni, J. 2006. Leadership Giving in Charitable Fund-Raising. *Journal of Public Economic Theory*, **8**(1), 1–22.

Andreoni, J., Brown, P.M., & Vesterlund, L. 2002. What makes an allocation fair? Some experimental evidence. *Games and Economic Behavior*, **40**(1), 1–24.

Ariely, D., Bracha, A., & Meier, S. 2009. Doing good or doing well? Image motivation and monetary incentives in behaving prosocially. *American Economic Review*, **99**(1), 544–555.

Baetschmann, G., Staub, K.E., & Winkelmann, R. 2011. Consistent estimation of the fixed effects ordered logit model. *Unpublished manuscript*.

Bag, P.K., & Roy, S. 2011. On sequential and simultaneous contributions under incomplete information. *International Journal of Game Theory*, **40**(1), 119–145.

Bala, V., & Goyal, S. 1998. Learning from neighbours. *The Review of Economic Studies*, **65**(3), 595–621.

Baldassarri, D., & Grossman, G. 2011. Centralized sanctioning and legitimate authority promote cooperation in humans. *Proceedings of the National Academy of Sciences*, **108**(27), 11023.

Becker, S. O., & Ichino, A. 2002. Estimation of average treatment effects based on propensity scores. *The Stata Journal*, **2**(4), 358–377.

Beekman, G., Bulteand, E., & Nillesen, E. 2011. Corruption, Investments and Contributions to Public Goods: Experimental Evidence from Rural Liberia. *Unpublished manuscript*.

Benabou, R., & Tirole, J. 2006. Incentives and prosocial behavior. *The American Economic Review*, **96**(5), 1652–1678.

Besley, T., Pande, R., & Rao, V. 2012. Just rewards? Local politics and public resource allocation in South India. *Unpublished manuscript*.

Bicchieri, C. 2005. *The grammar of society: The nature and dynamics of social norms*. Cambridge University Press.

Bracha, A., Heffetz, O., & Vesterlund, L. 2009. Charitable Giving: The Effect of Exogenous and Endogenous Status. *Unpublished manuscript*.

Bruhn, M., & McKenzie, D. 2009. In Pursuit of Balance: Randomization in Practice in Development Field Experiments. *American Economic Journal: Applied Economics*, 200–232.

Chattopadhyay, R., & Duflo, E. 2004. Women as policy makers: Evidence from a randomized policy experiment in India. *Econometrica*, **72**(5), 1409–1443.

d'Adda, G. 2012. Leadership and Influence: Evidence from an Artefactual Field Experiment on Local Public Good Provision. *Unpublished manuscript*.

Eckel, C.C., & Wilson, R.K. 2001. Social learning in a social hierarchy: An experimental study? *Unpublished manuscript.*

Eckel, C.C., & Wilson, R.K. 2007. Social learning in coordination games: does status matter? *Experimental Economics*, **10**(3), 317–329.

Eckel, C.C., Fatas, E., & Wilson, R. 2010. Cooperation and status in organizations. *Journal of Public Economic Theory*, **12**(4), 737–762.

Gächter, S., Nosenzo, D., Renner, E., & Sefton, M. 2010a. Sequential vs. simultaneous contributions to public goods: Experimental evidence. *Journal of Public Economics*, **94**(7), 515–522.

Gächter, S., Nosenzo, D., Renner, E., & Sefton, M. 2010b. Who Makes a Good Leader? Cooperativeness, Optimism and Leading-by-example. *Economic Inquiry.*

Grossman, G., & Baldassarri, D. 2012. The Impact of Elections on Cooperation: Evidence from a Lab-in-the-Field Experiment in Uganda. *American Journal of Political Science.*

Harbaugh, W.T. 1998. The prestige motive for making charitable transfers. *The American Economic Review*, **88**(2), 277–282.

Hermalin, B. E. 1998. Toward an Economic Theory of Leadership: Leading by Example. *American Economic Review*, **88**(5), 1188–1206.

Hermalin, B. E. 2007. Leading for the Long Term. *Journal of Economic Behavior and Organization*, **62**, 1–19.

Huck, S., & Rey-Biel, P. 2006. Endogenous leadership in teams. *Journal of Institutional and Theoretical Economics*, 253–261.

Humphreys, Macartan, Masters, William A, & Sandbu, Martin E. 2006. The role of leaders in democratic deliberations: results from a field experiment in São Tomé and Príncipe. *World Politics*, **58**(04), 583–622.

Jones, B., & Olken, B. 2005. Do leaders matter? National leadership and growth since World War II. *The Quarterly Journal of Economics*, **120**, 835–864.

Karlan, D., & List, J. 2012. How can Bill and Melinda Gates increase other people's donations to fund public goods? *NBER Working Paper.*

Karlan, D., & McConnell, M. 2012. Hey Look at Me: The Effect of Giving Circles on Giving. *Unpublished manuscript.*

Kumru, C.S., & Vesterlund, L. 2010. The effect of status on charitable giving. *Journal of Public Economic Theory*, **12**(4), 709–735.

Levy, D.M, Padgitt, K., Peart, S.J., Houser, D., & Xiao, E. 2011. Leadership, cheap talk and really cheap talk. *Journal of Economic Behavior & Organization*, **77**(1), 40–52.

Meidinger, C., & Villeval, M.C. 2002. Leadership in Teams: Signaling or Reciprocating? *Unpublished manuscript.*

Miguel, E., & Gugerty, M.K. 2005. Ethnic diversity, social sanctions, and public goods in Kenya. *Journal of Public Economics*, **89**(11), 2325–2368.

Miller, G., & Mobarak, A.M. 2011. Intra-Household Externalities and Low Demand for a New Technology: Experimental Evidence on Improved Cookstoves. *Unpublished manuscript.*

Nielson, W., & Wichmann, B. 2012. Social Networks and Non-market Valuations. *Unpublished manuscript.*

Olken, B.A., & Singhal, M. 2011. Informal Taxation. *American Economic Journal: Applied Economics*, **3**, 1–28.

Potters, J., Sefton, M., & Vesterlund, L. 2005. After you: Endogenous sequencing in voluntary contribution games. *Journal of Public Economics*, **89**(8), 1399–1419.

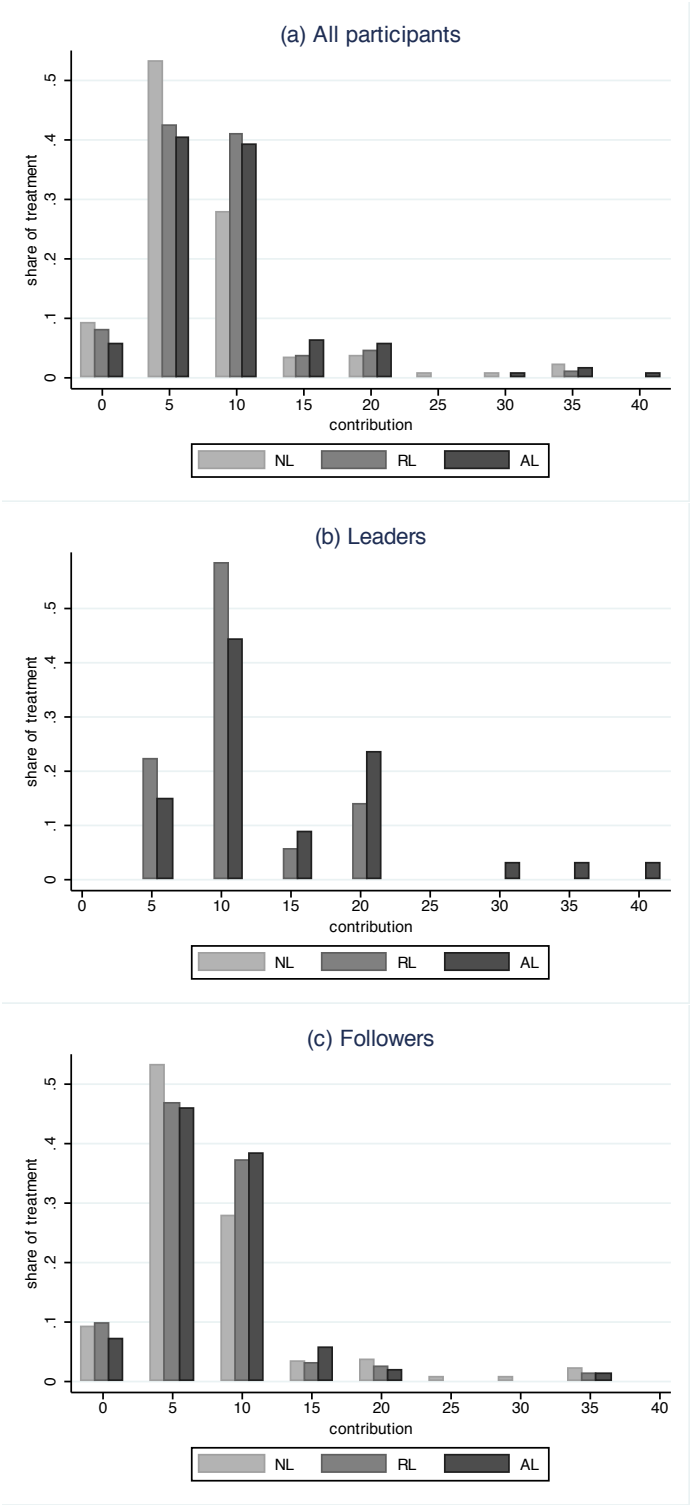
Potters, J., Sefton, M., & Vesterlund, L. 2007. Leading-by-example and signaling in voluntary contribution games: an experimental study. *Economic Theory*, **33**(1), 169–182.

Reinikka, R., & Svensson, J. 2004. Local capture: evidence from a central government transfer program in Uganda. *The Quarterly Journal of Economics*, **119**(2), 679–705.

Varian, H.R. 1994. Sequential contributions to public goods. *Journal of Public Economics*, **53**(2), 165–186.

Vesterlund, L. 2003. The informational value of sequential fundraising. *Journal of Public Economics*, **87**(3-4), 627–657.

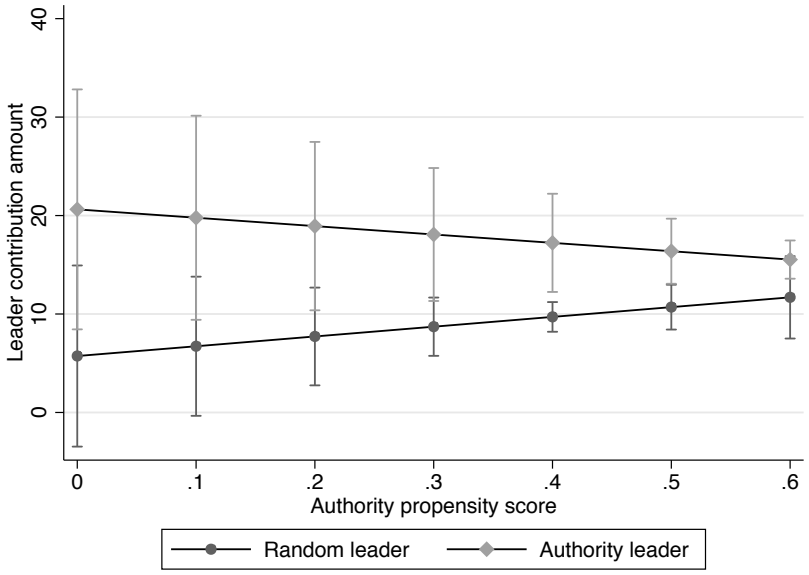
Figure 1: Histogram of contributions by participant type and treatment



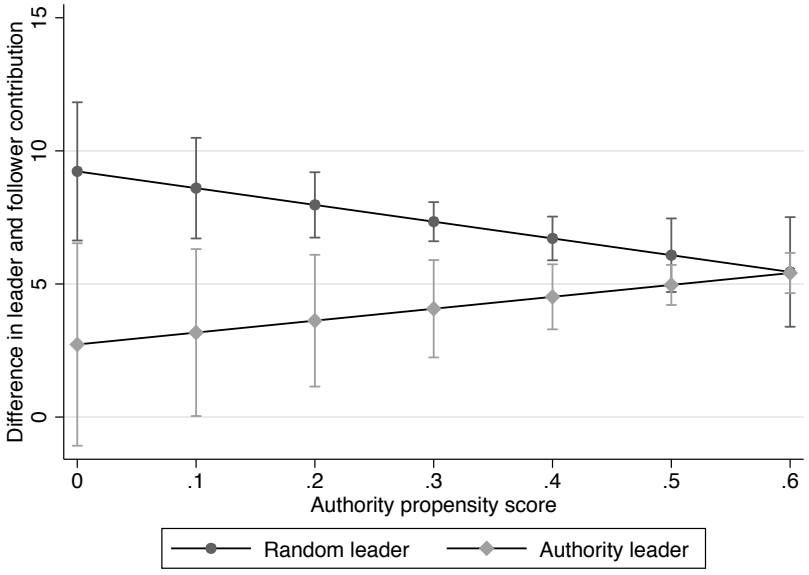
Notes: Figures represent histograms of contribution amounts in bins of 5 Bs. Each of the figures describes contributions for different samples of participants: all (top), contribution leaders only (middle) and followers only (including the NL treatment, bottom). The shading describes each of the three experimental treatments, and the histogram plots the share of each treatment in the different contribution bins.

Figure 2: Authority characteristics vs. size of leader contribution

(a) Authority characteristics and leader contributions



(b) Authority characteristics and leader influence over followers



Notes: Figures represent the marginal effects of regression coefficients for random and authority contribution leaders. See text for a description of the regressions. We do not report results for authority propensity scores beyond 0.6 because differences are not statistically different across treatments.

Table 1: Total contributions to the public good (all participants)

	Total		Individual					
	Continuous		Continuous		≥ 10 Bs.		Ordered logit	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
RL	-0.941	-0.579	-0.183	-0.286	0.100*	0.093*	0.262	0.242
	(3.865)	(4.613)	(0.652)	(0.662)	(0.055)	(0.055)	(0.226)	(0.237)
AL	6.952	9.110*	1.257*	1.065	0.174**	0.155**	0.703***	0.630**
	(4.280)	(4.924)	(0.739)	(0.695)	(0.066)	(0.065)	(0.264)	(0.275)
Controls		Yes		Yes		Yes		Yes
RL=AL (p-value)	0.102	0.034	0.072	0.052	0.273	0.323	0.067	0.088
Dep. Variable mean, excluded category	42.947		7.767		0.378		2.396	

Notes: N=104 in columns 1 and 2, N=580 in columns 3-8. Columns 1 and 2 show OLS estimates of treatment effects on total session contributions. Columns 3-6 show OLS estimates of treatment effects on individual contributions. Columns 7 and 8 show ordered logit estimates of a model in which the dependent variable acquires values 1,2,3, and 4 when contributions fall in [0,5), [5,10), [10,15), and [15,40] respectively. All specifications include community fixed effects and standard errors clustered at the community level. Controls refer to the full set of individual and session level controls shown in the balance table. Pseudo R-squared presented in columns 7 and 8. * p<0.10, ** p<0.05, *** p<0.01.

Table 2: Leader contributions to the public good

	Continuous		≥ 10 Bs.		Ordered logit	
	(1)	(2)	(3)	(4)	(5)	(6)
Authority	-0.921	-0.481	0.006	-0.027	-0.164	0.125
	(2.257)	(1.948)	(0.171)	(0.153)	(0.761)	(0.831)
RL	2.400*	1.633	0.347***	0.315***	1.245***	1.381***
	(1.266)	(1.392)	(0.080)	(0.097)	(0.364)	(0.432)
AL	7.192***	6.077**	0.424**	0.372**	2.273***	1.780**
	(2.637)	(2.349)	(0.196)	(0.178)	(0.872)	(0.906)
Controls		Yes		Yes		Yes
test RL=AL (p-value)	0.098	0.098	0.706	0.760	0.244	0.650
test Authority=AL (p-value)	0.084	0.107	0.242	0.204	0.110	0.301
Dep. Variable Mean, excluded category	7.751		0.372		2.402	

Notes: N=258. The sample consists of individuals who led by example in RL and AL and all subjects who participated in the NL treatment. Authority refers OTB presidents in NL. Columns 1-4 present OLS estimates of treatment effects. Columns 5 and 6 present ordered logit estimates of a model in which the dependent variable acquires values 1, 2, 3, and 4 when contributions fall in [0,5), [5,10), [10,15), and [15,40] respectively. All regressions include community fixed effects and standard errors clustered at the OTB level. Controls refer to the full set of individual and session level controls shown in the balance table. Pseudo R-squared presented in columns 5 and 6. *p<0.10, **p<0.05, ***p<0.01.

Table 3: Follower contributions to the public good

	Continuous				≥ 10 Bs.		Ordered Logit	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
RL	-0.388	-0.364	-0.896	-0.775	-0.086	-0.085	-0.304	-0.267
	(2.411)	(2.421)	(0.834)	(0.903)	(0.100)	(0.103)	(0.461)	(0.453)
AL	-0.010	0.352	-1.512***	-1.124	-0.208***	-0.189**	-1.136***	-1.143***
	(1.023)	(1.164)	(0.361)	(0.882)	(0.049)	(0.080)	(0.212)	(0.369)
RL x leader contribution	-0.027	-0.034						
	(0.238)	(0.235)						
AL x leader contribution	0.005	-0.022						
	(0.078)	(0.084)						
RL x leader contribution ≥ 10 Bs.			0.448	0.228	0.212*	0.206*	0.530	0.493
			(1.117)	(1.117)	(0.112)	(0.111)	(0.496)	(0.483)
AL x leader contribution ≥ 10 Bs.			1.856*	1.379	0.372***	0.343***	1.678***	1.663***
			(0.968)	(1.282)	(0.085)	(0.104)	(0.374)	(0.494)
RL total effect: Leader contribution ≥ 10 Bs.			-0.448	-0.547	0.126**	0.121**	0.226	0.225
			(0.791)	(0.769)	(0.062)	(0.060)	(0.259)	(0.266)
AL total effect: Leader contribution ≥ 10 Bs.			0.344	0.255	0.164**	0.154**	0.542*	0.520
			(0.898)	(0.880)	(0.070)	(0.069)	(0.308)	(0.320)
Controls		Yes		Yes		Yes		Yes
RL=AL (p-value)	0.891	0.797	0.501	0.787	0.279	0.444	0.102	0.141
RL x leader contrib. = AL x leader contrib. (p-value)	0.912	0.966	0.420	0.556	0.284	0.408	0.084	0.113
RL total effect = AL total effect (p-value)			0.489	0.443	0.619	0.653	0.322	0.353
Dep. Variable mean, excluded category	7.767		7.767		0.378		2.399	

Notes: N = 510. Columns 1-6 show OLS estimates of treatment effects. Columns 7 and 8 show ordered logit estimates of a model in which the dependent variable acquires values 1, 2, 3, and 4 when contributions fall in [0,5), [5,10), [10,15), and [15,40] respectively. All specifications include community fixed effects and standard errors clustered at the OTB level. Controls refer to the full set of individual and session level controls shown in the balance table. Pseudo R-squared presented in columns 7 and 8. * p<0.10, ** p<0.05, *** p<0.01.

Table 4: Heterogeneous treatment effects - information

	Continuous		≥ 10 Bs.		Ordered Logit	
	(1)	(2)	(3)	(4)	(5)	(6)
Uninformed follower						
RL: leader contribution < 10 Bs.	0.191	0.317	0.025	0.026	0.189	0.207
	(1.027)	(1.154)	(0.127)	(0.132)	(0.548)	(0.555)
RL: leader contribution ≥ 10 Bs.	0.270	0.351	0.175***	0.180***	0.509*	0.558**
	(0.827)	(0.780)	(0.062)	(0.063)	(0.270)	(0.274)
AL: leader contribution < 10 Bs.	-1.506*	-1.043	-0.315**	-0.293*	-1.412**	-1.440**
	(0.772)	(1.170)	(0.120)	(0.159)	(0.618)	(0.718)
AL: leader contribution ≥ 10 Bs.	0.849	0.619	0.172**	0.144*	0.704*	0.643*
	(1.005)	(0.900)	(0.082)	(0.078)	(0.374)	(0.363)
Informed follower						
RL: leader contribution < 10 Bs.	-1.611	-1.648*	-0.216*	-0.233**	-0.926*	-0.906*
	(0.989)	(0.879)	(0.117)	(0.109)	(0.487)	(0.470)
RL: leader contribution ≥ 10 Bs.	-0.521	-0.924	0.097	0.064	0.061	-0.049
	(1.127)	(1.209)	(0.090)	(0.092)	(0.382)	(0.387)
AL: leader contribution < 10 Bs.	-0.691	-0.403	-0.027	-0.027	-0.647	-0.647
	(0.751)	(1.065)	(0.104)	(0.089)	(0.468)	(0.536)
AL: leader contribution ≥ 10 Bs.	0.537	0.567	0.187**	0.185**	0.547*	0.530
	(0.933)	(0.965)	(0.087)	(0.089)	(0.327)	(0.357)
Tests (p-value):						
RL, leader contrib.<10Bs: uninformed=informed	0.105	0.126	0.093	0.057	0.027	0.040
RL, leader contrib.≥10Bs: uninformed=informed	0.395	0.201	0.333	0.184	0.159	0.052
AL, leader contrib.<10Bs: uninformed=informed	0.398	0.565	0.148	0.212	0.431	0.439
AL, leader contrib.≥10Bs: uninformed=informed	0.684	0.946	0.877	0.665	0.877	0.665
Uninformed, leader contrib. <10Bs: RL = AL	0.152	0.408	0.052	0.133	0.050	0.075
Uninformed, leader contrib. ≥10Bs: RL = AL	0.624	0.782	0.977	0.664	0.600	0.805
Informed, leader contrib. <10Bs: RL = AL	0.405	0.357	0.203	0.138	0.665	0.710
Informed, leader contrib. ≥10Bs: RL = AL	0.491	0.351	0.437	0.300	0.303	0.229
Individual and session controls		Yes		Yes		Yes
Dependent Variable mean, excluded category	7.351		0.360		2.350	

Notes: N = 510. Columns 1-4 show OLS estimates. Columns 5 and 6 show ordered logit estimates of a model in which the dependent variable acquires integer values 1 through 4 when contributions fall in [0,5), [5,10), [10,15), and [15,40] respectively. The excluded category is uninformed subjects in NL. All specifications include community fixed effects and standard errors clustered at the OTB level. Controls refer to the full set of individual and session level controls shown in the balance table. Pseudo R-squared in columns 5 and 6. * p<0.10, ** p<0.05, *** p<0.01.

Appendix

Table A.1: Household level selection in to the study

	Eligible	Invited	Participated	Diff.
	(1)	(2)	(3)	(3) - (1)
Household head's education	4.44	4.128	4.264	-0.176
	[3.679]	[3.507]	[3.564]	(0.177)
Household assets	2.05	1.941	1.972	-0.078
	[1.647]	[1.570]	[1.551]	(0.078)
Caring for environment is top value	0.386	0.385	0.395	0.009
	[0.487]	[0.487]	[0.489]	(0.024)
Participated in all OTB meetings this year	0.321	0.366	0.366	0.045 *
	[0.467]	[0.482]	[0.482]	(0.023)
Participates in OTB projects	0.582	0.636	0.659	0.077 ***
	[0.493]	[0.482]	[0.475]	(0.024)
Always agrees with community decisions	0.641	0.671	0.672	0.031
	[0.480]	[0.470]	[0.470]	(0.023)
Always trusts NGOs	0.394	0.404	0.407	0.013
	[0.489]	[0.491]	[0.492]	(0.024)
Held past leadership position in community	0.074	0.094	0.103	0.029 **
	[0.263]	[0.292]	[0.305]	(0.014)
N	1438	673	580	

Notes: Columns 1-3 show means with standard deviations in brackets for sample of participants at each stage of of the experiment. The column "Diff." shows the mean difference in between households that were eligible and those that participated, with estimated standard errors in parentheses. Significance levels are for a two-sided t-test: * $p<0.10$ ** $p<0.05$ *** $p<0.01$. See text for discussion of covariates omitted from the table.

Table A.2: Treatment non-compliance

Binary dependent variable is:	Switched out of			Switched in to		
	AL	RL	NL	AL	RL	NL
	(1)	(2)	(3)	(4)	(5)	(6)
Individual contribution decision	0.0019	-0.002	0.0015	-0.004	0.0041	0.0008
	(0.0046)	(0.0026)	(0.0016)	(0.0034)	(0.0043)	(0.0009)
Female	0.1177*	-0.019	-0.038	-0.016	0.0259	0.0325
	(0.0641)	(0.0284)	(0.0385)	(0.0461)	(0.0378)	(0.0319)
Years of education	-0.005	-0.002	0.0071	0.0041	-0.0120*	0.0045
	(0.0088)	(0.0062)	(0.0068)	(0.0083)	(0.0068)	(0.0045)
Household assets	0.0058	-0.0350*	0.0408	-0.014	0.0169	-0.007
	(0.0363)	(0.0200)	(0.0332)	(0.0340)	(0.0310)	(0.0075)
Number of children attending local school	0.0316	-0.001	0.0046	0.0199	0.0117	-0.005
	(0.0319)	(0.0104)	(0.0051)	(0.0222)	(0.0188)	(0.0052)
Evaluated the teacher as good or excellent	0.000	0.0292	0.0061	0.0638	-0.056	0.027
	(0.0625)	(0.0618)	(0.0086)	(0.0625)	(0.0641)	(0.0271)
Caring for environment is top value	-0.119	0.0134	-0.002	-0.007	-0.069	-0.045
	(0.0878)	(0.0729)	(0.0054)	(0.0719)	(0.0809)	(0.0449)
Participated in all OTB meetings this year	0.018	-0.013	-0.04	-0.037	-0.003	0.0057
	(0.0721)	(0.0598)	(0.0401)	(0.0705)	(0.0710)	(0.0087)
Participates in OTB projects	-0.013	0.0364	-0.035	-0.009	1.272	-0.011
	(0.0529)	(0.0603)	(0.0350)	(0.0722)	(0.0519)	(0.0128)
Always agrees with community decisions	-0.088	-0.019	-0.033	-0.016	-0.09	-0.033
	(0.0574)	(0.0637)	(0.0329)	(0.0614)	(0.0573)	(0.0329)
Always trusts NGOs	0.0401	0.0398	-0.001	0.0617	-0.004	-0.001
	(0.0518)	(0.0581)	(0.0047)	(0.0685)	(0.0480)	(0.0047)
Held past leadership position in community	0.0307	-0.04	-0.029	-0.073	0.0277	0.032
	(0.0863)	(0.0593)	(0.0293)	(0.0618)	(0.0975)	(0.0338)
Experimenter indicator	-0.107	-0.058	-0.053	-0.113	-0.043	-0.053
	(0.1238)	(0.1046)	(0.0533)	(0.1139)	(0.1136)	(0.0533)
Session size at contribution time	-0.161	0.1363*	-0.054	0.0659	-0.104	-0.054
	(0.1327)	(0.0745)	(0.0552)	(0.1082)	(0.1236)	(0.0552)
Community Size	0.0034	0.000	0.008	0.0072	0.0011	0.0019
	(0.0062)	(0.0018)	(0.0056)	(0.0054)	(0.0046)	(0.0024)
Travel time to nearest market	0.000	0.0003	0.000	4.711	0.000	0.0003
	(0.0004)	(0.0004)	(0.0002)	(0.0003)	(0.0003)	(0.0003)
Pupils provide their own books	0.1295	-0.004	0.045	0.0638	0.051	0.045
	(0.1174)	(0.1140)	(0.0449)	(0.1126)	(0.1179)	(0.0449)
N	165	158	188	157	165	188
Number of individuals with dep var = 1	27	15	5	19	22	5
Number of communities with dep var = 1	6	3	1	4	5	1

Notes: OLS regressions of binary treatment non-compliance on individual-level characteristics. Each cell is a separate regression. The sample in columns 1-3 are all sessions assigned to AL, RL and NL, respectively. The sample in columns 4-6 are all sessions that received AL, RL and NL, respectively. Columns 1, 2, 4 and 5 are estimated for followers only. Standard errors in parentheses are clustered at the OTB level. * p<0.10 ** p<0.05 *** p<0.01.

Table A.3: Treatment balance among study participants

	NL mean (sd)	RL - NL	AL - NL	AL - RL
	(1)	(2)	(3)	(4)
Individual received information	0.527	0.001	0.007	0.007
	[0.501]	(0.011)	(0.011)	(0.011)
Female	0.330	0.004	-0.120***	-0.124***
	[0.471]	(0.038)	(0.043)	(0.036)
Years of education	4.500	0.241	0.453	0.212
	[3.352]	(0.429)	(0.399)	(0.351)
Household assets	1.676	0.359*	0.523**	0.164
	[1.302]	(0.183)	(0.198)	(0.212)
Number of children attending local school	0.601	0.086	0.027	-0.058
	[1.027]	(0.116)	(0.083)	(0.107)
Evaluated the teacher as good or excellent	0.548	0.104	0.070	-0.034
	[0.499]	(0.070)	(0.070)	(0.065)
Caring for environment is top value	0.415	-0.052	-0.007	0.045
	[0.494]	(0.059)	(0.053)	(0.053)
Participated in all OTB meetings this year	0.351	0.027	0.015	-0.012
	[0.479]	(0.061)	(0.069)	(0.056)
Participates in OTB projects	0.691	-0.080	-0.016	0.063
	[0.463]	(0.054)	(0.049)	(0.041)
Always agrees with community decisions	0.676	-0.029	0.021	0.050
	[0.469]	(0.052)	(0.050)	(0.047)
Always trusts NGOs	0.410	0.008	-0.017	-0.025
	[0.493]	(0.057)	(0.053)	(0.051)
Held past leadership position in community	0.096	0.009	0.014	0.005
	[0.295]	(0.037)	(0.032)	(0.031)
Experimenter indicator	0.505	-0.013	-0.008	0.005
	[0.501]	(0.148)	(0.150)	(0.150)
Session size at contribution time	5.585	0.042	0.075	0.033
	[0.536]	(0.119)	(0.097)	(0.106)
Community Size	23.931	4.457*	4.064	-0.393
	[9.908]	(2.227)	(2.539)	(1.750)
Travel time to nearest market	171.755	-5.760	7.669	13.429
	[138.141]	(24.430)	(20.011)	(23.331)
Pupils provide their own books	0.590	0.101	0.022	-0.079
	[0.493]	(0.084)	(0.083)	(0.084)

Notes: N = 580. Column 1 shows means with standard deviations in brackets. Columns 2 to 4 show coefficients from linear regressions of each covariate on a binary treatment variable with standard errors clustered at the OTB level in parentheses. * p<0.05 **p<0.01 ***p<0.001.

Table A.4: Participant characteristics, by leadership role

	Non-leaders	RL - Non-leaders	AL - Non-leaders	AL - RL
	(1)	(2)	(3)	(4)
Female	0.298	0.0264	-0.060***	-0.408***
	[0.458]	(0.0243)	(0.0154)	(0.1239)
Years of education	4.547	0.0035	0.0122***	0.0253*
	[3.339]	(0.0034)	(0.0035)	(0.0139)
Household assets	1.896	0.0036	0.0284***	0.0752***
	[1.490]	(0.0065)	(0.0071)	(0.0270)
Number of children attending local school	0.639	-0.006	0.0061	0.0591
	[1.084]	(0.0069)	(0.0099)	(0.0444)
Evaluated the teacher as good or excellent	0.598	0.0248	0.0119	-0.053
	[0.491]	(0.0193)	(0.0208)	(0.1267)
Caring for environment is top value	0.382	0.0161	0.0361	0.0849
	[0.486]	(0.0219)	(0.0231)	(0.1281)
Participated in all OTB meetings this year	0.351	0.0176	0.0452**	0.113
	[0.478]	(0.0194)	(0.0192)	(0.1036)
Participates in OTB projects	0.661	-0.0430*	0.0352*	0.3200***
	[0.474]	(0.0227)	(0.0194)	(0.1118)
Always agrees with community decisions	0.676	-0.0630**	0.0481***	0.4444***
	[0.468]	(0.0244)	(0.0177)	(0.1025)
Always trusts NGOs	0.396	0.0052	0.0395*	0.1421
	[0.490]	(0.0215)	(0.0206)	(0.1155)
Held past leadership position in community	0.108	-0.034	-0.012	0.123
	[0.310]	(0.0283)	(0.0326)	(0.1817)
N	510	546	544	70

Notes: Column 1 shows means with standard deviations in brackets for all subjects in NL and followers in RL and AL. Columns 2 to 4 show coefficients from univariate regressions of binary leadership role on each exaplanatory variable (each cell is a separate regression) with standard errors clustered at the OTB level shown in parentheses. *p<0.05 **p<0.01 ***p<0.001.

Table A.5: Robustness checks - Total contributions to the public good (all participants)

	Total		Individual				
	Continuous		Continuous		≥ 10 Bs.		Ordered Logit
	IV	Limited Sample	IV	Limited Sample	IV	Limited Sample	Limited Sample
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
RL	2.476	-4.231	0.085	-0.850	0.126**	0.066	0.008
	(4.424)	(5.503)	(0.724)	(0.816)	(0.054)	(0.067)	(0.295)
AL	17.663***	10.470*	1.797**	0.949	0.219***	0.167**	0.585*
	(5.720)	(5.265)	(0.864)	(0.841)	(0.073)	(0.074)	(0.315)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	104	84	580	469	580	469	469
RL=AL (p-value)	0.000	0.002	0.011	0.010	0.139	0.119	0.009
Dep. Variable mean, excluded category	42.947	43.968	7.767	7.965	0.378	0.377	2.413

Notes: Columns 1, 3, and 5 show 2SLS IV estimates. Columns 2, 4, 6, and 7 restrict the sample to communities that complied with treatment assignment. All specifications include community fixed effects, standard errors clustered at the community level, and the full set of individual and session-level controls shown in the balance table. Pseudo R-squared reported in column 7. * p<0.10, ** p<0.05, *** p<0.01.

Table A.6: Robustness checks - Leader contributions to the public good

	Continuous		≥ 10 Bs.		Ordered Logit
	IV	Limited Sample	IV	Limited Sample	Limited Sample
	(1)	(2)	(3)	(4)	(5)
Authority	-2.990	-0.298	-0.159	-0.027	0.098
	(3.015)	(1.910)	(0.226)	(0.162)	(0.806)
RL	1.921	0.806	0.331***	0.293**	1.092**
	(1.373)	(1.686)	(0.094)	(0.114)	(0.505)
AL	9.491**	6.093**	0.551**	0.380*	1.928**
	(4.060)	(2.411)	(0.273)	(0.191)	(0.896)
Controls	Yes	Yes	Yes	Yes	Yes
N	258	197	258	197	197
test RL=AL, p-value	0.053	0.063	0.401	0.670	0.334
test Authority=AL, p-value	0.070	0.113	0.144	0.221	0.227
Dep. Variable Mean, excluded category	7.751	7.955	0.372	0.369	2.423

Notes: The sample consists of individuals who led by example in RL and AL and all subjects who participated in the NL treatment. Columns 1 and 3 present 2SLS IV estimates of treatment effects. Column 2, 4 and 5 restrict the sample to communities that complied with treatment assignment. All regressions include community fixed effects and standard errors clustered at the OTB level. Authority refers OTB presidents in NL. Pseudo R-squared reported in column 5. *p<0.10, **p<0.05, ***p<0.01.

Table A.7: Robustness checks - Follower contributions to the public good

	Continuous				≥ 10 Bs.		Ordered Logit
	IV	Limited Sample	IV	Limited Sample	IV	Limited Sample	Limited Sample
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
RL	-0.364	-0.026	-1.209	-1.200	-0.144	-0.089	-0.480
	(2.357)	(3.056)	(1.248)	(1.109)	(0.152)	(0.135)	(0.578)
AL	0.352	0.082	0.666	-1.203	0.009	-0.162*	-1.111**
	(1.134)	(1.456)	(2.325)	(1.161)	(0.211)	(0.082)	(0.437)
RL x leader contribution	-0.034	-0.120					
	(0.229)	(0.310)					
AL x leader contribution	-0.022	-0.006					
	(0.082)	(0.090)					
RL x leader contribution ≥ 10 Bs.			0.695	0.053	0.259*	0.184	0.463
			(1.446)	(1.197)	(0.152)	(0.134)	(0.577)
AL x leader contribution ≥ 10 Bs.			-0.110	1.323	0.161	0.332***	1.597***
			(2.710)	(1.613)	(0.241)	(0.121)	(0.584)
RL total effect: Leader contribution ≥ 10 Bs.			-0.515	-1.148	0.115*	0.095	-0.017
			(0.823)	(0.952)	(0.064)	(0.075)	(0.329)
AL total effect: Leader contribution ≥ 10 Bs.			0.555	0.120	0.170**	0.170**	0.486
			(0.982)	(1.047)	(0.077)	(0.082)	(0.371)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	510	410	510	410	510	410	410
RL=AL (p-value)	0.791	0.975	0.553	0.999	0.632	0.669	0.404
RL x leader contrib. = AL x leader contrib. (p-value)	0.965	0.753	0.830	0.580	0.778	0.462	0.206
Dep. Variable mean, excluded category	7.767	7.965	7.767	7.965	0.378	0.377	2.419

Notes:Columns 1, 3, and 5 present 2SLS IV estimates of treatment effects. Columns 2, 4, 6, and 7 restrict the sample to communities that complied with treatment assignment. All specifications include community fixed effects, standard errors clustered at the community level, and the full set of individual and session level controls. Pseudo R-squared presented in column 7. * p<0.10, ** p<0.05, *** p<0.01.