# When Identifying Contributors is Costly: An Experiment on Public Goods

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**Abstract**

Studies show that identifying contributors increases contributions to public goods. In practice, viewing identifiable information is costly, which may discourage people from accessing it. We design a public goods experiment in which participants can pay to view information about identities and contributions of group members. We compare this to a treatment in which there is no identifiable information, and a treatment in which all contributors are identified. Our main findings are that: (1) contributions in the treatment with costly information are as high as those in the treatment with free information, (2) participants rarely choose to view the information, and (3) being a high contributor is correlated with choosing to view information about others.

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## 1. Introduction

Research shows that recognizing contributors increases contributions to public goods (Andreoni and Petrie, 2004; Soetevent, 2005; Rege and Telle, 2004; Karlan and McConnell, 2012; Samek and Sheremeta, 2014). However, in practice, in some environments people may choose not to view information about contributors, and contributors may not be aware of whether their identifiable information is viewed by others. Examples include non-profit organizations with a large pool of donors and online communities that rely on user contributions.

We know little about the value of information about others. Eckel and Petrie (2011) find that identifiable information can have strategic value in a trust game, and that participants are willing to pay for such information. List et al. (2004) find that individuals are more likely to vote "yes" to contribute funds to a public project when there is a chance that their vote will be viewed by others. Kurzban and Descoli (2008) report an experiment in which participants can access information about others' contributions to the public good and find that individuals are willing to purchase such information at a small cost. But despite clear practical applications, it is not clear how individuals value information about identities of fellow contributors and whether such information is helpful in increasing contributions to public goods.

We design a public goods experiment in which participants can pay a fee, simulating the time or effort cost in the field, to view information about identities and corresponding contributions of group members. We compare this to a treatment in which there is no identifiable information, and a treatment in which all contributors are freely identified. The design of our experiment is similar to Samek and Sheremeta (2014), who use a public goods game to investigate whether shame or prestige arising from recognition is a greater motivator for giving. Our contribution here is to focus on a completely different set of questions. First, does

recognition information need to be costless in order to be effective? Second, we ask whether, and which participants value the information. Our main findings are that: (1) contributions in the treatment with costly information are as high as those in the treatment with free information, (2) participants choose to view about 10% of the time, and (3) being a high contributor is correlated with choosing to view identifiable information about others.

## 2. Methods

We employ a linear public goods game (Groves and Ledyard, 1977) to study how visibility of contributors impacts individual contributions. In a laboratory experiment, $n$ risk-neutral individuals choose a portion of their endowments $e$ to contribute to a public good. Individual $i$'s contribution $c_i$ to the public good is multiplied by $m$ and given to each of $n$ individuals in the group, where $0 < m < 1$ and $m \times n > 1$. Thus, each individual $i$ chooses $c_i$ to maximize the expected payoff $\pi_i = e - (1-m)c_i + m\sum_{j \neq i} c_j$.

The experiment was conducted using z-Tree (Fischbacher, 2007). We used digital photos and first names to identify individuals to one another. Upon arriving at the lab, each individual wrote his or her first name on a card, and the experimenter took a photo of the individual with the card. Each individual was then randomly assigned to a computer station. Individuals participated in a group of $n = 5$, staying in the same group throughout the 20-period experiment. At the beginning of each period, individuals received an endowment of $e = 80$ experimental francs and chose their contribution level $c$ to the public good. Each individual's contribution was multiplied by $m = 0.4$ and the total of all contributions given to each of the 5 individuals in the group. Each individual kept the remainder of the 80-franc endowment that he did not contribute. After all contribution decisions were made, the computer displayed the total and individual contributions of all group members.

We conducted three treatments: In NONE, participants were anonymous to one another. In ALL and COSTLY, the photos and names of each group member were displayed on the input screen, but we varied the outcome screen information display. In ALL, the photos of each member were displayed below his or her contribution on the output screen, such that each individual was recognized and also "ranked" (see Figure 1). In COSTLY, after viewing the default NONE screen with a list of contributions but no identification, individuals had the option to pay an equivalent of \$0.15 to view information about contributors (as in ALL). Whether or not information was viewed by others was not disclosed.

The experiment was conducted with undergraduates at Purdue University. 120 individuals participated in 6 sessions, with 20 individuals participating in each session. 2 out of 20 periods were selected for payment using a random draw from a bingo cage. Experimental francs were used throughout the experiment, with a conversion rate of 20 francs = \$1. Average earnings were \$14 for a 60-minute session.

## 3. Results and Discussion

The Nash equilibrium prediction of the public goods game is to contribute nothing, i.e. $c^* = 0$. However, Table 1 and Figure 2 show that contributions are significantly higher than zero in all treatments.[1] These results are consistent with previous studies of public goods games (see Ledyard, 1995), suggesting that participants have social preference concerns. When comparing NONE to ALL, we find that, as reported in Samek and Sheremeta (2014),[2] recognizing all

[1] A t-test, comparing average contributions within each group to 0, gives the *p*-values of less than 0.05 for all treatments.

[2] Note that the data from ALL and NONE reported in this paper is the same data as reported in ALL and NONE in Samek and Sheremeta (2014). The innovation of the current work is the COSTLY treatment, which is not reported on in Samek and Sheremeta (2014).

contributors significantly increases contributions relative to anonymity (44.2 versus 23.4).[3] This finding is also consistent with Andreoni and Petrie (2004). We now turn to the main question of interest, which is the comparison of the COSTLY treatment to ALL and NONE.

In COSTLY, we impose a cost equivalent to $0.15 for viewing identifiable contributor information. A standard utility maximization model would predict that individuals never pay the cost to view. However, individuals may also get utility from viewing. For example, high contributors may wish to see the identities of individuals who were free riding, or they may get utility from seeing themselves in the high ranked positions. Conditional cooperators, i.e., individuals who are willing to contribute more to a public good the more others contribute (Fischbacher et al., 2001; McCarter et al., 2014), may wish to view identifiable information in order to discern whom they would like to emulate. Given that information about contributors may be viewed for the above reasons, contributions in COSTLY may be higher than in NONE.

Consistent with our conjecture, we find a significant increase in contributions in COSTLY relative to NONE (39.3 versus 23.4). Contributions in COSTLY are not significantly different from ALL (39.3 versus 44.2).[4] This brings us to the first result:

**Result 1:** Contributions in the treatment with costly information (COSTLY) are as high as those in the treatment with free information (ALL), and are higher than in the treatment with no identifiable information (NONE).

Is identifiable information viewed? Participants choose to view the identity of group members 9.3% of the time and viewing frequency decreases over time. The modal views per

[3] A Wilcoxon rank-sum test shows that average contributions over all periods in NONE are significantly lower than average contributions over all periods in ALL treatment ($p$-value < 0.05). The same conclusion holds when looking at periods 6-20 ($p$-value < 0.05).

[4] A Wilcoxon rank-sum test shows that average contributions over all periods in COSTLY are not significantly different from average contributions in ALL, but are significantly different from average contributions in NONE ($p$-values 0.47 and 0.00, respectively). The same conclusion holds when we use only periods 6-20 ($p$-value < 0.05).

individual across all periods is 1, with 47% of individuals choosing never to view, 24% of individuals viewing once, and the remainder viewing 2-10 times. This brings us to the second result:

**Result 2:** About half of participants view identifiable information at least once; however, over all periods participants choose to view less than 10% of the time.

We now examine who views the photos. It turns out that participants who never choose to view contribute on average 33.6 experimental francs each period, whereas participants who choose to view at least once contribute on average 43.5 experimental francs each period. Further, we see a significant correlation of 0.32 between viewing and contributing ($p$-value = 0.04). This brings us to the final result:

**Result 3:** There is a positive and significant correlation between contributing and choosing to view identities of others.

One could imagine the correlation going either direction – being a high contributor could cause people to view more (in line with a story that high contributors get utility from viewing), or viewing results in higher contributions (in line with a story that conditional cooperators choose to view and emulate high contributors). An analysis of the first period behavior provides suggestive evidence of the former: in period 1, those who view contribute on average 66.0, while those who do not view contribute on average 49.2. As shown in specification (2) of Table 2, *view_photo_lag* is positive (suggesting that in general viewing has a positive effect on contribution) and that *view_photo_lag* * *contribution_lag* is negative (suggesting that participants who viewed decrease their contributions the higher is their contribution).

## 4. Conclusion

Our results suggest that displaying information about the identities of all contributors, even if this information is costly (i.e., in terms of time and effort needed to discover such information), may be a very effective way to increase contributions to public goods. In other words, we have established that information does not need to be available at no cost to be effective at increasing donations: the mere presence of information is sufficient in our setting. Moreover, the information does not need to be viewed to be effective: in our setting, information was effective even when it was viewed only 10% of the time. Finally, availability of (costly) information is valued more by high, rather than low, contributors.

Our findings are relevant for non-profit organizations with a large donor base, suggesting that despite the visibility challenge (the gift of a particular donor may take time and effort for others to view) publicizing contributors is still effective. The findings of our experiment also have practical implications for online communities that rely on user-provided content to be successful. While online communities may struggle with how to display contributors when there are thousands of them, our research would suggest that as long as this information is public, it is not necessary for it to be readily accessible.

Our finding that contributions and viewing are positively correlated has implications for theory. First, consistent with a model of Benabou and Tirole (2006), suggesting that individuals care about their social image, high contributors may choose to view because they get a utility from seeing themselves as high contributors. Second, consistent with a model of Vesterlund (2003), suggesting that recognizable information about donors may lead to greater giving by future donors, a non-negligible number of contributors view information and overall viewing has

a positive effect on contributions in the next period. Thus, our results suggest that viewing may lead to higher subsequent contributions and higher contributors may view more.

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**Table 1: Summary Statistics**

| Treatment | Average Contribution | Contribution as % of Endowment | % of Contributions = 0 | % of Contributions = Endowment |
|---|---|---|---|---|
| NONE | 23.4 (0.9) | 29.3% | 34.4% | 8.3% |
| ALL | 44.2 (1.2) | 55.3% | 22.0% | 32.8% |
| COSTLY | 39.3 (1.2) | 49.1% | 33.6% | 32.8% |

Standard errors in parentheses.

**Table 2: Arellano-Bond Regressions for COSTLY**

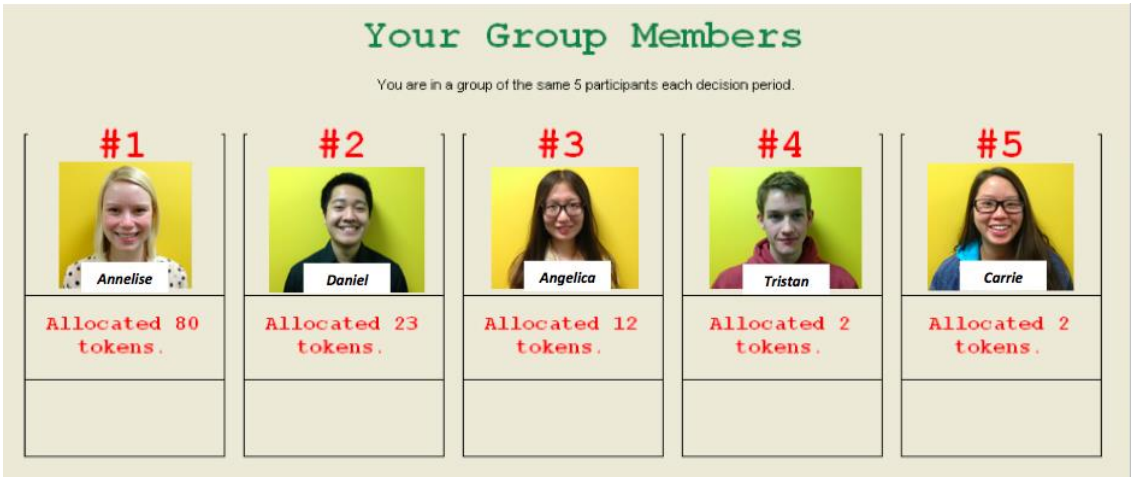
| VARIABLE | (1) Contribution | (2) Contribution |
|---|---|---|
| *contribution_lag* | 0.168*** | 0.191*** |
| | (0.0449) | (0.0470) |
| *group_contribution_lag* | 0.161*** | 0.155*** |
| | (0.0192) | (0.0193) |
| *view_photo_lag* | 2.822 | 16.48** |
| [=1 if viewed photo in the previous period] | (3.683) | (7.333) |
| *view_photo_lag * contribution_lag* | | -0.247** |
| [interaction term] | | (0.115) |
| *period* | -0.629*** | -0.616*** |
| | (0.186) | (0.187) |
| *constant* | 12.42*** | 12.33** |
| | (4.816) | (4.837) |
| Observations | 720 | 720 |
| Number of participants | 40 | 40 |

Standard errors in parentheses. *** p<0.01, ** p<0.05

**Figure 1: Output Screens**

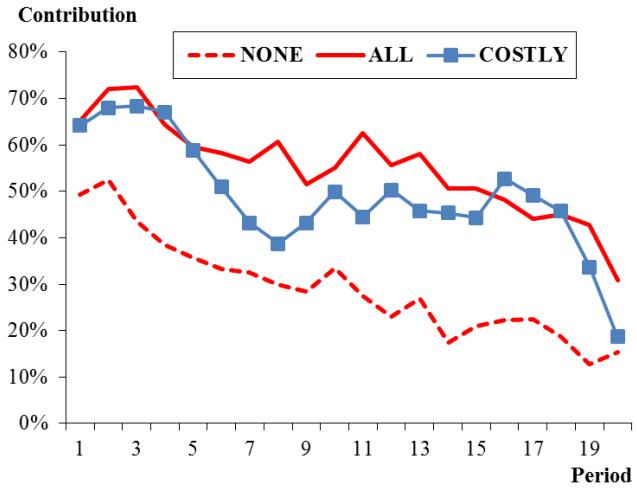
Treatment NONE


Treatment ALL




In COSTLY, participants see the NONE screen if they choose not to pay to view, and the ALL screen if they choose to pay to view. The numbers above the photo refer to the rank number (which may change in each period).

**Figure 2: Average Contribution as Percentage of the Endowment over Time**



## Appendix: Instructions for COSTLY Treatment

**INSTRUCTIONS**

In this experiment you will be placed in a group of **5 participants** (including you). You will remain in the same group for the entire experiment. The experiment will consist of **20 periods**. At the end of the experiment **2 out of 20** periods will be randomly selected for payment. After you have completed all periods two tokens will be randomly drawn out of a bingo cage containing tokens numbered from **1 to 20**. The token numbers determine which two periods are going to be paid in the game.

Each period you will be given **80 francs.** Francs will be converted to U.S. dollars at the end of the experiment at the rate of **20 francs = $1.** Each period you will be asked to decide how many francs you want to allocate to a **Group Account**. You may allocate any integer number of francs between **0** and **80**. The remainder will be automatically allocated to your **Individual Account**.

**EARNINGS**

After all participants have made their decisions, your earnings for the period are calculated. These earnings will be converted to cash and paid at the end of the experiment if the current period is the period that is randomly chosen for payment. Your earnings consist of two parts:

1) Your earnings from the **Individual Account**

2) Your earnings from the **Group Account**

Your earnings from the Individual Account equal to the francs that you keep for yourself and do not depend on the decisions of others. Therefore, for **every franc** you keep for yourself in your Individual Account, you earn **1 franc**. Your earnings from the Group Account depend on the total number of francs allocated to the Group Account by all 5 group members (including you). In particular, your earnings from the Group Account are **40 percent** of the **total allocation of all 5 group members** (including you) to the Group Account. Therefore, for every franc you allocate to the Group Account, you increase the total allocation to the Group Account by 1 franc. Therefore, your earnings from the Group Account rise by 0.4×1=0.4 francs. And the earnings of the other group members also rise by 0.4 francs each, so that the total earnings of the group from the Group Account rise by 2.4 francs.

In summary, your period earnings are determined as follows:

Your earnings = earnings from the Individual Account + earnings from the Group Account =

= 80 - (your allocation to the Group Account) + 0.4×(allocation of 5 group members to the Group Account)

***Example:*** Suppose that you allocated 40 francs to the Group Account and that the other four members of your group allocated a total of 120 francs. This makes a total of 160 francs in the Group Account. In this case each member of the group receives earnings from the Group Account of 0.4×160 = 64 francs. In addition, you also receive 40 francs from your Individual Account since you have kept 40 francs to your Individual Account.

**OUTCOME SCREEN**

At the end of each period, your allocation and the sum of all allocations in your group are reported on the outcome screen as shown below. To aid you in your calculation, you are also shown your earnings from your individual account and your earnings from the group account. Once the outcome screen is displayed you should record your results for the period on your **Personal Record Sheet** under the appropriate heading.

The photos and names of each member of your group will be displayed on the top of your screen at all times. At the end of each period, the photos of all group members will be re-arranged by the number of francs allocated to the Group Account in that period.

The allocations will be **ranked** from highest allocation to lowest allocation, and the amount of each group member's allocation will be listed on the screen.

**RANKING**

Further, each member in the group will be given a **ranking**, corresponding to the number of tokens allocated in that period within the group. For example, the member with the highest allocation in the group will be given the ranking of #1, the group member with the second-highest allocation will be given the ranking of #2, and so on. You have the choice to see the **ranking** of each group member as well as your own **ranking**. If you choose to view the rankings, click on "yes" for the question "Would you like to view the rankings?" If you choose to view the rankings, you will pay 3 experimental dollars, which will be subtracted from your outcome in each period, and the **photo** and **name** of each group member will be listed below his or her ranking on the screen. If you choose not to view the **rankings,** click on "no" for the question "Would you like to view the rankings?" If you do not view the rankings, you will not pay 3 experimental dollars.