

Visibility of Contributors and Cost of Information: An Experiment on Public Goods

Anya C. Savikhin^a and Roman M. Sheremeta^b

^aBecker Friedman Institute for Economic Research, The University of Chicago
5807 South Woodlawn Avenue, Chicago, IL 60637, U.S.A.

^bArgyros School of Business and Economics, Chapman University,
One University Drive, Orange, CA 92866, U.S.A.

October 12, 2011

Abstract

We experimentally investigate the impact of visibility of contributors and cost of information on public good contributions. First, we vary recognizing all, highest or lowest contributors. Second, we investigate the effect of imposing a cost on viewing contributors. Recognizing all contributors significantly increases contributions relative to the baseline, even when viewing contributors' information is costly. Recognizing only highest contributors does not increase contributions compared to not recognizing contributors, but recognizing only lowest contributors is as effective as recognizing all contributors. These findings support our conjecture that aversion from shame is a more powerful motivator for giving than anticipation of prestige.

JEL Classifications: C72, C91

Keywords: public-goods, information, experiments

Corresponding author: Anya Savikhin, savikhin@uchicago.edu, 773-609-0425. We want to thank Gerhard Klimeck and George Adams III at the nanoHUB.org for generous funding of this project and Kory Garner for help in conducting experiments. We also thank Jim Andreoni, Timothy Cason, Shakun Datta Mago, Peter DeScioli, Dirk Engelmann, Laura Gee, Justin Krieg, Rob Kurzban, John List, Lise Vesterlund and participants at the International Economic Science Association meetings for helpful discussions and comments. Any remaining errors are ours.

1. Introduction

The desire for social approval is one of the reasons why individuals will act more generously in public if their generosity is viewable by others (Hollander, 1990). It has been acknowledged that recognizing contributors by revealing their identity increases contributions to public goods (Andreoni and Petrie, 2004; Rege and Telle, 2004; Anderson et al., 2009).¹ Social groups, charity organizations and online communities, which are often modeled as public goods games, publicize individuals' contributions for this reason, and very few contributions are actually done anonymously. While there is agreement among researchers and practitioners that recognizing contributors has a positive effect, the reasons for this effect are not clear. In this paper, we systematically investigate whether the increase in contributions is driven by the recognition of the highest contributors or of the lowest contributors. We also evaluate whether knowing that one's identity and the corresponding contribution may be viewed by others is a sufficient motivator to increase giving, and whether individuals are willing to incur a cost to view identifiable information about group members.

We conducted a series of controlled laboratory experiments that explore the effect of information visibility on giving. We build our study on the design of Andreoni and Petrie (2004) by investigating a public goods setting with a treatment in which no identifiable information about participants is displayed and a treatment in which photos and names of participants are displayed. We extend this study with three novel treatments. In the first treatment, individuals decide whether or not to incur a cost to view identifiable information about group members' contributions in each period. In the other two new treatments, only the highest two or only the

¹ Results from psychology literature also suggest that individuals may use information about others' contributions as a reference point to perform social comparisons (Berkowitz, 1972; Loewenstein et al., 1989; Bazerman et al., 1992). It has also been found that announcing a "target contribution," splitting contributions into levels, or allowing a "leader" to contribute first and set an example can increase contributions (Andreoni and Petrie, 2004; Rege and Telle, 2004; Anderson et al., 2009).

lowest two contributors are identified in each period. The latter two treatments allow us to disentangle whether it is the aversion from shame or the anticipation of prestige that causes the observed increase in contributions.

While the link between the public goods game in the laboratory and social organizations in the field is imperfect, public goods games have been studied extensively to answer questions about charitable giving and about contributions to social groups (e.g., Ledyard, 1995; Andreoni and Petrie, 2004; Landry et al., 2006). Moreover, it is difficult to directly investigate the impact of visibility of contributors in naturally occurring or field data because in practice, social networks cannot be fully identified and viewing behavior is difficult to control or measure. Abstracting from the interpretation of which specific institutions in the field have more or less similarity to the public goods setting, our findings provide theoretical implications and general guidelines for practice.

The new treatments address the effectiveness of several mechanisms that social groups, charities and online communities may employ when publishing contributor information in practice. While these institutions endeavor to publicize all information, this is often difficult, if not impossible, for several reasons. First, when there are many contributors, publicizing the names of all of them may not be feasible. In this case, organizations that rely on philanthropic donations often publicize the names of the largest contributors, e.g. by naming a building after the highest contributor or by publicly announcing contributors in categories by size of contribution (Harbaugh, 1998; Andreoni and Petrie, 2004; Li and Riyanto, 2009). Second, it is improbable that every member of the social network will view all of the contributor's information, especially when the list of contributors is long. Organizations may recognize all contributors by publishing lists on websites and in other media, but it is not clear that this

information is always viewed due to the time and effort that must be spent in order to locate information about specific contributors.² Time and money have been previously identified as scarce resources affecting the choice to search for information (Gabaix et al., 2006).

We find that contributions are significantly increased when contributors are recognized (i.e., photos and names of all contributors are displayed after the contribution stage) relative to when contributors are not recognized. When viewing information about contributors is costly, there is no significant difference in contributions as compared to the case where all contributors are recognized by default, suggesting that simply the possibility of being recognized is sufficient to drive the increase in contributions. This effect holds even though the identities of contributors are viewed less than 10% of the time. We also pinpoint which information is most effective at increasing contributions. Recognizing only the highest contributors is not significantly different from not recognizing contributors, while recognizing only the lowest contributors is as effective as recognizing all contributors. This result suggests that it is the fear of shame, rather than the anticipation of prestige, that drives the identification-related increase in contributions in our setting.

The results of our experiment provide guidelines for increasing contributions to public goods through changing display of information in practice. Our findings suggest that social groups, charity organizations and online communities should always post information about contributors, even when it is costly for others to view such information. In addition, increasing participation in socially desirable activities, such as voting or community service, could be achieved by publishing lists of community members who have and have not participated in such activities.

² Empirical studies show that online users tend to ignore information that takes time to find; for example, on eBay, buyers rarely click through to view detailed feedback information about sellers (Resnick et al., 2006).

2. Experimental Environment, Design and Procedures

Some of the most fundamental questions about charity contributions and contributions to social groups have been answered using the public goods game setting in the experimental laboratory (Ledyard, 1995). In a simple linear public goods game (Groves and Ledyard, 1977), n identical risk-neutral players choose a portion of their endowments e to contribute to a public good. Player i 's contribution c_i to the public good is multiplied by m and given to each of n players in the group, where $0 < m < 1$ and $m \times n > 1$. Thus, the payoff for player i is given by: $\pi_i = e - c_i + m \sum_j c_j$.

We employ the public goods game to study how visibility of contributors and cost of information impact individual contributions. Specifically, we study 5 treatments, summarized in Table 1: a baseline treatment in which contributors were not publicly recognized for their contributions (None-Free), a treatment in which only participants who contributed the highest amount were recognized for their contributions (Top-Free), a treatment in which only the participants who contributed the lowest amount were recognized for their contributions (Bottom-Free), a treatment in which all participants were recognized for their contributions (All-Free), and a treatment in which all contributors were recognized but this information was costly for others to view (All-Costly).

Similar to the design of Andreoni and Petrie (2004), we chose to use digital photos to identify subjects to one another. Digital photos capture and preserve the appearance of the person but do not allow for communication, which may confound the effects of identification alone. In addition to the photo, we included first names as part of the identification of subjects. Upon arriving at the lab, each subject wrote his or her first name on a name card, and the experimenter took a photo of the subject holding up the name card. Each subject was then randomly assigned

to a computer station in the lab. We used z-Tree 3.3.6 (Fischbacher, 2007) to record subject decisions and display photos of subjects.

Subjects were assigned to a group of 5, and stayed in the same group throughout the entire experiment, playing a public goods game for a total of 20 periods.³ At the beginning of each period, subjects received an endowment of 80 experimental francs and were asked to choose their level of contribution to the public good. Each subject's contribution to the public good was multiplied by $m = 0.4$ and the total of all contributions given to each of the 5 subjects in the group. Each subject kept the remainder of the 80-franc endowment that he did not allocate to the public good. Subjects did not know others' decisions before making their own decisions. After all subjects made their contributions, the computer displayed the total contribution to the group account and the individual contributions of all 5 group members, sorted by contribution amount from largest to smallest.⁴

The photos and names of each group member were displayed on the input screen for all subjects, but we varied the display of identifiable information about contributors on the outcome screen across treatments. In the None-Free treatment, no additional identifiable information about contributors was revealed. In the All-Free treatment, the names and photos of each member were displayed below his or her contribution, such that each individual was recognized and also "ranked" (see Figure 1). In the Top-Free treatment, the names and photos of only the top two contributors (those ranked #1 and #2) were displayed below their contributions. Similarly, in the Bottom-Free treatment, the names and photos of only the bottom two

³ Unlike Andreoni and Petrie (2004), we decided to employ a fixed matching design. The main reason for this is that by using fixed matching we amplify the effect of prestige and shame, which we argue are one of the main motivating factors for contributions, and hence create the most conducive environment wherein our conjectures could be tested. Moreover, individuals repeatedly participate in social groups and online communities, and thus we fixed matching design better represents these environments.

⁴ While social groups of 5 are rarely observed in practice, the choice of small group allows us to assume that all 5 photos are costlessly viewed by participants when they are displayed.

contributors (those ranked #4 and #5) were displayed below their contributions. In the All-Costly treatment, after making contribution decisions, and after viewing the default “None-Free” screen with a list of individual contributions but no identification of contributors, subjects had the option to pay a small cost (3 experimental francs; equivalent of \$0.15) to view the identifiable information about all contributors (as in the All-Free treatment) on the screen. Whether or not information was viewed was not disclosed to subjects during the experiment.

The experiment was conducted at the Vernon Smith Experimental Economics Laboratory. Volunteers were recruited from a pool of undergraduate students at Purdue University. A total of 200 subjects participated in 10 sessions, with 20 subjects participating in each session. All subjects participated in only one session of this study. Some subjects had participated in other economics experiments that were unrelated to this research. At the end of the experiment, 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. Subjects earned \$14 on average, and sessions (including instruction time) lasted approximately 60 minutes. Subjects also completed a demographic questionnaire at the end of each session.

3. Hypothesis Development

3.1. Visibility and Cost of Information

Our goal is to document behavior when display of identifiable information is varied. We provide several testable conjectures based on the existing theory and based on findings of previous work. The standard Nash equilibrium prediction of the public goods game is to contribute nothing (free-ride), i.e. $c^* = 0$. However, previous experimental studies have found

that many subjects contribute significant amounts on average. There is also heterogeneity in contributions: while some subjects contribute their entire endowment, other subjects fully free-ride and contribute nothing (Ledyard, 1995; Fehr and Gächter, 2000). Behavioral arguments for why individuals contribute positive amounts to public goods include pure altruism, “warm glow” (Andreoni, 1989, 1990; Ledyard, 1995) and inequality aversion (Rabin, 1993; Fehr and Schmidt, 1999). The desire for social esteem has been noted as a source of prosocial behavior, both in the early works of Adam Smith (Smith, 1790) and in more recent models of human behavior (Ellingsen and Johannesson, 2008).

Social recognition adds another set of commonly cited motivators, including prestige (Harbaugh, 1998), shame (Tadelis, 2007) and the desire to demonstrate wealth (Glazer and Konrad, 1996). Previous research has shown that displaying identifying information in public goods and dictator games increases contribution levels due to social concerns or decreased social distance (Andreoni and Petrie, 2004; Rege and Telle, 2004; Soetevent, 2005; Charness and Gneezy, 2008). In light of previous research, we predict that individuals will contribute more in the All-Free treatment, where all contributors are recognized, as compared to the None-Free treatment, where no contributors are recognized.

Conjecture 1: Recognizing all contributors increases contributions to the public good.

In a novel All-Costly treatment, we also investigate contribution behavior when group members have the option to incur a cost to view identifiable information. In a recent study, Eckel and Petrie (2011) find that subjects in a trust game are willing to incur a cost to see the photos of their counterparts, and this leads to more cooperation and higher efficiency. However, efficiency increases only for subjects who buy the information. In related work, 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. Finally, Kurzban and Descoli (2008) report an experiment in which participants could access information about the lowest, median or highest contribution to the public good. They find that subjects are willing to purchase information on previous-round behavior at a small cost, although imposing the cost decreases aggregate contributions. Based on these previous findings, we conjecture that contributions in the All-Costly treatment will be higher as compared to the None-Free treatment, but will be lower relative to the All-Free treatment.

Conjecture 2: Imposing a cost on recognizing contributors increases contributions relative to the baseline, but it decreases contributions relative to the case where there is no cost of recognizing contributors.

3.2. Prestige and Shame

In the Top-Free and Bottom-Free treatments, we compare the effect of identifying only the highest or only the lowest contributors. We propose that identifying top contributors, as in the Top-Free treatment, activates prestige or pride (Hollander, 1990; Gilbert, 1998; Harbaugh, 1998). Pride is a powerful positive emotion that arises when one is approved of or admired by others (Hollander, 1990; Gilbert, 1998). In economic terms, Harbaugh (1998) refers to ‘prestige’ as the increase in utility that comes from having the amount of a contribution publicly known. The documented existence of prestige and pride in the literature suggests that our Top-Free treatment of recognizing the highest contributors will increase overall contributions relative to the baseline None-Free treatment. We will use the term ‘prestige’ to refer to any increase in utility due to being recognized.

Conjecture 3: Recognizing the highest contributors increases contributions to the public good due to prestige.

Another argument for why people give is to avoid feeling shame and guilt (Frank, 1988; Ketelaar, 2004). Shame (and guilt) may arise when an individual has committed a moral transgression, such as choosing to free-ride on others' contributions. In the literature, shame is defined as an emotion that induces behavior due to the fear of what others will think, and it is associated with a decrease in utility due to being believed to have acted inadequately (Tangney et al., 1992; Keltner and Buswell, 1996; Tadelis, 2007). Similarly, guilt arises when an individual realizes that she has hurt someone with her behavior and thus perceives herself as a bad person, independent of being recognized (Lewis, 1971; Baumeister et al., 1994).⁵ The documented existence of shame suggests that recognizing the lowest contributors in the Bottom-Free treatment will increase contributions because individuals will anticipate shame and will try to avoid loss in utility due to shame by increasing their contributions.

Conjecture 4: Recognizing the lowest contributors increases contributions to the public good due to shame.

Our design also allows us to measure the relative effect of shame versus prestige on giving, by comparing the Top-Free to the Bottom-Free treatment. The relative impact of prestige and shame has not been investigated, so we provide a conjecture based on social image and loss aversion theory. Concerns for social image play a role when making a decision to contribute (Benabou and Tirole, 2006; Andreoni and Bernheim, 2009; Ariely et al., 2009). We suggest that

⁵ Psychologists have found that priming individuals with feelings of guilt, but not shame, increased cooperativeness in a social dilemma game with anonymous participants (Ketelaar and Au, 2003; de Hooge et al., 2007). Guilt was only effective for selfish individuals and did not increase the contributions of prosocial individuals who were already contributing (de Hooge et al., 2007). While guilt is expected to result in an increase in prosocial behavior (to make up for wrongdoing), according to psychologists, shame is expected to result in hiding or withdrawing from the situation and from others (Tangney et al., 1996). In our experiment, hiding from the situation comes from increasing contributions to avoid being recognized again as a low contributor.

prestige and shame are polar opposites: prestige increases, while shame decreases, social image and utility. According to loss aversion theory of Tversky and Kahneman (1991), individuals weigh losses more heavily than gains. Thus, according to loss aversion theory, individuals may be concerned more with avoiding loss in utility and social image due to shame than with seeking a gain in utility and social image due to prestige. Identifying the highest contributors, as in the Top-Free treatment, measures the preference for a gain in utility and social image, as individuals motivated by prestige will contribute more. On the other hand, identifying the lowest contributors, as in the Bottom-Free treatment, measures the preference for a loss in utility and social image, as individuals will contribute more to avoid shame. Our conjecture, therefore, is that due to loss aversion, recognizing the lowest contributors will have a greater effect on increasing contributions than recognizing the highest contributors.

Conjecture 5: Recognizing the lowest contributors increases contributions more than recognizing the highest contributors.

4. Experiment Results

4.1. Overview

The summary statistics are reported in Table 2 and the average contributions over all 20 periods are displayed in Figure 2. Relative to standard theoretical predictions ($c^* = 0$), we find significant over-contribution in all treatments, with contributions declining over time.⁶ Note that as the result of over-contribution, subjects' payoffs are significantly higher than the equilibrium prediction. Our finding of over-contribution is consistent with previous experimental studies, which report that over-contribution is common in public goods environments (Ledyard, 1995).

⁶ A t-test, comparing average contributions to 0, gives the p-values of less than 0.05 for all treatments.

The results from our baseline treatment None-Free are in line with previous work – we find that contributions are at 29.3% of the endowment over all periods. Andreoni (1988, 1995) reported overall contributions at 33.2%, while Croson (1996) reported contributions at 35.7% of the endowment.

4.2. The Effect of Visibility and Cost of Information

Consistent with Conjecture 1, we find that recognizing all contributors in the All-Free treatment significantly increases overall contributions relative to the None-Free treatment.⁷ Our baseline treatment None-Free is most similar to Andreoni and Petrie’s (2004) “Information” treatment. In our baseline, contributions are equal to 29.3% of the endowment, while Andreoni and Petrie (2004) find that contributions are at 26.9% of the endowment. Our treatment All-Free is similar to Andreoni and Petrie’s (2004) treatment “Information-and-Photos.” While they find that the average contribution is 48.1% of the endowment in “Information-and-Photos,” we find marginally higher contributions, 55.3% of the endowment. One major difference between our work and Andreoni and Petrie (2004), is that we use a fixed matching while they use a random matching design. An additional difference between our treatment All-Free and their “Information-and-Photos” treatment is that we also include the first name of each individual. The fixed matching and the additional identification by first name may cause the minor increase in contributions in our treatments relative to Andreoni and Petrie’s experiment.⁸

⁷ A Wilcoxon Mann-Whitney rank-sum test shows that average contributions over all periods in the None-Free treatment are significantly lower than average contributions over all periods in the All-Free treatment (p-value < 0.05). The same conclusion holds when looking at periods 6-20 (p-value < 0.05).

⁸ We do not claim that this marginal increase in contribution levels is solely due to the addition of the first name component; as other experimental design aspects, for example, ranking the subjects, overall endowment, are also different across our experiment and the experiment of Andreoni and Petrie (2004). A clean test of whether the first name component increases contributions could be achieved by running another treatment of our experiment with the name removed; however, we chose not to do this as this is not the main question of our study.

Result 1: Recognizing all contributors significantly increases contributions relative to no recognition.

In the All-Costly treatment, we imposed a small cost on individuals who wished to view the identities of all contributors. Consistent with Conjecture 2, we find a significant increase in contributions in the All-Costly treatment relative to the baseline None-Free treatment. However, contrary to Conjecture 2, there is no significant difference in contributions between treatment All-Free and treatment All-Costly.⁹

Result 2: Imposing a cost on recognizing contributors increases contributions relative to no recognition, but it does not decrease contributions relative to the case when identifiable information is available by default.

The fact that contributions in the All-Costly treatment are not significantly different from contributions in the All-Free treatment is unexpected, and it highlights the practical importance of making information about identities of all contributions publicly available, even if this information is costly to access.¹⁰ Looking closer at the data, we find that participants choose to view the identity of group members less than 10% of the time, even though the price to view is small (\$0.15 per view).¹¹ As displayed by Figure 3, the viewing frequency decreases over time, from 10% of subjects choosing to view in the first five periods to only 5% of subjects choosing to view in the last five periods. The modal number of total views per subject across all 20 periods is 1, with 47.5% of subjects (38 out of 80) choosing to never view the identifiable information,

⁹ A Wilcoxon Mann-Whitney rank-sum test shows that average contributions over all periods in the All-Costly treatment are not significantly different from average contributions in the All-Free treatment, but are significantly different from average contributions in the None-Free treatment (p-values 0.47 and 0.00, respectively). The same conclusion holds when we use only periods 6-20 (p-value < 0.05).

¹⁰ The increase in contributions in the All-Costly treatment may be driven by different factors. First, individuals may believe that group members are viewing their information at a high rate, or close to the rate of views in the All-Free treatment. Second, simply the chance that one may be recognized is a strong enough motivator to avoid free-riding. These two explanations can be explored in future experiments that control for expectations.

¹¹ With 20 periods and 40 individuals in the All-Free treatment, the number of times photos are viewed is 74/800 (9.2%).

23.8% of subjects (19 out of 80) viewing once, and the remaining 28.7% of subjects viewing 2-10 times.¹² The finding that some subjects are willing to pay a small cost to view identities of others is in line with the recent findings of Eckel and Petrie (2011), who investigate the informational value of a photo in a trust game and find that at a similar, low price, a fraction of subjects purchase the photos of their matches (50% at the rate of \$0.20 per view). The difference between our paper and the work of Eckel and Petrie is that in our paper, subjects already have information about identity of group members in the input screen, and purchase information about what each group member contributed at the end of the period, while in Eckel and Petrie subjects purchase the photo of the match prior to the start of the game.

4.3. The Effect of Prestige and Shame

In the Top-Free and Bottom-Free treatments, we compare the effect of recognizing only the highest or lowest contributors. We find that displaying the identities of only the top contributors, as in the Top-Free treatment, marginally increases contributions, and average contributions in this treatment are not significantly different from contributions in the None-Free baseline treatment (27.8 versus 23.4).¹³ This finding differs from Conjecture 3, indicating that displaying only top contributors is not an effective way to increase overall contributions to public goods in our setting.

Result 3: Displaying the identity of only the highest contributors marginally increases contributions relative to no recognition, but the effect is not significant.

¹² No subject chose to view more than 10 times over the 20 rounds.

¹³ A Wilcoxon Mann-Whitney rank-sum test shows that contributions are not significantly different between None-Free and Top-Free treatments (p-value = 0.35). Based on the power test, this difference would have been significant if we had 236 independent observations per each treatment. However, contributions are significantly different between All-Free and Top-Free (p-value < 0.05).

When comparing contributions between the Top-Free and All-Free treatments, we find that contributions in the Top-Free treatment are significantly lower than in the All-Free treatment (27.8 versus 44.2).¹⁴ This finding further indicates the ineffectiveness of displaying only top contributors. It also suggests that the increase in contribution levels in the All-Free treatment relative to the None-Free treatment (Result 1) is not caused by the display of top contributors.

The findings from the Top-Free treatment are surprising given the recent literature on prestige and the success of increasing giving through categorizing contributors by size of contribution (Harbaugh, 1998; Li and Riyanto, 2009). We suggest that one reason why we do not find a significant effect of prestige is that in our experiment, prestige is relative. That is, one only has to be better than three individuals in order to gain prestige. On the other hand, when contributors are categorized by gift amount as in Harbaugh (1998), prestige is absolute.

In the Bottom-Free treatment, we find that displaying the identities of only the lowest contributors significantly increases contributions relative to both the None-Free and Top-Free treatments (44.9 versus 23.4 and 27.8). Moreover, contributions in the Bottom-Free treatment are not significantly different from contributions in the All-Free treatment (44.9 versus 44.3).¹⁵ This finding is consistent with Conjecture 4, indicating that recognizing only the bottom contributors is an effective way to increase contributions. Moreover, recognizing only the bottom contributors is as effective as recognizing all contributors.

Result 4: Displaying the identity of only the lowest contributors significantly increases contributions relative to the case where no identities are displayed, and is not significantly different from displaying the identities of all contributors.

¹⁴ A Wilcoxon Mann-Whitney rank-sum test shows that contributions are significantly lower in Top-Free than All-Free treatment (p-value = 0.00).

¹⁵ A Wilcoxon Mann-Whitney rank-sum test shows that contributions in the Bottom-Free treatment are significantly higher than in the None-Free and Top-Free treatments (both p-values < 0.05). However, contributions are not different between the Bottom-Free and All-Free treatments (p-value = 0.60).

The finding that contributions in the Top-Free treatment are not significantly different from contributions in the None-Free treatment, but contributions in Bottom-Free are significantly greater than contributions in the None-Free treatment, indicates that the effect from identifying contributors is primarily driven by motivators such as avoiding shame from being a low contributor, rather than by motivators such as seeking prestige from being a high contributor.¹⁶ These findings are in support of Conjecture 5, which suggests that individuals may in fact be loss averse when it comes to social image.¹⁷

4.4. Leaders and Laggards

Similar to Andreoni and Petrie (2004) and Gunnthorsdottir et al. (2001), we investigate the presence of leaders and laggards in our experiment. “Leaders” set an example by contributing a lot, while “laggards” contribute little (Andreoni and Petrie, 2004). We use a simple classification system to discover “leaders” and “laggards,” where a leader is defined as any individual who contributed 60 or more experimental francs (75% of the endowment) and a laggard is defined as any individual contributed 20 or less experimental francs (25% of the

¹⁶ Another explanation of why contributions increase when low contributors are identified is that displaying only the bottom contributors serves as an exogenous punishment mechanism for low contributors. It has been shown in the literature that social disapproval (either monetary or non-monetary) is a very powerful mechanism that improves individual contributions to public goods (Fehr and Gaechter, 2000, 2002; Masclet et al., 2003). Moreover, experiments on voting find that displaying lists of non-voters is more effective than displaying lists of voters (Panagopoulos, 2001). Historically, communities “shamed” wrong-doers by publicly identifying them. Therefore, subjects trying to avoid social disapproval should contribute sufficient amounts in order to avoid being the lowest contributors.

¹⁷ Note that a potential drawback of our design is that some prestige may come from not being identified as a low contributor in Bottom-Free, and some shame may occur from not being identified as a high contributor in Top-Free. Recall that there are 5 individuals total in each group, and either the top 2 or bottom 2 are identified in each treatment. Thus, not being identified in top (bottom) means that one is either the median contributor or the bottom (top) two contributors. We suggest that being the median contributor does not bring shame or prestige. However, it is true that there is some probability (66%) that non-identified members are at the bottom (top) of the distribution.

endowment) in the first period.¹⁸ The remaining subjects are classified as “followers.” The analysis of behavior in the first period allows us to consider the effect of visibility of contributors independent of the reputation that forms when participating in the game over several periods.

We conjecture that treatments All-Free and All-Costly should increase leaders and decrease laggards relative to treatment None-Free. In the Top-Free treatment, leaders are more likely while laggards are less likely to be revealed, so we conjecture that the proportion of leaders should be increased but the proportion of laggards should not change relative to treatment None-Free. In the Bottom-Free treatment, leaders are less likely while laggards are more likely to be revealed, so we conjecture that the proportion of leaders should not change while the proportion of laggards should decrease relative to None-Free.

Table 3 shows the distribution of leaders and laggards as a percentage of total number of subjects. Comparing treatment None-Free with All-Free, we find that in treatment All-Free there are almost twice as many leaders (52.5% versus 30.0%), and almost four times fewer laggards (10.0% versus 35.0%), and these differences are significant.¹⁹ Leaders contribute an average of 92.5% of their endowment, while laggards contribute an average of 11.6%.

While treatment All-Free, compared to treatment All-Costly, does not result in significantly different contributions on average, the effect on the proportion of leaders and laggards is different. Imposing a cost on viewing information does not reduce the number of leaders in the All-Costly relative to the All-Free treatment, but it more than doubles the number

¹⁸ Andreoni and Petrie (2004) use a similar approach of classifying leaders who contributed 15 or more tokens out of 20 and as laggards as those who contributed 5 or fewer tokens out of 20. However, the difference is that we use only one set of 20 periods while in Andreoni and Petrie (2004), subjects complete 5 sequences of contributions with different group members. In that case, they use the measure for “leaders” as those who contributed 15 or more in 4 out of 5 sequences, and as “laggards” as those who contributed 5 or fewer tokens in 4 out of 5 sequences.

¹⁹ A Chi² goodness of fit test has a p-value of 0.04 when comparing leaders, and a p-value of 0.01 when comparing laggards.

of laggards.²⁰ Thus, lowering the probability of being identified has an effect on the lowest contributors, but not on highest contributors. However, no significant difference in choice to view photos is observed between leaders and laggards. Over the course of the experiment, leaders view photos 9.5% of the time, while laggards view photos 13.2% of the time, and followers view photos 4.5% of the time.²¹

If individuals care about prestige of being displayed as one of the top two contributors, we should expect to see a greater number of leaders in the Top-Free relative to the None-Free treatment. However, we do not find this in the data. The proportion of leaders in both treatments is the same.²² Moreover, Figure 4, which displays the distribution of contributions in all treatments, indicates that there are almost no differences in distributions between treatments None-Free and Top-Free. This finding further supports our earlier suggestion that prestige is not the primary factor that causes higher contributions from identifying contributors. In addition, this finding may be due to the fact that prestige is relative in this setting, and depends heavily on participants' expectations. If participants do not expect the highest contributors to give over 75% of the endowment, then we may not find a high proportion of leaders.

If individuals are concerned about feeling shame by being displayed as one of the bottom two contributors, we should expect to see a lower number of laggards in the Bottom-Free relative to the None-Free treatment. This is exactly what our data indicate. There are significantly fewer

²⁰ A Chi² goodness of fit test has a p -value of 0.66 when comparing leaders and p -value of 0.05 when comparing laggards.

²¹ A Wilcoxon Mann-Whitney ranksum test for pairwise comparisons of proportion of times viewed aggregated for each subject results in p -values above 0.10 in all cases; e.g. Leader vs. Laggard p -value = 0.88, Leader vs. Follower p -value = 0.22, Laggard vs. Follower p -value = 0.38. Moreover, no significant correlation exists between amount given in period 1 and proportion of times photos are viewed (Spearman's rank correlation coefficient = -0.03 with p -value = 0.81).

²² Interestingly, there are more laggards in the Top-Free treatment even compared to the None-Free treatment. This may be because highlighting only the top contributors implicitly emphasizes that the rest of subjects are laggards and thus they should not contribute as much. It is also possible that highlighting only top contributors may implicitly de-emphasize the guilt effect, and thus cause more laggards in the Top-Free treatment relative to the None-Free treatment.

laggards in the Bottom-Free than in the None-Free treatment (17.5% versus 35.0%).²³ Similar conclusions can be drawn by comparing aggregate distribution of contributions (Figure 4). This finding, therefore, further supports our Conjecture 5 that shame is one of the main factors in increasing contributions when participants are identified.²⁴ It is also interesting to note that there are more leaders in the Bottom-Free than in the None-Free treatment (42.5% versus 30.0%).²⁵ It is likely that subjects who are trying to avoid shame are doing so by contributing very substantial amounts, which brings them into the category of leaders. This, again, could be due to the relative nature of being identified as a bottom contributor.

5. Discussion of Practical Implications

The results of our experiment suggest that displaying information about the identities of all contributors, even if this information is not readily available and takes effort to discover, may be a very effective way to increase contributions in practice. The improvement resulting from recognizing only top contributors relative to not recognizing any contributor is only marginal, while recognizing only the lowest contributors is very effective. These results provide practical guidelines for increasing contributions to public goods through changing display of information. Our findings suggest that all identifying information should be displayed, even if it is costly to view.

Because shame appears to be a powerful motivator to contribute, one may ask the question: why don't social groups, charity organizations and online communities practice displaying only bottom contributors? While these institutions face the problem of increasing

²³ A Chi² goodness of fit test has a p-value of 0.08 when comparing laggards.

²⁴ The proportion of leaders and laggards in the Bottom-Free is not significantly different from the All-Free (p-values are 0.37 and 0.33).

²⁵ This difference is not significant, however. A Chi² goodness of fit test has a p-value of 0.25 when comparing leaders.

contributions, they also face the first-order problem of attracting and retaining contributors. Given the opportunity of free entry and exit, individuals may simply avoid contributing to communal and charity groups that identify the lowest contributors. Although future work should explore in detail how the possibility of entry and exit affects contributions, our findings provide guidelines for increasing socially desirable participation and contribution within organizations or communities when entry and exit is costly or impossible. For example, alumni donations make up a large portion of a university's endowment. One becomes an alumni through receipt of a diploma from a particular university, and it is fairly difficult to remove oneself from this group due to social ties to fellow alumni. Alumni giving, thus, represents a potential community in which exit is costly. In this case, alumni organizations may choose to publish lists of alumni in which both high, low and no gifts are displayed to others.²⁶

The findings of our experiment also have practical implications for online communities that rely on user-provided content to be successful. Similar to charity organizations, online communities can increase contributions of effort through publicly acknowledging members. In online communities and forums, contributions usually take the form of user-provided content such as responding to questions on a Question and Answer forum or rating items on the site. Recognizing contributors is often done by online communities through publicly available rankings with lists of all contributors or through publicly recognizing only top contributors. There are a number of research studies investigating contributions to various online communities and forums (Ludford et al., 2004; Rafaeli et al., 2004; Rana and Hinze, 2004; Harper et al., 2007; Farooq et al., 2007; Yang et al., 2008; Adler et al., 2008; Chen et al., 2010;).²⁷ For example, a

²⁶ Of course, these lists could be prohibitively long for larger universities, which is why these lists could be published online.

²⁷ Separate bodies of work exist on contributions to question and answer sites such as Yahoo! Answers or Google Answers (Rafaeli et al., 2007; Harper et al., 2007; Chen et al., 2010), contributions involving greater effort and

related study suggests that contributors to Wikipedia, an online encyclopedia based on user contributions, receive social benefits that increase in the number of group members (Zhang and Zhu, 2011). Another study finds that social comparison information affects the behavior of users in the online movie-rating community MovieLens (Chen et al., 2010). We contributed to this growing literature by providing concrete suggestions for the display and visibility of identifiable contributor information, which can also be implemented in online settings.

6. Conclusion

The results of our experiment replicate previous findings that revealing identities of contributors significantly increases overall contributions. We find that imposing a cost for viewing identifiable information about contributors does not have a significant effect on contributions as compared to the case when identifiable information is publicly available. We also find that recognizing only the top contributors is not significantly different from not recognizing contributors, while recognizing only the lowest contributors is as effective as recognizing all contributors. Therefore, our results suggest that shame is a greater motivator than prestige in this setting, and that the risk of being identified is sufficient to increase contributions.

Future work should study channels through which costly identification operates. It would be interesting to learn whether it is a high expectation of being viewed or whether it is the anticipated impact on utility from being viewed that is the primary driving force of increasing contributions. In addition, the impact of shame and prestige in environments where entry and exit are costless is of great interest and should be the subject of future research.

expertise to sites such as Taskcn or SourceForge (Yang et al., 2008; Adler et al., 2008; Chatterjee and Pye, 2008), review posting on sites such as Amazon, eBay or MovieLens (Savikhin, 2009; Chen et al., 2010), and use of collaborative online communities to encourage relationships (Rana and Hinze, 2004; Farooq et al., 2007).

References

- Adler, B. T., de Alfaro, L., Pye, I., & Raman, V. (2008). Measuring Author Contributions to the Wikipedia. Paper presented at the Proceedings WikiSym, 2008
- Anderson, L., & Stafford, S. (2009). An Experimental Study of the Effect of Announcements on Public Goods Contributions. The College of William & Mary, Working Papers.
- Andreoni, J. (1989). Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence. *Journal of Political Economy*, 97, 1447-1458.
- Andreoni, J. (1990). Impure Altruism and Donations to Public Goods: A Theory of Warm-Glow Giving. *Economic Journal*, 100, 464-477.
- Andreoni, J., & Petrie, R. (2004). Public goods experiments without confidentiality: a glimpse into fund-raising. *Journal of Public Economics*, 88, 1605-1623.
- Andreoni, J. & Bernheim, D. (2009). Social image and the 50-50 norm: A theoretical and experimental analysis of audience effects. *Econometrica*, 77 (5), 1607-1636.
- 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.
- Baumeister, R. F., Stillwell, A. M., & Heatherton, T. F. (1994). Guilt: An interpersonal approach. *Psychological Bulletin*, 115, 243-267.
- Benabou, R., & Tirole, J. (2006). Incentives and prosocial behavior, *American Economic Review*, 99 (1), 544-555.
- Broberg, T., Ellingsen, T., & Johannesson, M. (2007). Is generosity involuntary? *Economics Letters*, 94(1), 32-37.
- Broucek, F. J. (1991). *Shame and the Self*. New York: Guilford Press.
- Charness, G., & Gneezy, U. (2008). What's in a name? Anonymity and social distance in dictator and ultimatum games. *Journal of Economic Behavior & Organization*, 68(1), 29-35.
- Chen, Y., Harper, F. M., Konstan, J., & Li, S. X. (2010). Social Comparisons and Contributions to Online Communities: A Field Experiment on MovieLens. *American Economic Review*, 100, 1358-98.
- Chen, Y., Ho, T. H., & Kim, Y. M. (2010). Knowledge Market Design: A Field Experiment at Google Answers. *Journal of Public Economic Theory*, 12(4), 641-664.
- Croson, R. T. A. (1996). Partners and strangers revisited. *Economics Letters*, 53, 25-32.
- de Hooge, I. E., Zeelenberg, M., & Breugelmans, S. M. (2007). Moral sentiments and cooperation: Differential influences of shame and guilt. *Cognition and Emotion*, 21(5), 1025-1042.
- Duffy, J., & Kornienko, T. (2010). Does competition affect giving? *Journal of Economic Behavior & Organization*, 74, 82-103.
- Eckel, C.C., & Petrie, R. (2011). Face Value. *American Economic Review*, 101, 1497-1513.
- Farooq, U., Ganoë, C. H., Carroll, J. M., & Giles, C. L. (2007). Supporting distributed scientific collaboration: Implications for designing the CiteSeer collaboratory. Paper presented at the Proceedings of the 40th Hawaii International Conference on System Sciences.
- Fehr, E., & Gächter, S. (2000). Cooperation and Punishment in Public Goods Experiments. *American Economic Review*, 90, 980-994.
- Fehr, E., & Gächter, S. (2002). Altruistic punishment in humans. *Nature*, 415, 137- 140.

- Frank, R. H. (1988). *Passions within reason: The strategic role of the emotions*: WW Norton & Co.
- Funk, P. (2010). Social incentives and voter turnout: evidence from the Swiss mail ballot system. *Journal of the European Economic Association*, 8(5), 1077-1103.
- Gabaix, X., Laibson, D., Moloche, G., & Weinberg, S. (2006). Costly information acquisition: Experimental analysis of a boundedly rational model. *The American Economic Review*, 1043-1068.
- Gilbert, P. (1998). What is shame? Some core issues and controversies. In P. Gilbert & B. Andrews (Eds), *Shame: Interpersonal behaviour, psychopathology and culture* (pp. 3–38). New York: Oxford University Press.
- Glazer, A., & Konrad, K. (1996). A signaling Explanation for Charity. *American Economic Review*, 86, 1019-1028.
- Groves, T., & Ledyard, J. (1977). Optimal Allocation of Public Goods: A Solution to the Free Rider Problem. *Econometrica*, 45, 783-809.
- Gunnthorsdottir, A., Houser, D., & McCabe, K. (2007). Disposition, history and contributions in public goods experiments. *Journal of Economic Behavior and Organization*, 62, 304-315.
- Harbaugh, W. (1998). The prestige motive for making charitable transfers. *American Economic Review*, 88, 277-282.
- Harper, F. M. (2007). Encouraging Contributions to Online Communities with Personalization and Incentives. *Lecture Notes in Computer Science*, 4511, 460.
- Harper, F. M., Li, S. X., Chen, Y., & Konstan, J. A. (2007). Social comparisons to motivate contributions to an online community. *Lecture Notes in Computer Science*, 4744, 148.
- Hollander, H. (1990). A social exchange approach to voluntary cooperation. *The American Economic Review*, 1157-1167.
- Keltner, D. (1996). Evidence for the distinctness of embarrassment, shame, and guilt: A study of recalled antecedents and facial expressions of emotion. *Cognition and Emotion*, 10(2), 155-172.
- Ketelaar, T. (2004). Ancestral emotions, current decisions: Using evolutionary game theory to explore the role of emotions in decision-making. In C. Crawford & C. Salmon (Eds.), *Darwinism, public policy and private decisions* (pp. 145–168). Mahwah, NJ: Erlbaum.
- Ketelaar, T., & Au, W. T. (2003). The effects of guilt on the behaviour of uncooperative individuals in repeated social bargaining games: An affect-as-information interpretation of the role of emotion in social interaction. *Cognition and Emotion*, 17, 429-453.
- Kurzban, R., & DeScioli, P. (2008). Reciprocity in groups: information-seeking in a public goods game. *European Journal of Social Psychology*, 38, 139–158.
- Landry, C.E., Lange, A., List, J.A., Price, M.K., & Rupp, N.G. (2006). Toward an Understanding of the Economics of Charity: Evidence from a Field Experiment. *Quarterly Journal of Economics*, 121(2), 747-782.
- Ledyard, J. (1995). Public Goods: A Survey of Experimental Research. In J. Kagel and A.E. Roth (Eds.) *Handbook of Experimental Economics*, Princeton, NJ.
- Lewis, H. B. (1971). Shame and guilt in neurosis. *Psychoanalytic Review*, 58(3), 419-438.
- Li, J., & Riyanto, Y. E. (2009) Category Reporting in Charitable Giving: An Experimental Analysis, Working Paper.
- List, J. A., Berrens, R. P., Bohara, A. K., & Kerkvliet, J. (2004). Examining the role of social isolation on stated preferences. *American Economic Review*, 94(3), 741-752.
- Ludford, P. J., Cosley, D., Frankowski, D., & Terveen, L. (2004). Think different: increasing

- online community participation using uniqueness and group dissimilarity. Proceedings of the SIGCHI conference on Human factors in computing systems (2004) ACM Press: Vienna, Austria, 631-638.
- Masclet, D., Noussair, C., Tucker, S., & Villeval, M. (2003). Monetary and Non-Monetary Punishment in the Voluntary Contributions Mechanism. *American Economic Review*, 93, 366-380.
- Morgan, J., & Sefton, M. (2000). Funding Public Goods with Lotteries: Experimental Evidence. *Review of Economic Studies*, 67, 785-810.
- Nathanson, D. L. (1987). *The many faces of shame*. New York: Guilford Press.
- Orzen, H. (2005). Fundraising through competition: Evidence from the lab. CeDEx Working Paper 2005-04.
- Rafaeli, S., Ravid, G., & Soroka, V. (2004). De-lurking in virtual communities: a social communication network approach to measuring the effects of social and cultural capital. Paper presented at the 37th Hawaii International Conference on System Sciences, Waikoloa, Big Island, Hawaii.
- Rana, O. F., & Hinze, A. (2004). Trust and reputation in dynamic scientific communities. *IEEE Distributed Systems Online*, 5.
- Rege, M., & Telle K., (2004). The impact of social approval and framing on cooperation in public good situations. *Journal of Public Economics*, 88, 1625-1644.
- Resnick, P., Zeckhauser, R., Swanson, J., & Lockwood, K. (2006). The value of reputation on ebay: A controlled experiment. *Experimental Economics*, 9, 79-101.
- Soetevent, A. (2005). Anonymity in giving in a natural context- a field experiment in 30 churches. *Journal of Public Economics*, 89, 2301-2323.
- Smith, A. (1790). *The Theory of Moral Sentiments*. 6th edition. (First edition 1759). London: A. Millar.
- Tadelis, S., (2007). *The Power of Shame and the Rationality of Trust*, UC Berkeley, Working Paper.
- Tangney, J. P. E., & Fischer, K. W. (1995). *Self-conscious emotions: The psychology of shame, guilt, embarrassment, and pride*. New York: Guilford Press.
- Yang, J., Adamic, L. A., & Ackerman, M. S. (2008). Crowdsourcing and Knowledge Sharing: Strategic User Behavior. In EC'08, 246-255.
- Zhang, X., & Zhu, F. (2011). Group Size and Incentives to Contribute: A Natural Experiment at Chinese Wikipedia. *American Economic Review*, 101(4), 1601-1615.

Table 1: Summary of Treatments

Treatment	Display of Identities	Cost of Information	Number of Subjects	Number of Independent Observations
None-Free	None	Free	40	8
All-Free	All players	Free	40	8
Top-Free	Top 2 players	Free	40	8
Bottom-Free	Bottom 2 players	Free	40	8
All-Costly	All players	Costly	40	8

Table 2: Average Statistics

Treatment	Average Contribution	Contribution as % of Endowment	% of Contributions = 0	% of Contributions = Endowment
None-Free	23.4 (0.9)	29.3%	34.4%	8.3%
All-Free	44.2 (1.2)	55.3%	22.0%	32.8%
Top-Free	27.8 (1.0)	34.8%	24.4%	10.9%
Bottom-Free	44.9 (1.0)	56.1%	12.4%	25.1%
All-Costly	39.3 (1.2)	49.1%	33.6%	32.8%




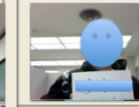
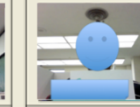
Standard error of the mean in parentheses.

Table 3: Distribution of Leaders and Laggards

	None-Free	All-Free	Top-Free	Bottom-Free	All-Costly
Leaders	30.0%	52.5%	30.0%	42.5%	47.5%
Laggards	35.0%	10.0%	32.5%	17.5%	27.5%

Treatment All-Free

Your Group Members
You are in a group of the same 5 participants each decision period.

#1	#2	#3	#4	#5
				
Allocated 80 tokens.	Allocated 58 tokens.	Allocated 10 tokens.	Allocated 5 tokens.	Allocated 2 tokens.

Treatment Top-Free

Your Group Members
You are in a group of the same 5 participants each decision period.

#1	#2	#3	#4	#5
				
Allocated 80 tokens.	Allocated 58 tokens.	Allocated 10 tokens.	Allocated 5 tokens.	Allocated 2 tokens.

Treatment None-Free

Your Group Members
You are in a group of the same 5 participants each decision period.

#1	#2	#3	#4	#5
Allocated 80 tokens.	Allocated 23 tokens.	Allocated 12 tokens.	Allocated 2 tokens.	Allocated 2 tokens.

Figure 1: Output Screens (Names and Photos are Removed)

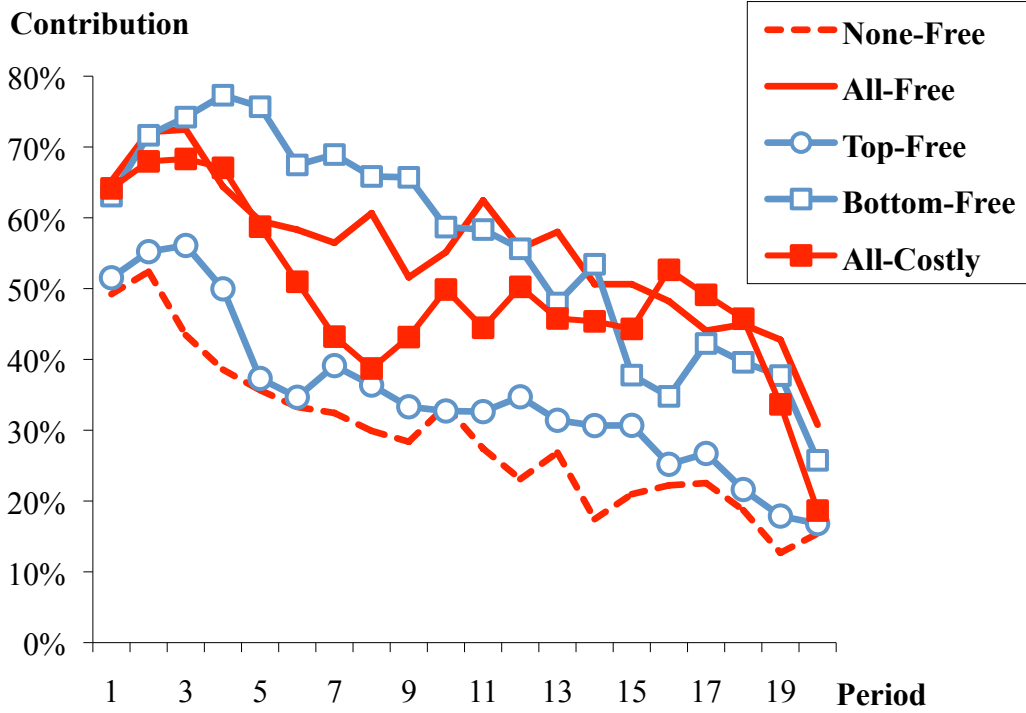


Figure 2: Average Contribution as Percentage of the Endowment over Time

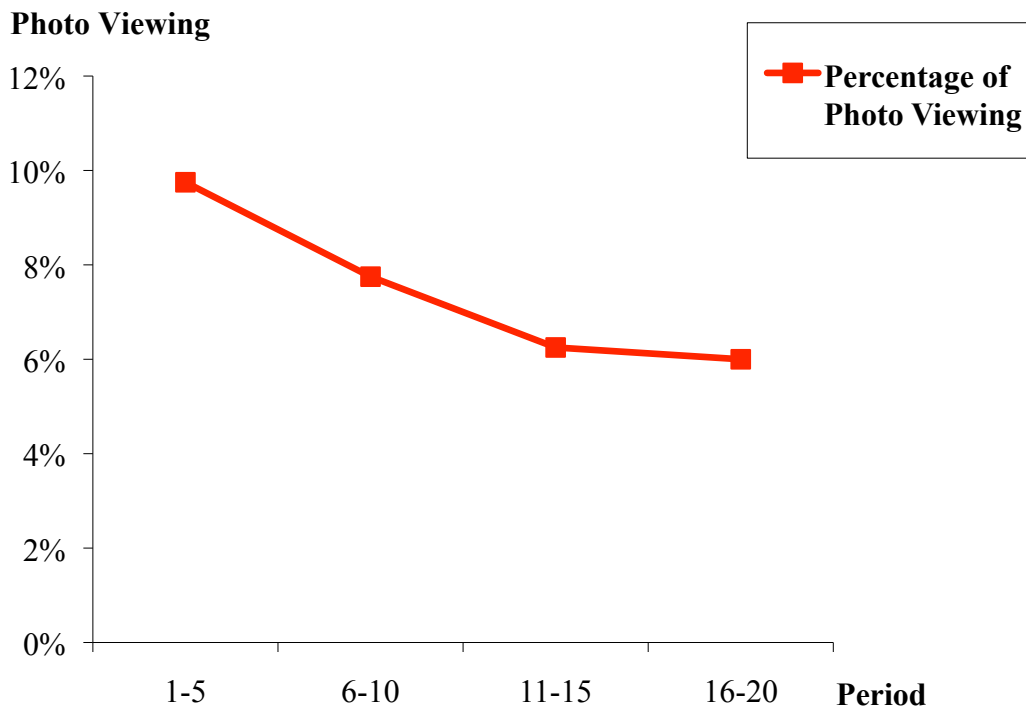


Figure 3: Viewing Photos of Members over Time (All-Costly Treatment)

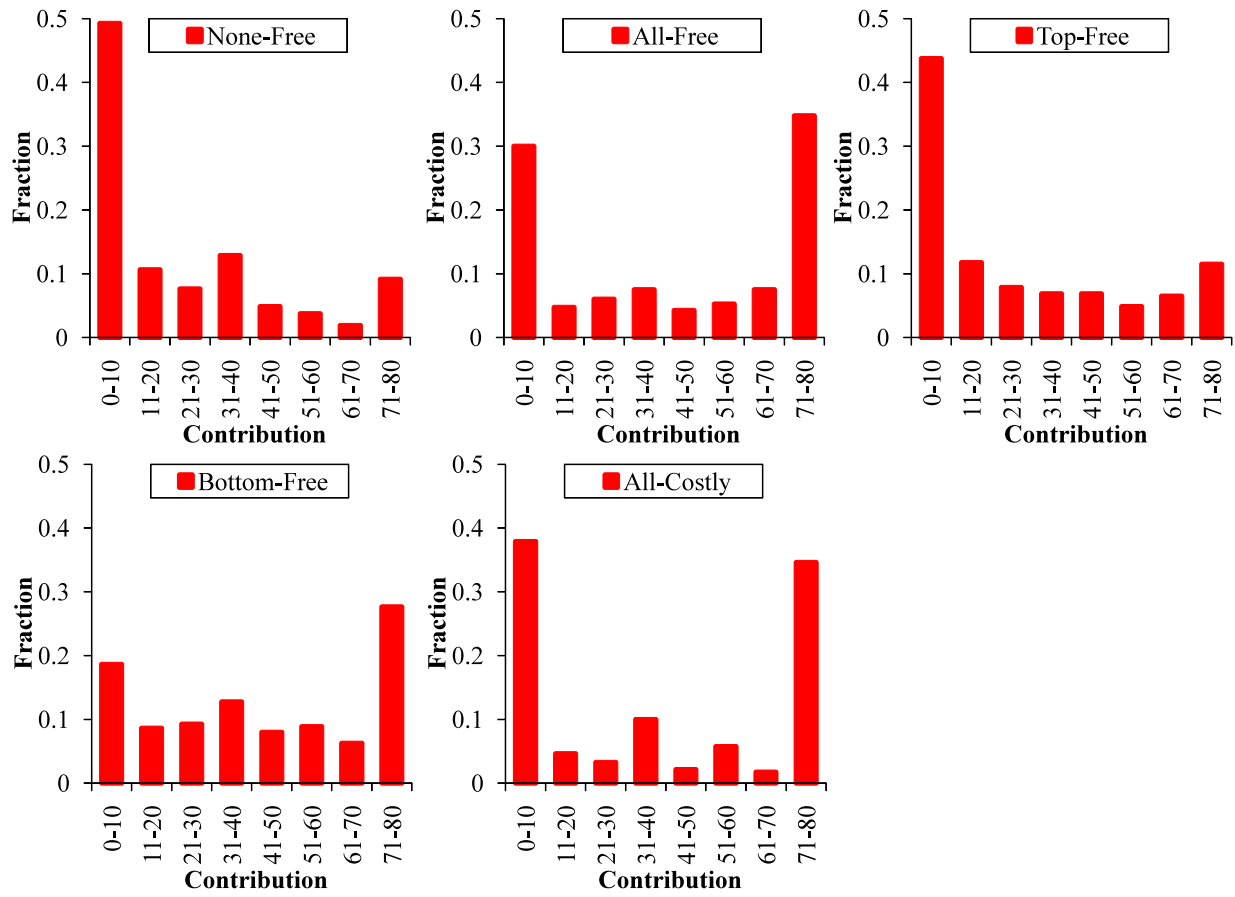


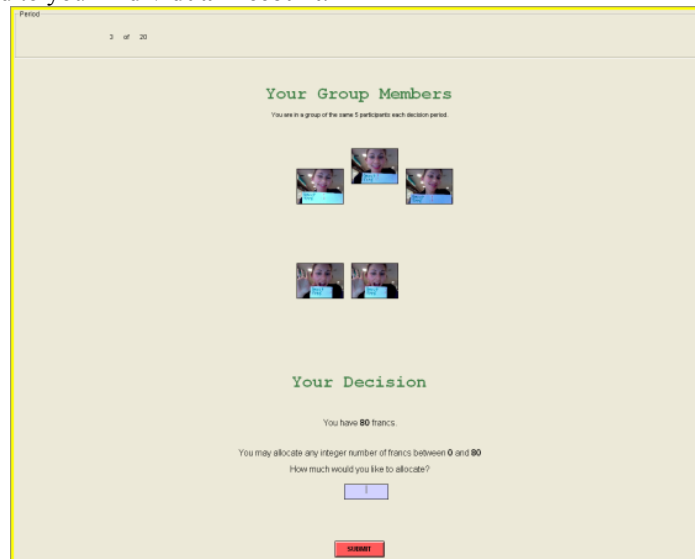
Figure 4: Distribution of Contributions in all 20 Periods

Appendix: Instructions for AC 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 $0.4 \times 1 = 0.4$ 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:

$$\begin{aligned} \text{Your earnings} &= \text{earnings from the Individual Account} + \text{earnings from the Group Account} = \\ &= 80 - (\text{your allocation to the Group Account}) + 0.4 \times (\text{allocation of 5 group members to the Group Account}) \end{aligned}$$

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 $0.4 \times 160 = 64$ 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.

Period 1 of 20

Your Group Members

You are in a group of the same 5 participants each decision period.

#1	#2	#3	#4	#5
Allocated 80 tokens	Allocated 23 tokens	Allocated 12 tokens	Allocated 2 tokens	Allocated 2 tokens

Outcome

Your allocation to the Group Account:	2
Sum of all allocations in Your Group :	119
Earnings from your Group Account: $0.4 \times 119 =$	47.6
Earnings from your Individual Account: $1.0 \times 40 =$	78.0
Total earnings for this period:	125.6

Would you like to view rankings (with name and photo) of your group members? (Cost to view: 4 experimental dollars)