Social Policy Instruments and the Compliance Environment

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Abstract

Two types of social policy instruments — making group behavior public to the individual and making individual behavior public to the group — are used by charities to encourage giving and by policymakers to incentivize other prosocial behaviors. However, models of social norms suggest that the effects of such interventions are theoretically ambiguous and may even backfire in low-compliance environments. We examine these questions in the context of a public good game. Exploiting a unique experimental design, we show that initial contributors' giving decisions are sensitive to the behavior of the group while initial non-contributors' decisions are not. In contrast, making own behavior public to the group increases contributions for all group types, even those comprised entirely of initial non-contributors. These findings suggest that publicizing contributions causes individuals to respond to a common understanding of prosocial behavior that is not defined solely by the initial group norm.

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1 Introduction

Encouraging prosocial behavior is of great interest to policymakers. Just one form of such behavior — charitable giving from individuals and households — was over $400 billion in the United States in 2018 (Giving USA Foundation, 2019). This giving is widespread, with approximately 90% of individuals in the U.S. making charitable donations (Independent Sector, 2001).[1] Beyond charitable giving, individuals engage in environmental protection; donate blood and organs; vote when they surely are not pivotal; wash their hands and wear masks to curtail disease; and take many other prosocial actions, such as privately contributing to public goods (Olken and Singhal, 2011; DellaVigna et al., 2012; Bice and Hoyt, 2000; Ferris, 1984).

A rich literature has explored how social forces motivate charitable giving and other forms of prosocial behavior. This literature has identified two types of social policy instruments. The first instrument, providing "peer information," involves giving information about what others are doing to a decision maker. The second instrument, providing "social recognition," involves making public what a decision maker does (i.e., making the decision maker's actions identifiable and observable to others).[2] These types of interventions have been used in both field and lab settings, and interventions often combine both instruments. For example, publicizing all gifts to a public good provides information about contributions of others and identifies each individual's giving decision.

While there are many examples of these interventions being deployed successfully in practice, some models of behavior suggest that the efficacy of these instruments depends fundamentally on baseline contribution levels. In addition, effects may be heterogeneous for those initially engaging in the desired behavior (contributors, voters, tax compliers) and

[1] See also Vesterlund (2006), List (2011), Andreoni and Payne (2013), and Brown et al. (2015).

[2] On peer information: see Frey and Meier (2004), Martin and Randal (2008), Shang and Croson (2009), Bracha et al. (2011), and Gee and Schreck (2018) on charitable giving; Goldstein et al. (2008) and Allcott (2011) on environmental protection; Coffman et al. (2017) on job choice; and Keser and Van Winden (2000), Fischbacher et al. (2001), and Fischbacher and Gächter (2010) on laboratory public good provision. Kessler (2017) finds that just announcing support for a charity can encourage others to give. On social recognition: see Perez-Truglia and Troiano (2018) on tax compliance; Gerber et al. (2008) and DellaVigna et al. (2016) on voting; Harbaugh (1998), Ariely et al. (2009), Karlan and McConnell (2014), and Samek and Sheremeta (2017) on charitable contributions; Linardi and McConnell (2011) on volunteering; Charness and Gneezy (2008) on dictator game giving; Tadelis (2007) on trustworthy behavior; and Rege and Telle (2004), Filiz-Ozbay and Ozbay (2014), Samek and Sheremeta (2014), and Samek and Sheremeta (2016) on laboratory public good provision.

those failing to do so. Both of these issues point to the relevance of examining how these two policy levers interact with the compliance environment — the proportion of individuals engaging in the prosocial action in the absence of the social intervention.

For example, providing information about peer behavior can encourage contribution when others give more than expected but can also discourage contribution when others give less than expected (see, e.g., Croson and Shang (2008) for empirical evidence). This pattern may arise because individuals respond to information in others' decisions (Vesterlund, 2003), because they are motivated by reciprocity (Sugden, 1984), or due to conformity (Bernheim, 1994). Similarly, some models that aim to explain the effects of social recognition also predict that baseline contribution levels interact with the efficacy of making an individual's contribution public. If the individual cares about being perceived as fair or norm-compliant (Andreoni and Bernheim, 2009) or is more likely to conform to the actions of others when his or her actions are public (Bernheim, 1994), then making contributions public in low-giving environments may reinforce low levels of giving and fail to increase contributions.[3]

Our knowledge of how these social policy levers interact with the compliance environments is limited. Field studies utilizing these interventions tend to focus on contexts in which baseline compliance is high or target only initial non-prosocial actors, and observational variation in the compliance environment does not allow causal identification. And while there are numerous laboratory studies examining how group behavior affects individual decisions (often referred to as "conditional cooperation" in this context) and how various forms of social recognition or social pressure affect behavior, this study is the first — to the best of our knowledge — to focus explicitly on how the compliance environment interacts with these interventions in a public good setting.[4]

In this paper, we use an innovative experimental design to vary the compliance envi-

[3] Alternative models of social recognition suggest that making prosocial decisions public would generally increase giving. These models suggest social recognition induces contribution because agents seek social approval (Holländer, 1990); because it allows agents' choices to signal their underlying generosity (Bénabou and Tirole, 2006), wealth (Glazer and Konrad, 1996), or both (Bracha and Vesterlund, 2013).

[4] In particular, we explore a repeated contribution environment in which individuals are asked to give repeatedly. While there are a number of papers about publicizing contributions in repeated settings — see Soetevent (2005) on charitable giving; Gerber et al. (2008) on voting; and Andreoni and Petrie (2004), Filiz-Ozbay and Ozbay (2014), Samek and Sheremeta (2014), and Samek and Sheremeta (2016) on repeated laboratory public goods — we are unaware of any previous work explicitly examining how making contributions public affects behavior across different compliance environments.

ronment (i.e., the baseline level of prosocial behavior). Subjects play a repeated binary public good game in groups of four. Our algorithm for group assignment generates exogenous variation in the number of contributors each individual is paired with, conditional on own contribution decision at baseline. In all treatments, this information is provided to all individuals in the group. That is, we always provide subjects with *peer information*, but the information they receive is exogenously varied via the group composition.

To vary social recognition, we inform all participants that there will be a snack break after the session while the experimenters organize payments. In the *social recognition* treatment, subjects are told they will wear name tags during the snack break that link them back to their contribution decisions during the experiment. We see advantages of this design innovation, as discussed in Section 2.1.[5]

We introduce variation in both peer information and the presence of social recognition only after subjects have made their first-round contribution decisions. This feature of our design allows us to explore how behavior responds among two types of decision makers — baseline contributors and baseline non-contributors — and to investigate which types of agents respond to which social policy instruments.

We present three main results. First, subjects randomly put in groups with more contributors give at significantly higher rates, consistent with the literature on conditional cooperation. We find, however, that only individuals who contribute in the first round (i.e., before they observe the contributions of others) respond to the number of other contributors in their group; initial non-contributors do not appear to respond to peer behavior.

Second, we find that social recognition significantly increases individual contributions. This effect is driven initially by the subjects who do not contribute in the first round. Later in the game, however, there is a substantial treatment effect of social recognition for initial contributors, encouraging them to maintain a high level of giving.

[5]There is significant experimental evidence that monetary punishment and reward can influence behavior in public good games. For example, games where group members can punish one another between each round can increase contribution to the public good (Fehr and Gächter, 2000). Even non-monetary punishment (akin to scolding) can increase contribution, but more severe punishment (i.e., monetary rather than non-monetary) generates more contribution to the public good (Masclet et al., 2003). Here, we do not impose a specific punishment technology and do not allow for punishment between rounds of the game. Instead, we investigate how individuals respond to the threat of organic social reward and punishment, which will be imposed after all choices are made. In this way, we reveal how subjects respond to the treatment without round-by-round feedback about what type of punishment they have received.

Third, we find that social recognition increases contributions from groups at every initial contribution level, even those with zero baseline contributors. This result demonstrates that while peer information has differential effects across compliance environments, the reaction to social recognition appears to be based on a more inherent sense of what behavior is socially desirable.

Our results underscore the significant appeal of using social recognition to increase public good contribution. While financial incentives like subsidies for contribution can be quite costly and may need to be in place continuously to be effective, social recognition can potentially be implemented at a low cost but still deliver substantial positive effects, even for initially low-contribution groups.[6] In addition, our results speak to the different motivations for responding to social recognition. Our results imply that publicizing contributions induces individuals to respond to a common understanding of prosocial behavior that is not defined solely by the initial group norm. This suggests our findings are more consistent with models focusing on social approval or signaling positive traits than models focusing on conformity to others' actions.

2 Experimental Design

The experiment involved subjects in groups of four making binary contribution decisions in a finitely repeated public good game. Subjects were told that they would play 16 rounds of the public good game in the same group. In each round, each subject had a \$5 endowment and could either contribute nothing or contribute the whole endowment ($g_i \in \{0, 5\} \ \forall \ i$). Binary contribution of \$5 to the public good generated a payoff of \$2 for each of the four group members. Payoffs (in U.S. dollars) thus took the following form (where i is one of the four participants in the group, and so the contribution of i is included in the summation indexed by j):

$$\pi_i = 5 - g_i + 0.4 \sum_{j=1}^{4} g_j$$

[6] The cost of implementing a policy and its efficacy are only two inputs into the policy's overall welfare effects. For work on the welfare effects of social recognition, see Butera et al. (2019); for work on the welfare effects of peer information, see Allcott and Kessler (2019).

The payoffs of the public good were explained to subjects and, before any choices were made, they were allowed to spend up to two minutes making hypothetical contribution choices for four players and observing the resulting payoffs for all group members.[7] Subjects were told that they would be paid for the results of one randomly selected round of the 16. Finally, subjects were told that the rules of the game might change and they would be informed if they did.[8]

All sessions included 16 subjects, and subjects were assigned to groups of four within that session. We introduce several unique design features to test the impact of peer information and social recognition on behavior.

Random assignment to compliance environment The experimental design generated variance in initial group cooperation levels by randomly assigning subjects to groups. To ensure that we are powered to measure behavior in very low and very high compliance groups, we generated excess variance by making group assignments conditional on first period giving. We did this by informing subjects that they would play in the same group for all 16 rounds, but (unknown to the subjects) we placed them into groups as a function of their first round choice. This allowed us to create more "extreme" groups (e.g., of all defectors or all cooperators) than would have occurred if groups had been assigned before the first round decision.[9] Since subjects receive information about the number of other contributors in their group after making their initial contribution decision, they can respond to the number of other contributors in their group starting in round 2.

[7] The wording of the experiment called the public good a "group pot" and the decision was whether or not to "allocate" their $5 to the group pot. While used throughout the paper, the words "public good" and "contribute" were not used in the instructions, which can be found in Appendix A.1.

[8] At the end of the experiment discussed here, we introduced a surprise restart for a second 16 rounds in which we changed the payoff structure of the game. Because this was unknown to subjects ex ante, it cannot have impacted the experimental results here. Instructions and data from these rounds is available on request.

[9] When using this technique, we were careful not to deceive subjects by telling them anything inaccurate. For example, we told subjects they would be playing all rounds of the game in the same group (which was true, since payoffs for the first round were determined based on the assigned group); but we did not state that the group had been formed prior to a subject's first-round contribution decision (since they were not yet in a group when they made that contribution decision). This experimental design feature is related to, but slightly different from, experimental designs that create more-generous and less-generous groups based on how subjects play in games preceding the public good game of interest (see, e.g., Aksoy and Krasteva (2020)).

Provision of peer information All subjects received information about the contribution decisions of others in their group from the prior rounds. After first-round contribution decisions were made, each subject was given a unique ID and told that, going forward, their contribution decisions would be associated with this ID and shown to the other members of their group. After round 1, subjects only learned the number of subjects in their group who had contributed. After round 2, and throughout the rest of the study, subjects received more detailed information, namely the specific history of play for each particular group member. This data allowed subjects to determine whether the same participants were contributing in each round. A table showing the allocation choice for each ID in their group (for each round starting with round 2) was displayed continuously on each subject's screen for the next fifteen rounds (see an example in Appendix Figure A7).

Random assignment to social recognition treatment Subjects were randomly assigned to the *peer information only* treatment or to the *social recognition* treatment in a between-session design. In the *peer information only* sessions, subjects' unique ID numbers were private information. In the *social recognition* sessions, subjects were told that their ID numbers, and thus their contribution decisions, would be associated with their real identities. This variation was introduced at the same time as the ID numbers were introduced, starting in round 2, allowing round 1 to serve as a baseline and balance check.

In both the *peer information only* and *social recognition* treatments, subjects were told that at the end of the study, they would have two minutes to look over the contributions of all their group members by ID and then spend 15 minutes at the back of the laboratory having drinks and snacks with the other 15 subjects in the session. In the *social recognition* treatment, however, subjects were informed that their ID number would be made public to the other group members (see screenshots in Appendix Figure A6). In particular, subjects were told that after all decisions were made in the experiment, subjects would: (1) stand up at the same time as their other group members, (2) announce their ID number, and (3) receive a name tag with their ID number that they would wear during the 15 minutes of drinks and snacks at the back of the laboratory.[10]

[10]Since social recognition is implemented at the end of the game, this design requires subjects to anticipate the costs and benefits associated with having their contribution decisions made public.

2.1 Comments on experimental design

This experimental design allows us to make several important advances. First, as noted above, the design generates exogenous and excess variation in peer contributions, conditional on a subject's first round contribution decision. This allows us to measure how subjects respond to different levels of peer information.

Second, the excess variation in our group formation generates more than the expected number of groups at extreme contribution levels (e.g., 0 initial contributors out of 4 and 4 initial contributors out of 4) allowing us to be well powered to explore low-compliance and high-compliance environments. Previous experiments on making contributions public have looked for average effects on contributions and found that public revelation leads to higher contributions. We are explicitly interested in heterogeneity in compliance environment and, in particular, how social recognition works in low-contribution environments, since it is for groups with 0 and 1 initial contributors that the models discussed in the Introduction predict that social recognition might not increase giving.

Third, choices are binary and subjects make their first contribution decision without knowing the contributions of others and without any threat of social recognition. We consequently can identify two different types of subjects: (1) initial non-contributors who, faced with a public good game played with a fixed group for 16 rounds, choose not to contribute in the first round; and (2) initial contributors who, faced with the same game, choose to contribute in the first round. We can therefore test for heterogeneity in behavioral responses by subject type.

Fourth, the design allowed for subjects to face the threat of social recognition but for subjects to make all their contribution decisions before they learned the identities of their group members. Keeping identities private until the end of the game allows for the effect of social reward and punishment to be measured in a repeated setting without confounding information, coordination, empathy, or solidarity that might arise from protocols that allow individuals to see pictures of or interact with other members of their group before making all their contribution decisions.[11]

[11] Seeing group members or interacting with group members has the potential to alter subjects' beliefs about the types of individuals with whom they are playing or create feelings of kinship or solidarity that might affect contribution decisions. For example, Reinstein and Riener (2012) finds that individuals respond more to another donor's gift when the donor's identity is known and finds that individuals respond more to

Fifth, because we observe individuals playing repeatedly in the same group for 16 rounds, we can investigate the dynamics of repeated play under the threat of social recognition.

Sixth, we use a snack break at the end of the experiment to construct an environment where the consequences of social recognition can organically arise. This allows our experiment to approximate the types of normal social interactions through which recognition or shame may occur in practice.

3 Results

The results section proceeds as follows. Section 3.1 presents results from the *peer information only* treatment that are based on exogenously varied group composition. Section 3.2 examines the impact of introducing social recognition by making contributions public. Section 3.3 discusses heterogeneity in the *social recognition* treatment results.

3.1 Peer Information

We can identify the causal effect of varying others' contributions on one's own subsequent behavior since subjects are randomly assigned (conditional on their own first round decision) to groups with different numbers of contributors.[12] The cleanest test arises from examining round 2 behavior in the *peer information only* treatment, where individuals learn how many other individuals in their group contributed the previous round, and then choose whether or not to contribute.

Table 1 demonstrates the strong impact of others' giving on own contributions when given peer information. As shown in the first column, having one additional person in your group contribute in the first round leads to a 10 percentage point increase in the likelihood

the gifts of female donors than male donors. Our design focuses on how making contribution public affects behavior through the possibility of social reward and punishment, isolated from these other forces. In a similar spirit, Andreoni and Petrie (2004) have a control condition in which they provide pictures of subjects in the group, but do not provide information about how much each subject contributed to the public good, which helps control for some of the other forces that might affect behavior when contributions are public. The repeated nature of the design contrasts with previous studies that make contributions public but look at one-shot decisions, as in Rege and Telle (2004) and Linardi and McConnell (2011).

[12] We condition on own first round decision since the experiment was designed to generate excess variance in group composition, so initial contributors are more likely to be grouped with other initial contributors and initial non-contributors are more likely to be grouped with other initial non-contributors.

of giving in the second round. This suggests that the effect of providing peer information depends significantly on the content of that information.

There is also significant heterogeneity by whether subjects were initial contributors. Figure 1 shows that for initial non-contributors, exogenously varied round 1 giving appears to have little effect on round 2 contribution behavior. On the other hand, initial contributors' round 2 contributions are strongly affected by the number of other initial contributors in their group. Those in groups with no other initial contributors choose to contribute less than 50% of the time, while those in groups with 2 or 3 other contributors give almost universally.

The second column of Table 1 shows that among initial contributors, the influence of being in a group with an extra contributor in round 1 is a 14.9 percentage point increase in round 2 contribution. The third column shows the effect is small and insignificant for initial non-contributors. The fourth column shows that the influence of others' contributions is marginally statistically significantly different for initial contributors and initial non-contributors, with a p-value of 0.055.

These results show that individuals do on average condition their round 2 giving on others' contribution decisions. However, the results also highlight important heterogeneity in conditional cooperation. In particular, simply placing non-contributors with other contributors may not motivate these individuals to change their behavior. Those initially inclined to give are the ones who demonstrate conditionally cooperative subsequent giving.

3.2 Social Recognition

We next turn to examining the effect of social recognition on individual behavior. The effects of social recognition are theoretically ambiguous. Various models of behavior predict that making individuals' contributions public could amplify the conditional cooperation effects seen above, induce individuals to comply with a group norm, or directly encourage individuals to engage in prosocial behavior.

Figure 2 shows the impact of social recognition of contributions on average across all groups: an immediate increase in giving in round 2, a more stable level of contributions as the game progresses, and no steep drop-off in round 16 contribution (a steep drop is visible in the *peer information only* treatment, where contributions are not identifiable).

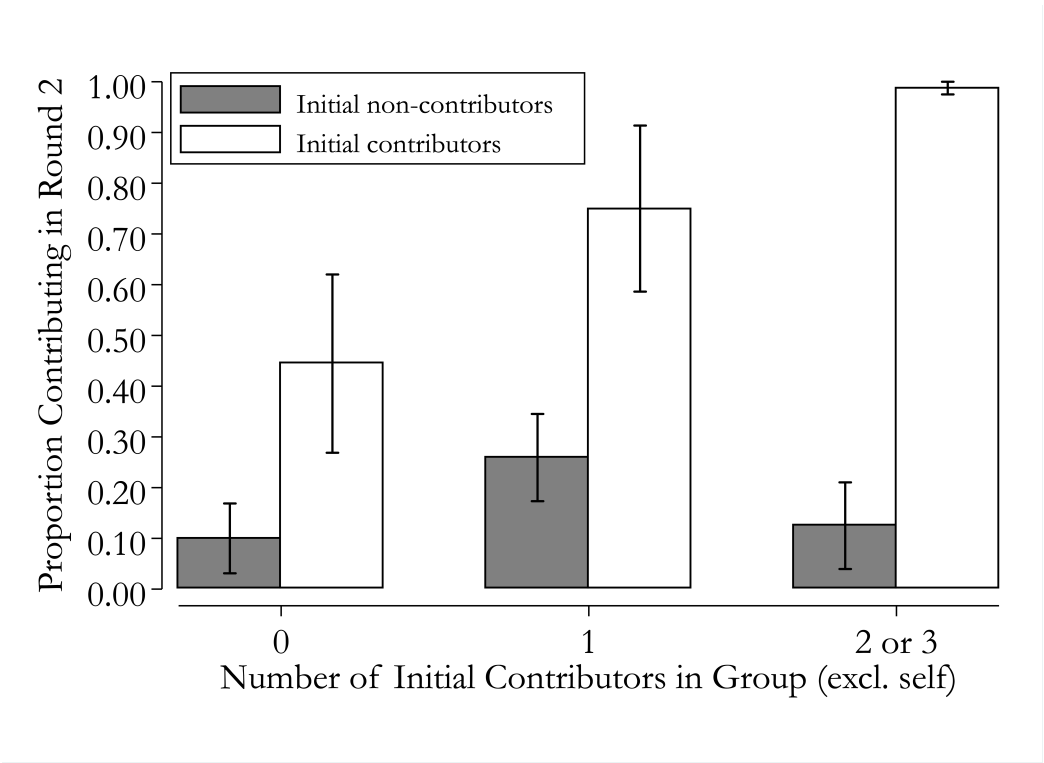
Table 1: Effect of Round 1 Contribution on Round 2 Contribution

	Dependent Variable: *Round 2 Contribution*			
	(1)	(2)	(3)	(4)
	Combined	Initial Contributors	Initial Non-Contributors	Combined
Initial Contributors in Group	0.0982***	0.149***	0.0218	0.0218
	(0.0344)	(0.0437)	(0.0481)	(0.0478)
Own Initial Contribution	0.621***			0.423***
	(0.0741)			(0.119)
Group × *Own*				0.127*
				(0.0640)
Constant	0.0702	0.575***	0.151**	0.151**
	(0.0602)	(0.119)	(0.0602)	(0.0599)
Observations	160	97	63	160
R-squared	0.601	0.273	0.003	0.616

*** p<0.01, ** p<0.05, * p<0.1

Notes: Robust standard errors in parentheses, clustered by group. *Initial Contributors in Group* is round 1 contributors in subject's group, excluding own contribution, and thus ranges from 0 to 3. *Own Initial Contribution* is a binary variable indicating own round 1 giving. *Group* × *Own* interacts those two variables. Data is from the *peer information only* treatment.

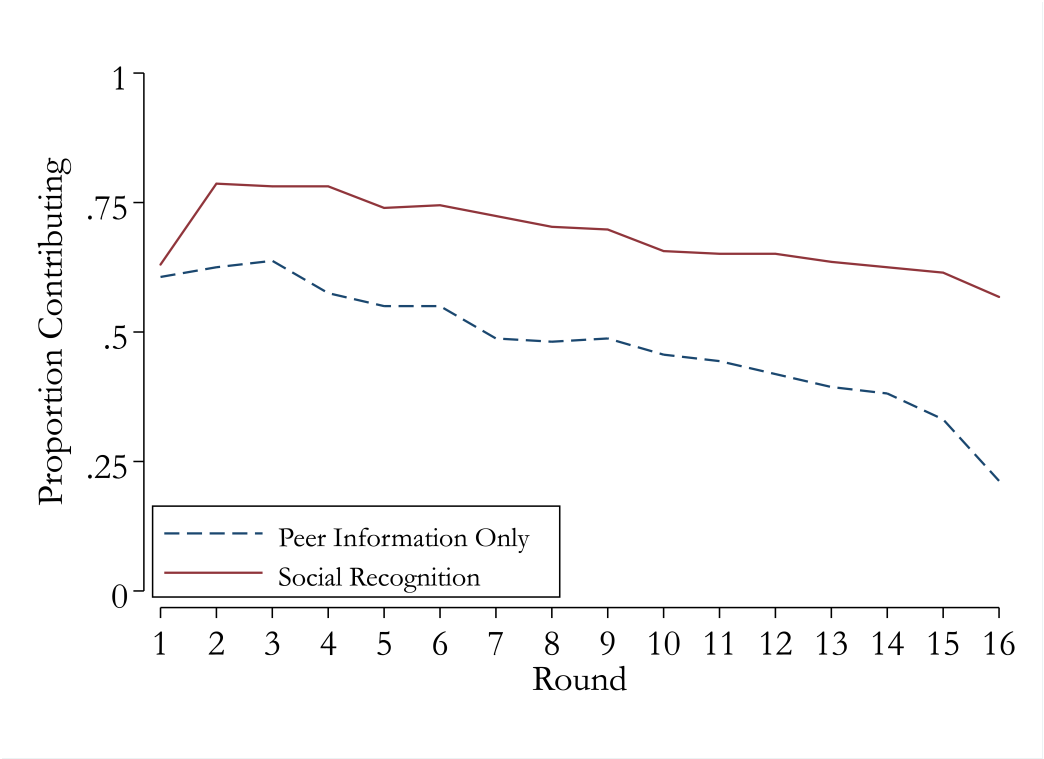
Figure 1: Effect of Group Composition in the *Peer Information Only* Treatment



Notes: Standard error bars are shown around each mean. Data is from the *peer information only* treatment.

This indicates that individuals both immediately anticipate the effects of individual identifiability and respond even though there is no specific punishment or recognition technology within the game (i.e., all potential social reward and punishment will only occur during the post-game snack break).

Figure 2: Average Effect of *Social Recognition* Treatment



Notes: Figure shows mean proportion contributing by treatment averaged across all groups. Round 1 is before the treatment is introduced, so the proportion contributing is nearly equal across the two treatments in round 1.

A regression in Table 2 further illustrates these dynamics. Column (1) shows that the *social recognition* treatment creates an overall 22 percentage point increase in contribution rates across the 15 treated rounds of the game relative to the *peer information only* treatment. Column (2) considers round 2, when the exogenous treatment effect is first introduced, and shows a 16 percentage point increase due to the *social recognition* treatment.

In the *peer information only* treatment, contributions decline significantly between rounds 2 and 16, as the reciprocity motive (i.e., the hope to create subsequent giving by others by contributing in this round) diminishes. This decrease is mitigated in the *social recognition* treatment, resulting in a 35 percentage point effect of the *social recognition* treatment in round 16, as shown in column (3). This pattern can be seen in column (4), where the coefficient on *Round* is significantly negative, but the interaction on *Social Recognition* × *Round* is significantly positive.

Table 2: Effect of *Social Recognition* Treatment

	Dependent Variable: *Contribution*			
	(1)	(2)	(3)	(4)
	Rounds 2-16	Round 2	Round 16	Rounds 2-16
Social Recognition	0.222***	0.161**	0.355***	0.138*
	(0.0742)	(0.0693)	(0.0749)	(0.0756)
Round				-0.0244***
				(0.00315)
Social Recognition × *Round*				0.00936**
				(0.00442)
Constant	0.469***	0.625***	0.213***	0.688***
	(0.0572)	(0.0591)	(0.0459)	(0.0637)
Observations	5,280	352	352	5,280
R-squared	0.050	0.032	0.130	0.081

*** p<0.01, ** p<0.05, * p<0.1

Notes: Robust standard errors in parentheses, clustered by group. There are 88 clusters in each regression. *Social Recognition* is a binary variable indicating the subject was assigned to the *social recognition* treatment. *Round* is a variable indicating the round of the game and ranges from 2 to 16. *Social Recognition* × *Round* interacts those two variables

Given that information on peer giving appeared to have a little impact on initial non-contributors, one might wonder whether the effects of social recognition also vary by initial contribution status. Figure 3 shows that the increase in round 2 giving is large for initial non-contributors, whose contributions in the *social recognition* treatment are more than

double those in the *peer information only* treatment.[13] While these initial non-contributors are not responsive to peer information, they do respond to the possibility of social reward or punishment by becoming more likely to give in round 2. Next, we explore this effect across compliance environments.

3.3 Heterogeneity in Social Recognition Effects

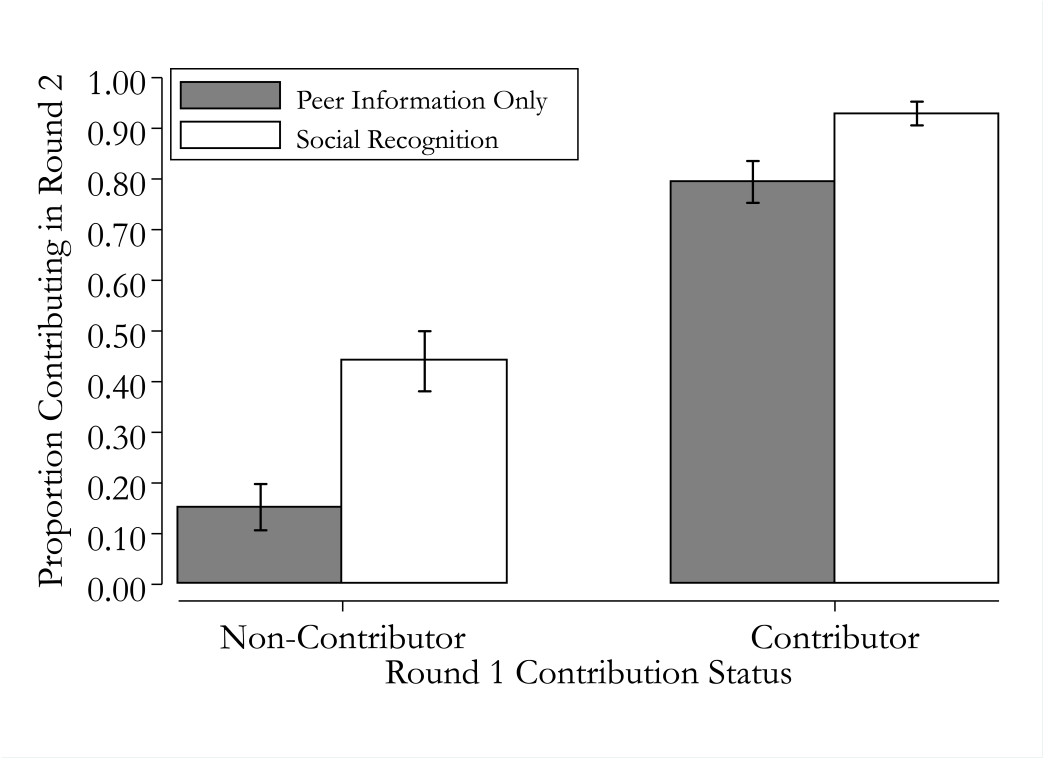
As noted in the Introduction, it is unclear whether we should expect social recognition to increase public good provision across all groups. Making individual behavior public could theoretically increase conformity to a prevailing group norm of no contribution. We have already seen that the *social recognition* treatment can be effective at getting even non-contributors to give, but that effect could be driven by non-contributors who fear shame for not giving in high contribution groups. Groups with very low levels of initial contribution could be unaffected, or even negatively affected, by the *social recognition* treatment. To examine this, we look at the impact of the *social recognition* treatment by initial group composition. Figure 4 shows that there is, in fact, a very large initial increase in contributions in the *social recognition* treatment even among groups with 0 or 1 initial contributors. In the case of groups with one initial contributor, this is driven by both increasing the giving of non-contributors and sustaining the giving of the initial contributor (see Appendix Figure A8). In groups with 0 initial contributors, this is necessarily driven by converting initial non-contributors into contributors.

Thus, the *social recognition* treatment is effective even for low-performing groups. These results demonstrate that individuals appear to respond to an internal sense of socially acceptable behavior, even when empirically they are in a low compliance environment. Thus, individuals appear to know that even though there was little-to-no contribution in their group initially, contributing is still the right thing to do. In addition, results suggest that social recognition can be a motivator even when individuals who might "judge" a subject's behavior were initial non-contributors themselves.

Another result that is apparent from Figure 4 is that initially high-performing groups

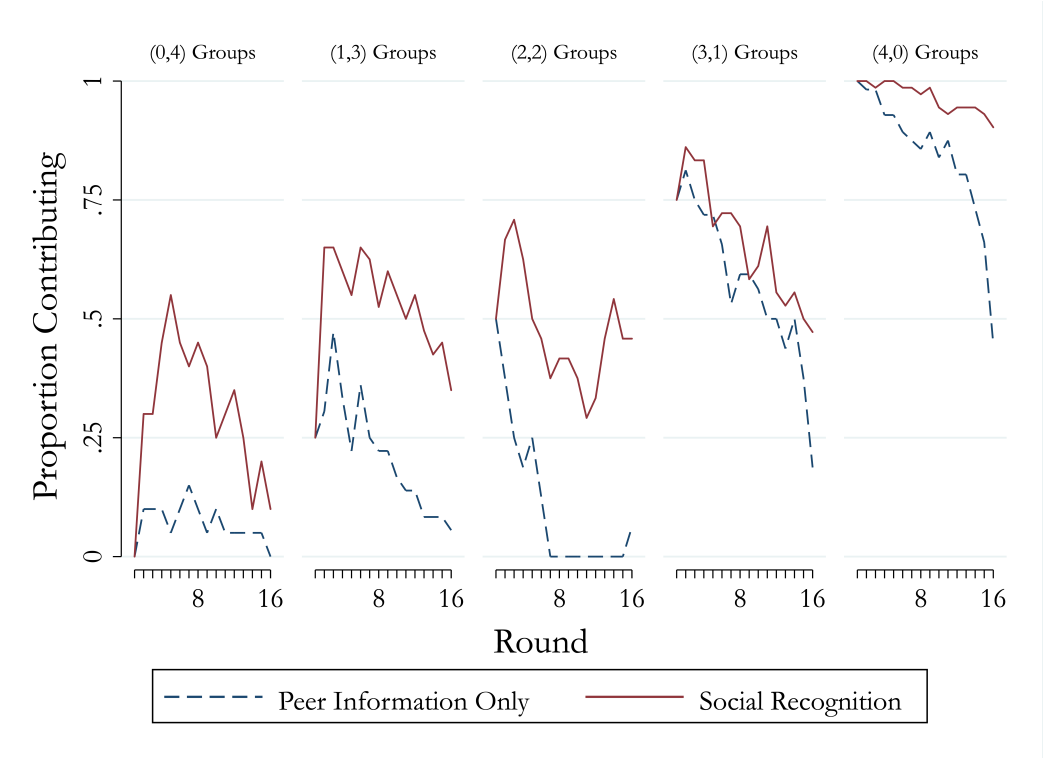
[13] The increase for initial contributors may be mechanically small because the contribution level is already so high. Note that the figure re-weights the observations to counteract the fact that initial contributors are more likely to be in groups with other contributors and thus have stronger conditional cooperation motives to give in round 2.

Figure 3: Effect of *Social Recognition* Treatment, by Initial Contribution Status



Notes: Standard error bars are shown around each mean. Means and standard errors are weighted to have equal representation of each group type (i.e., for non-contributors, groups with each of 0 to 3 initial contributors are equally weighted; for contributors, groups with each of 1 to 4 initial contributors are equally weighted). This re-weighting provides the cleanest test of the effect of *social recognition* treatment in round 2, since initial contribution is correlated with others' round 1 contribution, and others' round 1 contributions can influence subsequent own contribution.

Figure 4: Effect of *Social Recognition* Treatment by Group



Notes: Figure shows mean proportion contributing by treatment and control condition, with one panel for each initial group composition, averaged across all groups with that initial group composition. For the label "(X,Y) Group," X represents the number of round 1 contributors and Y represents the number of round 1 non-contributors. Note $X + Y = 4$ for all groups. Round 1 is before the treatment is introduced, so the proportion contributing is identical and equal to $X/4$ for each panel.

see the largest benefit of the *social recognition* treatment at the end of the game, when they experience a much smaller drop-off in contribution. This is due in part to a ceiling effect, since initial contributors in high compliance group contribute at high rates early in the game.[14]

Table 3 shows how the number of initial contributors per group interacts with the *social recognition* treatment in round 2 (the first round of the treatment) and in round 16 (the last round). In round 2, having additional initial contributors has a negative interaction with the *social recognition* treatment, suggesting the effect of the treatment is larger in low-contribution groups than in high-contribution groups. However in round 16, this effect is reversed, and additional initial contributors strengthens the impact of the *social recognition* treatment.

4 Conclusion

This paper examines two policy instruments regularly used to increase contributions to public goods: making group behavior public to the individual (peer information) and making individual behavior public to the group (social recognition). We use a public good game to test the impacts of peer information and social recognition interacted with the compliance environment.

Our novel experimental design assigns individuals to groups and reveals treatment status after first-round contribution decisions have been made. This allows us to identify two "types" of subjects — those who contribute in the first round of a finitely repeated public good game and those who do not — and to control the compliance environment. We create excess variation in group composition to measure the impact of the two policy tools in both high-compliance and low-compliance environments. Because subjects' first round decisions matter for their assigned groups, we are able to execute this without deception, truthfully telling subjects they are playing in the same group for all 16 rounds.

Peer information is provided to all subjects in the form of information on the number of contributors in a group. By randomly assigning subjects to groups with more or fewer

[14]However, we also do not see a strong effect of lone initial non-contributors increasing their giving in high-performing groups. Groups with one non-contributor paired with three initial contributors do not immediately respond to the *social recognition* treatment.

Table 3: Effect of *Social Recognition* Treatment by Compliance Environment

	Dependent Variable: *Contribution*			
	Group Level		Ind. Level	
	(1)	(2)	(3)	(4)
	Round 2	Round 16	Round 2	Round 16
Social	1.364***	0.681*	0.307***	0.189**
	(0.321)	(0.394)	(0.0782)	(0.0922)
Initial Contributors in Group	0.915***	0.461***	0.119***	0.0963***
	(0.0657)	(0.106)	(0.0294)	(0.0336)
Social × *Init. Contrib. in Group*	-0.320***	0.276*	-0.0884***	0.0819*
	(0.0872)	(0.148)	(0.0298)	(0.0457)
Own Initial Contribution			0.530***	0.188***
			(0.0536)	(0.0484)
Constant	0.281	-0.268*	0.0877	-0.0769*
	(0.242)	(0.155)	(0.0609)	(0.0389)
Observations	88	88	352	352
R-squared	0.797	0.514	0.506	0.340

*** p<0.01, ** p<0.05, * p<0.1

Notes: Robust standard errors in parentheses, clustered by group in columns 3 and 4. *Social* is a binary variable indicating the subject was assigned to the *social recognition* treatment. *Initial Contributors in Group* is round 1 contributors in subject's group, excluding own contribution, and thus ranges from 0 to 3. *Social* × *Init. Contrib. in Group* interacts these two variables. *Own Initial Contribution* is a binary variable indicating own round 1 giving.

contributors, we can causally identify the impact of peer information on own subsequent contribution decisions. Consistent with work on conditional cooperation, we find a strong impact of the compliance environment (i.e., the number of contributors in a group) on the efficacy of providing peer information.

Replacing one initial non-contributor with one initial contributor increases contribution rates by 10 percentage points. We find that the effect of this peer information also depends on own initial contribution status. Initial non-contributors are not impacted by others' initial contributions, while initial contributors do respond. In other words, initial contributors' continued giving is conditional on others doing the same. Consequently, peer information alone cannot transform a low-contribution or mixed-contribution group into a high-contribution group. This result suggests that in the absence of a mechanism for increasing the contributions of free riders, total public good giving may decline when only information about others' contributions is available.[15]

Half of the sessions were randomly assigned to the *social recognition* treatment. We utilized a snack break at the end of the experiment to generate an environment where social reward and punishment could be meted out in an organic way. Subjects in the *social recognition* treatment knew their real identities would be associated with their giving decisions, creating the anticipation of social reward or punishment during the snack break. We find that the *social recognition* treatment increases contributions by 16 percentage points in the second round, and an average of 22 percentage points over the 15 treated rounds of the experiment.

The *social recognition* treatment affected both initial non-contributors and initial contributors, and, importantly, the results show a strong impact of the *social recognition* treatment even among the groups with no initial contributors. Indeed, the *social recognition* treatment generated an immediate effect on initial non-contributors, generating a large increase in contribution from low performing groups starting in round 2. In contrast, the *social recognition* treatment affects behavior in high performing groups by helping them sustain cooperation at the end of the finitely repeated game.

In other words, social recognition works even in a low compliance environment. Our findings thus mitigate a theoretical concern that making contributions public might encour-

[15]Indeed, conditional cooperation has been used to explain the declining profile of contribution across rounds of a finitely repeated public good game (Ambrus and Pathak, 2011).

age conformity to low-contribution or no-contribution norms. Instead, we find that social recognition increases contributions from initial non-contributors, even among groups with low levels of giving overall. Moreover, social recognition helps initially high-performing groups sustain contribution even as dynamic incentives dissipate. These findings suggest that publicizing contributions causes individuals to respond to a common understanding of prosocial behavior that is not defined solely by the initial group norm.

We thus highlight two effective mechanisms for encouraging public good contributions. For those naturally inclined to contribute, witnessing high contribution by others is encouraging, and helps to sustain giving. However, peer information should be disbursed with caution, as its effectiveness is strongly dependent on the level of group compliance. Social recognition appears to be effective at increasing contributions irrespective of initial group compliance. It is particularly effective at bringing into the fold those not inclined to contribute while sustaining giving for those who initially do so. Thus, social recognition can be a powerful tool to motivate individuals to change behavior toward what is commonly accepted as socially desirable, even when such socially desirable behavior is empirically absent.

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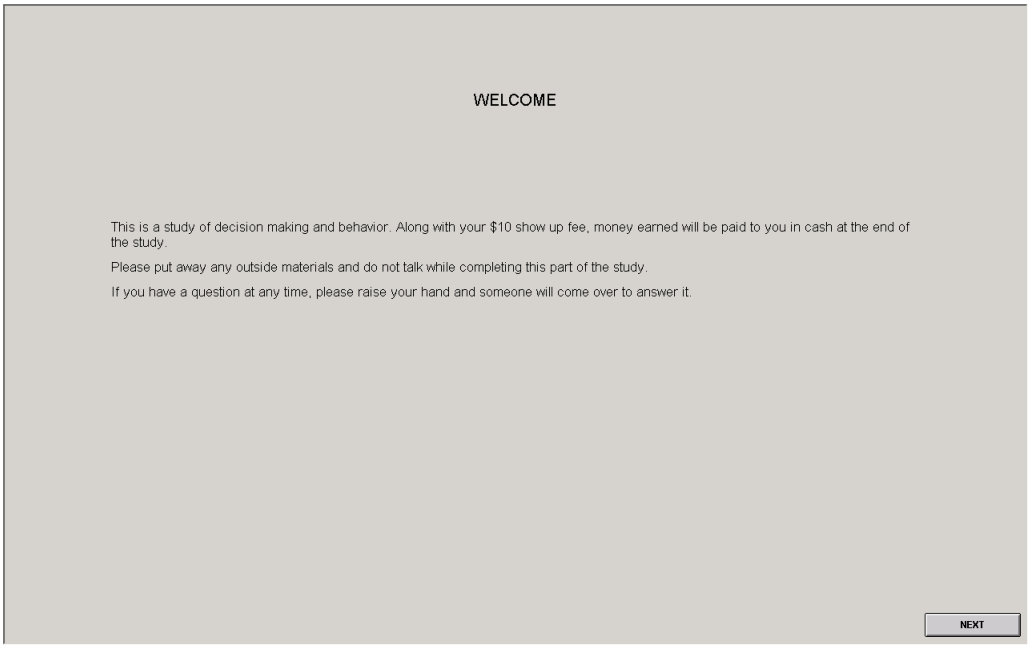
A Appendix

A.1 Experimental Instructions

The experiment was run on z-tree (Fischbacher, 2007). The screens shown to the subjects in the experiment appeared in the order shown below. All screens were identical between the treatments, except for the screen shown in Figure A6, which differed between the *peer information only* and *social recognition* treatments. The instructions were read aloud to subjects as they proceeded through the study, so there was common knowledge of all instructions. (One session designated to be in the *social recognition* treatment was excluded from analysis because of an error in how the instructions were read by a research assistant running the sessions.)

Figure A1: Introduction

(a) Welcome Screen



(b) Introduction to the Study

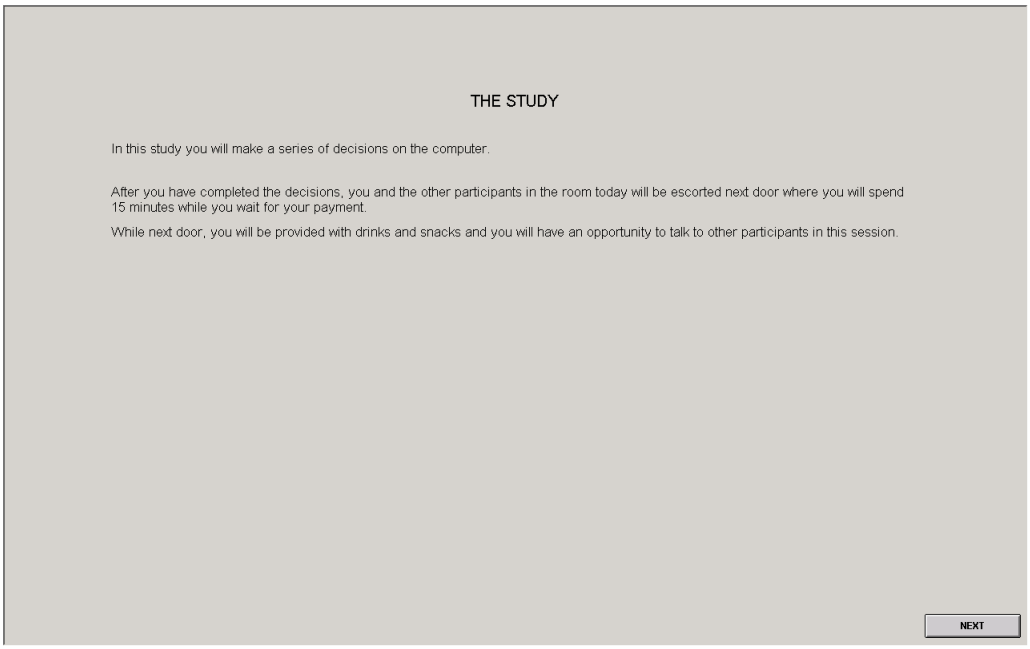
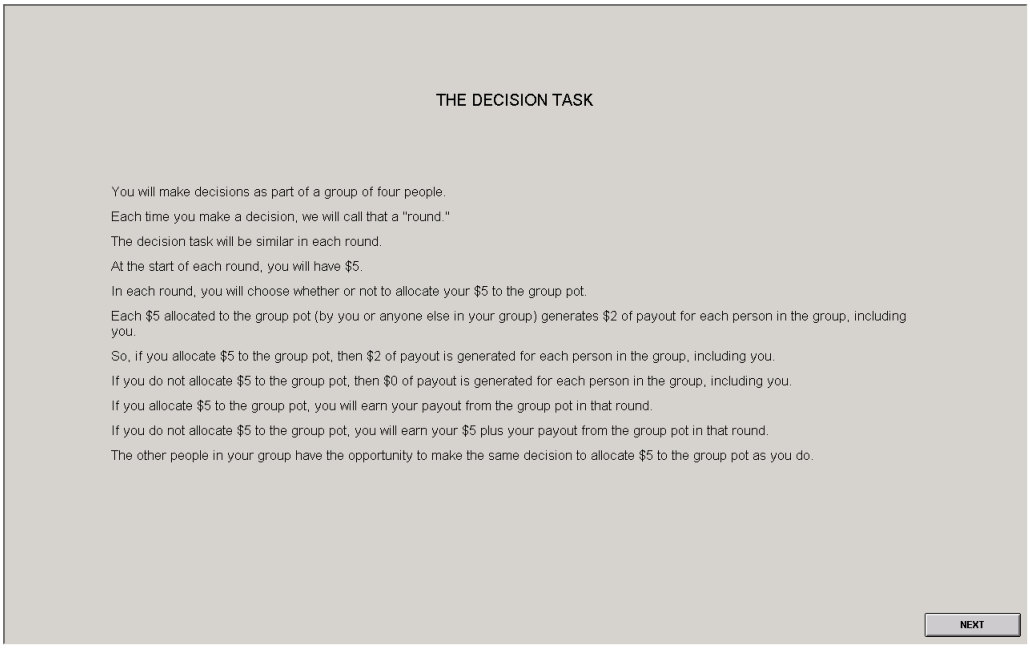


Figure A2: Decision Task

(a) Description of Decision Task



(b) Decision Task Trial

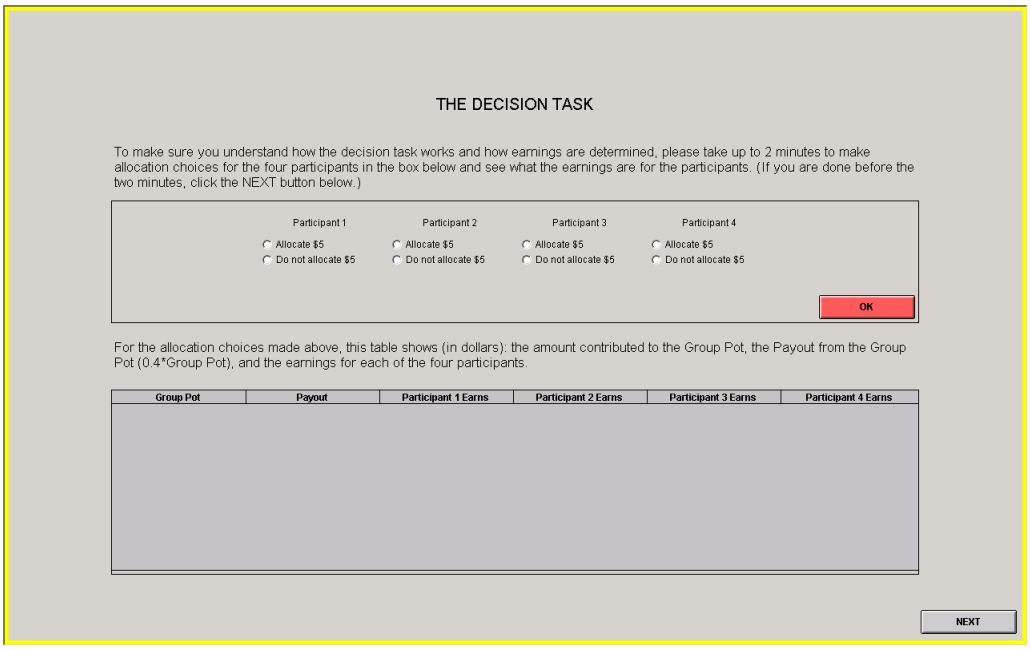


Figure A3: Introduction of 16 Rounds

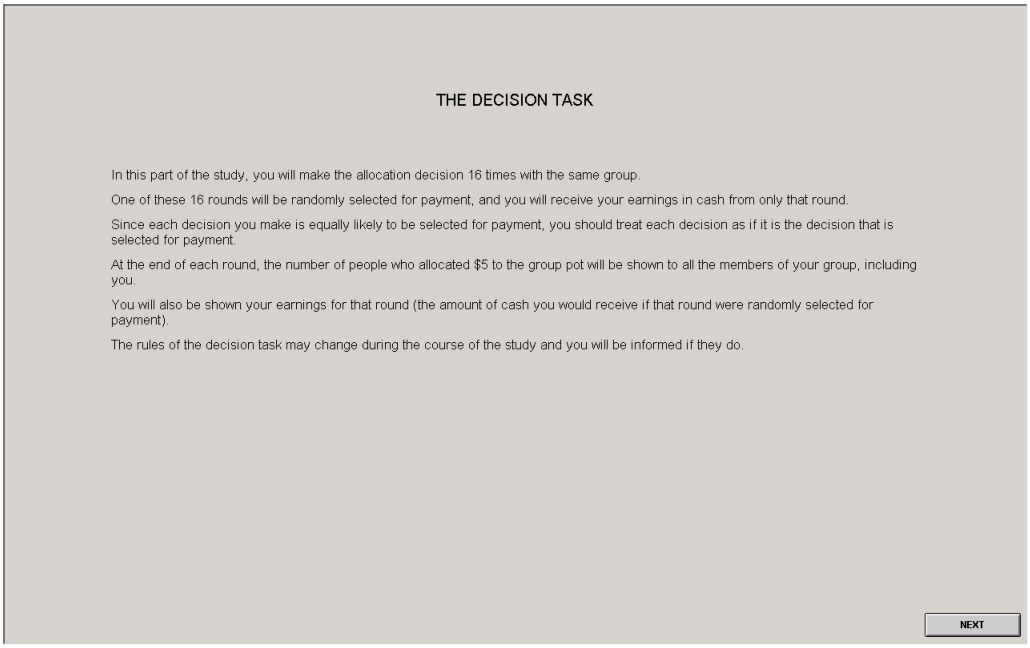
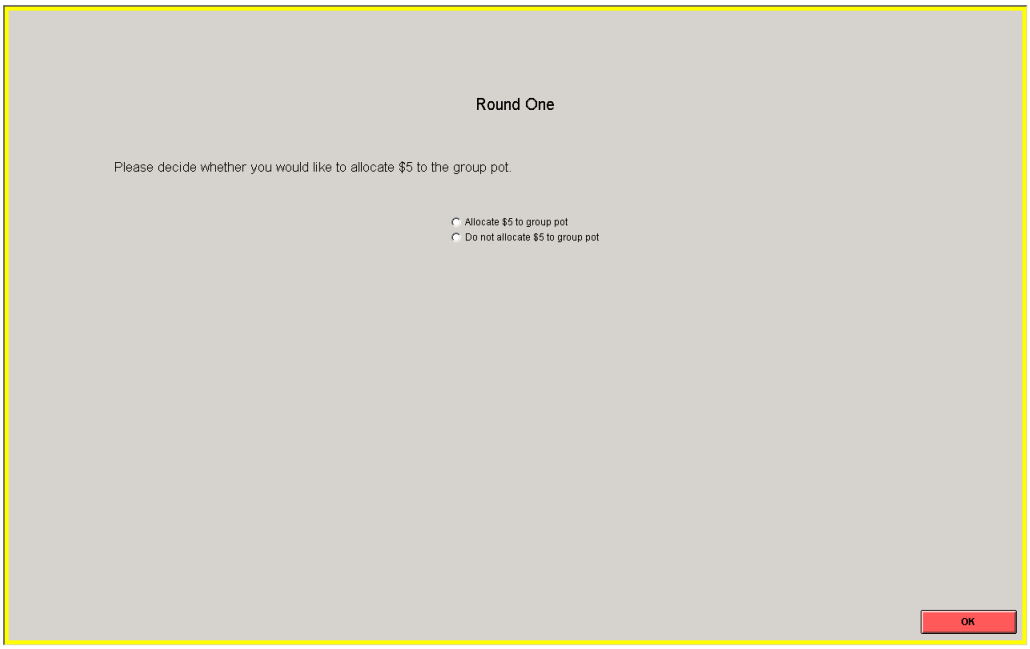


Figure A4: Round 1

(a) Round 1 Decision Screen



(b) Round 1 Outcome Screen

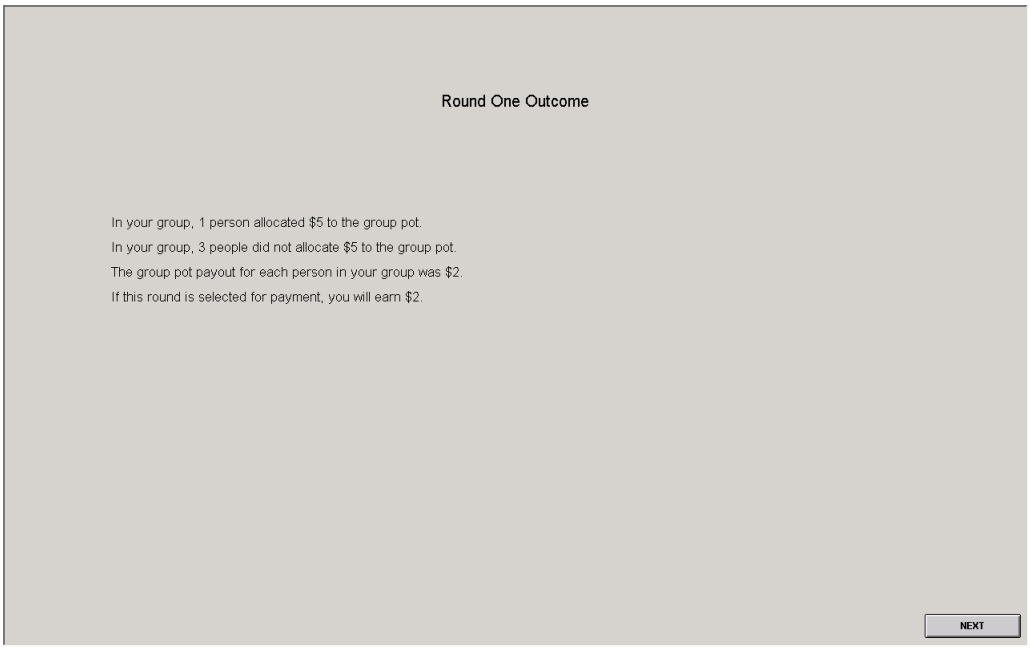


Figure A5: Group Assignment

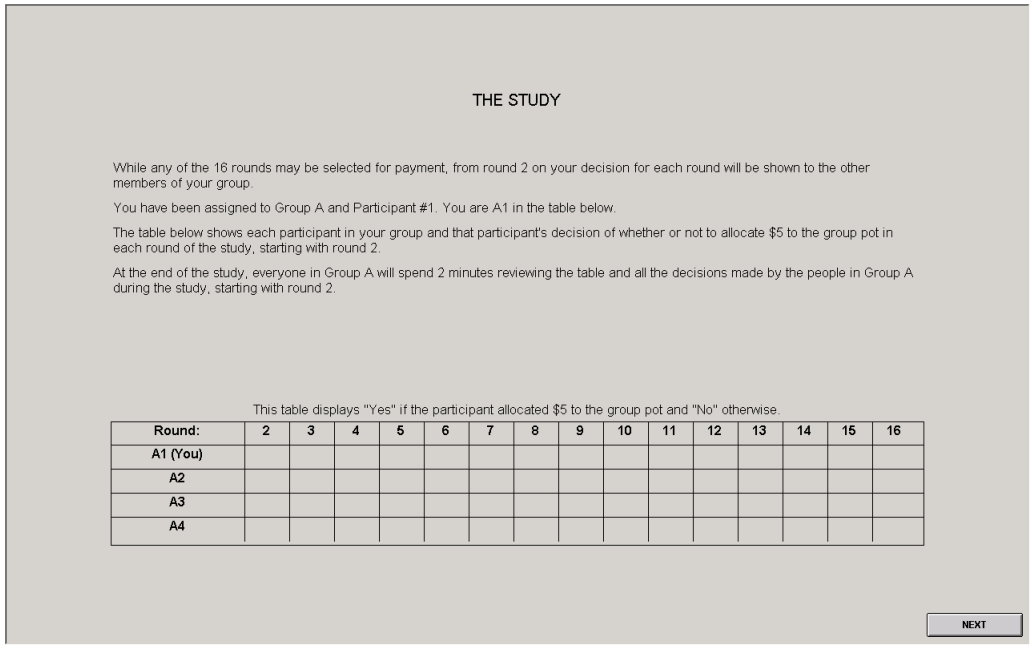
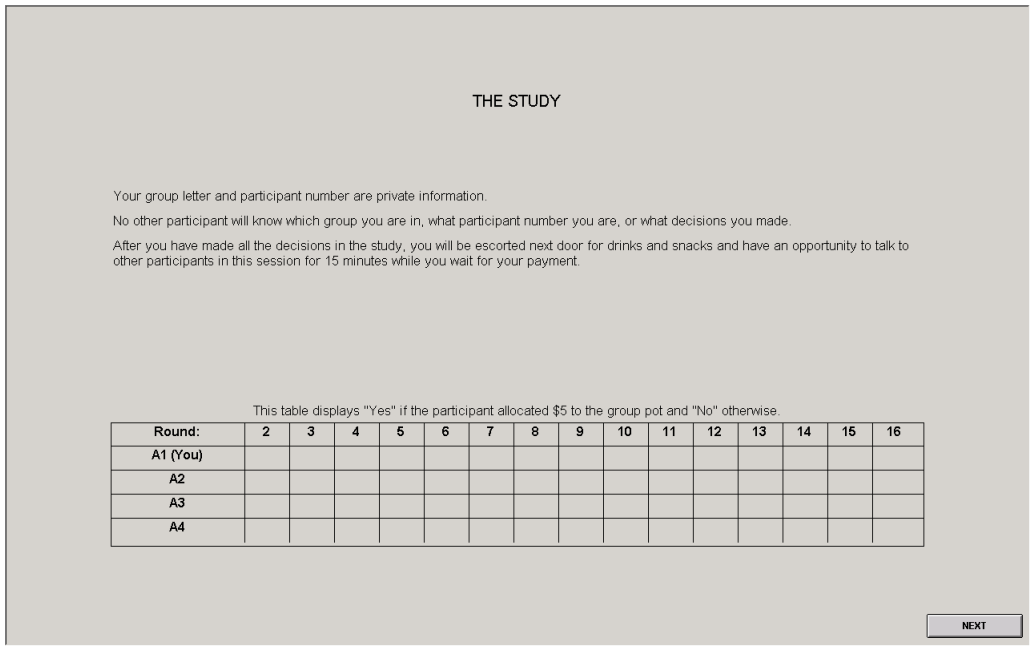


Figure A6: Treatment

(a) *Peer Information Only* Treatment



(b) *Social Recognition* Treatment

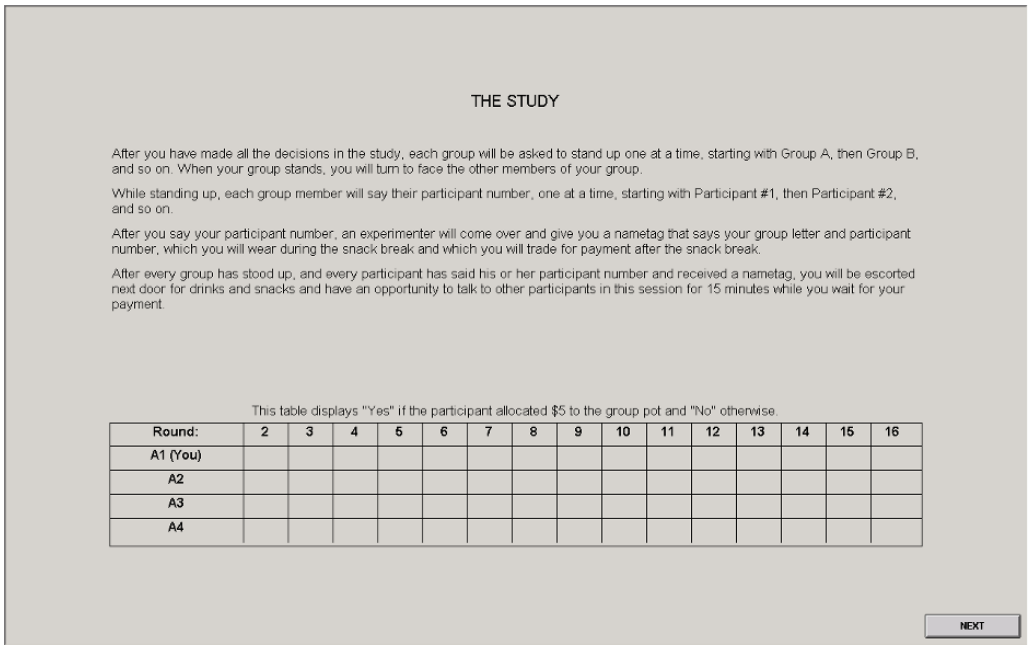
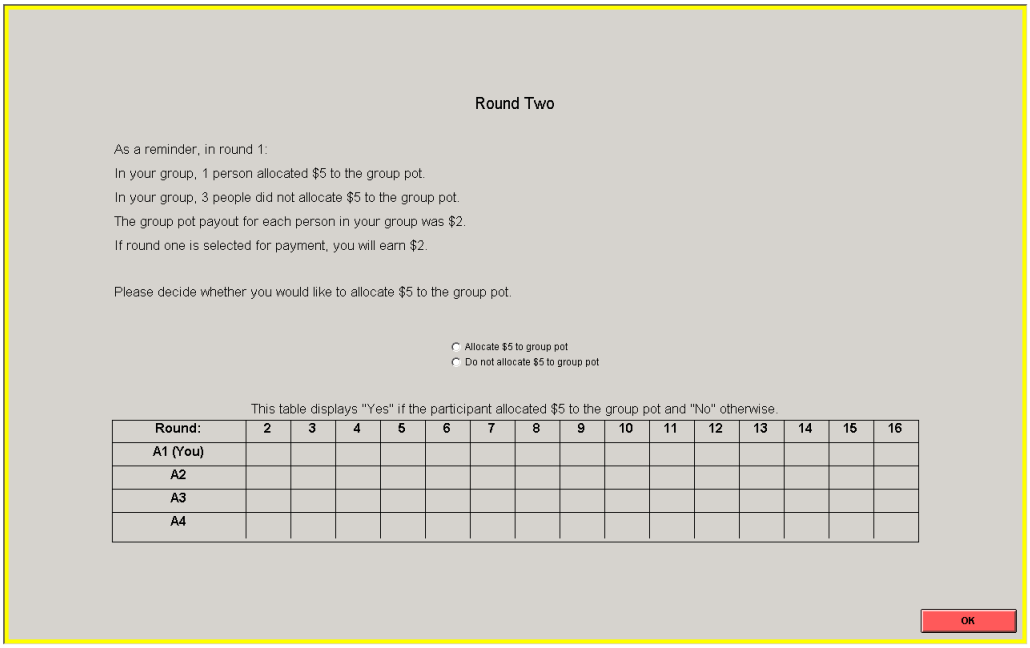


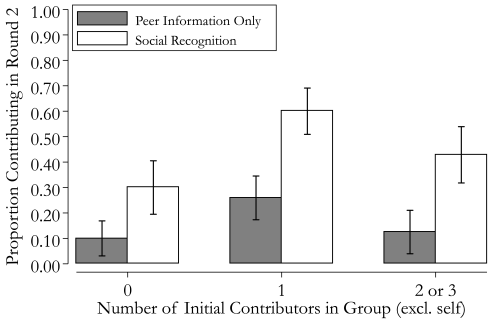
Figure A7: Round 2 and Subsequent Rounds Decision Screen



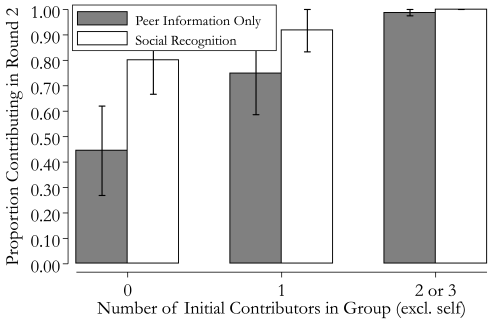
A.2 Additional Results

Figure A8: Effect of *Social Recognition* Treatment on Round 2 Contributions, by Group and Initial Contribution

(a) Initial non-contributors



(b) Initial contributors



Notes: Standard errors are shown around each mean.