The Role of Automatic Donations in Increasing Charitable Giving*

Homa Zarghamee
Kent D. Messer
Harry M. Kaiser
William D. Schulze

CORNELL UNIVERSITY

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ABSTRACT

Messer et al. (2006) shows that three contextual—cheap talk, a status quo of giving, and voting on whether or not to participate in the VCM together result in contribution rates of roughly 95% sustained over the full course of a ten-round experiment with linear payoffs, homogeneous valuation, and a low MPCR. While real-world examples of a status quo of giving exist, establishing a system of compulsory giving with refunds by request is not feasible in many public good environments, where it may make more sense to allow the donor to establish for herself the status quo she will face in future rounds. The effects of cheap talk and voting are considered in laboratory experiments in which each participant has the option of using a contribution plan whereby she gives the provider access to her funds and specifies an amount to be withdrawn each round. Results show that with this option of self-selection into the status quo of giving, groups (comprised of undergraduate business majors) subject to both cheap talk and voting give sustained 100% contributions for 16 of 20 rounds, with contributions as a percent of income falling no lower than 97% in the remaining rounds. The effects of MPCR is experimentally examined and decomposed into the separate effects of the group fund multiplier and group size. A dynamic model of social norms, sensitive to these effects and the above findings, is constructed and estimated. Initial results of an on-going field study aiming to mimic the above results are presented.

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1. INTRODUCTION

Traditional economic theory dictates that, where there is the opportunity for it, free-riding should be more than expected. Keeping form, the Nash equilibrium level of donations to a public good using the voluntary contribution mechanism (VCM) is for all individuals to act as free-riders and contribute nothing. In general, the results of VCM experiments conducted over a number of rounds simultaneously support and stray from the economic prediction, in that contribution rates start out anomalously high, usually around 50% of the maximum, and proceed to decay toward the Nash equilibrium, with tenth round contribution rates at approximately 10%. The level of contributions and extent to which high rates of efficiency can be sustained, however, are quite sensitive to the particularities of the experiment's framework, or its *context*. It is important that context and incentive-compatibility not be mistaken. There is a prolific literature on mechanisms that induce and experimentally meet Nash equilibria greater than zero[1]; here, however, the concern is with attaining efficiency when incentives command contrarily.

Context can significantly affect outcomes of the VCM, as shown in a wide array of studies. The works of the first experimental economists to address public good provision were, in fact, concerned with one specific contextual factor, namely repetition (subjects undergoing a number of rounds of the VCM instead of just a one-shot game).[2] Since, not only have basic parameters of the VCM—the marginal per capita return (MPCR), group size, homogeneity of payoffs and endowments—undergone experimental

[1] Falkinger et al (2000); Fehr and Schmidt (2000); Isaac et al (1988)

[2] The works of Isaac et al (1985) and Kim and Walker (1984) were aimed at showing that Marwell and Ames (1979), sociologists, had results minimizing the role of free-riding because they had conducted VCM experiments of only one round.

scrutiny, but so have factors like "types" of subjects[3], the framing of the payoff tables presented to subjects, pre-play communication, prior experience with fellow group members, the status quo, and sequence of play. Stunningly, it is shown in Messer et al (2006) that cheap talk, a status quo of giving (whereby subjects proactively request refunds from the public good rather than proactively contributing to it), and voting on whether or not to participate in the VCM together result in contribution rates of roughly 95% sustained over the full course of a ten-round experiment with linear payoffs, homogeneous valuation, and a low MPCR of 0.21.

While examples of a status quo of giving surely exist, establishing a system of compulsory giving with refunds by request is not feasible in many public good environments. A viable alternative, though, is allowing the status quo of giving to be established not by the public good provider, but rather by the donor himself. The donor can opt into a contribution plan whereby he gives the provider access to his funds and specifies an amount to be withdrawn on a periodic basis by the provider, who is bound to grant refund requests. The palatability of such a mechanism, here called *automatic donation*, is likely from the donor's perspective given the results of Messer et al (2006), where we see that the combination of cheap talk and voting produces comparable first-round contribution rates under both status quo scenarios. Hence, without an established status quo of giving, cheap talk and voting achieve nearly efficient first-round results, hinting that contributors feel cooperative in the first round and thus might be attracted to automatic donation. Choice of automatic donation would then effectively impose a status quo of giving for future rounds. Instead of deteriorating from near-efficiency, as in

[3] Cadsby and Maynes (1998) compares the performance of economists, nurses, and other groups who potentially display different levels of altruism.

Messer et al (2006) under cheap talk, voting, and a status quo of not giving, VCM contribution rates with automatic donation as an option would be expected to mimic the sustainability seen under a status quo of giving.

In fact, real-world instances of automatic donation schemes abound. American Cancer Society, Feed the Children, World Vision, America's Second Harvest, Habitat for Humanity International, and Food for the Poor, all among the top twenty U.S. organizations receiving highest donations, have automatic donation as a method of payment.[4] In some cases automatic donation is the primary contribution method donors use to contribute. For example, Dollar-Help, an organization in St. Louis, Missouri providing energy-assistance to needy families, has offered a payment option they call Automatic Giving for over twenty years, whereby an amount specified by the donor is automatically added to his monthly energy bill. In 2004, 90% of the $840,000 contributed in total came via Automatic Giving.

While it may seem that these automatic donation schemes are just commitment devices, it is important to note that by using them, individuals are not actually limiting their future choice sets in any way. Rather, they are self-selecting the status quo of giving. For an individual who wants to continue contribution to the public fund, automatic donation does not constrain freedom of choice; instead, it allows the individual to decide how she wants to make, or not make, decisions in the future, thus giving her all the time-saving and stress-reducing benefits of a "second-order decision" (Schwartz 2004). Second-order decisions are ones made by individuals to reducing a class of choices into one. This can be done by simply establishing a rule—"I will give ten dollars

[4] These organizations refused to give information regarding the percentage of contributors using automatic donation or the fraction of total contributions coming from such users.

a month to the public fund"—to relieve the *mental* duty of choosing an amount to contribute each month. But automatic donation has the additional benefit of getting rid of the *physical* process of, for example, writing and sending a new check each month, thereby collapsing the decision of how much to give each month to just one choice and one action.

We have conducted laboratory experiments to examine the ability of automatic donations, in a context of voting and cheap talk, to capture the effects of the status quo of giving. Not only were the contribution rates of Messer et al (2006) matched, but they were surpassed. In the case involving both cheap talk and voting, 100% of income was donated for the first sixteen rounds of a twenty-round experiment, with contributions as a percent of income falling no lower than 97% in the remaining rounds. Not only does it seem that context makes all the difference when it comes to the VCM, but so does the ability of the donor to proactively establish the context—namely the status quo of giving—for himself.

2. EXPERIMENTAL DESIGN

Four versions of the VCM were conducted, varying combinations of two factors—voting and cheap talk—as follows:

		VOTING	
		NO	YES
CHEAP TALK	NO	Version 1	Version 2
	YES	Version 3	Version 4

For each treatment, five sessions were conducted, each with seven subjects, for a total of 140 subjects, all recruited from undergraduate business and economics courses at Cornell University. All experiments were conducted at Cornell's Laboratory for Experimental Economics and Decision Research. Subjects earned an average of $15 for the hour-long experiment, and were paid at the end of the experiment. A given subject could only participate in the experiment once.

Subjects were given paper copies of the instructions which they had in their possession the duration of the experiment. When all were done reading, there was a power-point presentation going over the instructions again. Both the paper instructions and the power-point provided a payoff table which gave total donations to the group account from $0 to $7 in fifty-cent intervals and the corresponding individual payoffs. Clarifying questions were welcomed and answered prior to undertaking the experiment.[5]

The experiment involved two activities: a private lottery and the VCM. The private lottery occurred in all treatments, while the VCM occurred necessarily in half the treatments (Versions 1 and 3) and by majority vote in the other half (Versions 2 and 4). In the latter treatments, the vote occurred via computerized ballot before the first round of activity. Only the outcome of the vote, not the split, was disclosed to the subjects. It should be noted here that the majority vote had a pro-VCM result in all voting sessions; hence *all* subjects participated in both the VCM and private lottery each round. [6]

The experiment lasted 20 rounds. Subjects were not told the number of rounds, but were informed that it had been predetermined. They started each round with $2 and were totally capital-constrained across all rounds.

[5] See Appendix for the full instructions distributed to subjects.
[6] In Version 2, 89% and, in Version 4, 100% of subjects voted in favor of the VCM.

In the private lottery, subjects chose each round whether or not to purchase a $1 lottery ticket. They could purchase no more than one lottery ticket per round. A fair coin toss determined the payoffs for those who purchased lottery tickets; heads returned $2 for a net *gain* of $1, and tails returned nothing, for a net *loss* of $1. Hence there was no expected profit from purchasing a lottery ticket. If a subject did not purchase a lottery ticket, he saved the dollar.

In the VCM, subjects had the opportunity each round to put between $0 and $1 into a group account. They were informed that money put in the group account would increase 50% in value and then be redistributed evenly amongst the members of the group; money kept in an individual account would retain its original value. Hence, as in Messer et al (2006), the MPCR was 0.21. If subjects were in sessions of the VCM (as in all cases, since the VCM was never rejected by a majority vote), they started each round with $1 for use in the lottery and $1 for use in the VCM. Money was non-transferable between activities.[7]

Cheap talk took place in half of the treatments (Versions 3 and 4) before the start of the first round.[8] Subjects were given the opportunity to talk openly with the other members of their groups, barring, of course, any deal-making or threats. Possible outcomes and strategies regarding the VCM were open to discussion, as was, in the case of Version 4, the vote. After the five-minute cheap talk, subjects were asked to refrain from all sorts of communication with their group members until the end of the experiment was announced.

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[7] Subjects were instructed that if the majority vote resulted in no VCM, then they would have $2 at the start of each round, only one of which could be used to purchase a lottery ticket.

[8] In Version 4, where a vote was also held prior to the rounds of activity, cheap talk was engaged in before the vote.

In addition to the traditional method of contribution to the VCM, which we refer to as Round-by-Round, subjects in all sessions had the option of contributing via Automatic Donation. In the first round, each subject had to choose one of the two methods of contribution. A choice of Round-by-Round meant that each round the subject would choose and submit the amount she wished to donate in that round. Under Automatic Donation, however, she would choose and submit an amount that, until specified otherwise, would be automatically withdrawn from her private account each period and submitted to the group account. Subjects were free to switch contribution methods at any point. Further, any subject using Automatic Donation had the leeway to alter her per-round contribution. In other words, if she was using Automatic Donation to donate *x* each round, in any round she could change this amount to *y*. Doing this would make *y* the amount taken from her account and submitted to the public account each round thereafter. This point and the previous point regarding switching between contribution methods were emphasized in order to stress that Automatic Donation was not a strict commitment mechanism.

3. RESULTS AND DISCUSSION

Contribution Rates

Figure 1 provides a graphical summary of the main result of the paper, while Table 1 provides statistical results. The formal regression analysis here was done with the fraction of the total possible donations actually contributed by the group in a round as the dependent variable. The maximum that could be donated by a group in a given round was seven dollars, so, to keep the variable readily interpretable as the *fraction* donated,

all values were divided by seven. Therefore, a two-limit tobit was used, with a lower limit of 0 and an upper limit of 1. The independent variables were the following: cheap talk (0 = no cheap talk, 1 = yes), voting (0 = no vote, 1= vote), round, and all pairwise interactions of the first three.[9] Group effects were controlled for using a two-level mixed model structure with group as the random effect.

The results of Version 1 are consistent with past VCM experiments, with average contributions starting at 48.1%, decaying to 20% over the first ten rounds, and approaching the Nash equilibrium of zero with 4% contributions after twenty rounds. Figure 1 shows this decreasing trajectory for Version 1, which is statistically supported in Table 1 by the significance of the "round" coefficient, which is negative.

The isolated effect of voting is visually captured by considering the difference between Versions 1 and 2 in Figure 1. Both decay from roughly 48% to approximately 4% over the course of the twenty-round experiment. However, Version 2, in which the group votes to have the VCM, appears to decay much more rapidly, to less than 1% in the thirteenth and fourteenth rounds, slightly increasing thereafter. Table 1 shows however that, while it may appear to the contrary, the presence of the vote alone does not have a significant impact on donations.

The path of Version 3, when compared to that of Version 1, shows that cheap talk alone substantially increases contribution rates over all rounds. The first-round contribution rates of 97.1% are significantly greater than the 48.1% in Version 1. Further, the lowest level of contributions is over 60%, significantly exceeding the Nash equilibrium. The impact of cheap talk on donations is positive and statistically

[9] The three-way interaction was originally included, but was insignificant and highly correlated with the two-way interaction between voting and cheap talk.

significant at the one percent-level, as shown by the coefficient on the cheap talk dummy variable in Table 1. It should be noted, though, that cheap talk alone is correlated to greater decay, hence the negative coefficient on the interaction term between cheap talk and round. This result is consistent with Messer et al (2006), where cheap talk was noted to increase the rate of decay.

The most striking outcome is that of Version 4, in which an average contribution rate of 100% is maintained for the first 16 rounds, and the minimum contribution rate reached is over 97%. This decay is not statistically significant, as evidenced by the insignificance of the interaction term between cheap talk, voting, and round mentioned above. Furthermore, Table 1 shows that the interaction between cheap talk and voting has a significant, positive impact on contributions to the group account. The lack of attrition presented in Treatment 8 of Messer et al (2006) is here strengthened. Sustained contributions of 100% for over fifteen rounds in a VCM conducted amongst undergraduate business students, as far as the authors are aware, has never before been shown. That the mixture of cheap talk and voting creates highly efficient contributions to the public account in the presence of automatic donation is not terribly surprising, given the results of Messer et al (2006). However, the effectiveness of the interaction is surprising given that cheap talk alone actually heightens rates of decay and does not produce results nearly as remarkable as sustained 100% efficiency, and that voting alone has no statistically significant effect on contribution rates, while graphically appearing to, if anything, reduce them.

Use of Automatic Donations

In Figure 2, we see, by treatment, one ray depicting the percentage of total subjects using Automatic Donation to contribute to the group account over twenty rounds and a second ray illustrating the percentage of total subjects using Automatic Donation to donate nothing to the group account. The vertical distance between the two rays gives the percentage of total subjects using Automatic Donation to make strictly positive donations.[10]

From the charts for Versions 3 and 4, it is apparent that high usage of automatic deduction is correlated with high contribution rates. In Version 4, Automatic Donation was used in all cases to donate the full dollar, the maximum that could be donated by a subject in a given round. In Version 3, Automatic Donation was used only to donate one of two amounts: nothing or the full dollar. While donations of the full dollar occurred six times more often than zero-donations, employment of Automatic Donation to donate nothing is a persistent issue. Clearly, in the no-cheap talk treatments, Versions 1 and 2, one observes that automatic donors were usually donating nothing, since the two rays coincide for considerable numbers of rounds. In a real-world setting, however, one cannot imagine a situation in which somebody takes the time to fill out paperwork indicating that she wishes the public good provider to withdraw $0 periodically from her account. While the experimental design should have accounted for this possibility by allowing Automatic Donation to be utilized only to donate strictly positive amounts, the frequency of non-contributors using Automatic Donation should be ignored when considering the payment method's effect on contributions.

[10] Clearly, the distance between 100% and the percentage of total subjects using Automatic Donation gives the percentage using Round-by-Round.

4. THEORETICAL ANALYSIS

The round-*t* payoff to player *i* of participating in the experiment is given by:

$$\pi_{it} = y_{it} - c_{it} + \frac{m}{n}\sum_{i} c_{it} + L_{it}, \qquad c_{it} \in [0,1]$$

where c_{it} = the amount *i* donates to the group account in round *t*; L_{it} is the payoff from the private lottery, *m* is the group account multiplier, and *n* is group size. The fraction *m/n* gives the MPCR. The corresponding expected profits are identical to the payoff from the VCM alone. Assuming that utility is equal to payoff, expected profits are equivalent to the traditional VCM utility function:

$$u_{it} = E(\pi_{it}) = y_{it} - c_{it} + \frac{m}{n}\sum_{i} c_{it}$$

where u_{it} is individual *i*'s utility from the VCM in round *t*.

The above utility function was modified by Messer et al (2006) to capture the effect of context on choice via social norms, and it was proposed that utility takes the following form:

$$u_{it} = y_{it} - c_{it} + \frac{m}{n}\sum_{j=1}^{n} c_{jt} + \beta_{it}\left(c_{it} - y_{it}\right)$$

where β_{it} is an individual-specific, time-variant parameter representing taste for the social norm of contributing the full endowment to the group account. This parameter is separated into a time-variant, context-driven component, $\bar{\beta}_t$,and an individual-specific time-invariant component, α_i. This is stated in three main assumptions: (1) $\beta_{it} = \bar{\beta}_t + \alpha_i$, (ii) $\bar{\beta}_t = \bar{\beta}_{t-1} - D(C,V,S)(y_{it} - \bar{c}_{t-1})\bar{\beta}_{t-1}$, and (iii) $\bar{\beta}_0 = \bar{\beta}_0(C,V,S)$, where *D* represents the decay of the non-individual-specific component of taste for the social norm, which, along

with the initial level of this component, $\bar{\beta}_0$, is assumed to be a function of contextual factors, cheap talk (*C*), voting (*V*), and status quo (*S*).

With automatic donation, status quo is no longer a contextual factor in the laboratory, but can be thought of as a decision made at the individual level. What the results show is that, in the absence of cheap talk, contribution rates closely mimic analogous treatments of Messer et al (2006) where the status quo was not one of giving, while treatments with cheap talk mimic analogous treatments of Messer et al (2006) where there was a status quo of giving. Figure 3 shows the first ten rounds of contributions, by treatment, compared to both actual contributions and estimations of the analogous treatments from Messer et al (2006). That is, Treatment 1 is estimated from the model assuming no cheap talk, no vote, and status quo of not giving; Treatment 2 is estimated from the voting model with no cheap talk and status quo of not giving; Treatment 3 is estimated from the model with cheap talk and a status quo of giving, but no vote; and Treatment 4 is estimated from the full-context model of cheap talk, voting, and a status quo of giving.

This twofold role of cheap talk may have its roots in a number of different grounds. For example, some subjects lacking a comprehensive grasp on the experiment's instructions may gather from cheap talk information regarding surplus-maximizing behavior. It is possible that a bonded, single stratagem for the group, particularly one that starts with full contributions, is likely to result from communication. If so, it would be more likely for participants to sign on to automatic donation in treatments with cheap talk.

5. FIELD STUDY

The high sustained contribution rates of Version 4 could potentially greatly benefit charitable organizations relying on private contributions for funding. So to determine the robustness of Version 4's sustained giving, a field experiment was conducted.

Participants were church members solicited by their church's pastor to participate in an activity after mass and were not informed that they would be asked for contributions.[11] They were presented en masse with general information about the global AIDS crisis and the positive impact that charitable giving has. The person presenting the information was the same across churches.

The participants were then divided into smaller groups in separate rooms. In the no-context treatments, the subjects then made private decisions about whether or not they wanted to contribute to a fund dedicated to the prevention of mother-to-child transmission (MTCT) of AIDS.[12] Participants had the option of contributing using automatic deduction, contributing without using automatic deduction, or not contributing. Those using automatic donation were asked to provide their credit card numbers and specify an amount that to be charged to this credit card by the charitable organization each month. Those who wanted to contribute without using automatic deduction could do so online with their credit cards. If they wanted to pay by check, they were given an addressed and stamped envelope which could be used to send contributions. Those who chose not to contribute were also given an envelope so that they could not be identified by their peers as non-payers, which would unnecessarily pervert the incentive structure.

[11] The church received $25 for each participant it produced. It is important to note that his money went to the church and not the individual participants.

[12] During the informational sessions they were informed of the low-cost, high-efficiency nature of MTCT prevention.

In full context treatments, the members of the smaller groups were given the opportunity to engage in cheap talk with one another. They then voted—following the same standard of majority rule as in the laboratory experiments—on whether or not they wanted to participate in this charity as a group. If the majority vote resulted in them *not* participating, the group was free to leave. If the majority vote resulted in participation, then donations could be made following the same procedure as in the no-context groups.

6. CONCLUSION

The voluntary contribution mechanism has been shown by many to produce near-efficiency. Here, we use contextual factors that are easy to mimic—as opposed to, say, establishing an ex ante status quo of giving for a whole group or conditioning membership to a group on being a nurse—and attain sustained efficiency. Since these results are obtained in a laboratory environment, we take the experiment to a real-world setting where participants actually make decisions with and about their own money. The complexities of the real-world—heterogeneous endowments, heterogeneous tastes for the public good, an undefined multiplier for the public good—generate a challenging environment in which to examine the robustness of our laboratory results and also serves to enrich the theoretical model introduced in Messer et al (2006).

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Figure 1

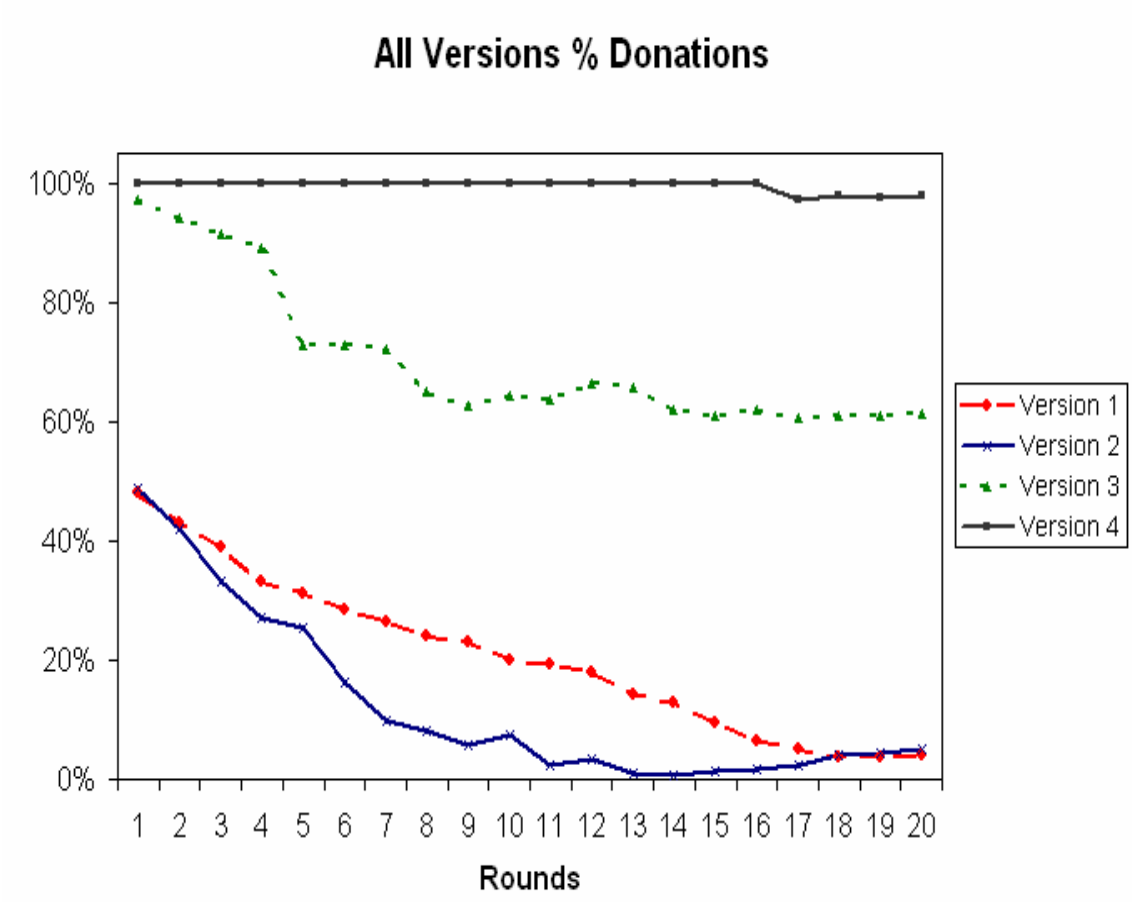

All Versions % Donations
100%
80%
60%
40%
20%
0%
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Rounds
Version 1
Version 2
Version 3
Version 4

Figure 2

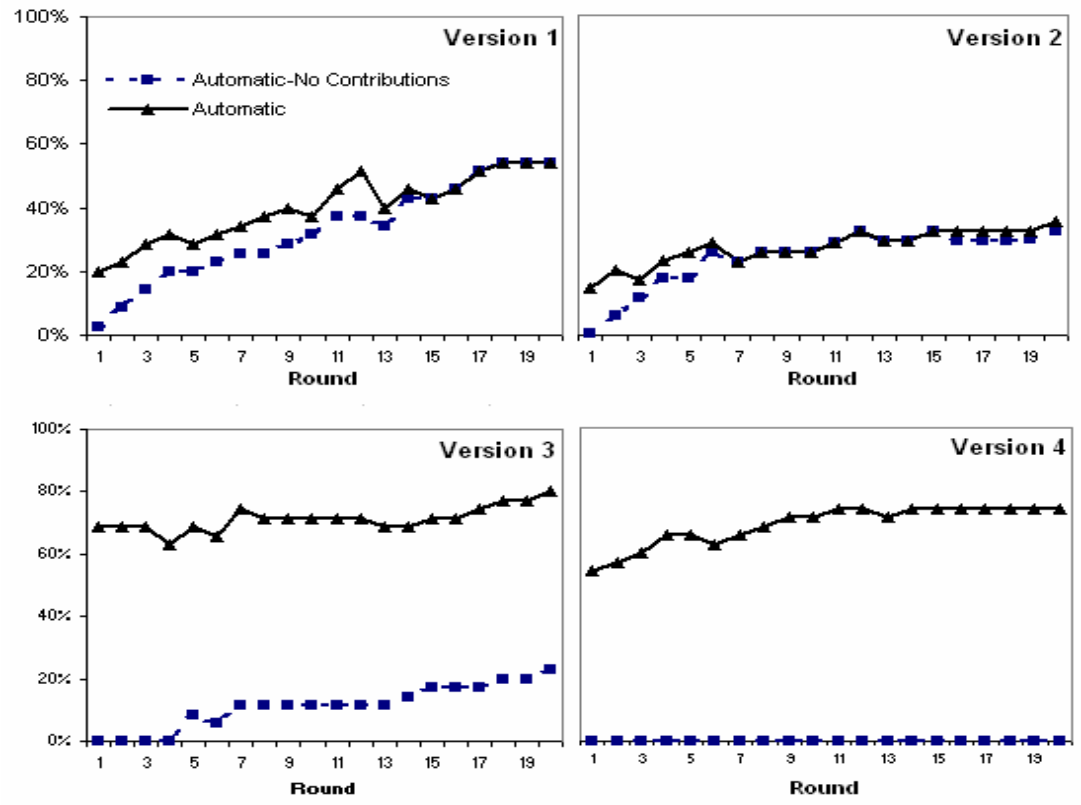

Version 1
Automatic-No Contributions
Automatic
100%
80%
60%
40%
20%
0%
1 3 5 7 9 11 13 15 17 19
Round
Version 2
Round
Version 3
Round
Version 4
Round

Table 1

Random-effects tobit regression — Number of obs = 400
Group variable (i): group — Number of groups = 20

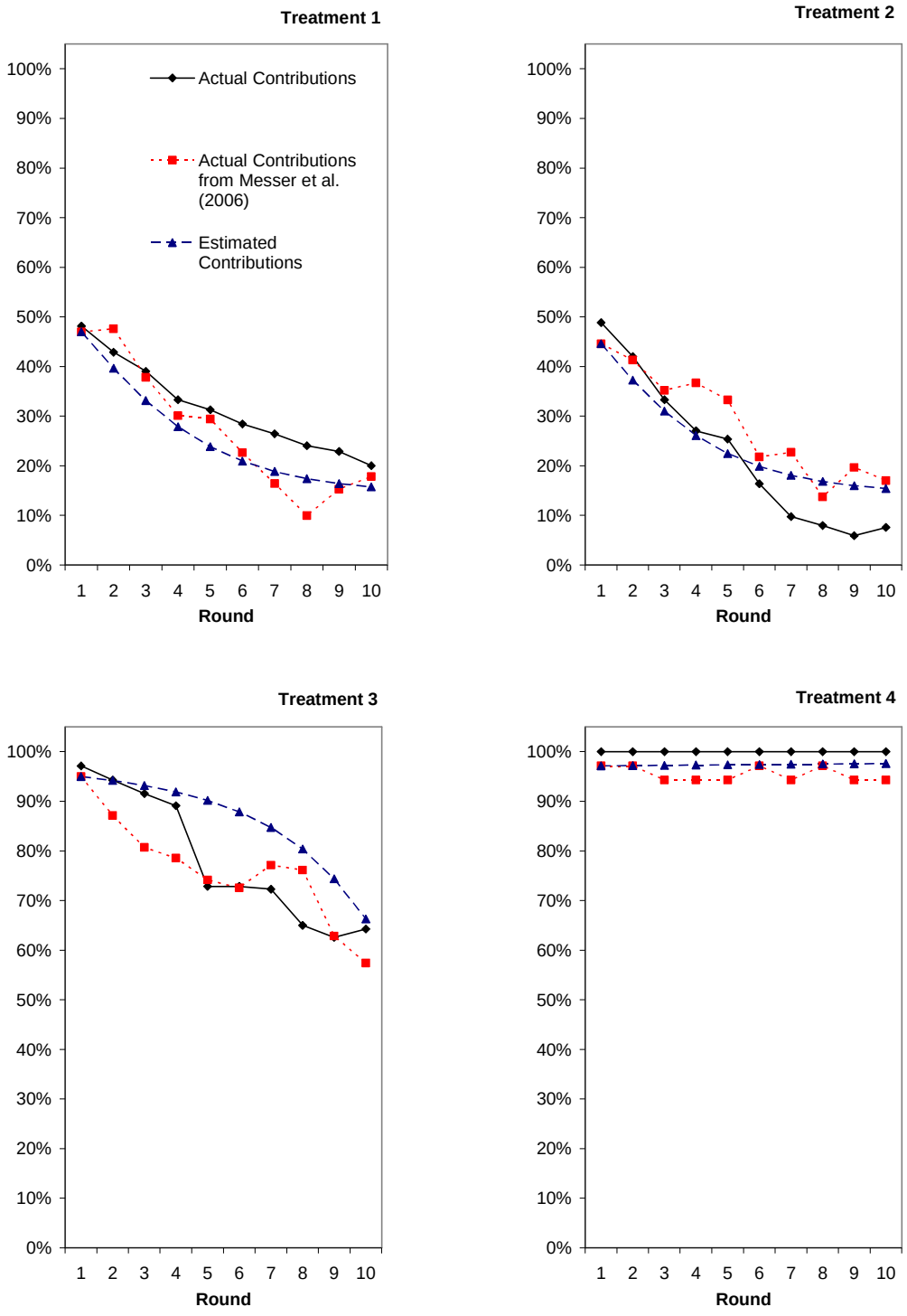
Random effects u_i ~ Gaussian

Wald chi2(6) = 362.76
Log likelihood = 27.050108 — Prob > chi2 = 0.0000

% Donated	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Cheap Talk	.9832731	.1665268	5.90	0.000	.6568865	1.30966
Voting	-.0944402	.223576	-0.42	0.673	-.5326412	.3437608
Round	-.0320348	.0029975	-10.69	0.000	-.0379098	-.0261598
Vote*CT	.8171983	.2438047	3.35	0.001	.33935	1.295047
Vote*Round	.004227	.00412	1.03	0.305	-.003848	.0123021
CT*Round	-.0208498	.0059052	-3.53	0.000	-.0324238	-.0092758
Intercept	.4342802	.1520793	2.86	0.004	.1362102	.7323502
sigma_u	.3606996	.0247886	14.55	0.000	.3121148	.4092843
sigma_e	.1479523	.0090999	16.26	0.000	.1301168	.1657878
rho	.8559819	.0176435			.8185946	.8877897

Observation summary: 59 left-censored observations
184 uncensored observations
157 right-censored observations

Figure 3


Treatment 1
Actual Contributions
Actual Contributions from Messer et al. (2006)
Estimated Contributions
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 2 3 4 5 6 7 8 9 10
Round
Treatment 2
Round
Treatment 3
Round
Treatment 4
Round