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Facebook to Facebook: Online Communication and  
Economic Cooperation

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# Facebook-to-Facebook: Online Communication and Economic Cooperation\*

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## Abstract

Traditionally, direct face-to-face communication has been found more effective for fostering economic cooperation than any form of indirect, mediated communication. We inquire whether this is still the case when most young people routinely use texting and online social media to communicate with each other. We find that young adults in our laboratory public goods experiment are just as adept at finding and sustaining cooperative agreements when communicating within a Facebook group and through online chat as they are in person.

**Keywords:** laboratory experiments; communication; public good voluntary contribution mechanism

**JEL Classification:** C91, D83, H41

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# 1 Introduction

Communication between agents is critical for economic cooperation in many settings (Ledyard 1995). Traditionally, experimental research has found that direct face-to-face communication is far more effective in achieving cooperation than any kind of indirect communication (Dawes et al. 1977; Isaac and Walker 1988; Davis and Holt 1992). Yet, the recent revolution in online communication has resulted in radical changes in the way people, especially younger generations, communicate with each other. According to the Pew Research Center, almost all young American adults (95% of 18-24 year-olds) own a cell phone and 97% of these cell owners use text messaging (Smith 2011). Furthermore, 90% of young adults use social networking sites (Perrin 2015), and Facebook remains by far the most popular platform, engaging 87% of young adult and 71% of all adult internet users (Duggan et al. 2015).

Given the now commonplace use of online communication media, does face-to-face still remain more effective for achieving cooperative goals? We address this question in the context of a voluntary contribution mechanism for public goods provision (hereafter VCM), a setting commonly used to study economic cooperation. A number of recent experimental studies comparing face-to-face with alternative media indicate that the gap is narrowing (Brosig et al. 2003; Bochet et al. 2006).<sup>1</sup> However, these studies do not specifically investigate commonplace online communication media as alternatives to face-to-face. We address this issue here. We test whether commonly used online communication media - specifically, the use of online chats and Facebook posts - are now as effective in achieving cooperation among young adults as traditional face-to-face communication.

## 2 Experimental Design

We conducted the following VCM laboratory experiment with students at a U.S. university. Each session involves 8–12 participants and is divided into three parts.

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<sup>1</sup>See also Fiedler and Haruvy (2009), Bicchieri and Lev-On (2011), Greiner et al. (2012), Greiner et al. (2014).

In Part 1, participants are divided into groups of four and play 10 periods of the VCM with the same group members. In each period of the VCM, a participant belonging to a four-person group has 10 tokens to allocate between a private and a public fund. The payoff function of person  $i$  contributing  $x_i$  tokens to the public fund is given by  $\pi_i(x) = 10 - x_i + 0.5 \sum_{j=1}^4 x_j$ , where  $\sum_{j=1}^4 x_j$  is the total group contribution to the public fund.

In Part 2, participants are randomly rematched into new groups of four, and are asked to communicate for 10 minutes within their new group. In this part, we implement four treatments in a between-subjects design:

**No Communication (NC)** Communication is absent in this baseline. After Part 1, participants are told that the experimenter needs a few minutes to set up for the next part.

**Face-to-Face (FTF)** Participants communicate with their new group face-to-face sitting around the table.

**Facebook-to-Facebook (FB)** Participants, in their new groups, are invited to a specific Facebook group.<sup>2</sup> They interact with one another via wall posts and post replies. All participants were removed from the Facebook group after 10 minutes.

**Online Chat (Chat)** Participants, in their new groups, interact with one another via the online text messaging option, “Chat box”, provided by z-Tree (Fischbacher 2007).

In Part 3, participants play another 10 periods of the VCM with the group they just communicated with. At the end of Part 3, we conducted a short exit survey.

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<sup>2</sup>One needs a Facebook account to join a Facebook group. As Facebook does not allow fake accounts, participants’ genuine accounts had to be used. In Session 1 of the FB treatment, three participants out of 12 did not have Facebook accounts, which had to be created on the spot with the experimenter’s help. For later sessions, we requested all of our participants, irrespective of treatment, to have a Facebook account. Given that around 90% of young American adults use Facebook (see Section 1), the subject pool selection bias introduced by this recruitment restriction is minimal.

Participants were recruited using ORSEE software (Greiner 2015). The game and the Chat part of the experiment were implemented via z-Tree (Fischbacher 2007). A standard web browser was used for communication in the Facebook treatment. A human observer took notes on the contents of the communication sessions of each group under FTF; computer logs were available for communication sessions of both FB and Chat.<sup>3</sup>

### 3 Experimental results

We conducted 13 experimental sessions with 124 students; each session had between 8 and 12 students. The students were mostly undergraduates, from various majors. The gender split was close to 50/50. 117 out of 124 participants had Facebook accounts; 71% of participants reported using Facebook every day and 84% had more than 100 Facebook friends. Average earnings were about \$21. Tables 3–4 in Supplementary Material C provide the experiment summary by treatment and session.

Figure 1 shows the dynamics of average contributions, and Table 1 displays the average contributions, and frequencies of full contributions of 10 tokens, in the pre-communication and post-communication parts by treatment. Figure 1 and Table 1 suggest that the contributions to the public good in the pre-communication part (periods 1-10) followed the usually observed pattern in all treatments. After communication (periods 11-20), contributions to the public good increased and reached close to the maximum of 10 tokens in all communication treatments. In fact, 23 out of 25 communication groups in our three communication treatments fully contributed until the penultimate period, with only occasional deviations. In comparison, none of the six groups under NC could achieve levels close to full contribution.<sup>4</sup>

To establish the significance of treatment effects, we report, in Table 2, the results of difference-in-difference regression estimations of individual contributions on part and treatment dummies, their interaction terms, and the “last period” dummy

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<sup>3</sup>See Supplementary Materials A and B for Experimental Instructions and Exit Questionnaire. The language of the experimental instructions explaining the communication part is in line with earlier studies on the effect of face-to-face communication on VCM play (Isaac and Walker 1988).

<sup>4</sup>See Figures 2–5 in Supplementary Material D.

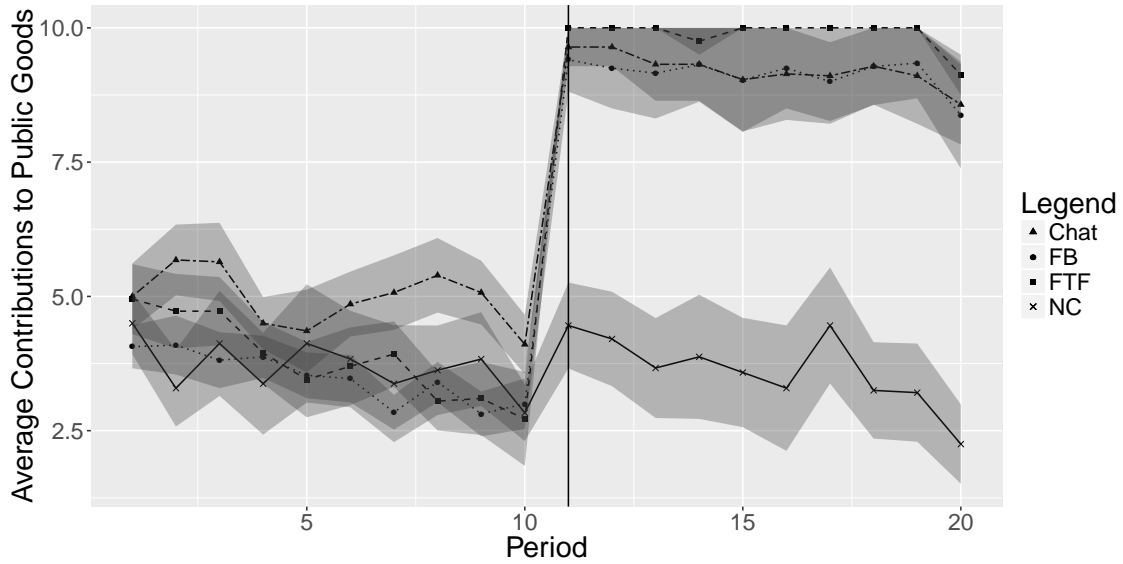


Figure 1: Mean contributions with group-based standard errors by treatment

Table 1: Average contribution and frequency of full contributions by treatment

Treatment	No. subjects	No. groups	Mean contribution, tokens		Full contributions frequency, percent	
			Pre-Comm	Post-Comm	Pre-Comm	Post-Comm
NC	24	6	3.69	3.63	7.50	6.67
FTF	40	10	3.85	9.89	15.05	98.75
FB	32	8	3.49	9.14	5.63	87.50
Chat	28	7	4.97	9.22	24.29	91.43

Table 2: Regression estimation of individual contributions to the public good

Contribution	Contribution amount Linear regression				Contribution amount Ordered logistic regression				Probability of full contribution Logit regression			
	Coef.	<i>Std. Err.</i>	95% conf. Interval		Coef.	<i>Std. Err.</i>	95% conf. Interval		Coef.	<i>Std. Err.</i>	95% conf. Interval	
const.	3.79***	0.92	2.55	5.02	—	—	—	—	-2.45***	0.09	-2.59	-2.32
Part 3	-0.07	0.80	-1.13	0.99	-0.04	0.34	-0.57	0.44	-0.13	0.36	-0.73	0.20
FTF	0.14	0.96	-1.45	1.78	-0.08	0.49	-0.92	0.73	0.77***	0.25	0.21	1.22
FB	-0.20	0.92	-1.47	1.04	-0.08	0.47	-0.79	0.59	-0.31	0.46	-1.19	0.36
Chat	1.28	1.12	-0.94	3.24	0.57	0.54	-0.58	1.43	1.38	0.65	-0.09	2.40
Part3 FTF	6.12***	0.85	4.66	7.55	6.35***	1.41	5.33	7.97	6.29***	0.61	5.30	7.63
Part3 FB	5.72***	1.05	3.87	7.57	3.86**	1.68	2.28	7.62	4.94***	1.43	3.97	8.66
Part3 Chat	4.32***	1.37	1.98	7.08	3.63**	4.90	1.89	20.19	3.68**	1.63	1.55	7.64
last period	-0.94***	0.15	-1.22	-0.65	-0.69***	0.11	-0.95	-0.51	-0.82**	0.36	-1.95	-0.45
	Number of obs = 2472				Number of obs = 2472				Number of obs = 2472			
	Wald chi2 = 27638.14				Wald chi2 = 85.44				Wald chi2 = 1759.43			
	Adj R-squared = 0.4844				Pseudo R2 = 0.1961				Pseudo R2 = 0.5666			

Baseline: Part 1, NC. Bootstrap replications based on 13 clusters in Session. 95 percentile bootstrap conf. intervals.

\*\*\* – significant at 1%; \*\* – significant at 5% level

(taking non-zero values for periods 10 and 20 only). For each estimation, we conducted 1000 bootstrap replications based on 13 session clusters to account for possible interdependencies of observations within sessions and a relatively small number of independent sessions (Efron and Tibshirani 1994). The table displays the results of both linear and ordered logit regressions of individual contribution amounts, as well as logit estimation of the probability of full contribution.<sup>5</sup>

All three regression specifications convey qualitatively similar results: The treatment effects coefficients on “Part3 FTF”, “Part3 FB” and “Part3 Chat” are all positive and significant at the 1% or 5% level. This confirms that the changes in contribution levels and in the probability of making the full contribution between pre-communication and post-communication parts are statistically different (higher) in all three communication treatments as compared to the NC baseline. Further, comparing changes in contributions across three communication treatments, we find

<sup>5</sup>See Deaton (1998, p. 91) on the dangers of using nonlinear, such as limited dependent variable, regressions, when the distribution of the error term is unknown. As a robustness check, we present the results of both linear and nonlinear regression estimations.

no significant differences among the treatments: The null hypothesis of no difference among “Part3 FTF”, “Part3 FB” and “Part3 Chat” coefficients is sustained based on the chi-squared test ( $p > 0.1$  for all three regression specifications reported in Table 2).

Why was communication so successful in producing and maintaining full contributions? Brosig et al. (2003) and Bochet et al. (2006) attribute the effectiveness of communication under VCM to the individual’s ability to discuss cooperative strategies and to express commitments to these strategies. Accordingly, we analyzed communication sessions for each group to address two simple questions. First, was there game-relevant discussion? And second, did the group discuss and agree on contributing all 10 tokens each to the public fund?

In all three communication treatments, the overwhelming majority of groups discussed the game and agreed on the full contributions. Specifically, under FTF, all 10 groups agreed on the full contribution level and fully contributed until the penultimate period (except for momentary declines); in FB, seven out of the eight groups agreed on the full contribution level and followed through with the agreement; in Chat, six out of seven groups agreed on the full contribution level and fully contributed until the penultimate period. We conclude:

**Conclusion** *There were no significant differences in the effectiveness of direct Face-to-Face communication as compared to communication mediated through Facebook or Chat. Under all three communication media, one-time communication allowed for full and sustained cooperation in the VCM game. The overwhelming majority of groups discussed the game, agreed to fully contribute to the public good, and followed through with their agreements until the penultimate period.*

## 4 Discussion

Our results suggest that among a population of college students, there is no longer a difference in the effectiveness of direct face-to-face communication compared to communication mediated through familiar online media (Facebook and online chat) in sustaining cooperation in a simple VCM game. While the three media differ



in the potential richness of communication and social channels (e.g., Roth 1995), we observed that our participants were able to use these media equally effectively in finding and sustaining cooperative agreements. In contrast to early studies that used recurring communications (Isaac and Walker 1988), only one communication session was necessary to sustain full cooperation until the penultimate period in almost all (23 of 25) communication groups.<sup>6</sup>

As our subject pool consists of young adults who are familiar with online media, – 117 out of our 124 participants have Facebook accounts, – we cannot say if the result would be different had we used a different subject pool for whom texting and Facebooking are less common. However, given the commonplace use of these online media (see Section 1), a subject pool of non-users would be less representative of the current U.S. population overall and of young adults in particular.

A question motivated by our work is what effect does the use of online social media have on people’s cooperative behavior? Some survey results suggest that Facebook users are more trusting than others, have closer relationships, and get more social support than other people (Hampton et al. 2011). Although we cannot fully explore the connection in this short note, we inquire whether participants who reported to be daily Facebook users (71% of all participants), or those who have more than 100 Facebook friends (84% of all participants), behaved in the VCM any differently than other participants. Our regression estimations suggest that the daily Facebook users contributed to the public good slightly less (0.64 tokens less in the linear regression specification), whereas the effect of having more than 100 Facebook friends was positive but insignificant.<sup>7</sup> A deeper investigation of these effects is warranted. We leave it for future studies.

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<sup>6</sup>Observing frequent defections in the last period of the post-communication VCM game validates our results even further, indicating that our participants were fully aware of the strong incentive to defect, but did not act on it until the very last period.

<sup>7</sup>See Table 5 in Supplementary Material C.

## References

- Bicchieri, C. and Lev-On, A. (2011). Studying the ethical implications of e-trust in the lab. *Ethics and Information Technology*, 13(1):5–15.
- Bochet, O., Page, T., and Putterman, L. (2006). Communication and punishment in voluntary contribution experiments. *Journal of Economic Behavior and Organization*, 60(1):11–26.
- Brosig, J., Weimann, J., and Ockenfels, A. (2003). The effect of communication media on cooperation. *German Economic Review*, 4(2):217–241.
- Davis, D. and Holt, C. (1992). *Experimental economics*. Princeton University Press.
- Dawes, R., McTavish, J., and Shaklee, H. (1977). Behavior, communication, and assumptions about other people’s behavior in a commons dilemma situation. *Journal of Personality and Social Psychology*, 35:1–11.
- Deaton, A. (1998). *The analysis of household survey: a microeconomic approach to development policy*. Johns Hopkins University Press.
- Duggan, M., Ellison, N., Lampe, C., Lenhart, A., and Madden, M. (2015). Social media update 2014. Technical report, Pew Research Center. <http://www.pewinternet.org/2015/01/09/social-media-update-2014/>.
- Efron, B. and Tibshirani, R. J. (1994). *An introduction to the bootstrap*. CRC press.
- Fiedler, M. and Haruvy, E. (2009). The lab versus the virtual lab and virtual field: An experimental investigation of trust games with communication. *Journal of Economic Behavior and Organization*, 72(2):716–724.
- Fischbacher, U. (2007). z-tree: Zurich toolbox for ready-made economic experiments. *Experimental Economics*, 10:171–178. 10.1007/s10683-006-9159-4.
- Greiner, B. (2015). Subject pool recruitment procedures: organizing experiments with orsee. *Journal of the Economic Science Association*, 1(1):114–125.

- Greiner, B., Caravella, M., and Roth, A. E. (2014). Is avatar-to-avatar communication as effective as face-to-face communication? an ultimatum game experiment in first and second life. *Journal of Economic Behavior & Organization*, 108:374–382.
- Greiner, B., Güth, W., and Zultan, R. (2012). Social communication and discrimination: a video experiment. *Experimental Economics*, 15(3):398–417.
- Hampton, K., Goulet, L. S., Rainie, L., and Purcell, K. (2011). Social networking sites and our lives. Technical report, Pew Research Center. <http://www.pewinternet.org/2011/06/16/social-networking-sites-and-our-lives/>.
- Isaac, R. and Walker, J. (1988). Communication and free-riding behavior: The voluntary contribution mechanism. *Economic Inquiry*, 26(4):585–608.
- Ledyard, J. (1995). Public goods: A survey of experimental research. In J. Kagel, J. and Roth, A., editors, *Handbook of Experiment Economics*, pages 111–194. Princeton University Press.
- Perrin, A. (2015). Social media usage: 2005-2015. Technical report, Pew Research Center. <http://www.pewinternet.org/2015/0/08/social-networking-usage-2005-2015/>.
- Roth, A. (1995). Bargaining experiments. In Kagel, J. and Roth, A., editors, *Handbook of Experimental Economics*, pages 349–443. Princeton: Princeton University Press.
- Smith, A. (2011). Americans and text messaging. Technical report, Pew Research Center. <http://www.pewinternet.org/2011/09/19/americans-and-text-messaging/>.

## List of Supplementary Materials

- A Experimental Instructions
- B Exit questionnaire
- C Supplementary tables
- D Supplementary figures

## Supplementary Material A

### EXPERIMENT INSTRUCTIONS – PART I

#### Introduction

Welcome to the experiment. This is an experiment funded by a research foundation to study decision making. For showing up on time, you will be paid a \$5 show-up fee. In addition, you may receive additional earnings as the result of the outcomes in the experimental session. All earnings that you make will be in “computer dollars.” At the end of the experiment we will pay you in cash an amount equal to \$0.05 for every computer dollar you earn.

Today’s session will take about an hour and a half. Please do not communicate with other participants during the experiment.

Click **CONTINUE** when you are ready to go on.

#### Decisions and payoffs

At the beginning of this decision making experiment you will be matched with three other people, randomly selected from the people in this room, to form a group of four. You will remain in this group of four people for the duration of the whole decision-making experiment. The names of the other members of your group will not be revealed.

At the beginning of each period, you and each other person in your group will receive 10 tokens. You must decide how much of this amount to keep, and how much to contribute to the PROJECT: you can contribute any number between 0 and 10. Only integer values will be accepted. Contributions in one period do not carry over to the next.

Each token that you keep earns you one computer dollar. The sum of your and others’ contributions to the PROJECT is multiplied by two and divided equally among all 4 people in your group, and your share will go to your earnings. Thus,

$$\text{Your Earnings} = \text{Tokens kept} + \frac{2 * (\text{Total group contribution to the PROJECT})}{4}$$

Click **CONTINUE** when you are ready to go on.

#### Examples

In order to help you determine the potential earnings in light of the decisions of you and the other people in your group, you have access to the *Calculator* at all times. This allows you to explore hypothetical situations before actually making decisions.

Let’s try it now.

EXAMPLE 1: Suppose that all the other people in your group contributed a total of 13 tokens. If you decide to contribute 5 tokens, the total group contribution to the PROJECT will be  $13 + 5 =$

18 tokens. Under “If your contribution to the PROJECT is:”, enter “5” tokens and under “If the sum of others’ contribution to the PROJECT is:”, enter “13” tokens. Press **CALCULATE**. This should yield you earnings of 14 computer dollars (5 computer dollars from token not contributed +  $(2*18)/4$  computer dollars from the PROJECT).

Feel free to experiment with the calculator now. You are now free to enter any number between 0 and 30 under “If the sum of others’ contribution to the PROJECT is:” and any number between 0 and 10 under “If your contribution to the PROJECT is:” to explore how your earnings change given different contributions from yourself and others.

ARE THERE ANY QUESTIONS?

Click **NEXT** when you’re done.

### **Entering Decisions in Decision Box**

Your computer screen will display the period number and your subject number. You are going to make decisions with the other members of your group for 10 periods. Your subject number will be your subject number for the entire experiment.

The left side of your screen will display a calculator which will allow you to test different combinations of contributions by you and your group members. Below that, starting from period 2, there will be a history box that will show your contribution, others’ contribution, and your earnings for each period. When you are ready to make a decision regarding your contribution for the period, input your contribution amount in the lower right side of your screen, in the **DECISION BOX**, and click **NEXT**.

Please practice entering your decision in the decision box now. This is for practice, and it will not affect your earnings in the actual experiment.

ARE THERE ANY QUESTIONS?

Period		1 of 1		Remaining time [sec]: 43	
You are Subject Number: 1					
<p><b>This is your calculator.</b></p> <p>Your Endowment: 10.00  Total Endowment of Others in Your Group: 30.00</p> <p>If your contribution to the PROJECT is: <input type="text"/></p> <p>If the sum of others' contribution to the PROJECT is: <input type="text"/></p> <p>Your Earnings From What You Kept = 0.00  Your Earnings from the PROJECT = 0.00  Your Total Earnings = 0.00</p> <p style="text-align: right;"><b>Calculate</b></p>			<p>There are 4 people in your group, including yourself.</p> <p>Every unit that you put into the PROJECT will be multiplied by 2 and divided by all 4 people in your group.</p>		
<p><b>This is your history box.</b></p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div>			<p style="text-align: center;"><b>DECISION BOX</b></p> <p>Your Endowment 10</p> <p>Your contribution to the PROJECT: <input type="text"/></p> <p>Please Press <b>NEXT</b>.</p> <p style="text-align: right;"><b>NEXT</b></p>		

Click **CONTINUE** when you are ready to go on.

## Results Screen

Once everyone in the room has entered their contribution to the PROJECT, you will see the results screen.

The results screen shows your contribution to the PROJECT, the sum of all contributions, and your earnings for the period will be displayed.

Period	1 of 1	Remaining time [sec]: 58
You are Subject Number: 1		
<p><b>Period 1 Results</b></p> <p><b>Your Endowment:</b> 10.00</p> <p>Your contribution to the PROJECT: 0.00</p> <p>Sum of others' contribution: 0.00</p> <p><b>Total Contribution to the PROJECT:</b> 0.00</p> <p><b>Your Earnings From What You Kept =</b> 10.00  <i>Your Earnings From What You Kept = 10 - 0</i></p> <p><b>Your Earnings From The PROJECT =</b> 0.00  <i>Your Earnings From The PROJECT = (2 * 0)/4</i></p> <p><b>Your Total Earnings For This Period =</b> 10.00  <i>Your Total Earnings For This Period = (10 - 0) - (2*0)/4</i></p> <p>Please Press OK.</p>		
		<input type="button" value="OK"/>

ARE THERE ANY QUESTIONS?

Click **CONTINUE** when you are ready for a review.

**Review**

Use the calculator on this screen to answer the following questions.

Suppose you kept 3 computer dollars and your other group members contributed 16 computer dollars each to the PROJECT. What is:

1. The total group contribution to the PROJECT? \_\_\_\_\_
2. Your earnings from the PROJECT? \_\_\_\_\_
3. Your earnings for the period? \_\_\_\_\_

Once the experimenter has checked your work, press **NEXT**.

This will continue for 10 periods. After the 10 periods are over, you may be asked to participate in another decision-making activity. Once all activities are over, the computer will sum your earnings from all activities and you will be paid in cash in private.

ARE THERE ANY QUESTIONS?



## EXPERIMENT INSTRUCTIONS – PART II (FTF)

In some previous experiments, participants found it beneficial to communicate with each other. We will now give you an opportunity to communicate in person.

You will have an opportunity to communicate in groups of four people. You will be facing the other people in your group. The people in your discussion group are picked at random from your session participants and are not necessarily the same people that you were matched with in Part 1 of the experiment. The experimenter will direct you to your discussion group now. **Please do not start communication until the experimenter says so.**

ARE THERE ANY QUESTIONS?

Has everyone joined the group now? You will now be given 10 minutes to communicate with the people in your group. **After the communication time is over, you will participate in the same set of decision-making experiments as in Part I, with the group of people you just communicated with.**

Please start communication now.

[PAUSE]

The communication time is now over. Please stop talking and return to your computer terminals.

You will now participate in the same set of decision-making experiments as in Part I, with the group of people you just communicated with. Again, the experiment will continue for 10 periods. Your earnings from this part of the experiment will be added to your earnings in Part 1 and will be paid to you in private at the end of the experiment.

ARE THERE ANY QUESTIONS?

## EXPERIMENT INSTRUCTIONS – PART II (FB)

In some previous experiments, participants found it beneficial to communicate with each other. We will now give you an opportunity to communicate through Facebook group. In your screens please enter your email address that is connected to your Facebook account.

When you're done entering your email address, please press OK.

Please give the experimenter a few minutes to invite your email addresses to a Facebook group. The experiment will invite you to join a Facebook group. In the email address that you have provided us earlier, you will find a message from Facebook inviting you to a group. You will have an opportunity to communicate in groups of four people. The people in your discussion group are picked at random from your session participants and are not necessarily the same people that you were matched with in Part 1 of the experiment. Prior to starting communication, we will give you few minutes to log in to your Facebook account and join the group. **Please do not start communication until the experimenter says so.**

ARE THERE ANY QUESTIONS? Please raise your hand if you cannot find the invitation in your email, or if you need help joining the Facebook group. On the next page, you will find step-by-step instructions on how to join the group, communicate with the other people in your group, and delete your Facebook account.

[PAUSE]

Has everyone joined the group now? You will now be given 10 minutes to communicate with the people in the group via Facebook posts. **After the communication time is over, you will participate in the same set of decision-making experiments as in Part I, with the group of people you just communicated with.**

Please start communication now.

[PAUSE]

The communication time is now over. Please log off your Facebook accounts and close the web browser. The experimenter will remove you from the discussion group momentarily.

You will now participate in the same set of decision-making experiments as in Part I, with the group of people you just communicated with. Again, the experiment will continue for 10 periods. Your earnings from this part of the experiment will be added to your earnings in Part I and will be paid to you in private at the end of the experiment.

ARE THERE ANY QUESTIONS?

## EXPERIMENT INSTRUCTIONS – PART II (C)

In some previous experiments, participants found it beneficial to communicate with each other. We will now give you an opportunity to communicate via computer.

You will have an opportunity to communicate in groups of four people. You will be communicating by sending and receiving text messages to and from the other people in your group. The people in your discussion group are picked at random from your session participants and are not necessarily the same people that you were matched with in Part 1 of the experiment. In your screens, you will see a chat box where you can type messages to people in your group. **Please do not start communication until the experimenter says so.**

ARE THERE ANY QUESTIONS?

You will now be given 10 minutes to communicate with the people in your group via text messages. **After the communication time is over, you will participate in the same set of decision-making experiments as in Part I, with the group of people you just communicated with.**

Please start communication now.

[PAUSE]

The communication time is now over.

You will now participate in the same set of decision-making experiments as in Part I, with the group of people you just communicated with. Again, the experiment will continue for 10 periods. Your earnings from this part of the experiment will be added to your earnings in Part 1 and will be paid to you in private at the end of the experiment.

ARE THERE ANY QUESTIONS?

## EXPERIMENT INSTRUCTIONS – PART II (NC)

In this part of the experiment, you will participate in the same set of decision-making experiments as in Part I, with a new group of people. The people in your group are picked at random from your session participants and are not necessarily the same people that you were matched with in Part I of the experiment. We will need a few minutes to set up your new groups. During this time you may use the web browser to surf the net or check your email or Facebook account if you want. Please do not close the z-Leaf program if you decide go to the web browser.

ARE THERE ANY QUESTIONS?

[PAUSE]

The setup time is now over. Please close the web browsers.

**You will now participate in the same set of decision-making experiments as in Part I, with the new group of people.** Again, the experiment will continue for 10 periods. Your earnings from this part of the experiment will be added to your earnings in Part I and will be paid to you in private at the end of the experiment.

ARE THERE ANY QUESTIONS?

## Supplementary Material B: Exit Questionnaire

### Feedback

Your ID number is:

1

What is your gender?

- MALE
- FEMALE

What is your major at UH?

What type of student are you?

- Freshman Undergraduate
- Sophomore Undergraduate
- Junior Undergraduate
- Senior Undergraduate
- Graduate
- Other

Have you participated in an Economics Experiment before?

- Yes
- No

Have you participated in a Psychology Experiment before?

- Yes
- No

Do you have a Facebook account?

- Yes
- No

How often do you use it?

- Every Day
- Once or Twice a Week
- Not that Often
- Not Applicable

How many Facebook friends do you have?

- Less than 10
- 10 to 50
- 50 to 100
- More than 100
- Not Applicable

END

## Supplementary Material C: Additional Tables

Table 3: Session Summary by Treatment

Treatment	# Sessions	# Subjects	# Comm. Groups
NC	2	24	—
FTF	5	40	10
FB	3	32	8
Chat	3	28	7

Table 4: Summary of Experimental Sessions

Treatment	Session ID	# Subjects	# Comm. groups	Ave. pay, \$
Facebook	1	12	3	21.67
Face to Face	2	8	2	21.25
No Comm	3	12	—	20.25
Facebook	4	8	2	21.88
Face to Face	5	8	2	21.88
No Comm	6	12	—	17.92
Chat	7	8	2	22.63
Chat	8	12	3	22.00
Facebook	9	12	3	20.75
Chat	10	8	2	21.75
Face to Face	11	8	2	22.25
Face to Face	12	8	2	21.88
Face to Face	13	8	2	21.63

Table 5: Regression estimation of public good contributions, with added Facebook use explanatory variables

Contribution	Contribution amount				Contribution amount				Probability of full contribution			
	Linear regression				Ordered logistic regression				Logit regression			
	Coef.	Std. Err.	95% conf. Interval		Coef.	Std. Err.	95% conf. Interval		Coef.	Std. Err.	95% conf. Interval	
constant	4.03***	1.12	1.90	5.61	---	---	---	---	-2.40***	0.57	-3.89	-1.69
Part 3	-0.07	0.81	-1.13	0.99	-0.04	0.36	-0.59	0.45	-0.13	0.37	-0.75	0.21
FTF	0.18	1.08	-1.52	1.94	-0.04	0.60	-0.96	0.94	0.81***	0.25	0.23	1.31
FB	-0.19	1.04	-1.62	1.38	-0.07	0.60	-0.96	0.92	-0.27	0.51	-1.09	0.63
Chat	1.33	1.26	-1.43	3.43	0.63	0.64	-0.57	1.70	1.44	0.68	-0.12	2.37
Part3 FTF	6.12***	0.87	4.67	7.56	6.39***	0.97	5.46	7.96	6.37***	0.66	5.57	8.02
Part3 FB	5.72***	1.02	3.87	7.57	3.90***	1.68	2.37	7.69	5.00***	1.59	4.09	9.31
Part3 Chat	4.32***	1.44	1.98	7.66	3.65**	4.67	1.56	20.18	3.73**	1.84	1.54	8.29
last period	-0.94***	0.15	-1.22	-0.64	-0.70***	0.12	-0.98	-0.52	-0.82	0.43	-2.26	-0.48
Daily FB use	-0.64**	0.26	-1.22	-0.21	-0.50**	0.20	-1.01	-0.21	-0.63*	0.38	-1.48	0.02
100 friends	0.22	0.40	-0.47	1.16	0.11	0.33	-0.30	1.07	0.39	0.60	-0.38	1.87
	Number of obs = 2472				Number of obs = 2472				Number of obs = 2472			
	Wald chi2(10) = 9883.16				Wald chi2(10) = 113.68				Wald chi2(10) = 840.53			
	Adj R-squared = 0.4891				Pseudo R2 = 0.1991				Pseudo R2 = 0.5720			

Bootstrap replications based on 13 clusters in Session. Confidence intervals based on bootstrap 95% percentiles

\*\*\* -- significant at 1%; \*\* -- significant at 5% level; \* -- significant at 10% level

## Supplementary Material D: detailed figures by treatment

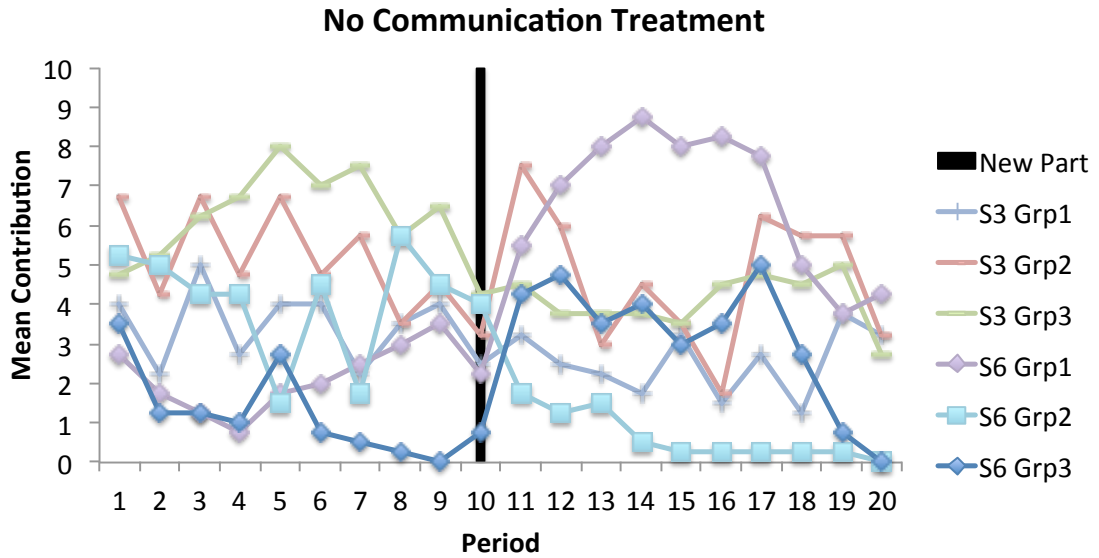


Figure 2: Per Group Average Contribution: No Communication





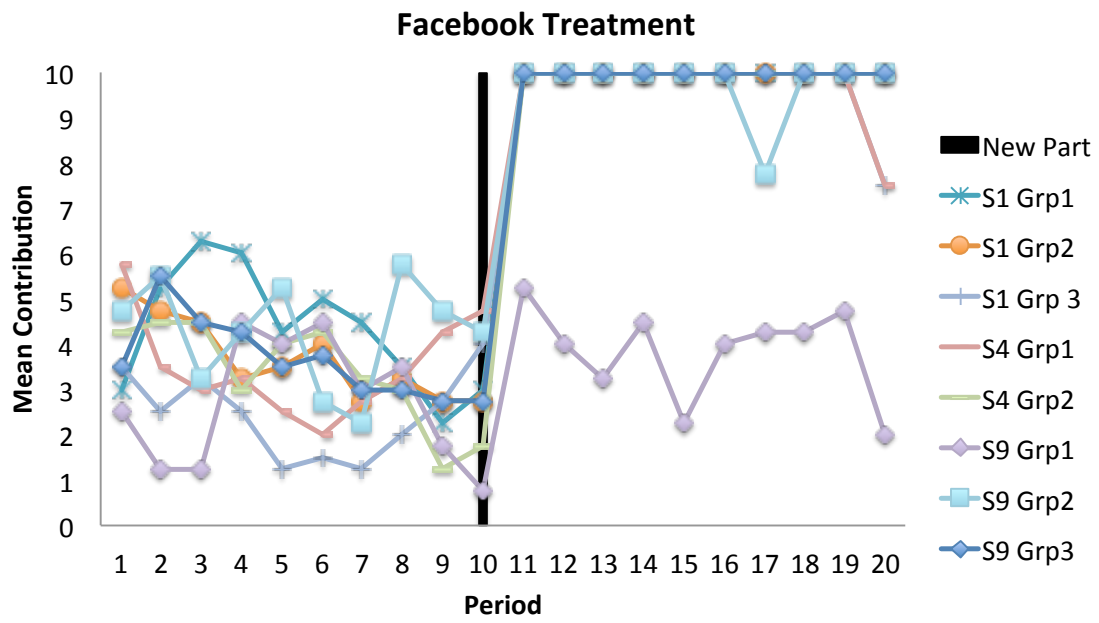


Figure 4: Per Group Average Contribution: Facebook

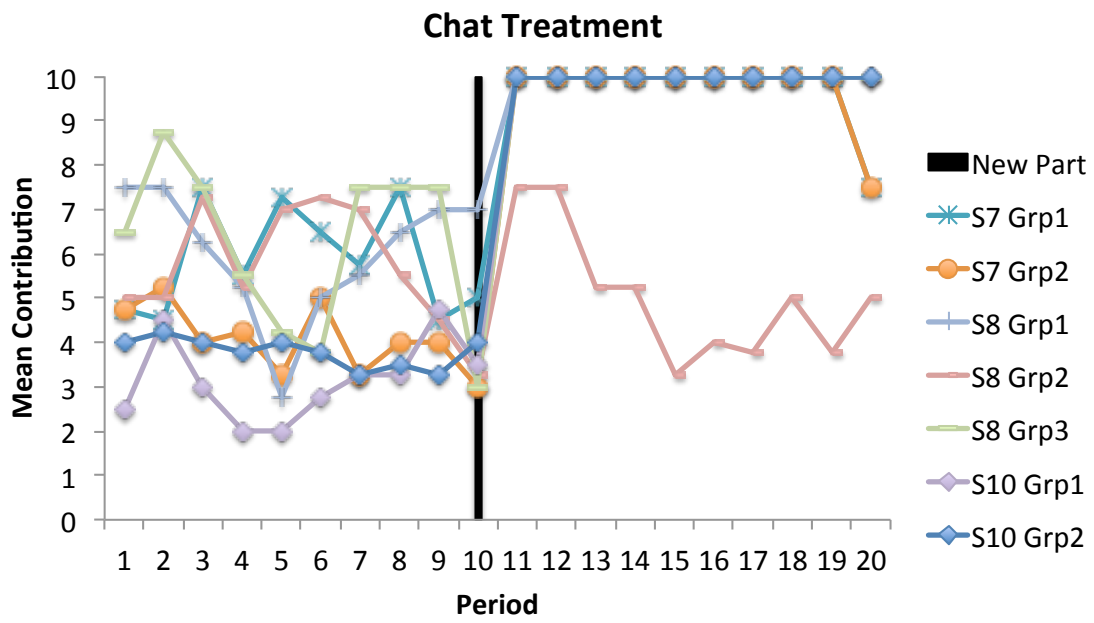


Figure 5: Per Group Average Contribution: Chat