Costly Communication and Cooperation in a Changing Water Common Pool

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Abstract:

It is well known among researchers that communication between users in CPRs facilitates cooperation and self-regulation of the resource use. It is less well known under which circumstances such communication can emerge and effectively contribute to cooperation.

This paper studies (1) whether the size of a CPR has an effect on the provision of voluntary costly communication, and (2) whether different ways to provide costly communication affect the relationship between communication and cooperation. For this purpose, the paper presents the results of a series of field experiments in rural Colombia comparing two costly communication treatments against a non-communication baseline in scenarios of different sizes of the CPR. The costly communication treatments differ in the way communication is provided. In the "public communication" treatment, communication is provided to all users if a threshold of indvidual and flexible contributions is reached. In the "private communication" treatment, communication is allowed only to users who pay a fix communication fee.
There is not a clear relationship between changes in the size of the CPR and individual contributions to the provision of communication in any of the communication treatments. Most impontantly, however, the "public communication" treatment can result in a significant increase of cooperative behavior with regard to a non-communication situation, regardless of changes in the size of the CPR, which is not the case of the "private communication treatment".

Key words: CPR field experiments, costly communication, natural resource scarcity, Colombia

1. INTRODUCTION

The use of communication to address over extraction and under provision problems in common pool and public good experiments has a long experimental tradition in social dilemma research. Experimental evidence shows that communication entails significant improvements over Nash equilibria in non-cooperative games even in the absence of enforcement mechanisms (Balliet 2010, Ostrom 2006, Sally 1995). The robustness of the findings about the impact of communication on cooperation has led experimentalists to move to more realistic treatments or to treatments that make communication and its positive impacts less likely to occur (Cardenas 2000, Schmitt et al. 2000, Bochet and Putterman 2009). This implies a focus on the analysis of the conditions in which communication does or does not have an effect on cooperation (Balliet 2010). This paper aims to contribute to this literature by studying the impact of two alternative treatments for costly communication in common-pool resources (CPR) in a context where the size of the CPR varies along the experiment.

The experiments discussed in this paper where conducted in rural Colombia, specifically in the Coello watershed with small local farmers. This watershed is located in the central Andean Cordillera with annual rainfall ranging from below 1000 mm to more than 3970 mm. Thus, nowadays water availability is not a problem in the region (water quality is); however, there is a growing concern about future scarcity problems.

The introduction of costly communication in social dilemma experiments aims to capture the organizational costs of generating forums where communication can take place as well as the opportunity costs of participating in those forums (Isaac and Walker 1991). Despite the relevance of this setting in the field, experiments addressing this issue are rare in the literature. In their seminal works, Isaac and Walker (1991; heretofore IW) and Ostrom and Walker (1991; heretofore OW) tested a version of costly communication in a VCM experiment and in a CPR experiment respectively. In both experiments, individuals had the option to make a fix contribution to a "discussion fund". If the majority of the individuals in the group contributed to the fund, then the threshold of contributions to allow communication was reached and all group members were allowed to communicate. IW and OW found that costly communication can make a difference in terms of outcomes and dynamics with respect to both no-communication and free communication situations. In this paper we test the effectiveness of two modified versions of IW and OW costly communication experiments.

Additionally, we aim to contribute to the communication literature as well as the more general experimental literature by studying the impact of different ecological conditions on cooperation in social dilemmas. Works integrating the ecological reality of participants into experiments have been praised for testing the external validity of field experiments as well as increasing the relevance of behavioral experiments (Janssen 2010, Anderies et al. 2011). A growing number of those studies analyze the effects of the size of CPRs on cooperation (Mason and Phillips 1997; Osés-Eraso and Viladrich-Graou, 2007; Osés-Eraso et al 2008; Blanco et al. 2011). We build on some of those works by incorporating different sizes of the CPR in our design. We extend those studies, however, by including costly communication.

The rest of the paper is organized as follows: Section 2 includes a literature review on the influence of communication in cooperative strategies in CPR experiments. Section 3 presents the CPR model of our experiments, based on Osés and Viladrich (2007). Section 4 develops the experimental design separating by communication treatments and treatments changing the size of the CPR. Next, section 5 presents our results, and finally, section 6 concludes.

2. LITERATURE REVIEW

Since the 50s, more than 100 studies have found significant evidence to conclude that communication can significantly increase cooperation in non-cooperative games (Sally 1995, Ostrom 2006, Balliet 2010). Some studies have compared the effectiveness of different communication treatments, including one-shot vs. repeated communication, costly communication vs. free communication, different communication channels, and different constraints over who can communicate with whom and the information that can be shared during the communication episodes (Brosig et al. 2001, Bos et al. 2001, Cardenas et al. 2004, Bochet et al. 2009, Schmitt et al. 2000). Other studies have addressed the interaction of communication with other variables, including heterogeneous players, external regulations and sanctioning mechanisms (Hackett et al. 1994, Wilson 1986, Ostrom et al. 1992, Bochet et al. 2006, Velez et al. 2010). To the best of our knowledge, there are no experiments addressing interactions between communication treatments and ecological variables. In this study, we aim to start filling that gap by (i) comparing the effectiveness of costly communication depending on the way communication is provided, and (ii) addressing the interaction of costly communication and exogenous changes in the size of the CPR.

Communication is not free in real life settings. At best, communicating is time consuming for individuals and thus involves opportunity costs. At worst, communication has to planned, and this requires coordination and organization costs. Much of the costs of communication are sunk costs; individuals are not reimbursed the cost of communication if they are not satisfied with the experience or if communication ends up not happening. Assuming that members of a group value communication as something desirable and communication is non-excludable, we can think of the opportunity to communicate as a public good. When communication is costly, non-refundable, and non-excludable, the provision of communication exhibits an assurance problem. An individual may have no incentive to contribute to the communication fund if he/she is not assured that other who benefit from it will also share the costs of its provision. In this sense providing costly communication is a public good problem (IW). In both OW and IW, communication was modeled through a provision point Voluntary Contribution Mechanism (VCM), aiming to reproduce the incentives of communication as provided in a centralized way through the creation of some kind of organization. In a provision point VCM the opportunity to communicate only occurs if the sum of individual's contributions reaches a minimum threshold. If the threshold is reached, the communication opportunity is provided, and everybody can participate including those individuals who had not contributed to the communication fund. Additionally, the provision point VCM used in both experiments included discrete contributions and no-refund features: participants could only contribute a fix amount to the communication fund, and this amount was not refunded if the provision point was not reached.

All experimental groups in IW succeeded relatively early in the game to fund the communication mechanism. Communication groups, in turn, reached high cooperation levels close to 90% of the social optimum. More remarkably, participants used costly communication in a relatively efficient way, by not having repeated meetings[1]. This led the authors to argue that a single experience of communication can have a positive impact on individual´s cooperative behavior beyond the immediate rounds that follow that experience. OW compared the impact of costless vs. costly communication in a CPR setting and found similar results than IW. All groups participating in the costly communication experiments in OW managed to provide communication opportunities.

Previous studies show that whether contributions to a provision point VCM are continuous or discrete can make a difference on the capacity of subjects to reach the minimum threshold. Cadsby and Maynes (1999), for example, find that allowing continuous contributions facilitate both contributions and provision "because it gives the group a cooperative outcome which is symmetric in pure strategies on which to focus" (69). More generally, however, public good experiments with provision point and continuous contributions features result in suboptimal provision of the good (Isaac et al. 1989, Asch et al. 1993, Bougherara et al. 2011, Cadsby and Maynes 1999). Some of these studies support that when a continuous contributions feature is in place, participants face two sources of uncertainty; they must decide not only whether to contribute to the provision of the good or not (resulting in the assurance problem discussed above), but also how much to contribute so the good is not under or overprovided (Ash et al. 1993, Isaac et al. 1989). Any or both sources of uncertainty would be causes of suboptimal provision of the good (Isaac et al. 1989). Whether some of the above findings also apply in a CPR game where communication is modeled as a public good is an open question. We address this question by exploring the implications of the continuous contributions feature in a provision point VCM in one of our communication treatments.

Further, previous literature has addressed the implications of enabling communication among sets of participants within a group as opposed to among all members of the group. Schmitt et al. (2000) tested and compared three communication treatments in a CPR dilemma where only some participants were invited to communicate with one another. According to their results, the effectiveness of communication in preventing rent seeking can decrease when a subset of appropriators is excluded from communication, and when there is high uncertainly about the behavior of the excluded appropriators. Similarly, Kinukawa et al. (2000) allowed communication only among subgroups of participants. Their results show that whenever participants are allowed to communicate with two other subjects at a time in a way that all participants are connected either directly or indirectly, cooperation can increase. However, whenever the connection among all participants is not guaranteed, cooperation can decrease. In our second communication treatment, we address the effect of having a subgroup of members communicating, by modeling the provision of communication as a private good.

[1] IW and OW also examined the conversations of participants and found that in some groups where participants agreed upon a cooperative mechanism for the provision of the first social dilemma, participants also agreed on not having further meetings.

3. MODEL

The CPR model we use for this research is based in Osés-Eraso and Viladrich-Grau (2007). We model the strategic decisions of a group of n watershed users who can extract water from a watershed of total size K_0 (in experimental currency units). Each one of the n individuals, i, has an equal endowment e that can be invested in the extraction of the CPR, or invested in a safe outside activity with marginal payoff α. Every unit invested in the extraction, x_i, where $x_i \in (1, e)$, yields w units for the agent, but reduces the CPR by c units, while every point placed in the safe option yields α units for the agent, leaving the common-pool resource unchanged.

$$K_f(X) = K_0 - cX \qquad (1)$$

where c>1, X is the aggregate group units invested in the extraction, $X = \quad x_i$, and K_f is the remaining units of the resource at the end of a round after extraction decisions by all agents have taken place. At the end of each round all remaining K_f units are evenly distributed among all n players. Therefore, payoffs for each player π_i depend on the vector of individual appropriators' investments in the resource$\boldsymbol{x} = \quad x_1, \ldots, x_n$.

$$\pi_i(\boldsymbol{x}) = wx_i + \alpha \;\; e - x_i \;\; + \frac{K_f}{n}, \text{ if } X>X^*, \text{ where } w>0 \text{ and } \alpha>0 \qquad (2)$$

In order to describe a social dilemma for the extraction decision of the CPR we assume $w - c \;\; < \alpha < (w - \frac{c}{n})$. Investment in the CPR, the watershed, is more efficient from the individual perspective, since marginal net benefit from extraction is higher than investment in the safe option (see figure 1). This is $w - \frac{c}{n} \;\; > \alpha$. At the same time, at the aggregate level investment in the safe option entails higher net benefits than investment in the common pool resource. This is α>(w-c), and thus it is more efficient from the social perspective. In this game, the dominant individual strategy is full appropriation, $x_i = e$, while social efficiency requires a minimum level of resource extraction $x_i = 0$. Note that the level of the natural resource K_0 does not influence the incentive structure of agents. Both the Nash equilibrium and the social optimum are independent on the abundance or scarcity of the resource, allowing us to interpret subjects' bahavior as a response to changes in the availability of resources.

We include a total of six treatments, as presented in Table 1. Each treatment consists of 30 rounds divided in three stages (ten rounds per stage), along which we combine two sequences of changes in the size of the CPR and two communication treatments. In the first stage of the experiments all groups participated in a baseline with a high size of the resource (H) and no communication; and in the second and third stages of the experiment we introduce changes in the size of the resource (medium and low resource levels) as well as the opportunity to communicate by means of different provision mechanisms. For all the treatments the Nash equilibrium and social optimum is respectively 20 and 0 individual extraction units. The different levels of the CPR do not affect these equilibria, nor does the existence of communication, which is considered "cheap talk" according to economic theory.

a. Communication Treatments

In the first of our communication treatments, the provision point treatment (heretofore PP), we use a version of IW and OW's communication experiments. We still model the provision of communication as a provision point VCM but we allow continuous individual contributions instead of discrete contributions. Thus, at the beginning of each round, individuals decide if they want to contribute to the communication fund and if they do so, by which amount. If the sum of contributions reaches (or surpasses) the provision point, all group members can communicate, including those individuals who had not contributed to the communication fund. If the provision point is not reached, contributions are not refunded. In this treatment, it is possible for one person to solely contribute the amount necessary to reach the provision point.

In our second treatment, the private communication treatment [2] (heretofore PC), communication is modeled as if provided in a decentralized way through a series of exclusive meetings[3]. At each round, participants decide whether or not to contribute to the provision of communication by paying a fix individual fee. Then, communication is allowed in each round just for those individuals who had paid the fee.

In the PC treatment we set the fix fee that each player invests on communication (V_i) equal to a 50% of the difference between an individual's payoff when all group members play the social optimum and the Nash equilibrium[4]. We defined the cost of individual payments to be high enough to make the provision a non-trivial problem but yet not to make provision so costly that provision would never take place. A 50% of that difference resulted in $V_i = 20$. For the PP treatment we set the threshold (T), where $T = V_i*5 = 20*5 = 100$. That will be the exact same cost of the whole group participating in the PC treatment will need to face if the 5 members decided to pay.

Following the above mentioned works on provision point VCM experiments with continuous contributions, we expect that individuals in our PP treatment manage to communicate a limited number of times. In turn, and following existing communication literature, we expect that the occurrence of communication has a positive impact on cooperation.

In the PC treatments we also expect communication to emerge relatively frequently, as communication can be provided in this treatment when a minimum of two participants pay for it.

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2 It is questionable whether the provision of communication without a provision point is still a public good or a club good. Like public goods, club goods enjoy non-rivalry; contrary to public goods, however, club goods are excludable (Ostrom et al. 1994). When communication is provided without a provision point, the cost of communication would be proportional to the amount of participants and only those who contribute would be able to communicate. Depending on whether we consider communication as just the fact of exchanging information or also the eventual development of cooperative agreements vis-à-vis a first-order dilemma, we might consider communication as a club good or a public good, respectively.

3 To the best of our knowledge, there are examples of real situations where communication is provided in a decentralized and unorganized way. Direct users of irrigation systems, fisheries or forests, meet with each other on an informal and ad hoc basis in public spaces. In these situations, communication happens exclusively among those who meet, and there is no organization that coordinates the meetings or disseminates the information generated at each meeting.

4 The difference between an individual's payoff at the group optimum and at the single-period Nash equilibrium was \$0.39 in Ostrom and Walker (1991). These authors used V_i = \$0.20, which was approximately 50%.

By the same token, however, we do not expect cooperation resulting from PP communication treatments to be significantly higher than in a situation with no communication. As shown by previous studies (Schmitt et al. 2000, Kinukawa et al. 2000) we expect that the eventual occurrence of communication just among subgroups of participants as opposed to among all members in a group goes against the effectiveness of communication.

b. Scarcity Treatments

During the experiment three levels of the CPR are evaluated: a high level (H), a medium level (M) and a low level (L) that appear at different stages (10 rounds) of the game. Subjects participated in one of the following scarcity treatments: HMH and HML, where each letter refers to the level of the CPR for each stage of the game. Notice that all treatments start with a high level of the CPR in stage 1, it decreases in stage 2 for treatments HMH and HML. For treatment HML it decreases again in stage 3 and it increases for HMH.

We set the level of the CPR available in the low level $K_{0,L}$= 300, so that when all players in a group extract their whole endowment, there is no resource left to be distributed among players ($K_f(100) = 0$). This is aimed to avoid negative units of the resource to be distributed among players at the end of a round, which would be counter intuitive for users of water resources such as those participating in the experiments. The initial state of the natural resource in the medium and high levels are arbitrarily defined as 30% higher than the immediately smaller level; $K_{0,M}$=450, and $K_{0,H}$=675.

4. EXPERIMENTAL DESIGN

The experiments were conducted with a total of 30 groups, evenly divided among six treatments (5 groups per treatment). All the sections were done in different locations of the Colombian Coello watershed in July 2010.

The recruitment process was done by word of mouth with the help of local leaders and two NGO's working in the area. All the community members older than 18 years old were invited to participate, however we did not allow people from the same household to participate in the same group. The experiments were conducted in paper and pencil.

At the beginning of the experiment, the experimenter read aloud the instructions, at that point any communication among participants was forbidden. The instructions specify that participation was voluntary and that all the information gathered was confidential and only for research purposes. Additionally we explained that the experiment consisted of three stages each one of ten rounds, but details about the different stages were not provided from the beginning. The instructions were clear about the fact that extractions in one round did not affect the water availability in the following round. Any questions were solved in private. Subjects played several practice rounds in order to familiarize with the game. Participants with reading and/or writing difficulties got assistance to write their decisions. Each session lasted about four hours.

After finishing round 10, we read a new set of instructions in all groups. In the PP treatment, we informed subjects that they will have the opportunity communicate as a group for 3 minutes if they individually paid for it and altogether reached 100 "*pesos del juego*". We also informed them that their payments would not be reimbursed if they did not reach the communication threshold. Similarly, we informed subjects in the PC treatment that they will have a chance to communicate with each other if they paid for it and that only those who paid would be able to communicate. Also, we informed subjects that if just one of them paid there would no communication and the money would not be reimbursed to that person.

All the communication interactions were held in an area different than that where the experiment was taking place. Before starting the communication time the experimenter asked the participants for consent to video record the conversations. All participants allowed us to do so. Each one of the participants had a sticker with his player number that was visible to the camera. Once the experimenter had set the camera recording she left and the conversation started. In occasions where only some group members communicated (i.e in the PC treatment), a research assistant stayed with the individuals that did not pay to communicate to avoid any communication among them.

5. RESULTS AND DISCUSSION

Figures 1 to 4 display the sum of individual contributions to the communication fund by group and round, for the stages 2 and 3. Each figure corresponds to a combination of one of the two communication treatments (PP or PC) and one of the two sequences of scarcity (HMH or HML). In general, the sum of contributions was higher in the early rounds of stage 2 and decreased over the rounds. In some groups, contributions notably increased at the beginning of stage 3, particularly in the PP treatment (see group 2 in Figure 1 and groups 4 and 5 in Figure 2). It is not clear, however, whether that increase indicates some general relationship between a change in the level of the resource and the eagerness of individuals to contribute to communication in the PP treatment. In the PC treatments, never more than 4 people paid for communicating at one round (see figures 3 and 4; the sum of contributions is never higher than 80), thus, never more than 4 people communicated. This was not the case in the in the PP treatments as five people paid at least at one round in most of the groups. In most of these occasions the provision point was reached (see in figures 1 and 2 that the sum of contributions hits and surpasses 100 in some rounds); however, the provision point was also reached in rounds where just 4, 3 and 1 subjects paid for communication. Alternatively, the provision point in the PP treatments was not reached in many rounds, including occasions when 4 and 5 subjects had paid.

Figure 5 contains 6 series, each of them representing average individual extraction days in a particular combination of treatments over the 30 rounds of the experiment. At stage 1 (from round 1 to 10), all series represent average individual extraction days in the high level condition. At this stage, the average of extraction days across treatments was approximately 6.10. This is consistent with previous findings in the field (Cardenas 2011, Lopez et al 2010, Cardenas et al. 2000) showing that, in the absence of institutions, individual decisions lay between the Nash Equilibrium and the social optimum. Generally, the lowest extraction average series correspond to the PP communication treatments, followed by the PC treatments and the no communication treatments. This is the case across all stages and particularly under a low resource level at the stage 3.

Table 2 presents a random effects model explaining individual extraction days as a function of the stage of the game, the level of the CPR and the communication treatments (no communication, PP and PC). The variables of this model are interactions of a particular resource level, stage and communication treatment. For example, variable *Mstage2* is a dummy variable taking the value 1 for a medium level of the CPR in stage 2 and with no communication, and zero otherwise. Similarly, *Lstage3_PC* takes the value 1 for individuals who played under a low level of the CPR in stage 3, with the possibility of having private communication. .

Model 2 in Table 2 extends Model 1 by controlling for the number of communication meetings that subjects have attended in the PP and PC treatments respectively. Thus the variables of this model are interactions of a particular resource level, stage, communication treatment, and number of meetings attended. For example, variable *Mstage2_1st PP meeting* is a dummy variable taking a value of 1 for a medium level of the CPR in stage2 when the subject had attended one provision point communication meeting and zero otherwise. Similarly, the variable *Mstage2_3rd and more PCmeeting* takes a value of 1 for a medium level of the CPR in stage 2 when the subject had attended 3 or more private communication meetings.

First, we explore the results for scarcity treatments without communication. According to Model 1 and 2, when subjects face an intermediate decline in the level of the CPR (from 675 in the first stage to 450 in the second stage), they do not significantly change their behavior compared to the first stage (variable *Mstage2* is not significant in Model 1 or 2). In stage 3, however, the results are different. In treatments where subjects face again a high level of the resource, they do not extract significantly different as compared to the first stage, whereas when the level of the CPR further diminishes in stage 3 to the low level (from 450 in the second stage to 300 in the third stage), subjects extract more than in the high condition in the first stage (positive and significant coefficient of variable Lstage3at the 10% level of significance).

According to Model 1, in all treatments where communication was allowed we observe decreases in the extraction levels as compared to the first stage, where communication was not allowed. However, the two communication treatments generate different results. Extraction levels in the PP treatments are significantly lower (1%) with respect to the first stage of the experiment across all stages and resource levels (see variables *Mstage2_PP*, *Hstage3_PP* and *Lstage3_PP*). This is not the case with regard to the PC treatments. Extraction levels in the PC treatment are also lower with respect to extraction levels at the first stage (see Mstage2_PC); however, extraction levels at stage 3 are not (see *Hstage3_PC* and *Lstage3_PC*), indicating that the negative impact of communication on extraction levels in the PC treatment disappears over time.[5]

Model 2 attempts to control the findings in Model 1 for the number of communication meetings that subjects have experienced in the PP and PC treatments respectively. The results

[5] In a similar model, we controlled for the impact of time (i.e. number of rounds played), and found it significant. In that model, all the coefficients of the PC treatment were significant across all stages and levels.

confirm and also qualify the findings from Model 1. The PP treatment can result in significant reductions in individual extractions as compared to the baseline (first stage of the experiment), and can do it from the occurrence of a first communication meeting across most of the resource level scenarios. Only when subjects have experienced a medium to high increase in the level of the resource, a first communication meeting is not enough to improve cooperation (coefficient of *Hstage3_1st PP meeting* is not significant). The PC treatment seems to be much less effective than the PP treatment in promoting cooperation. The experience of a first communication meeting does not affect cooperative behavior in any resource level scenario, and the experience of a second meeting is only effective before subjects experience a change in the level of the resource, at the stage 2 (see negative and significant coefficient of *Mstage2_2nd PC*)[6].

Model 2 does not control for the number of subjects who communicate. In the PP treatment, it is always 5, but in the PC treatment it varied. The differences found between the two communication treatments could be partially explained by this.

6. CONCLUSIONS

The impact of communication on cooperation depends on the way costly communication is provided. When communication is provided as a provision point public good with the impact of communication on extraction levels is more effective and robust than when communication is provided as a private good. Extraction levels in the PP treatment decrease regardless of resource levels and stages. This is not the case in the PC treatment, as extractions only decrease at the second stage of the experiment. Additionally, experiencing a first meeting under the PP treatment results in cooperative behavior in most of the resource level scenarios, which is not the case when the meeting occurs under the PC treatment.

These findings can be understood with regard to the different capacity of the two communication treatments to articulate communication among all participants in each group. Although the number of communication instances in the PC treatment was higher than in the PP treatment, communication in the PC treatment emerged only among small subsets of participants, i.e. rarely among four participants and never among all members of a group. This may explain the reduced effectiveness of the PC treatment, as previous experimental studies support (Schmitt et al. 2000 and Kinukawa et al. 2000).

[6] In a similar model, we controlled for the impact of time (i.e. number of rounds played), and found it significant. In that model, the coefficients of the first and second meetings in the PC treatment were significant across all levels.

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FIGURES AND TABLES

Figure 1.

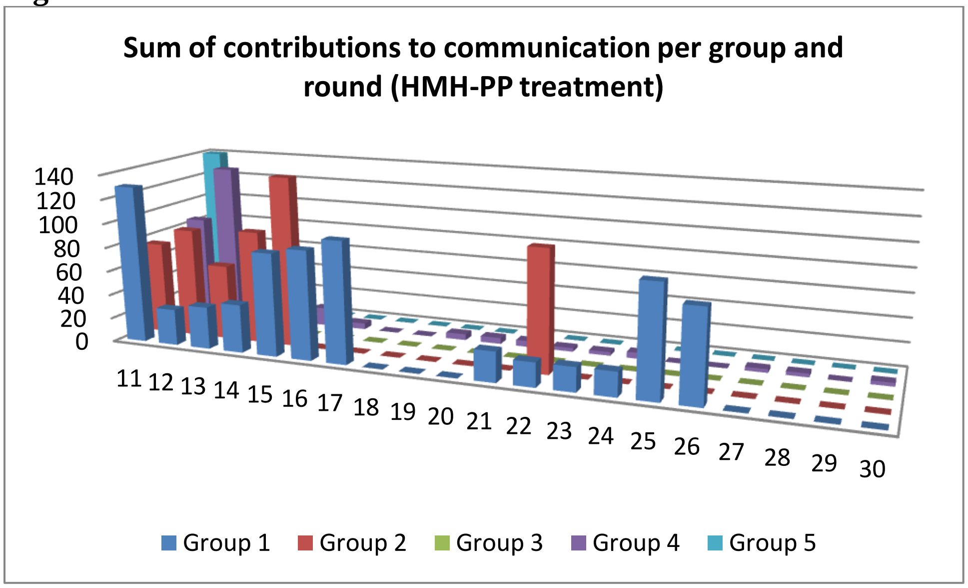

Figure 2.

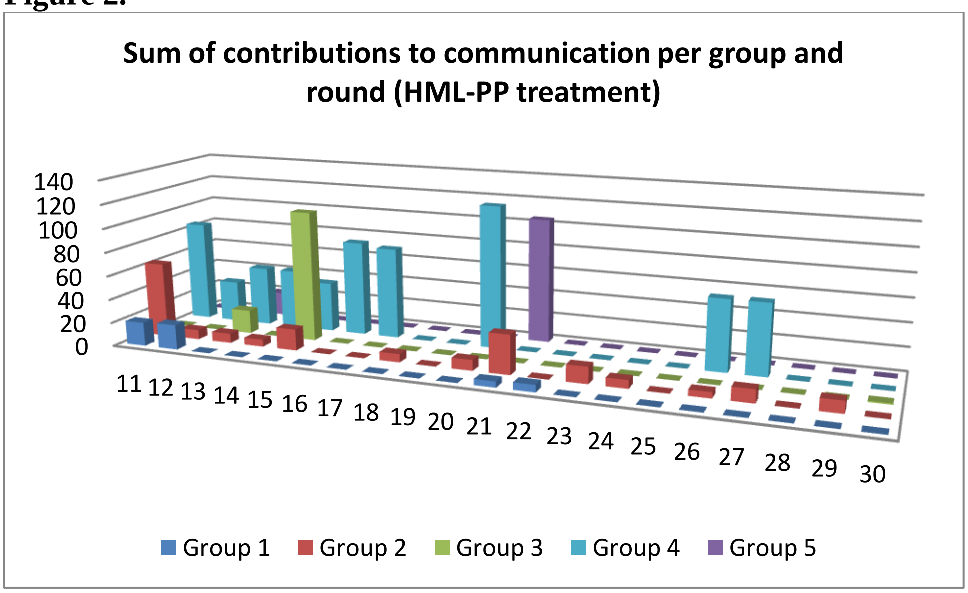

Figure 3.

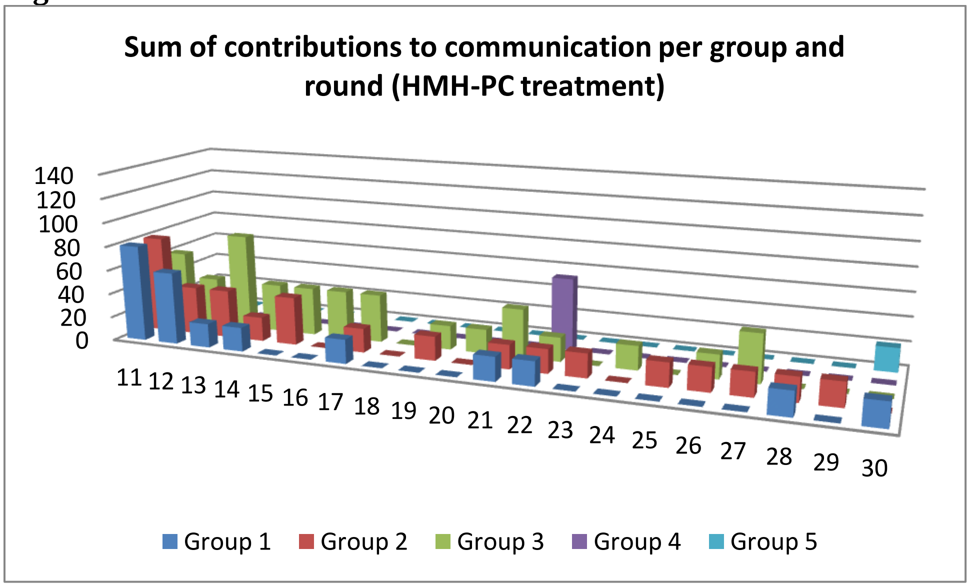

Figure 4.

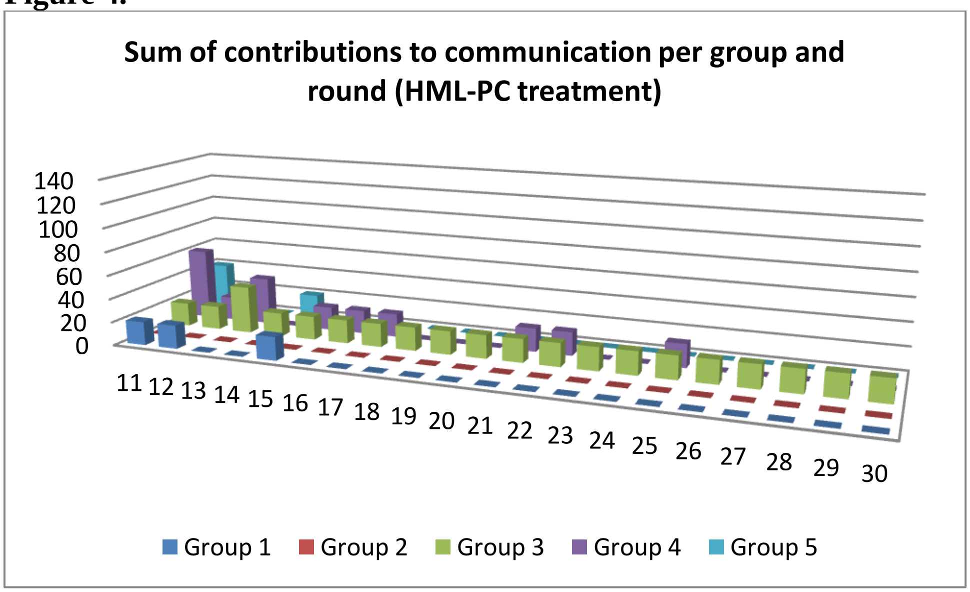

Figure 5

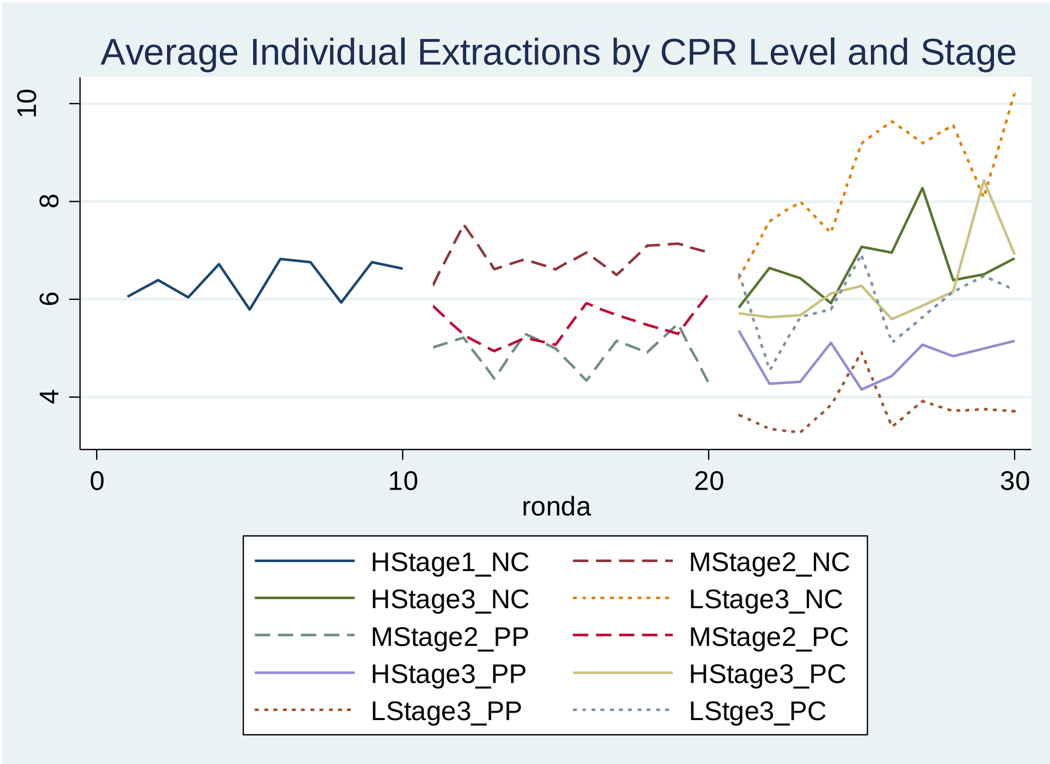

Table 1. Number of groups and participants in each combination of Communication and Scarcity Treatments.

		Scarcity Treatments		TOTAL
		HMH	HML	
Communication Treatments	No communication (baseline)	5 groups 25 subjects	5 groups 25 subjects	50
	Provision Point	5 groups 25 subjects	5 groups 25 subjects	50
	Private Contribution	5 groups 25 subjects	5 groups 25 subjects	50
TOTAL		75	75	150

HMH= High resource level in stage 1, Medium resource level in stage 2, and High resource level in stage 3

HML= High resource level in stage 1, Medium resource level in stage 2, and Low resource level in stage 3

Table 2. **Random effects model explaining individual extractions.**

Independent Variables	**Model 1**	**Model 2**
Mstage2	-0.235 (0.244)	-0.229 (0.241)
Mstage2_PP	-0.828*** (0.244)	
Mstage2_1st PP meeting		-1.96*** (0.354)
Mstage2_2nd PP meeting		-3.7*** (0.955)
Mstage2_PC	-0.860*** (0.244)	
Mstage2_1st PC meeting		-0.562 (0.426)
Mstage2_2nd PC meeting		-1.39* (0.505)
Mstage2_3rd and more PC meeting		-1.16
Hstage3	0.486 (0.323)	0.490 (0.32)
Hstage3_PP	-0.844*** (0.323)	
Hstage3_1st PP meeting		-0.117 (0.482)
Hstage3_2nd PP meeting		-3.92*** (0.501)
Hstage3_PC	-0.173 (0.323)	
Hstage3_1st PC meeting		0.266 (0.547)
Hstage3_2nd PC meeting		-1.4 (0.923)
Hstage3_3rd and more PC meeting		-0.13 (0.724)
Lstage3	0.552* (0.323)	0.559* (0.320)
Lstage3_PP	-2.109*** (0.323)	
Lstage3_1st PP meeting		-2.84*** (0.387)
Lstage3_PC	-0.375 (0.323)	
Lstage3_1st PC meeting		-0.809 (0.531)
Constant	6.394*** (0.346)	6.365*** (0.334)
Observations	4500	4500
Number of individuals	150	150