CGS WORKING PAPER

Time for Helping

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This study investigates whether individuals engage in prosocial behavior when it requires their time but not money. In a lab experiment with rigorous anonymity arrangements, subjects receive their payoff beforehand and can engage in a tedious task to increase the earnings of a passive recipient. We find that individuals work for a significant amount of time.

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1 Introduction

A popular example for experimental evidence on prosocial behavior is giving in dictator games (Forsythe et al. 1994). A dictator receives a monetary endowment of E whereas his counterpart, known as the recipient, gets no initial endowment. The dictator can give away any amount of money $X \in [0, E]$ to the recipient. The typical finding in dictator games is that less than 20 percent of dictators keep everything and those who give transfer, on average, 20 percent of their endowments to a recipient (Camerer 2003: 57). In general, this negates the neoclassical assumption of a selfish Homo economicus. However, when the experimental environment is double-blind ("no one including the experimenter or any subsequent observer of the data could possibly know any subject's decision", Hoffmann 1996: 653) and, therefore, highly anonymous, more than 50 percent of dictators give nothing.

The numerous studies on altruistic behavior focus mainly on monetary giving. However, many real life situations involve other resources, such as time or effort – for example, helping a colleague to solve a problem, assisting an elderly person to cross a street, volunteering for social events with disabled individuals, spending time in a hospital with a sick person. Thus, it is of a great importance to study the willingness to dedicate time for the benefit of another person.

We use a simple experimental setting to investigate the action of giving by making it more arduous and time costly. Subjects in the role of senders received their payoff of €10 at the very beginning of the experiment. They can then perform a task in order to generate money for their recipient. The simplicity of the task leads to homogeneous costs of effort among senders. Additionally, we use a procedure that provides strict anonymity, ruling out concerns such as self-esteem and self-signaling (Bénabou and Tirole 2006, Falk and Ichino 2006). Importantly, senders can leave the laboratory at

any time without being seen by the experimenter. We further use the Becker-DeGroot-Marschak (BDM) mechanism to control for the subjects' opportunity costs of time (Becker 1964).

We observe a high proportion of prosocial time spending in the treatment with a recipient. In the control treatment, where no recipient was involved, the majority of subjects immediately left the lab.

Few other studies, for example, Carpenter and Myers (2010), Linardi and McConell (2011), Capellari et al. (2011), Ellingsen and Johannesson (2011) look at decision contexts where time is at stake. Elllingsen and Johannesson (2009) show that in an ultimatum game subjects accept a loss of time more readily than a loss of money. In dictator and ultimatum games by Noussair and Stoop (2012), proposers could decide how to distribute the necessary waiting time before receiving their earnings between themselves and receivers. The proposers are willing to take over between 30 and 40 percent of waiting time for the recipients. To our best knowledge, no other experimental studies have so far looked at a context where time sacrifices instead of monetary gifts must be made in order to help a disadvantaged party to increase its payoff.

2 Experimental Procedure and Design

The experiment was fully computerized using the software z-Tree (Fischbacher 2007) in the Cologne Laboratory of Economic Research (CLER). In total, 64 subjects participated in the main treatment and 26 in the control treatment (66 percent females, mean age is 23.5). All subjects were recruited at the University of Cologne using the online recruiting system ORSEE (Greiner 2004). The subjects had not taken part in any bargaining experiments before. The invitation for the experiment stated that the

subjects should schedule between 15 minutes and 2 hours and 15 minutes for the experiment.

Furthermore, we invited groups of 8 participants in 15-minute phases to make sure that new subjects constantly entered and exited the laboratory.[1] This number of subjects was sufficiently large to ensure anonymity and prevent participants from registering how long other individuals stayed in the laboratory.[2] The phased-entry procedure minimized peer and social status effects as discussed, for instance, by Bénabou and Tirole (2006), Falk and Ichino (2006).

Upon entering the lab, the subjects were seated in a separated cubicle. They were randomly assigned either to the role of the sender or the recipient. Senders found an envelope with €10 under their keyboard. The instructions on the computer screen explicitly told the senders to take (and keep) the money. Each sender was matched with one anonymous recipient, who received only a mandatory minimum show-up fee of €2.50 and had no further initial earnings from the experiment. For the show-up fee, the recipients had to stay in the laboratory for 15 minutes longer than their corresponding sender. Consequently, they left the lab separately.

The sender could contribute to the payoff of her recipient by staying in the laboratory and entering the number "1122334455" each and every 15 seconds. For each number entered, €0.05 was credited to the recipient's account.[3] The task was designed in such a way that any enjoyment from performing the task can be ruled out. Additionally, the participants had to be attentive. Furthermore, no special ability was required for typing the same 10 digit number, and, hence, learning-effects can be neglected. The

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[1] Subjects who arrived early did not wait in front of the laboratory, but rather could proceed to their individual cubicles inside the laboratory.

[2] A similar innovative procedure was used by Abeler et al. (2011) using different rooms for an experiment. In their study, participants were always alone in a room to work on a real effort task.

[3] This task is similar to Ariely et al. (2009), who study the impact of public information on donations to a charity. Subjects clicked X and Z on their keyboards for up to 5 minutes as often as they wanted. However, in our study, the next task appears only every 15 seconds.

presented task therefore led to homogeneous effort costs among senders. The only possible heterogeneity was due to different opportunity costs of time.

Importantly, while senders had to actively participate in the experiment, recipients were permitted to use the Internet for private purpose. Senders were informed about this detail in order to mitigate the possible argument that the time that the recipient is required to stay in the lab was too unbearable and not worth the earnings generated by the sender.

Senders could end the experiment any time. At the end they were asked to answer a short questionnaire about their reservation wage and the experiment before they could leave the laboratory. The questionnaire contained the Becker-DeGroot-Marschak mechanism (BDM) for the reservation wage elicitation (Becker 1964). Subjects had to state their minimum wage for working on the experimental task for 60 minutes. They were told that a random number would be drawn.[4] From all subjects who stated their minimum wage below this number, one subject would be randomly selected and invited to the laboratory to perform the task for 60 minutes. The pay for this task performance would be the indicated payoff.[5]

The exit of the laboratory was arranged through a different door that was not visible to an experimenter, who was seated at the registration desk. During the whole experiment, there was no experimenter permanently present in the lab. A second experimenter only had to enter the lab from time to time to privately instruct particular *recipients* (whose sender had finished the experiment) to proceed with the questionnaire and to deliver their payoffs.

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[4] The upper boundary of this random number was reported as the realistic maximum of a minimum wage.
[5] Text and its explanation were based on Ellingsen and Johannesson (2009). For a better understanding, an example was provided.

To control for a possible experimental demand effect, we conduct a control treatment with no benefitting party. All other parameters stayed the same, but senders worked on the task knowing that no one would be influenced by their work on the task.

3 Manipulation Check

In the post-experimental questionnaire, subjects evaluated different statements on a 7-point Likert scale. We apply a two-sided Wilcoxon signed rank test to test whether the mean answer is significantly different from the neutral response of 4. The data shows that the experimental design worked as desired. Subjects report low enjoyment in performing the task and low shame to leave the experiment early. Subjects also did not work on the task because they had nothing else to do (all p-values < 0.01).[6]

4 Results

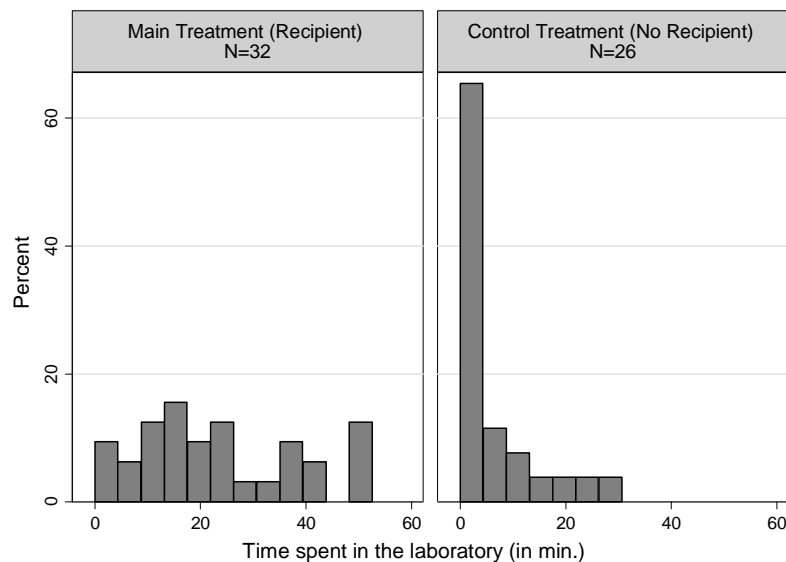Figure 1 shows the distribution of time spent in the laboratory.

Figure 1 – Distribution of time spent in the laboratory by senders
Note: The number of independent observations is equal to 32 in the main treatment and 26 in the control treatment.

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[6] There is no between-treatment difference in the questionnaire responses.

Result 1: When there is a recipient involved, senders work for a significant amount of time.

In the main treatment, the senders earned an average of €4.71 (*med* = 3.78, *sd* = 3.07) for the recipients. Considering that at least 15 seconds were necessary to send €0.05 to the recipient, this corresponds to an average working time of at least 23.56 minutes (*med* = 18.88, *sd* = 15.34).

Discounting the spent time with the true reservation wage obtained from the BDM mechanism leads to an average of €4.81 (*med* = 4.21, *sd* = 3.40) This is not significantly different from the payoffs actually earned for the recipients (two-sided Wilcoxon signed-rank test, $z = -0.234$, $p = 0.815$)[7]

Result 2: The working time is significantly reduced when there is no recipient.

Whereas in the main treatment only 9.38 percent of individuals generate less than €1, in the control treatment, when no recipient is involved, this number amounts to 65.38 percent (two-tailed Fisher's exact test, $p < 0.001$).

On average senders stayed at least 6.24 minutes (*med* = 3.25, *sd* = 8.08), which is equivalent to €1.25 (*med* = 0.65, *sd* = 1.62) The difference between the two treatments in the time spent in the lab is highly significant (two-sided Mann-Whitney U test, $z = 4.435$, $p < 0.001$). This result indicates that the senders' decisions about how much time they are willing to spend in the laboratory significantly depend on the existence of a recipient who benefits from their effort. Thus, the effort provision is not purely driven by the experimental demand effect.

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[7] The reservation wage is not different between the main and control treatments (two-sided Mann-Whitney U test, $z = -1.371$, $p = 0.171$).

5 Discussion and Conclusion

This study addresses the question of whether individuals will spend time in order to help to increase earnings of a passive recipient. The senders' payoff remains unchanged and is paid beforehand. The task is tedious and time consuming. The strict anonymity arrangements, freedom to leave the lab at any time, and homogeneous effort costs are important features of our experiment. Furthermore, this design and procedure rule out concerns about social status and peer effects, leaving no opportunity for signaling one's generosity.

We find that senders generate a significant amount of money for recipients and thereby spent a non-negligible amount of time in the lab. Unlike the findings of Hoffman (1996), rigorous anonymity conditions do not provoke egoistic, self-regarding behavior. Importantly, generosity depends significantly on the existence of the benefiting party.

While sharing monetary resources is already a part of the conventional wisdom, we provide clean evidence that prosocial behavior is also present when it requires time expenditure.

6 Acknowledgments

7 References

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8 Appendix with Experimental Instructions

1 Invitation Email (Translated from German)

Hello (name),

I would like to invite you to a new experiment.

The following dates are available:

(dates)

Please note that the duration of the experiment depends on your decision and on the decisions of the other participants. Thus, the duration of the experiment can be between 15 minutes and 2 hours 15 minutes.

2 Instructions for Senders in the Main Treatment (Translated from German)

(Instructions were provided on the computer screen)

Welcome

Welcome, and thank you for participating in today's experiment.

Please make sure that you are in the correct cabin!

You will receive the instructions in a moment. These instructions will explain the decision-making situations to you. Please read them carefully. If you have any questions, please don't hesitate to signal this by clicking on the help button located on the left edge of the screen. We will be glad to help you.

Endowment

At the beginning of the experiment you receive an endowment of €10.

We ask you to please take the endowment and sign the receipt before you make any decisions.

Your endowment and the receipt are located in an envelope under your keyboard. Please fill in the receipt with your name and your signature. Afterwards, please take the money, put the receipt back in the envelope, and - at the end of the experiment - put this envelope in a box near the exit. This box is labeled with "receipts".

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Complete anonymity is guaranteed. This means that it won't be possible for the experimenter to create any link between your name and your decisions after the experiment. Moreover, other participants won't learn your identity.

Please click on the button "filled in" to go on.

Information

Please read the following instructions carefully. They will explain what decisions you need to make in the course of the experiment. If you have any questions, please don't hesitate to signal this by clicking on the help button located on the left edge of the screen. We will be glad to help you as soon as possible.

Any form of communication during the experiment is prohibited. This applies to verbal as well as electronic communication. Please turn off your mobile phone and any other electronic devices and don't use the Internet. Non-compliance will lead to exclusion from this and further experiments.

Furthermore, you are not allowed to do anything else (e.g. reading a book) except what is stated in the instructions. Non-compliance will lead to exclusion from this and further experiments as well.

Please pay continuous attention to the computer screen.

Experiment

There are 2 different types of participants - participant A and participant B. The cabin number randomly determines the type assigned to a participant. You are participant A.

All participants are divided into groups of 2. Each participant A is randomly assigned to one participant B. Unlike you, participant B will get her payout at the end of the experiment in cash.

The amount depends on your decision.

All group assignments, payouts, and decisions are anonymous in this experiment.

This means that no participant will ever learn the identity of the others. Similarly, it is not possible for the experimenter to match your decision with your identity.

Furthermore, the participants were invited at different times. This can result in disturbances during the experiment (e.g., people who arrive or leave the experiment). Don't let this disturb you.

Decision

You have already received your endowment of €10. The €2.50 show-up fee is included in this €10. You definitely keep your endowment, i.e., you don't need to pay anything back.

Participant B of your group of two has not received any payment at the beginning of the experiment. Participant B will only receive the €2.50 show-up fee at the end of the experiment.

You now have the possibility to increase the payment to participant B. Therefore, a window will appear on your computer screen to type the combination "1122334455" and confirm with "OK". 15 seconds after you have successfully typed the combination and confirmed with "OK" the same window will appear again. For every

time you successfully type the combination and confirmed with "OK", participant B will receive 5 Eurocent. Participant B of your group will get the amount of money acquired at the end of the experiment in cash. You can work on this task a maximum of two hours.

You can end the experiment at any point by clicking the button "Exit". We then ask you kindly to fill in a short questionnaire, and hereafter you can leave the laboratory. Please note that the entrance is not the exit. The exit is at the other end of the lab. You maintain your anonymity while you are leaving. Outside of the lab a privacy shield between the entrance and the exit will give you further anonymity.

You will receive different types of information while you are working on the task. On the top left you will see an approximate (!) minutes display, and on the top right you will see an exact seconds display. Below the seconds display you will see the amount of money already acquired for participant B.

Participant B has no possibility to increase her payment. Due to her show-up fee of €2.50 she is obligated to stay in the lab as long as you do plus an additional 15 minutes. Participant B is allowed to use the Internet while you are working. During the last 15 minutes of her time (the time after you have left the lab), it is prohibited that participant B uses the Internet.

Payment

The payment of todays experiment is as follows:

Your payment: €10

Payment of participant B of your group: €2.50 + €0.05*Amount of windows you have confirmed with the required combination and "OK"

In the following you will receive some questions to test your understanding and a test screen. Afterwards, the experiment will start.

3 Instructions for Recipients in the Main Treatment (Translated from German)

(Instructions were provided on the computer screen)

Welcome

Welcome, and thank you for participating in today's experiment.

Please make sure that you are in the correct cabin!

You will receive the instructions in a moment. These instructions will explain the decision-making situations to you. Please read them carefully. If you have any questions, please don't hesitate to signal this by clicking on the help button located on the left edge of the screen. We will be glad to help you.

Information

Please read the following instructions carefully. They will explain what decisions you need to make in the course of the experiment. If you have any questions, please don't hesitate to signal this by clicking on the help button located on the left edge of the screen. We will be glad to help you as soon as possible.

Any form of communication during the experiment is prohibited. This applies to verbal as well as electronic communication. Please turn off your mobile phone and

any other electronic devices and don't use the Internet. Non-compliance will lead to exclusion from this and further experiments.

Experiment

There are 2 different types of participants - participant A and participant B. The cabin number randomly determines the type assigned to a participant. You are participant B.

All participants are divided into groups of 2. Each participant A is randomly assigned to one participant B. Participant B will get her payout at the end of the experiment in cash.

All group assignments, payouts, and decisions are anonymous in this experiment.

This means that no participant will ever learn the identity of the others. Similarly, it is not possible for the experimenter to match your decision with your identity.

Furthermore, the participants were invited at different times. This can result in disturbances during the experiment (e.g., people who arrive or leave the experiment). Don't let this disturb you.

Instructions

Participant A has already received an initial amount of 10€ at the beginning. The €2.50 show-up fee is included in this €10. You also receive an amount of €2.50 for participation at the end of the experiment. However, you will not receive any additional money at the beginning and you need to stay in the laboratory as long as participant A plus 15 min.

In the process of the experiment participant A has an opportunity to increase your payment. Therefore, he has to type the following combination of numbers "1122334455" and confirm such with "OK". Each time, the participant confirms the right combination with "OK", you will receive 5 Eurocents. The participant A can freely choose the time he will spend for taking part in the experiment and following the task. He can stay up to 2 hours. Meanwhile you have to stay in the laboratory. After participant A has finished the experiment and left the laboratory, you will have to stay another 15 min. You will get a notice as soon as you can leave the laboratory. During the experiment you are allowed to use the Internet. More information in the following!

During the last 15 minutes which you need to stay longer as participant A, you are forbidden to use the Internet. In case of disregard you will be dismissed from the experiment. When leaving the laboratory, please note that the entrance is not the exit. The exit is at the other end of the lab. You maintain your anonymity while you are leaving. Outside of the lab a privacy shield between the entrance and the exit will give you further anonymity.

4 Instructions for the BDM Mechanism (Translated from German)

(Instructions were provided on the computer screen)

What is the lowest amount of money (in €) for which you would be willing to work 60 minutes on the task from the main part of the experiment?

Please note that your decision is binding.

In the following, a random number X will be drawn. This random number lies between zero and the realistic maximum amount of money that someone would demand for completing this task.

One participant will be selected from all participants of your type (A or B) whose stated wage is below the randomly drawn number. This participant must come back on a date of her choice in order to complete the task. In return, she will receive her stated amount of money.

An Example for the presented mechanism:

Mr. Popeye's stocks of spinach are empty and therefore he wants to pick weeds in the upcoming week for 6 hours in his parents' front yard. His parents suggest the mechanism explained above and estimate that Mr. Popeye would at the most demand 90 cans of spinach for his work. Hence, they draw a random number between 0 and 90. To increase the chance of working for his parents, Mr. Popeye needs to think about his lowest amount of cans for which he would work.

He says that he wants to have 30 cans of spinach. His parents draw a 60. Thus, Mr. Popeye can choose one day to work in his parents' front yard.

5 Instructions for Senders in the Control Treatment (Translated from German)

(Instructions were provided on the computer screen)
Only the parts which are different from the above are shown

Experiment

All group assignments, payouts and decisions are anonymous in this experiment. This means that no participant will ever learn the identity of the others. Similarly, it is not possible for the experimenter to match your decision with your identity. Furthermore, the participants were invited at different times. This can result in disturbances during the experiment (e.g., people who arrive or leave the experiment). Don't let this disturb you.

Decision

You have already received your endowment of €10. The €2.50 show up fee is included in this €10. You definitely keep you endowment, i.e., you don't need to pay anything back.

You now have the possibility to type the combination "1122334455" into an appearing window and confirm with "OK". Always 15 seconds after you have successfully typed in the combination and confirmed with "OK" the same window will appear again. Typing in the required number and confirming with "OK" has no influence on your payout or the payout of any other participant. You can work on this task a maximum of two hours.

You can end the experiment at any stage by clicking the button "Stop". We then kindly ask you to fill in a short questionnaire and hereafter you can leave the laboratory. Please note that the entrance is not the exit. The exit is at the other end of the lab. You maintain you anonymity while you are leaving. Outside of the lab a privacy shield between the entrance and exit will give you further anonymity.

You receive different types of information while you are working on the task. On the top left you see an approximate (!) minutes display, and on the top right you see an exact seconds display. Below the seconds display you can see the windows already confirmed.