House Money Effects on Charitable Giving: An Experiment

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Abstract

Numerous papers have documented that subjects in VCM and dictator games behave differently (usually more generously) with laboratory money than with money they have "earned" in the lab or brought to the lab in cash. Using a charitable giving experiment during which subjects could donate to up to three different real world charities , we decompose these "house money" effects into into two components: the "tangibility" of cash in hand relative to money (or ecu's) promised on a computer screen, and the "Lockean desert" of earned money relative to random windfall gains. We find that both effects are important.

1 Introduction

Several papers report that subjects' decisions in public goods or voluntary contribution mechanism (henceforth VCM) and dictator games depend on whether they have earned their endowment (e.g., through their performance in the laboratory) or it has merely been allocated to them (e.g., Cherry et al. 2002, Hoffman and Spitzer [1985], Loomes and Burrows [1994]). This effect is usually interpreted as a result of Lockean desert effects (Rutstrom and Williams [2000])or a different mental accounting over windfall gains (Sheffrin and Thaler [1988], Thaler [1985] and Thaler and Johnson [1990]); we will refer to this as the *earnings effect*. But this literature has largely ignored a second component of the "house money" bias that limits the external validity of laboratory results: people may treat money they are promised (or hold in the form of tokens) differently then cash they have physically held – we call this the *tangibility effect*. For example, Clark [2002] compares contribution rates when subjects are asked to input $8 of their own money to purchase tokens to play a VCM game to the contribution rates when they do not put in their own money. Subjects with the former treatment play with their "own" money they have presumably earned (and hence may feel they deserve) outside the laboratory. And they have also physically given over this money (although they subsequently play with tokens), so the money is somewhat tangible. Still, since they do use tokens, this experiment may not be powerful enough to observe tangibility effects. And insofar as a house money effect is present (as Harrison's [2007] comment asserts), the tangibility and earnings effects are inseparable.

We examine potential house money effects in a charitable giving experiment. We use a 2×2 design to differentiate two components of the house money effect. Firstly, the treatments vary according to the extent to which subjects should see the money as *earned* or *deserved*; we compare compensation based on performance on a five minute task to a randomly allocated payment. The second variation in the treatments involves the tangibility of the payment: we either give cash to the subjects *before* they decide how much to donate (and they physically place any donations they make into envelopes)

or they allocate their donation from an "endowment" on the computer screen and they are paid cash at the end of the experiment. Thus, we separately test whether *earning the money* and having *cash in hand* affect giving behavior in the lab.

We argue that this difference in contributions results because subjects more carefully consider the alternative (own-consumption) uses of money when it is more tangible, and are thus less likely to "purchase" a less tangible good such as the warm-glow that results from giving to charity.[1] [2]

1.1 Literature review

Hoffman and Spitzer [1985, p. 260] propose that experimental subjects behave as if they believe in an earnings-based notion of justice; an unequal income distribution is (un)just when initial entitlements are (randomly assigned) earned. Rutstrom and Williams [2000] have subjects perform a real effort task to try to disentangle the subjects earnings into two components: effort based and productivity based.

Cherry et al. [2002] ran a series of dictator experiment. In the baseline treatment subjects played a standard dictator game, where subjects were asked to allocate a randomly entitled amount of money (either \$10 or \$40) to another subject. Subjects were paid the *resulting* distribution in cash. In their *earnings* treatment endowments were based on performance in a cognitive task (solving GMAT questions). Subjects were entitled \$10 if they solved fewer than 10 questions and \$40 if they solved more. In all three of their treatments - baseline, earnings and earnings double blind - dictator subjects received their money in cash. In the double blind procedure, the dictators became almost entirely *hardnosed*, keeping nearly all of the money.

Oxoby and Spraggon [2008] analyze a similar set up as Cherry et al. [2002]. In addition they introduced a treatment, where the receiver had the possibility to "earn" the money and the dictator knew that and got randomly allocated some cash. They could replicate the results of Cherry et al. in their baseline treatment and additionally found, that when the receiver earned the money, dictators were willing to give up 50% or more of their endowment. This shows the importance of how the dictator perceives her opponent as deserving the money.

In contrast to Cherry et al. and Oxoby and Spraggon, Clark [2002] does not find house money effects in a VCM setting.[3] This is an apparent contradiction: the subjects who bring their own money to Clark's treatment have presumably earned this money at some point, so why should they be less hardnosed then in Cherry et al.? One reason may be that Clark's subjects who bring their own money are *also* allocated *house money*, although only at the end of the experiment. Because of this, they have the same expected earnings as the other subjects (treatment H), and this was announced when recruiting the subjects.Thus, these subjects are just as likely to treat the money they are playing with as a windfall gain. In contrast, Cherry et al.'s dictator subjects in the earnings (E) treatment arrive an hour earlier than the recipient subjects and have to answer 17 questions from the GMAT; hence, they are more likely then Clark's subjects to see their payment as hard-earned. This may also have triggered a fairness norm (Lockean desert): room-A subjects who earned the money by spending an

[1] In contrast to VCM games, in which contributions can be seen as a risky strategic behavior (see Kreps et al., 1982 and Andreoni, 1988) house money effects in our charitable contribution dictator game cannot be attributed to greater risk preference.

[2] Oberholzer-Gee and Eichenberger (1999) make a similar case, arguing that subjects do not fully consider the opportunity costs of the funds they give away in experiments. Also see Mazar, Amir, and Ariely (2007) who find more cheating when dealing with exchangeable tokens then when dealing with cash.

[3] Even considering the comment of Harrison [2007], who reanalysed Clark's data to deal with the potentially non-independent error structure, the effects are not as strong as inCherry et al.

hour answering questions may feel it is unfair that room-B subjects should get some of this without having done any of the work. [4]

Cherry et al.'s baseline treatments offer a greater contrast from their earnings treatments. In the baseline, both recipients and dictators have done the same "work" (i.e. showing up to the experiment), so inequity aversion (with respect to utility, i.e., earnings minus disutility of effort or loss of time) may lead dictators to give some money to their partner. Furthermore, the dictators are told that the money has only been "provisionally allocated" to the pair. This language suggests that the experimenter expects the money to be divided, perhaps equally, to each member of the pair.

Another reasonable explanation for this difference between these two papers' findings is that Cherry et al.'s subjects are using cash, while Clark's subjects use tokens. True, Cherry et al. do report a high rate of giving by the baseline-treatment dictators, and dramatically lower offers (and a lower rate of positive offers) when they introduce earnings and anonymity treatments. But the earnings treatments may be having the significant hardnosing effect because the earnings are in cash and are highly tangible. If the earnings were specified on a computer screen or as tokens, the subjects might not become quite as hardnosed. In other words, there may be an interaction between earnings and tangibility effects.

Our design separately measures the effect of cash versus an abstract allocation (*tangibility*) and the effect of earned versus randomly endowed money (*earnings*). This distinction is important: both of these effects are ubiquitous in laboratory experiments.. Furthermore, because we are using charitable giving (which we argue better reflects other-regarding behavior) rather than the payments to other subjects, we can rule out one type fairness concerns: the desert of charitable recipients should be unaffected by how hard the subject worked. Furthermore, there should be no reference-point difference between our treatments: the time spent in the experiment is nearly identical, so subjects in each of our treatments should have the same earnings expectations.

2 Experimental design

We introduce a 2×2×2 design that differs in the payment regime of subjects' endowments (the first 2x2 component) and in the charities in the decision set (the third treatment dimension).[5] All treatments are assigned orthogonally; we have a fully balanced design. The subjects' donations are sent electronically on behalf of the participants at the end of the experiment.. The payments discussed below are all and everything subjects can earn during the experiment. The sessions were run at the Jena University Experimental Economics lab using the standard subject pool. For ease of implementation, we run each of the four payment regime treatments in a separate session, but the participants come from the same subject pool and the times and dates of the experiment are close together so that selection issues are kept to a minimum. The sessions are otherwise kept as much alike and involve as little experimenter intervention as possible as possible. For this purpose the lab was divided into an outer partition - which serves as a meeting room before the experiment and as a room for the administrators during the

[4] More prosaically, it may have triggered a reference-point effect – subjects who are asked spend a longer time in an experiment will expect to earn more, based on their previous experience in experiments, and will thus give away less, as earning below this reference point leads to a large utility loss.Another possible explanation could be that the recency of earning matters: I might treat money that I earned a minute ago differently from money I got at the beginning of the month.

[5] This latter treatment pertains to our simultaneous work on "expenditure substitution" in charitable giving (for an earlier draft, see Reinstein [2008]); we leave these results out of the present paper.

experiment - and an inner partition with computer terminals on which the subjects make decisions and answer questions. These were separated so that it was impossible to see the inner partition from the from the outer partition and vice-versa. For administrative purposes, a volunteer from the participants helped with the procedures whenever communication between the inner and the outer part of the lab was necessary. Furthermore, to ensure our credibility, this volunteer supervised the online donations made by the experimenters after the other participants had been dismissed.

At the beginning of the experiment all subjects were assured that we will make no attempt to connect their name to their decisions made. Next we asked for a volunteer to help us with administrative issues, mainly allocating the sealed envelopes with payouts at the end of the experiment. None of the subjects were told that it was a charitable giving experiment at this stage.

The task Subjects in some of the treatments (PE and PC, described below) are asked to perform a task, and told that their endowment will depend on their performance. The task is to add up five two-digit numbers[6]; participants are not allowed to use a calculator but may use scratch paper and a pencil, which we provide. The numbers are randomly drawn and presented to the subjects as in the example below:

12	77	34	55	62	__

After they have completed one calculation, they are given a new one, and a record of the number of correctly solved tasks is presented on the screen. The participants are given five minutes to solve as many tasks as possible. We argue that this task is sufficiently annoying to make subjects feel that the money they receive is *earned* when they do the task before the actual entitlement or cash payment. Snapshots of the computer screens of the relevant stages can be found in the appendix.

The charitable giving stage This stage is a one-shot dictator game where subjects can donate none, some, or all of their endowment to charities. Every possible split of the money in units of 50 Euro cents is allowed. This stage involves two (randomly assigned) treatments: subjects are presented either two or three charities. The two charities that were presented to both groups were *Brot für die Welt* (BftW) – "Bread for the World", a German development aid agency and the World Wild Life Fund for Nature (WWF), a nature conservancy charity. The third "treatment" *was Deutsches Rotes Kreuz* (DRK) - the German Red Cross - which operates in similar areas as *BftW*. Subjects were given information about each of the three charities on the computer screen[7] and next had to decide how much (if anything) to donate to each available charity and enter this into the computer[8]. Our use of multiple charities should reduce the noise surrounding different tastes for charities and allow us to get more useful data on subjects who have some preference for at least one of the charities presented.

Treatment 1: Performance / Entitlement (PE) Subjects in treatment 1 complete the task first and are told how much this *earned* them. We did not specify exactly how performance translated into payoffs, but we made clear that the probabilityof higher earnings is increasing in the number of

[6]This task has been used in various occasions for testing competitiveness (e.g., [Niederle and Vesterlund, 2007]).
[7]Screenshots can be found in the appendix.
[8]The order of the presentation of the charities, both on the description screens and on the actual donation screen are stratified over subjects, in order to control (and test) for potential order effects.

tasks correctly completed. After the task, subjects get paid either €5, €7.50 or €10 in cash and *then* make their donation decision.[9] They are paid anonymously at the end of the experiment in envelopes containing their earnings minus their total donations.

Treatment 2: Performance / Cash (PC) As in *PE*, subjects complete the task first and next learn how much their performance earned them. However, unlike in PE, they are paid in cash *before* they make their giving decision. Cash payments are administered with the help of the volunteer. After the task stage, the volunteer is prompted to come out and bring the numbered envelopes containing the money into the inner part of the lab (where all subjects remain seated at their desks), and to hand each subject the envelope with his or her subject number on it. The payment envelopes were carefully assembled so that they all look the same and have similar weights no matter how much money they contained.[10] Subjects are instructed to inspect and count the money in private at their computer desks. This procedure ensures *tangibility:* subjects hold real money in their hand. Next, they make their donation decision(s) by entering these choices on the computer screen. Finally, subjects are asked to put the chosen contributions (in cash) into the donation envelope and seal it.

Treatment 3: Random / Entitlement (RE) In this treatment, subjects are told they have been *allocated* €5, €7.50 or €10 randomly (they are told the amount on their computer screen) but are not given cash at first. The donation stage follows. At the end of the experiment they receive a cash payment equal to the entitled amount minus their total donations.

Treatment 4: Random / Cash (RC) In the RC treatment the volunteer hands the subjects envelopes containing either €5, €7.50 or €10 in cash as in the PC treatment. However, here the amounts allocated are *random* (as in RE). Next, these subjects make donation decisions on the computer screen and, as in the PC treatment, are asked to put their chosen contributions (in cash) into the donation envelopes.

3 Results

We first examine the differences between the amounts donated under each payment regime. Table 1 compares the overall proportion of the endowments donated to any of the two (or three) charities, pooling across charity treatments. Subjects donate significantly less when they are paid in cash then when their entitlement is only shown on the computer screen. In the latter case, subjects donate around 25% of the money. This figure is consistent with results from other dictator and VCM games, where subjects donate around one third of their endowment.[11] In contrast, when subjects are given cash in advance they donate only around 14% of it.

[9] We do not tell them that their pay is based on *relative* performance because we do not want them to compare themselves to other subjects in making their charitable contributions . This might lead them to believe that that subjects who earned more have a greater obligation to donate. In the treatments of October 2008, the first got €10, the second €7.50 and the rest of the subjects in the same session €5. In the sessions conducted in February and March 2009, the participants who were in the upper tercile of solved tasks received €10, in the middle tercile €7.50 and in the lower tercile €5.

[10] We did this by using coins of different increments. To the extent that small coins are less desirable then bills this would lead to a bias *against* or finding of a tangibility effect. Since payments in performance and random treatments had the same distribution, this should not impact our "earnings effect" findings.

[11] E.g., Eckel and Grossman [2003] found around 48% of endowment donated in their baseline treatment, and Andreoni and Petrie [2004] around 31% in their baseline treatment.

Table 1: Average proportion contributed by payment regimes

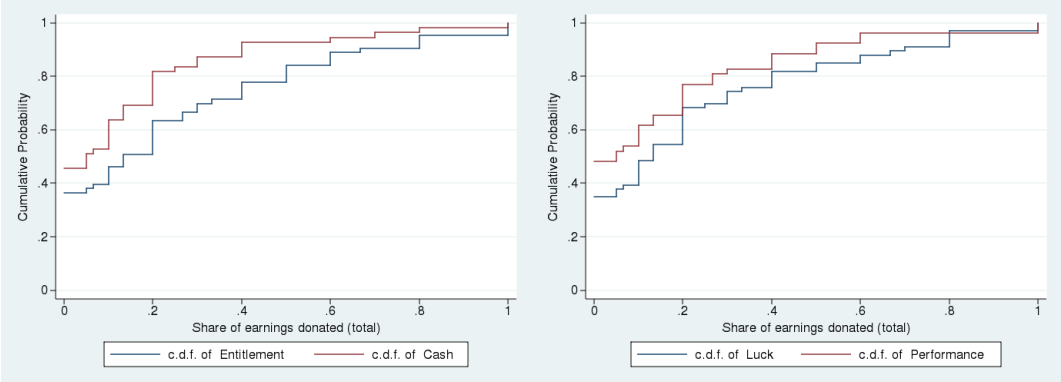
	Payment based on:			
Payment allocation	Luck	Performance	Total	N
Entitlement	0.27	0.21	0.25	63
Cash	0.17	0.11	0.14	55
Total	0.23	0.16	0.20	118
N	66	52	118	

Wilcoxon rank sum tests	
P(Entitlement > Cash)	.60*
	(.05)
P(Luck > Performance)	.58
	(.12)
P(Entitlement/Random > Cash/Performance)	.67*
	(.02)
P(Entitlement/Random > Cash/Random)	.61
	(.14)
P(Entitlement/Performance > Cash/Performance)	.58
	(.31)
P(Entitlement/Performance > Cash/Random)	.52
	(.82)

P-values in parentheses, * denotes significance at 5% level.

Figure 1 shows the cumulative distribution of the share of earnings donated over the earnings and payment treatments. The distribution of contributions under on-screen entitlements (RE and PE) stochastically dominates the distribution under cash payments (RC and PC). Similarly. the distribution under random payments (RE and RC) stochastically dominates the distribution under performance-based earnings (PE and PC). The difference between entitlement and cash is particularly striking. When they were given cash, no subject donated more than 40% of their income, while almost 45% donated nothing. In contrast, with the less tangible on-screen entitlement only, only around 38% failed to donate at all while around 5% donated all of their endowment. The evidence on luck versus performance is less pronounced, though visible: performance pay makes people more selfish in this charitable giving setting.

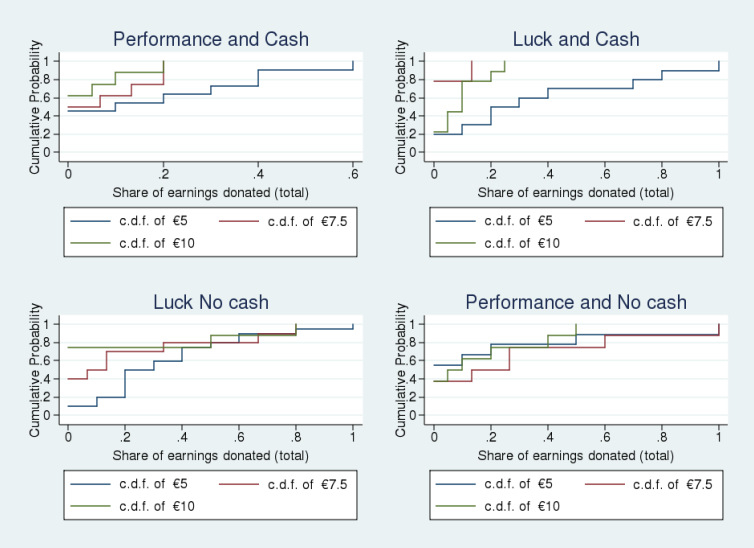
Figure 1: Cumulative Distribution Function of Share of Endowment Donated



The subject pool we are using consists mainly of subjects who are familiar with economic experiments and see them as a source of income. Money they get in the experiment is not a windfall gain for them, as they expect to get on average €7 per hour of experiment. At the beginning of each session, the duration of the experiment was announced ("This experiment will last around 35-40 minutes"), hence they should expect to earn around €5. We examine whether (under RE and RC treatments) the random[12]"windfall"of an additional €2.50 or €5 leads those subjects to behave more generously.

Figure 2 shows the cumulative distribution of the share of earnings donated given the stake size. Not only do subjects give relatively less, their propensity to donate at all is significantly lower - 82% in the €5 treatment and around 50% in treatments €7.5 and €10. Pooling the high stake treatments (€7.50 and €10) and performing a test on the share of subjects who donated in the high stake treatment and in the low stake treatment (€5) rejects the hypothesis that these proportions are the same at a 1% significance level.

Figure 2: Cumulative Distribution Function of Share Donated by Stake Size, Random-endowment Treatments



4 Conclusion and Implications

Our experiment disentangles tangibility and earnings effects, and finds both are present in approximately equal measure in a charitable giving dictator setting. This helps to reconcile the *hardnosing* result of Cherry et al., 2002 with the previous experiments; the *hardnosing* was largely driven by cash payments, a feature they introduced in order to achieve subject-experimenter anonymity. More generally,we have uncovered a framing effect: the *tangibility* of the payment can dramatically effect behavior. These findings do not imply that experimenters should *always* use "tangible" cash. We cannot say whether the lower or higher level of contribution is more valid. Either frame (cash or endowment) may have external validity – in the field many decisions are made without physical cash – but researchers must be *aware* of this framing effect and take it into account.

[12]Of course this surprise might not be a real surprise, as the expectation is just a point estimate. When subjects participate in more experiments they are interested in their *realized* earnings over all those experiments. So a positive surprise only occurs if they have earned more than their discounted expected earning after all experiments they will participate in.

Our results may also be generalisable to real-world decisionmaking, particularly over intangible "warm-glow" goods such as charitable donations. For example, rather than asking for cash, charitable organizations might do better to solicit donations in less tangible forms, such as through credit-card donations, or payroll deductions from future years' income. The reluctance to part with cash might apply not only to charitable giving but to other forms of consumption. Future research into this might help explain the dramatic rise in consumer credit-card debt.

A Screenshots of experimental stages

Figure 3: The Task

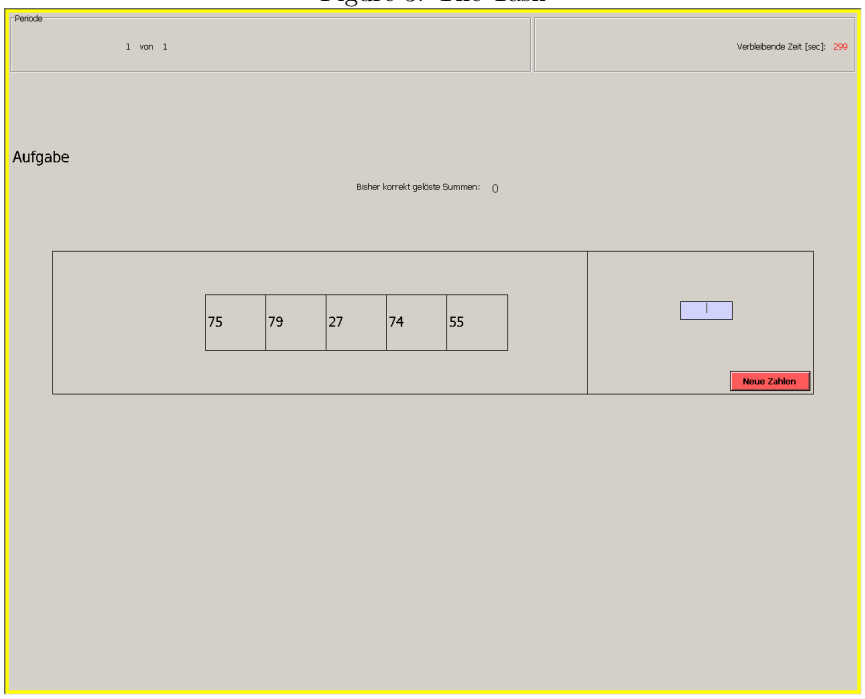


Figure 4: Promised Payments

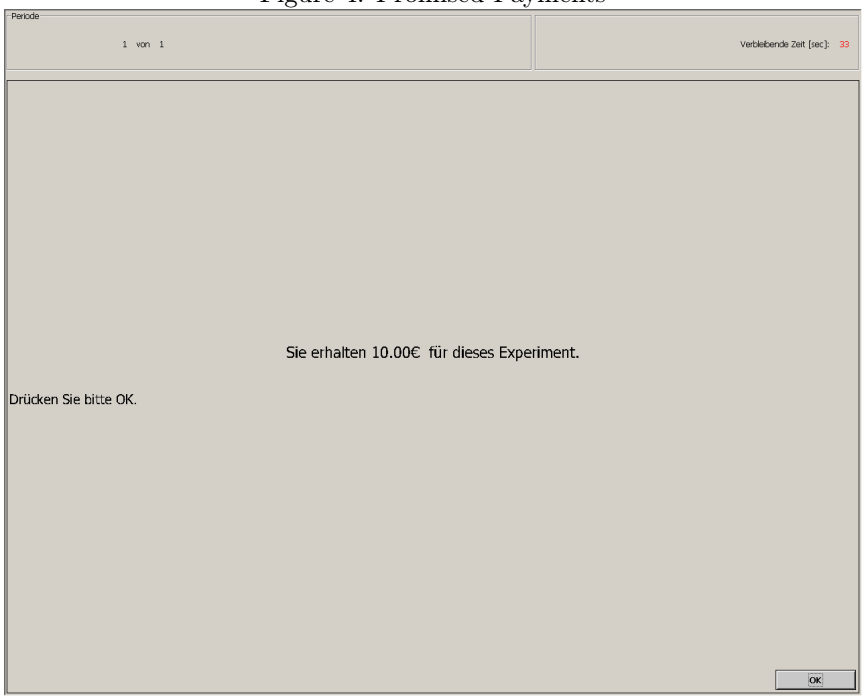
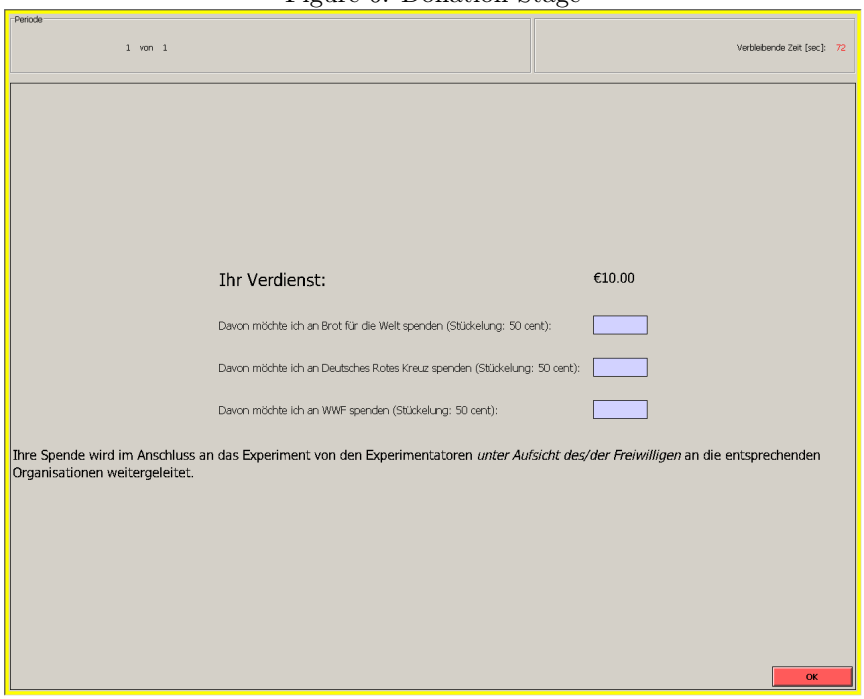


Figure 5: Cash Payments

Figure 6: Donation Stage



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