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Abstract

Negotiations frequently end in conflict after one party rejects a final offer. In a large-scale internet experiment, we investigate whether a 24-hour cooling-off period leads to fewer rejections in ultimatum bargaining. We conduct a standard *cash treatment* and a *lottery treatment*, where subjects receive lottery tickets for several large prizes - emulating a high-stakes environment. In the lottery treatment, unfair offers are less frequently rejected, and cooling-off significantly reduces the rejection rate further. In the cash treatment, rejections are more frequent and remain so after cooling-off. This treatment difference is particularly pronounced for subjects with lower cognitive abilities.

Keywords: negotiations, ultimatum game, emotions, cooling-off, cognitive abilities, behavioral biases, internet experiment.
JEL-Classification: C78, C99, D8.

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1 Introduction

This study investigates the stability of emotional influences on economic decision-making. While standard economic theory has emphasized the rationality of economic agents, dual-system models of decision-making argue that human behavior can be viewed as the outcome of the interaction between a (fast) affective system that reacts to emotions and motivational drives and a (slower) goal-based cognitive system.[1] Evidence indicates that the affective system tends to react first and to initially hold sway over the cognitive system (see, e.g. Zajonc, 1984).

Indeed, in the context of negotiations, recent neuroeconomic evidence (see, e.g., Koenigs and Tranel, 2007; Sanfey et al., 2003) shows that negative emotions, like anger, play an important role in subjects' decisions to reject offers that are deemed unfair (even though subjects forgo money by doing so). At the same time, it has long been argued by practitioners (see, e.g., Adler, Rosen, and Silverstein, 1998) that cooling-off periods (where negotiations are temporarily halted) are successful in lessening anger and help to avoid break-down of negotiations.[2] This raises the question whether after some time the deliberative system indeed prevails and leads parties participating in negotiations to accept offers that, while being perceived as unfair, have some monetary value

[1] Such dual perspectives on decision-making are ubiquitous in psychology (see, e.g., Kahneman, 2003; Chaiken and Trope, 1999). More recently, dual-system models have also been employed by economic theorists having rediscovered Adam Smith's (1790) long-ago insight that human behavior frequently emerges as the outcome of a struggle between "passions" and an "impartial spectator" (see, e.g., Fudenberg and Levine, 2006; Camerer, Loewenstein, and Prelec, 2005; Bernheim and Rangel, 2004; Loewenstein and O'Donoghue, 2004; Shefrin and Thaler, 1988).

[2] Cooling-off periods are also common instruments in consumer law, labor law, and a variety of other contexts (see, e.g., Camerer, Issacharoff, Loewenstein, O'Donoghue, and Rabin, 2003; Rekaiti and Van den Bergh, 2000; Cramton, Gunderson, and Tracy, 1999).

nevertheless? Put differently, does anger really subside with one night's sleep?

Investigating this issue may shed light on three questions. First, it may help to understand why bargaining frequently breaks down. Do negotiations break down due to subjects' stable preferences for equitable outcomes as suggested by recent fairness theories,[3] or due to hot emotional states that are, however, transient and lose importance over time? Second, more generally, how robust are results of economic experiments where emotions might play a role? Third, if cooling-off plays a role, under which circumstances is it more likely to be relevant? For example, does the effect of cooling-off (or, more generally, the effect of emotions) depend on what is at stake? Is it reasonable to assume that people tend to reflect stronger on high-stakes decisions?

To examine these questions, we study behavior in a particularly one–sided and unfair bargaining environment, the well-known ultimatum game (Güth, Schmittberger, and Schwarze, 1982; Nowak, Page, and Sigmund, 2000; and many others). Abundant experimental evidence documents that in the ultimatum game unfair offers from proposers are frequently rejected by responders, even though responders forgo money by doing so.[4] This suggests that rejection rates in the ultimatum game might fall if a cooling-off period is imposed.

Our innovation is that responders in the experiment get the (unanticipated) chance for revising their original decision after a 24-hour cooling-off period. We shall consider three alternative hypotheses that differ in whether and how rejection behavior by the responder changes from the first (initial) decision to the second (final) decision, which takes place after the cooling-off period.

[3] See, e.g., Bolton and Ockenfels (2000) and Fehr and Schmidt (1999).
[4] For surveys, see, e.g., Camerer (2003) and Roth (1995).

First, the "unconditional cooling-off" hypothesis would predict that rejection rates are lower for the final decision than for the initial decision regardless of what is at stake. Second, the "cooling–off if stakes are high" hypothesis would predict that, after the cooling-off period, the trade–off between emotions and rationality is decided in favor of rationality if stakes are perceived by subjects as high and decided in favor of emotions if they are perceived as low. Finally, the "rational" hypothesis would predict that rejection rates are low for both, the initial decision and the final decision because receiving any positive amount is better than receiving nothing for a rational decision maker who maximizes his expected monetary payoff.

We explore these hypotheses in an experiment conducted on the internet with 1250 participants. Subjects play an "ultimatum mini–game," in which proposers can make only two different offers about how to divide 10 "Lotto-Euros," an 8:2 split or a 5:5 split.[5] Responders can then accept or reject the respective offer. If they reject, both subjects get nothing. If they accept, the amount is divided as suggested by the proposer, namely 8 Lotto-Euros for the proposer and 2 for the responder or 5 for both, respectively. All responders receive an email 24 hours after their initial decision that gives them the opportunity to reconsider their decision. Responders learn of this possibility only after having made their initial decision. We make it clear that (i) every responder independently of his initial decision would be given this opportunity and (ii) the proposer would only be informed about the responder's final decision.

[5] For a more detailed discussion of internet experiments and related methodological issues, see, e.g., Drehmann, Oechssler, and Roider (2005, 2007).

We implement two different ways of paying subjects. In the *cash treatment* subjects receive their payoffs (2, 5, or 8 Lotto-Euros, respectively, exchanged one-to-one into actual euros) in the mail as cash. In the *lottery treatment* subjects receive the respective number of lottery tickets, which each has an equal chance of winning one out of six large prizes of 500 euros each. In both, the cash treatment and the lottery treatment, the expected monetary value of one Lotto-Euro is the same and equal to one euro, and this is known to subjects. However, as Tversky and Kahneman (1992, p. 298) have pointed out, "...people often prefer a small probability of winning a large prize over the expected value of that prospect", i.e., they exhibit non-linear probability weighting.[6] Therefore, we use the lottery treatment to emulate a "high stakes" environment (where subjects might be more reluctant to reject the (unfair) 8:2 offer). Without a lottery a high stakes condition would obviously be very expensive to carry out.[7]

We find clear evidence in favor of the "cooling–off if stakes are high" hypothesis. First, lower rejection rates in the lottery treatment than in the cash treatment both at the initial decision and the final decision indicate that subjects were indeed more tempted by the small prospect to win a large prize.[8] Second, after the cooling-off period, there is a statistically significant drop

[6] On non-linear probability weighting, see also, e.g., Gonzalez and Wu (1999) and Prelec (1998). For a recent application in the context of financial markets, see, e.g., Barberis and Huang (2008).

[7] Note that in the lottery treatment the (relatively large) size of the prizes was constant but, depending on the offer (and its acceptance), the probability of winning differed, which is in contrast to earlier experiments on the ultimatum game that randomly selected pairs of players who were actually paid (see, e.g., Güth, Schmidt, and Sutter, 2003).

[8] The earlier experimental literature provides mixed evidence on the effect of high stakes on rejection rates in the ultimatum game (see, e.g., Roth et al., 1991; Slonim and Roth, 1998).

in the rejection rate of unfair offers by 25 percent in the lottery treatment. Rejection rates in the cash treatment, however, are high initially (as has previously been found in many other experiments) and remain so after 24 hours. Taken together, relative to the initial rejection rate in the (standard) cash treatment, by paying subjects through a lottery and by additionally allowing for cooling-off, the rejection rate drops by more than 50% (in which case, from an ex-post perspective, making the unfair offer would have been optimal for a selfish, risk-neutral proposer).

Cognitive abilities may play an important role for negotiation tactics. To potentially identify different behavioral types, in the post-experimental questionnaire we also conduct the "Cognitive Reflection Test" (CRT), which has recently been put forward by Frederick (2005). This simple three-item test intends to differentiate between more impulsive and more reflective decision makers.[9] This test is interesting because Frederick (2005) documents that the CRT-score correlates strongly with subjects' time and risk preferences,[10] and the CRT compares very favorably in terms of predicting behavior to substantially more complex personality tests. We show that there is a relationship between the CRT-score and behavior also in our experiment. In particular, the difference in initial rejection rates between the cash treatment and the lottery treatment is almost exclusively driven by subjects scoring low in the CRT-test, i.e., only "impulsive" decision-makers seem to be prone to non-linear probability weighting.[11]

[9] That is, the CRT-test does not aim to measure intelligence per se, but rather "the ability or disposition to resist the response that first comes to mind" (Frederick, 2005, p. 35).

[10] For example, subjects with a relatively high CRT-score ("reflective" decision-makers) are significantly more patient.

[11] Oechssler, Roider and Schmitz (2008) replicate Frederick's (2005) results on time and

2 Experimental design

In this section, we first discuss how we recruited subjects, how the experiment was implemented, and why conducting the ultimatum mini-game on the internet is especially suited to address our research questions. We then introduce the Cognitive Reflection Test, and finally describe how we paid subjects.

2.1 Recruiting, Implementation, and Design Choices

In total 1250 participants participated in our online, web-based experiment. Subjects were recruited via emails. Email addresses were obtained from the economic experimental laboratories in Bonn, Cologne, and Mannheim (excluding students who had already participated in bargaining experiments). All those contacted had indicated their interest in participating in economic experiments. Of the participants, 90% were university students, 25% studied economics or business, and 46% were female. Average age of participants was 24 years.

The timing of the experiment is illustrated in Figure 1. After logging in on our website and providing some personal background information, subjects played a one-shot mini-ultimatum game between a proposer and a responder, where the proposer could make one out of two possible offers to divide a cake of 10 "Lotto-Euros" (our experimental currency). The website was linked to the Laboratory for Experimental Research in Economics at the University of Bonn to demonstrate that the experiment had a proper scientific background and that the promised financial rewards were credible. Each subject played

risk preferences, and find that the CRT-score also correlates strongly with a number of behavioral biases, such as base rate neglect, conservatism, or overconfidence.

one of our treatments once (see the appendix in Section 5 for a translation of the instructions).

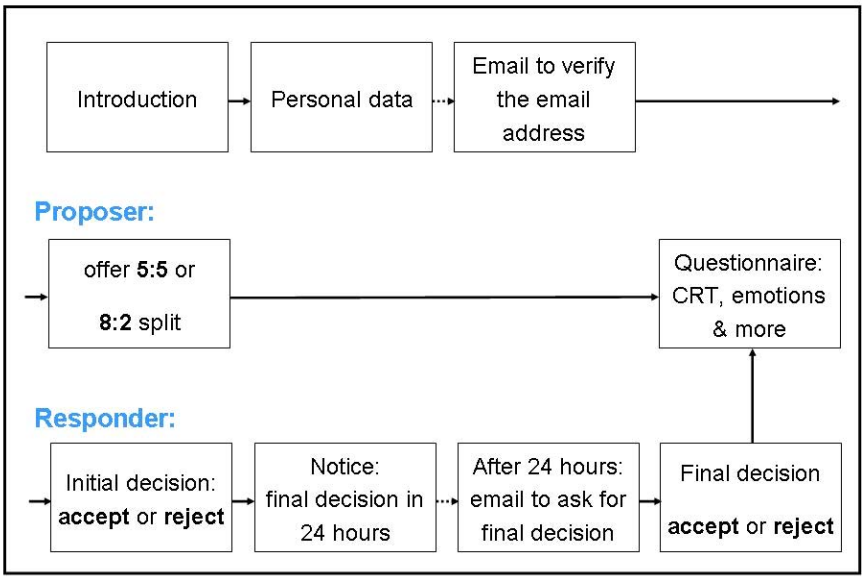

Figure 1: Timing of the experiment.

The proposer could either make the offer "5:5" (leaving both with the same number of Lotto-Euros) or the offer "8:2" (leaving the proposer (responder) with 8 (2) Lotto-Euros). After having read a description of the ultimatum game, each responder was told which offer the (randomly assigned, anonymous) proposer had made. Afterwards, the responder was asked to either reject or accept this offer (initial decision). Immediately after having made his choice, each responder was told that independent of his decision, every responder would have the opportunity to change his decision. That is, responders learned of this possibility only after having made the initial decision. 24 hours

(the cooling-off period) after his initial decision every responder received an automatic email containing a link redirecting him to the decision page. Only after this second (and final) decision, the proposer was notified whether his offer had been accepted, and responders knew that the respective proposer would learn only their final decision. Proposers were unaware of the existence of a cooling-off period as they were told only that they would be notified about the respective responder's decision within the next couple of days.

Emotional cooling-off might certainly play a role in a variety of contexts. We chose the ultimatum game for several reasons. First, it is very easy to explain to subjects. Thus, there is little danger that the difference between the initial and the final decisions is due to the fact that subjects understood the rules only after the cooling-off period. Second, there is a large literature to compare our results to. The ultimatum mini-game instead of the unrestricted ultimatum game was chosen to facilitate collecting more data on the rejection rates for particular offers.

Conducting the experiment on the internet allowed us to generate a high number of observations at reasonable cost. Also, a cooling-off period is easier to implement on the internet than in the lab. While conducting the experiment over the internet implies a certain loss of control relative to the laboratory, we had several measures in place to alleviate this issue. First, to prevent subjects from playing multiple times, each name-postal code combination (winners were notified via ordinary mail) and each email address was only allowed to play once. Second, immediately after having entered their personal data subjects received an email containing a link that allowed them to continue the experiment (see Figure 1). Thereby, we made sure that for each subject we had a

valid email address, which was necessary to alert responders of the end of the cooling-off period.[12] Finally, to reduce the possibility of different responders making each other aware of the cooling-off period prematurely, participants logging in on our website having an IP-address similar to the IP-address of an earlier participant (who had played within the last 30 minutes) were assigned to be a proposer.

2.2 Cognitive Reflection Test

The Cognitive Reflection Test (CRT) introduced by Frederick (2005) is a quick and simple three-item personality test, and we administered this test in the post-experimental questionnaire (see Figure 1). The CRT aims to differentiate between more impulsive and more reflective decision-makers. To achieve this, each of the three questions of the CRT has a seemingly intuitive (but incorrect) answer that springs quickly to mind, and the overwhelming majority of subjects indeed provide either the impulsive or the correct response (see Table 1).

The questions of the CRT are not difficult in the sense that the correct solution is easily understood when explained to subjects. Moreover, if a solution springs to mind it is easy for subjects to verify whether their response is indeed correct. That is, the CRT does not measure cognitive abilities per se. However, in the CRT, arriving at the correct answer may require overcoming the initial, impulsive response.

[12] Note that of the responders who initially accepted (respectively rejected) the unequal offer equally high fractions actually took the opportunity to return to the final decision screen after the cooling-off period (93.3%, respectively 93.0%). If a responder did not actually take a final decision, we assumed that he meant to stay at his initial decision.

Table 1: Cognitive Reflection Test

Question	Correct answer	Impulsive answer
A bat and a ball cost 110 cents in total. The bat costs 100 cents more than the ball. How much does the ball cost?	5 (52.56%)	10 (43.34%)
If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?	5 (68.35%)	100 (23.29%)
In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?	47 (75.34%)	24 (15.02%)

Note: The total number of observations is 1172. In parentheses, we report the relative frequency of the respective response in our data.

Overall, 1172 subjects completed the CRT, and 39.16% answered all three questions correctly. 30.20% of subjects answered two questions, 18.34% answered one question, and 12.29% answered none of the questions correctly.

2.3 Treatments and Payment

For the ultimatum mini-game, subjects were paid as follows. In the lottery treatment, we conducted at the end of the experiment a lottery with six prizes of 500 euros each. Lotto-Euros of subjects were converted 1:1 into lottery tickets. Each lottery ticket had an equal chance of winning. Importantly, the expected value of a lottery ticket was fixed in advance and equal to one (actual) euro, and this was known to subjects. Winners were notified by mail, and their prize money was transferred electronically to their bank account. In the cash treatment, each Lotto-Euro was converted 1:1 into euros. Payoffs (in

cash) were sent to subjects by mail.

After the ultimatum game decisions were taken, subjects were asked to fill in the post-experimental questionnaire. In the cash treatment, they were told that 6 of the participating subjects would be drawn at random and paid according to the following rules: Each drawn subject would receive a lump sum payment of 60 euros for filling in questions about their emotions. Furthermore, they would receive 5 euros for each correct answer on the CRT questions. There were also some more questions, which were used for a different experiment. In the lottery treatment, the questionnaire was unpaid. The results with respect to the CRT scores, however, do not differ between treatments. In both treatments, the average CRT score (i.e. the average number of correct questions) was 2.05 (which places our subjects well between students of MIT and Princeton in Frederick's (2005) sample).

3 Results

In a first step, we look at responder behavior in the initial decision. If responders are subject to non-linear probability weighting, they may be more reluctant to reject 8:2 offers in the lottery treatment than in the cash treatment.[13] To investigate this issue, we compare the rejection rates for the initial decision (right after responders received the 8:2 offer) across our two treatments. In the (standard) cash treatment, which has frequently been employed in the previous literature, the initial rejection rate is 42.55%, which is in line with earlier findings (see, e.g., Falk, Fehr, and Fischbacher, 2003) and in contradiction to the rational hypothesis (see Table 2 for an overview on the main

[13] In both treatments, the 5:5 offer was rejected by less than 2.5% of responders.

results of the experiment). In the lottery treatment, however, in which high prizes were available, initial rejection rates are significantly lower at 27.68% (Fisher exact test, one-tailed, $P = 0.018$); indicating that subjects indeed found the (small) prospect of winning a large prize more acceptable than the (small) expected value of this gamble. Hence, the lottery treatment indeed seems to emulate a "high stakes" environment.[14]

Table 2: Offers and rejections

		treatment	
		lottery	cash
offered	5:5	213 (65.5 %)	206 (68.7 %)
split	8:2	112 (34.5 %)	94 (31.3 %)
rejections	initial decision	5 (2.35 %)	5 (2.43 %)
of 5:5 offer	final decision	2 (0.94 %)	3 (1.46 %)
rejections	initial decision	31 (27.68 %)	40 (42.55 %)
of 8:2 offer	final decision	23 (20.54 %)	37 (39.36 %)

Note: Shown are the absolute numbers of offers and rejections in the lottery treatment (left column) and the cash treatment (right column) both for the initial decision (right after responders received the offer) and for the final decision (after a 24 hour cooling-off period). The percentages of offers and rejection frequencies are reported in parentheses.

In a next step, we study the effects of the cooling-off period. In the ("low stakes") cash treatment, rejection rates do not noticeably drop from the initial to the final decision. In the ("high stakes") lottery treatment, however, re-

[14] In the lottery treatment, a somewhat larger fraction of proposers made the 8:2 offer (see Table 2). However, this difference is not statistically significant, which might be due to the fact that we conducted a one-shot experiment. Slonim and Roth (1998), in their experiment on the effects of high stakes in the ultimatum game, report that proposers adjusted their behavior to the introduction of high stakes only slowly over the course of multiple rounds. Stahl and Haruvy (2008) have conducted treatments similar to our cash and lottery treatments. However, in their experiment the available prize was only \$5 and they did not find significantly different behavior across treatments.

jection rates were significantly reduced by more than 1/4 to 20.54% after the cooling-off period. Table 3 shows a cross-tabulation of responders' decisions after receiving the unfair 8:2 offer. For example, in the lottery treatment, 11 responders rejected the 8:2 split initially but accepted it after the 24-hour cooling-off period. The hypothesis that subjects are equally likely to accept unfair offers in both decision periods is rejected in favor of the hypothesis that cooling-off lowers rejection rates at the 5%-level of a one-sided non-parametric McNemar change test ($P = 0.029$).[15] To summarize, relative to the initial rejection rate in the (standard) cash treatment, by paying subjects through a lottery and by additionally allowing for cooling-off, the rejection rate drops by more than 1/2 from 42.55% to 20.54%.

Table 3: Number of responders' decisions following an 8:2 offer

treatment					
lottery			cash		
	final decision			final decision	
initial decision	accept	reject	initial decision	accept	reject
accept	78	3	accept	48	6
reject	11	20	reject	9	31

Note: Cross–tabulation of absolute numbers of responders' decisions after receiving the 8:2 offer.

To learn more about why subjects decided the way they did, we asked subjects about their motivations in a free-format question of the post-experimental questionnaire. Interesting for our purposes are, in particular, the answers of those responders who changed their mind during the cooling-off period. In the lottery treatment, where cooling-off had a significant effect, 9 out of the 11

[15] On the McNemar change test, see, e.g., Siegel and Castellan (1988).

responders who changed their mind from rejection to acceptance of the offer stated something like "two lottery tickets are better than none." At the same time, the 8:2 offer seems to have aroused similar (negative) emotions in both the cash treatment and the lottery treatment. In the post-experimental questionnaire, we asked subject to recall what they felt at the moment they made their final decision. On a 7-point scale, subjects had to rate their emotions for "anger", "envy", "surprise" and "gratefulness". As expected, responders who received the unfair offer felt significantly more anger, more envy, and less gratefulness than responders who received the 5:5 offer (pair-wise Mann-Whitney U tests, one-tailed, $P < 0.001$).[16] However, the reported emotion levels do not differ significantly across the cash and lottery treatments. Hence, in the lottery treatment, subjects apparently had a stronger incentive to contemplate accepting the proposal during the cooling-off period. This is exemplified by some of the answers to the above free-format question stating that "The initial rejection resulted from my desire to pay player A back. In the end, reason implied my change of mind." Or, "This time [i.e., at the final decision] I thought less about player A and he ripping me off, instead I thought of nothing but myself."

As discussed above, in order to possibly identify distinct behavioral types that may drive the difference in behavior in our two treatments, we administered Frederick's (2005) Cognitive Reflection Test (CRT). Splitting the sample of subjects into those that get 2 or 3 questions right in the CRT ("reflective decision-makers") and those that get less than 2 questions right ("impulsive

[16] They also felt significantly less surprise, which indicates that the majority of responders expected the unfair offer.

decision-makers"), we can observe an interesting phenomenon that may explain part of the difference between the standard cash treatment and the lottery treatment. Figure 2 depicts mean rejection rates for the initial decision split according to CRT performance.

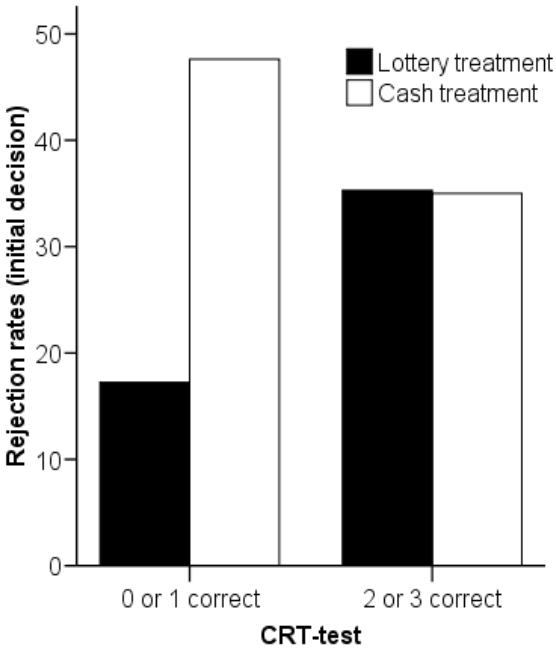

Figure 2: Average rejection rates of responders when receiving the 8:2 offer in the lottery treatment (black bars) and the cash treatment (white bars) for subjects with a CRT score of 0 or 1 and subjects with a CRT score of 2 or 3, respectively.

While reflective decision-makers show no difference in mean rejection rates between treatments, impulsive decision-makers have more than twice the rejection rate in the cash treatment than in the lottery treatment (Fisher exact test, one-tailed, $P = 0.023$). It seems that impulsive decision-makers are particularly susceptible to non-linear probability weighting, which leads them to

treat payoffs in the lottery treatment as high stakes, while reflective responders seem to base their initial decision on the expected value of the gamble.[17]

Reflective and impulsive responders also differ in an instructive way in the time it takes them to form their initial decisions. While in both the lottery treatment and the cash treatment, it takes reflective decision-makers almost exactly the same time to either accept or reject an (unfair) 8:2 offer (see Panel B of Figure 3), the picture looks markedly different for impulsive decision makers (see Panel A of Figure 3).

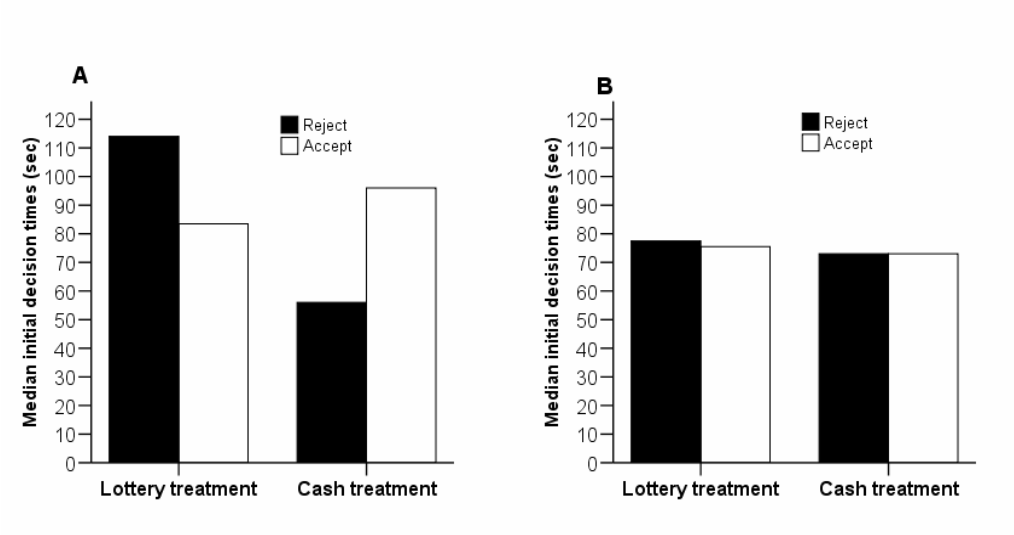

Figure 3: Decision times of responders who received the 8:2 offer when their initial decision is to reject it (black bars) or to accept it (white bars) for **(A)** responders with CRT scores of 0 or 1, and **(B)** for responders with CRT scores of 2 or 3. In both figures the two bars on the left refer to the lottery treatment and the two on the right to the cash treatment. "Decision time" is measured as the difference between the time the initial decision screen was displayed to the respective responder and the time the initial decision was submitted.

[17] Similar to Frederick (2005), we find that the CRT score differs significantly across men and women. However, the CRT score does not proxy for gender as the above CRT effects emerge separately both for men and women.

In the lottery treatment, the median time it takes impulsive decision-makers to reject an 8:2 offer is 114 seconds, whereas in the cash treatment, it is only 56 seconds, which is significantly shorter (Mann-Whitney U test, one-tailed, $P = 0.036$). In contrast, accepting the (unfair) offer requires shorter median decision times in the lottery treatment. This seems to indicate that, for impulsive responders, in the lottery (cash) treatment the "impulsive way to react" is to accept (reject) the unequal offer, and it seems to take time to overcome this initial impulse.[18]

Finally, we briefly discuss the robustness of our results. First, in order to rule out a possible alternative explanation for lower rejection rates at the final decision, in the post-experimental questionnaire we asked responders whether they had talked about the experiment with third parties during the cooling-off period. This might be an issue because there is evidence that groups are more willing to accept unequal offers in the ultimatum game (see, e.g., Bornstein and Yaniv, 1998). However, only one of the responders who had changed his mind reported to have talked to someone (and at the same time stated that this had not influenced his decision). Second, we implemented a within-subject design to control for unobserved heterogeneity and obtain more power in statistical tests. A drawback may be that subjects could be reluctant to change their initial decisions due to cognitive dissonance. However, this would imply that our above results provide only a lower bound on the potential effect of cooling-off, and actual effects may be larger. Third, despite the fact that subjects were recruited via official mailing-lists of established experimental laboratories, one

[18] For other studies on decision times in the context of the ultimatum game, see, e.g., Knoch, Pascual-Leone, Meyer, Treyer and Fehr (2006) and Rubinstein (2007).

might wonder whether subjects found our promise of later payment credible. This might be an issue because there is evidence indicating that rejection rates are higher for hypothetical payoffs than for real payoffs (see, e.g., Cameron, 1999). However, payment via a lottery is arguably less credible than payment in cash, which, contrary to what we find, would predict higher rejection rates in the lottery treatment. Hence, in a similar vein to above, if credibility was an issue at all, it would lead us to underestimate the effect of the lottery treatment on the initial rejection rate.

4 Conclusion

To summarize, in our internet experiment on the ultimatum game we find that rejection rates drop significantly when subjects have the opportunity to (emotionally) cool-off and stakes are perceived as high. If stakes are perceived as low, rejection rates are high before and after the cooling-off period. This suggests that cooling-off indeed seems to work in controversial bargaining situations when stakes are sufficiently high. More generally, our results indicate that a part of the rejections of unfair offers observed in earlier experiments (without cooling-off periods) might be driven not by stable preferences for fairness, reciprocity or other forms of social preferences but by relatively low stakes and by an emotional drive to punish the proposer, which, however, seems to fade away over time. To put it with Horace, "anger is a short madness".

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5 Appendix: Instructions

In the following we present an English translation of the German instructions. Each centered subheading represents a distinct page of our website respectively an email we sent to participants (see Figure 1 above). With respect to the post-experimental questionnaire we focus on questions posed to responders. The below translation of the instructions relates to the lottery treatment. Different formulations in the cash treatment are indicated in parentheses.

Introduction

Experiments on the internet

With the help of experiments on the internet the Universities of Bonn, Heidelberg, and Cologne want to verify various scientific theories. Further information about experimental economic research can be found here [hyperlink].

By participating in this experiment you support our scientific work. At the same time, you have the chance to earn some money within the experiment.

This experiment is about the division of 10 "Lotto-Euros" between two anonymous participants. The other participant with whom you play is randomly chosen.

We would be very pleased if you answered a few questions at the end of the experiment. Hence, in case you decide to participate, please play until the end of the experiment. The answers will take a few minutes only.

Upon conclusion of the experiment, your earned Lotto-Euros are exchanged for lottery tickets. Every Lotto-Euro is worth one ticket. In total, there will be 3000 tickets and 6 participants will win 500 euros each. Every ticket has the same chance of winning. Thus, the more Lotto-Euros you have, the better is your chance of winning. Winners will be notified by regular mail.

(In the cash treatment, the above paragraph was replaced by the following text: Upon completion of the experiment, we will send each of the 600 participants the earned Lotto-Euros – exchanged one-to-one into actual euros - in cash by regular mail.)

Personal data

Your data

Welcome to our online experiment!

Please note that each player can participate in the experiment only once.

Before you start with the game, we would like to ask you for some personal data. The outcomes of the game will be analyzed in an anonymous way, clearly separated from your personal data. The address will be used only to notify the winners. The data regarding field of study, age, and gender will serve only the scientific analysis.

Important: Please make sure that you enter a valid e-mail address, because you will receive e-mail from us within the experiment. Of course, we will treat also your e-mail address confidentially.

You can find further information regarding data security in the data protection declaration [hyperlink].

Surname: [_____]

First name: [_____]

Street: [_____]

Street number: [_____]

Zip code: [_____]

City: [_____]

E-mail: [_____]

Confirm e-mail: [_____]

Do you attend university? [pull-down menu]

Field of study: [pull-down menu]

If you attend university: for how many terms have you been studying? [pull-down menu]

If you have graduated already: are you a Ph.D. student? [pull-down menu]

Age: [pull-down menu]

Gender: [pull-down menu]

E-mail notice

How to carry on

Thank you for entering you data.

Now you will receive an e-mail in which there will be a link to continue the experiment.

The e-mail should arrive in your in-box right now.

Thank you very much for supporting our project!

Immediate e-mail

Dear participant:

Once again, thank you very much for your participation!

Please click on the following link to continue with the experiment: [hyperlink]

Proposer: decision screen

The experiment

This experiment is about the one-time division of 10 Lotto-Euros between you and another randomly chosen participant. Anonymity is guaranteed; this means that none of the participants will find out with whom he or she has played. Also, the decisions you make will be treated confidentially.

How many Lotto-Euros you and the other participant will earn depends on the decisions that both of you will make.

The two participants that have been assigned to each other are each allocated to one of two possible roles, respectively: the role of player A or the role of player B. Which participant is allocated to which role is again randomly chosen.

Player A proposes how the 10 Lotto-Euros should be split. Player A has two possibilities. He or she can make the offer "5:5" or the offer "8:2."

The offer that player A has made will be transmitted to player B. Player B can either accept or reject the offer.

Assume that player A has made the offer "5:5." If player B accepts, both participants will receive 5 Lotto-Euros.

Assume that player A has made the offer "8:2." If player B accepts, player A will receive 8 Lotto-Euros and player B will receive 2 Lotto-Euros.

If player B rejects the offer, then both participants receive 0 Lotto-Euros.

These rules are known to both participants.

Your decision

Your role is the one of player A.

Which offer do you make? [5:5 / 8:2]

Responder: initial decision screen

The experiment

This experiment is about the one-time division of 10 Lotto-Euros between you and another randomly chosen participant. Anonymity is guaranteed; this means that none of the participants will find out with whom he or she has played. Also, the decisions you make will be treated confidentially.

How many Lotto-Euros you and the other participant will earn depends on the decisions that both of you will make.

The two participants that have been assigned to each other are each allocated to one of two possible roles, respectively: the role of player A or the role of player B. Which participant is allocated to which role is again randomly chosen.

Player A proposes how the 10 Lotto-Euros should be split. Player A has two possibilities. He or she can make the offer "5:5" or the offer "8:2."

The offer that player A has made will be transmitted to player B. Player B can either accept or reject the offer.

Assume that player A has made the offer "5:5." If player B accepts, both participants will receive 5 Lotto-Euros.

Assume that player A has made the offer "8:2." If player B accepts, player A will receive 8 Lotto-Euros and player B will receive 2 Lotto-Euros.

If player B rejects the offer, then both participants receive 0 Lotto-Euros.

These rules are known to both participants.

Your decision

Your role is the one of player B.

Player A has made the offer "5:5."

Do you accept the offer? [yes / no]

Responder: notice

Your decision

Thank you for your entry.

How to carry on

Independent of the respective decision, each player B gets the opportunity to change his or her decision.

For this purpose, you will automatically receive an e-mail after 24 hours. The e-mail will contain a link with which you will be able to return to the decision page and to the post-experimental questionnaire.

Only after that, the experiment will end and only then, we will let player A know whether you have accepted or rejected his or her offer.

Thank you very much for participating!

Responder: e-mail after 24 hours

Dear participant:

Once again, thank you very much for your participation!

Please make now your final decision with regard to player A's offer. Please click on the following link to do so: [hyperlink]

Responder: final decision screen

Your final decision

As you already know, you have the role of player B. If you want to have another look at the basic structure of the game, please click here [hyperlink].

Player A made the offer "5:5."

If you accept, you will receive 5 Lotto-Euros and player A will receive 5 Lotto-Euros. If you reject, both of you will receive 0 Lotto-Euros.

Do you accept the offer? [yes / no]

Responder: post-experimental questionnaire

Questions relating to the ultimatum mini-game:

- Did you expect a different offer from player A? [yes / no]
- Did you know this game before? [yes / no]
- Have you talked to somebody else about this game **before** you made your **initial** decision? [yes / no]
- If so, has your **initial** decision been influenced in this way; i.e., did this make a difference with regard to your initial decision? [yes / no]
- Have you talked to somebody else about this game **after** you made your **initial** decision? [yes / no]

- If so, has your **final** decision been influenced in this way; i.e., did this make a difference with regard to your final decision? [yes / no]
- Why have you changed your decision or otherwise why did you stick to your decision? [_____]

Questions relating to experienced emotions:

Please enter for each of the emotions that are listed below the extent to which you have felt the respective emotion at the time of your final decision that you have just made.

To do so, please click each time at one of the seven boxes, where

1 = "emotion has not been felt" and
7 = "emotion has been felt very strongly."

emotion	1	2	3	4	5	6	7
envy							
anger							
joy							
surprise							
gratefulness							

CRT questions:

- A bat and a ball together cost 110 cents. The bat costs 100 cents more than the ball. How much does the ball cost? [_____ cents]
- If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets? [_____ minutes]

- In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake? [_____ days]

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