Cooling Off in Negotiations - Does it work?*

Jörg Oechssler
Department of Economics
University of Heidelberg

Andreas Roider†
Department of Economics
University of Bonn

Patrick Schmitz
Department of Economics
University of Cologne

February 2007

Abstract

In a large-scale internet experiment we investigate whether a 24-hour cooling-off period leads to fewer rejections of unfair offers in negotiations. We conduct a *cash treatment* and a *lottery treatment*, where subjects bargain over the distribution of lottery tickets for several large prizes. Unfair offers are less frequently rejected in the lottery treatment, and there cooling-off also plays a significant role. This questions the robustness of previous findings where negative emotions might also have been relevant. Finally, we subject participants to the *Cognitive Reflection Test* and find that only impulsive decisionmakers are prone to the observed non-linear probability weighting.

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

*We are grateful to Armin Falk, Al Roth, and Uwe Sunde for helpful discussions. We also thank the experimental laboratories at the Universities of Bonn, Mannheim, and Cologne for allowing us to use their mailing lists. Finally, we are very grateful to Alexander Voss who did an excellent job programming the experiment.

†Corresponding author: Department of Economics, Wirtschaftspolitische Abteilung, University of Bonn, Adenauerallee 24-42, 53113 Bonn, Germany, email: roider@uni-bonn.de, phone: +49-(0)228-739246.

1 Introduction

It has long been recognized by practitioners that anger plays an important role in determining the outcome of negotiations (see e.g., Adler, Rosen, and Silverstein, 1998). In particular, the literature has emphasized that cooling-off periods (where negotiations are temporarily halted) are one of the most commonly employed and successful methods of lessening angry moods.[1] In this study we address the question whether anger really subsides with one night's sleep.

To test this question 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 are frequently rejected, even though the responders forgo money by doing so. Recent neuroeconomic evidence (see e.g., Sanfey et al., 2003) indicates that negative emotions, like anger, play an important role in the decision to reject such offers. This suggests that rejection rates in the ultimatum game might fall if a cooling-off period is imposed.

In an experiment conducted on the internet with 1250 participants we let subjects play an "ultimatum mini–game",[2] in which proposers can only make two different offers about how to divide 10 "Lotto-Euros", an 8:2 split or a 5:5 split. 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. Our innovation is that *all* responders received a (neutral) email 24 hours after their initial decision that gave them the opportunity to reconsider their decision. We also implemented two ways of paying subjects. In the *cash treatment* subjects received 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 received the respective number of lottery tickets, which each had an equal chance of winning one out of six (large) prizes of 500 Euros each.

Note that in both the *cash treatment* and the *lottery treatment* the (expected) monetary value of one Lotto-Euro was the same and equal to one Euro. However, as Tversky and Kahneman (1992) have pointed out, "...people often prefer a small probability of winning a large prize over the expected value of that prospect." We take this observation at face value, and use the *lottery treatment*

[1] Cooling-Off periods are also common in consumer law and labor law.

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

to simulate a "high stakes" environment (where subjects might be more reluctant to reject the (unfair) 8:2 offer). We proceed this way because without a lottery a high stakes condition would obviously be very expensive to carry out.

We shall consider three alternative hypotheses. The "rational" hypothesis would predict that rejection rates are low for both, the first (initial) decision and the second (final) decision, which had to be made after 24 hours, because receiving any positive amount is better than receiving nothing. The "unconditional cooling-off" hypothesis would predict that rejection rates are lower for the second decision regardless of how subjects are paid. Finally the "cooling–off if stakes are high" hypothesis would predict that 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. That is, we would expect that rejection rates in the lottery treatment are lower to begin with and that they become even lower after the cooling–off period. For the cash treatment we would expect rejection rates to be high to start with (as shown in many other experiments) and not changing much by the cooling–off period.

We find clear evidence in favor of the "cooling–off if stakes are high" hypothesis as there is a (statistically significant) drop in the rejection rate of unfair offers by 25 percent in the lottery treatment. Rejection rates in the cash treatment, however, are high and remain so after 24 hours. In the post-experimental questionaire, 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, and Frederick (2005) finds that the CRT-score correlates strongly with subjects' time and risk preferences. Interestingly, we show that there is also a relationship between the CRT-score and behavior in our experiment. In particular, we find that the difference in the initial rejection rate between the cash treatment and the lottery treatment is almost exclusively driven by impulsive decisionmakers (i.e., only subjects scoring low in the CRT-test seem to be prone to non-linear probability weighting).[3]

The remainder of the paper is structured as follows. In Section 2 we present our results. Section 3 contains a brief conclusion. In Section 4, we discuss in more detail our experimental design.

[3]In a companion paper Oechssler, Roider, and Schmitz (2007) we find that the CRT-score also correlates strongly with a number of other behavioral biases, such as base rate neglect, conservatism, or overconfidence.

Table 1: **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 %)	$\Longleftarrow^{*}$	40 (42.55 %)
of 8:2 offer	final decision	23 (20.54 %)	$\Longleftarrow^{**}$	37 (39.36 %)

Note: * (**) Significant treatment difference at the 5% (1%) level, two-sided Fisher's Exact test.

2 Results

Table 1 gives an overview on the results of the experiment. In both treatments about 2/3 of proposers opted for the equal split, while roughly 1/3 chose the unfair split of 8:2. Rejection decisions are shown for the initial decision (right after responders received the offer) and for the final decision (after a 24 hour cooling-off period). In both treatments the 5:5 offer was rejected by less than 2.5% of responders.

Unfair offers, however, are frequently rejected, which is in line with a large body of previous literature and in contradiction to the rational hypothesis. In the cash treatment, rejection rates are around 40 percent and do not noticeable drop from the initial to the final decision. In the lottery treatment, in which high prizes were available, rejections rates already start lower (at 27.68%, which is significantly lower than 42.55% according to a Fisher's Exact test, 5% two–sided). More importantly, after the cooling–off period, rejection rates were reduced by more than 1/4 to 20.5%.

Table 2 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 (see e.g., Siegel and Castellan, 1988).

In a post-experimental questionnaire we asked subject to remember 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", "happiness", "surprise" and "gratefulness". As expected, responders who received the unfair offer felt

Table 2: **Change of decisons following 8:2 during cooling-off**

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: * Significant difference at the 5% level, one-sided McNemar change test.

significantly more anger, more envy, less happiness, and less gratefulness (all differences significant with p-values < 0.001 according to two-sided MWU tests). They also felt significantly less surprise, which indicates that the majority of responders expected the unfair offer.[4]

We also asked subjects to write a free-format comment why they decided the way they did. Interesting for our purposes are, in particular, the answers of those responders who changed their mind. In the lottery treatment 9 of the 11 responders who changed their mind from rejection to acceptance of the offer, stated something like "two lottery tickets are better than none."

Moreover, the lower rejection rate at the final decision cannot be accounted for by responders talking to third parties during the cooling-off period. In the post-experimental questionnaire we explicitly asked for this and only one of the responders who had changed his mind reported to have talked to someone (and at the same time states that this had not influenced his decision).

As discussed above, we also administered the "Cognitive Reflection Test" (CRT) of Frederick (2005) using exactly the same 3 questions he employed.[5] Splitting the sample of responders into those that get 2 or 3 questions right in the CRT and those that get less than 2 questions right, we can observe an interesting phenomenon that may explain part of the difference between the cash and the lottery treatments. Figure 1 shows mean rejection rates for the initial decision split according to CRT performance. While subjects who do well on the CRT show no difference in the mean rejection rate between treatments, subjects who

[4] There are no significant difference between the cash and the lottery treatments with respect to these questions.

[5] Note that 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:" conducting the CRT-test at such prestigious institutions as MIT or Princeton University (though with offering only a show-up fee) Frederick (2005) nevertheless finds a great deal of variation in CRT-scores (and averages of 2.18 and 1.63, respectively). In our experiment the average CRT-score is equal to 2.04.

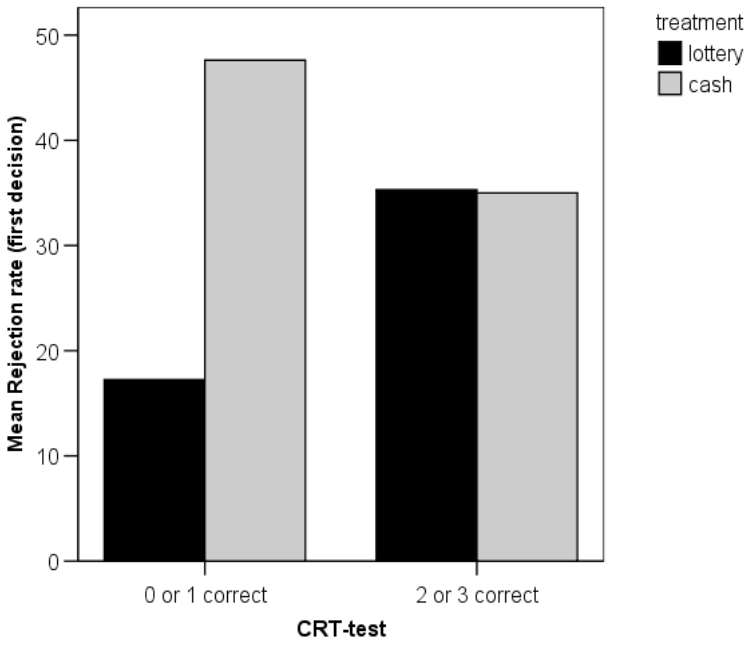

Figure 1: Rejection rates of responders, grouped by their CRT score and by treatment

perform poorly, have more than twice the rejection rate in the cash treatment than in the lottery treatment. It seems that those subjects are particularly susceptible to probability weighting, which leads them to treat payoffs in the lottery treatment as high stakes.

3 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[6] and by

[6] While some earlier experiments do not detect an effect of high stakes on rejection rates (see e.g., Roth et al., 1991; Cameron, 1999), Slonim and Roth (1998) find that both rejection rates and offers go down when monetary stakes are high.

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”.

4 Methods

4.1 Experimental design

During several months of 2006 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). We had several measures in place to ensure that subjects were only able to play once and that responders were unlikely to meet each other. All those contacted had given prior approval to participate 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 2. 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 proposer could either make the offer "5:5" (leaving both with the same amount 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. 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. To this end, 24 hours (the cooling-off period) after his 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.

Emotional cooling-off certainly plays a role in a variety of context. 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 increase statistical power as it allows to collect 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.

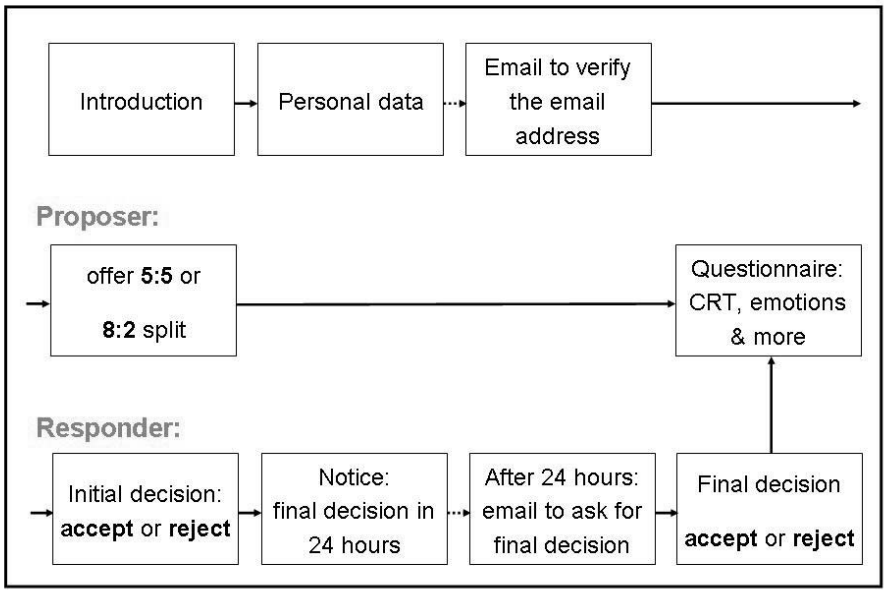

Figure 2: Timing of the experiment

4.1.1 Payment for ultimatum game

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 account.

In the *cash treatment*, each Lotto-Euro was converted 1:1 into Euros. Payoffs (in cash) were sent to subjects by mail.

4.1.2 Payment for questionnaire

After the ultimatum game decisions were taken, subjects were asked to fill in a questionnaire. They were told that 6 of the participating subjects would be drawn 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.

References

Adler, R., B. Rosen, and E. Silverstein (1998): "Emotions in Negotiation: How To Manage Fear and Anger," *Negotiation Journal*, 14(2), 161–179.

Cameron, L. (1999): "Raising the Stakes in the Ultimatum Game: Experimental Evidence from Indonesia," *Economic Inquiry*, 37(1), 47–59.

Drehmann, M., J. Oechssler, and A. Roider (2005): "Herding and Contrarian Behavior in Financial Markets: An Internet Experiment," *American Economic Review*, 95(5), 1403–1426.

——— (2007): "Herding with and Without Payoff Externalities: An Internet Experiment," *International Journal of Industrial Organization, forthcoming.*

Frederick, S. (2005): "Cognitive Reflection and Decision Making," *Journal of Economic Perspectives*, 19(4), 25–42.

Güth, W., R. Schmittberger, and B. Schwarze (1982): "An Experimental Analysis of Ultimatum Bargaining," *Journal of Economic Behavior and Organization*, 3(4), 367–388.

Nowak, M., K. Page, and K. Sigmund (2000): "Fairness Versus Reason in the Ultimatum Game," *Science*, 289, 1773–1775.

Oechssler, J., A. Roider, and P. Schmitz (2007): "Intuitive Decision-Making and Behavioral Biases," *mimeo, University of Bonn.*

Roth, A., V. Prasnikar, M. Okuno-Fujiwara, and S. Zamir (1991): "Bargaining and Market Behavior in Jerusalem, Ljubljana, Pittsburgh, and Tokyo: An Experimental Study," *American Economic Review*, 81(5), 1068–1095.

Sanfey, A., J. Rilling, J. Aronson, L. Nystrom, and J. Cohen (2003): "The Neural Basis of Economic Decision-Making in the Ultimatum Game," *Science*, 300, 1755–1758.

Siegel, S., and N. Castellan (1988): *Nonparametric Statistics for the Behavioral Sciences*. McGraw-Hill, Inc., New York, second edn.

Slonim, R., and A. Roth (1998): "Learning in High Stakes Ultimatum Games: An Experiment in the Slovac Republic," *Econometrica*, 66, 569–596.

Tversky, A., and D. Kahneman (1992): "Advances in Prospect Theory: Cumulative Representation of Uncertainty," *Journal of Risk and Uncertainty*, 5, 297–323.