Cooling-Off in the Ultimatum Game*

Jörg Oechssler
Department of Economics
University of Heidelberg

Andreas Roider†
Department of Economics
University of Bonn

Patrick Schmitz
Department of Economics
University of Cologne

August 2006

Extended Abstract

Motivation and preview of the results Abundant experimental evidence documents that in the ultimatum game unfair offers are frequently rejected. 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. At the same time, it has long been recognized by practitioneers that anger may play an important role in determining the outcome of negotiations; leading participants to retaliate against the offender (see e.g., Adler et al., 1998). In particular, this 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] This suggests that rejection rates in the ultimatum game might fall if a cooling-off period is imposed. And indeed, this is what we find in our experiment: there is a statistically significant drop in the rejection rate of unfair offers by 25 percent.

Experimental design To investigate the possible effects of cooling-off periods in June-July 2006 we conducted an internet experiment with 650 participants, where an substantial amount of prize money was at stake. In the following, we will first describe the experiment and then carefully explain our design choices.

After loging 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 distribute a cake of 10 "Lotto-Euros" (our artificial currency): she 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

*We are grateful to Armin Falk, Al Roth, and Uwe Sunde for helpful discussions. We also thank the Laboratory for Experimental Research in Economics at the University of Bonn and the Laboratory for Economic Research at the University of 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] Cooling-off periods are also common in consumer law and labor law.

assigned, anonymous) proposer had made and he 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 has 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.

First, while emotional cooling-off might play a role in a variety of context, we chose the ultimatum game because of its simplicity, i.e., there is no danger that only after the cooling-off period subjects have figured out the solution of the game. Second, in (unrestricted) ultimatum games, where the proposer might make any offer to distribute a given cake, statistically significant differences in rejection rates between two treatments are frequently difficult to detect because relatively few proposers make unfair offers. Thus, we decided on a mini-ultimatum game where there is only one fair respectively unfair offer. Such considerations also led us to conduct the experiment over the internet which allowed us to generate a high number of observations (for a more detailled discussion of internet experiments, see e.g., Drehmann et al., 2005, 2006). Finally, a cooling-off period is easier to implement on the internet than in the lab.

After the experiment, the Lotto-Euros where converted into lottery tickets. To six participants we handed out prizes of 500 Euros each, where 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 Euro, and this was known to subjects. Subjects were recruited through emails sent out to students who, at two experimental labs, had indicated their willingness to participate in experiments (excluding students majoring in economics and subjects who had already participated in bargaining experiments). We had several measures in place to ensure that subjects are only able to play once and that responders are unlikely to meet each other.

Results In the experiment, 34.5 percent of proposers made the unfair offer. While both at the first and the second decision, basically all responders receiving the fair "5:5" offer accepted, unfair offers were frequently rejected. At the first decision (to be made right after responders had received the offer), 27.7 percent of unfair "8:2" offers were rejected. However, after the one-day cooling-off period the rejection rate dropped to 20.5 percent, which is significantly lower at the 5%-level according to a non-parametric McNemar change test. This suggests that part of the rejections of unfair offers observed in earlier experiments (without cooling-off periods) is driven not by stable preferences for fairness but by an emotional drive to punish the proposer that fades away over time. To put it with Horace, "anger is a short madness".

Two remarks on our main result are in order. First, the previous literature that has looked at similar mini-ultimatum games has found higher rejection rates. For example, Falk, Fehr, and Fischbacher (2003) report a 45 percent rejection rate of the unfair "8:2" offer. In principle, one could image that in our experiment responders, after observing the offer, took somewhat more time to make the first decision; thereby already "cooling-off" to a certain degree. However, if at all, this seems to play a minor role. We have recorded the time at which subjects were shown the website, where the ultimatum game was explained and the proposer's offer was shown, and the time at which a decision was made. It turns out that on average responders took 1:43 minutes to read the description of the game and to decide on the unfair offer, and there is no significant

difference in response times between those accepting and rejecting. Rather, we suspect that (consistent with Prospect Theory) subjects might have valued a small probability (two lottery tickets) to win a large prize more than the expected value of 2 Euros (which, for example, was offered in cash in Fehr, Falk, and Fischbacher, 2003); thereby being less inclined to reject the low offer. We are currently conducting follow-up treatments to investigate this in more detail.

Second, the lower rejection rate at the second decision did not just arise because during the cooling-off period responders had talked to third parties (where it is known that group decisions might lead to lower rejection rates): in the post-experimental questionaire we explicitly asked for this, and only one of the responders who had changed his mind reports to have talked to third parties (and at the same time states that this has not influenced his decision).

Furthermore, as expected we find that on a 7-point scale responders who received the unfair offer reported to be significantly more angry than responders receiving the fair offer. Interestingly, by including questions relating to risk preferences in the post-experimental questionaire we also find that proposers who make the fair offer are significantly more risk-averse than proposers making the unfair offer.

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. More generally, this suggests that previous experimental findings where emotions, like anger, might play a role might not be stable over time.

References

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

Drehmann, M., J. Oechssler, and R. Andreas (2006): "Herding with and Without Payoff Externalities: An Internet Experiment," *International Journal of Industrial Organization, forthcoming*.

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.

Falk, A., E. Fehr, and U. Fischbacher (2003): "On the Nature of Fair Behavior," *Economic Inquiry*, 41(1), 20–26.

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.