

# DEMO: What Lies Beneath Players’ Non-Rationality in Ultimatum Game?

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The rational strategy suggested by the game theory predicts a human playing Ultimatum Game (UG) would have tendency to decide in accordance with the assumption of self-interested rationality, i.e. to choose more for oneself and offer the least amount possible for co-players [2]. This “utilitarian” and game-theoretically correct “rational” behaviour is however rarely observed when experiments are conducted with human beings [1]. Long-term research in experimental economics indicates that humans do not behave as selfish as traditional economics assume them to do. In UG, human-responders reject offers they find too low while human-proposers often offer more than the smallest amount. An intuitively plausible interpretation of this phenomenon is that responders would rather give up some profit than be treated unfairly. This “non-rational” behaviour provides an insight into human’s motivation as a *social* being.

The work challenges this view and insists on human rationality. The key hypothesis is that *humans behave rationally*, however, use different criterion than a pure economical profit. The proposed approach models a human-responder via Markov decision process with a reward function respecting both economical profit and fairness. Two types of a reward function are considered: **R1** - a reward respecting fairness towards both players, and **R2** - a reward respecting fairness towards the responder only. The influence of either economical profit or fairness is controlled by a weight. A comparison on the data gained from the games with human-responder shows that the reward **R2** leads to the strategy close to the human one while the reward **R1** often leads to the higher economical profits compare to either human strategy or strategy given by **R2**<sup>4</sup>.

## References

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2. Rubinstein, A.: Perfect equilibrium in a bargaining model. *Econometrica* 50(1), 97–109 (1982)

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