

Katrin Schmelz and David Dohmen

## What is in the black box of social decision-making? Exploring neuro-economic foundations and cognitive processes

### Course Description

This course examines biological mechanisms and cognitive processes of decision-making in the context of social interactions.

Behavioral Economics has developed numerous models of economic behavior going beyond pure self-interest. In the domain of social decision-making, models taking social preferences like fairness or reciprocity into account predict behavior much better. However, they are black box models, as they neglect the cognitive processes behind the observed behavior. To get a glimpse of what is in the black box, this seminar focuses on neuro-economic foundations and cognitive processes underlying social decision-making. *First*, we will motivate why looking into the brain and understanding cognitive processes is interesting to economists (or not). *Second*, you will learn about methods for tracing neurological and cognitive processes. *Third*, we will deal with process theories and neuro-economic experiments on social decision-making.

### Dates

- November 13, 8:30 – 13:00: Introduction and topics assignment
- December 4 (or 9) and 11, 8:15-18:00: Presentations

The seminar always takes place at the Thurgauer Wirtschaftsinstitut (TWI), Hauptstr. 90, Kreuzlingen.

### Preconditions

- Basic knowledge of game theory
- Basic knowledge of behavioral economics or neuropsychology
- Basic knowledge of experimental methods

### Seminar requirements

- Background readings: Glimcher and Fehr (2014), chapters 1-6.
- Presentation (max. 45min) of a topic. (counts 70% for grading)
- Critical discussion (about 5min) of another student's presentation.
- An outline of 3-5 pages which will serve as the structure for your bachelor thesis. (30%)

### Details on your bachelor thesis

The topic of your seminar presentation will be the basis for your bachelor thesis. In your thesis, you will explain and extend the topic of your talk. You should already present your extension ideas in your presentation. At the end of the seminar, you will submit an outline (annotated table of contents) for your bachelor thesis.

- November 13: you will decide on your broad topic.
- December 9/11: in your talk, you will present the refined topic with an extension.
- January 21: submission deadline for the outline of your thesis.
- January 25/26: individual feedback meeting on your outline.
- Another individual meeting for feedback on a draft of your thesis can be scheduled.
- Language: German or English.

## Basic Literature

Camerer, C. F., Loewenstein, G., & Prelec, D. (2005). Neuroeconomics: How neuroscience can inform economics. *Journal of Economic Literature*, 43, 9-64.

Glimcher, P. W., & Fehr, E. (Eds.) (2014). *Neuroeconomics: Decision Making and the Brain* (2nd ed.). San Diego: Academic Press.

Gloeckner, A., & Witteman, C. (2010). Foundations for tracing intuition: Models, findings, categorization. In A. Gloeckner & C. Witteman (Eds.), *Foundations for tracing intuition: Challenges and methods*: Psychology Press

## Empirical studies on various topics (non-exhaustive)

Albrecht, K., Abeler, J., Weber, B., & Falk, A. (2014). The brain correlates of the effects of monetary and verbal rewards on intrinsic motivation. *Frontiers in Neuroscience*, 8, 303.

Baumgartner, T., Heinrichs, M., Vonlanthen, A., Fischbacher, U., & Fehr, E. (2008). Oxytocin shapes the neural circuitry of trust and trust adaptation in humans. *Neuron*, 58(4), 639-650.

De Quervain, D. J. F., Fischbacher, U., Treyer, V., Schellhammer, M., Schnyder, U., Buck, A., & Fehr, E. (2004). The Neural Basis of Altruistic Punishment. *Science*, 305(5688), 1254-1258.

Hedden, T., Ketay, S., Aron, A., Markus, H. R., & Gabrieli, J. D. E. (2008). Cultural influences on neural substrates of attentional control. *Psychological Science*, 19(1), 12-17.

Knoch, D., Pascual-Leone, A., Meyer, K., Treyer, V., & Fehr, E. (2006). Diminishing reciprocal fairness by disrupting the right prefrontal cortex. *Science*, 314(5800), 829-832.

Kosfeld, M., Heinrichs, M., Zak, P. J., Fischbacher, U., & Fehr, E. (2005). Oxytocin increases trust in humans. *Nature*, 435(7042), 673-676.

Nash, K., Gianotti, L. R. R., & Knoch, D. (2014). A neural trait approach to exploring individual differences in social preferences. *Frontiers in Behavioral Neuroscience*, 8, 458.

Sanfey, A. G., Rilling, J. K., Aronson, J. A., Nystrom, L. E., & Cohen, J. D. (2003). The neural basis of economic decision-making in the ultimatum game. *Science*, 300(5626), 1755-1758.

Schultz, W., Dayan, P., & Montague, P. R. (1997). A neural substrate of prediction and reward. *Science*, 275(5306), 1593-1599.

Strang, S., Utikal, V., Fischbacher, U., Weber, B., & Falk, A. (2014). Neural Correlates of Receiving an Apology and Active Forgiveness: An fMRI Study. *PLoS ONE*, 9(2), 1-7.