

# Neuroeconomics Meetings (2013-400-PSY4731) Course Manual

January 2014

## 1 Course Description

The neuroeconomics meetings are organised as seminars where students and internal and external junior and senior researchers present and discuss basic and advanced research and research methods in neuroeconomics. In each meeting presentations will be given that focus in depth on research ideas in, and methods of, neuroeconomics. Each meeting will be followed by active discussion. The meetings take place on a bi-weekly basis. It is only compulsory in periods 4-6 of the first year but is also highly recommended for second year master students.

## 2 Structure and Requirements

This course consists of 5 meetings (in block 4) of two hours each. The first meeting will be used to make introductions and to discuss the basic elements of the class.

During each meeting two students will give an hour presentation each on a paper (or set of closely related papers) of their choosing (from the reading list, unless prior approval is granted). The presentation should include:

- The problem under consideration
- The methodology used
- The main results
- Strengths and weaknesses of the study and questions which, in the opinion of the presenter are still open or were not satisfactorily addressed by the paper.<sup>1</sup>

Each presentation will be followed by a class-wide discussion of the paper. The class at large may ask questions about the paper or discuss any of the points raised by the presentation or the paper's broader implications. One reasonable goal would be to brainstorm on how the study could be followed-up or extended to gain additional insights.

While the presenters will obviously have to go through the paper(s) they are presenting in great detail, all students are expected to have read the material **before** the meeting.

Each student is responsible for two presentations.

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<sup>1</sup>In my experience, students are afraid to be critical of a paper which was published in a prestigious journal. While natural, this is a fear that you should try to overcome. Even the most well-thought out papers leave many questions unanswered. You should, therefore, pay particular attention to what was left out and what additional questions you have or things you could do to further deepen our understanding of the behavioral problem in question.

### 3 Evaluation and Credit

The course has one Pass/Fail grade for blocks 4 - 6.

- Participation
  - This includes your physical and mental presence in each meeting and your participation in the discussion.
- Presentations
  - This includes the quality of your presentations and understanding of the topic. Each student must present twice in blocks 4 - 6.

The grade is PASS if each part scores 5.5 or higher. Else it is FAIL.

### 4 Literature

Here is the list of suggested papers that students can choose from.

#### Computational and Process Models of Decision Making

- Deco, Gustavo, et al. "Brain mechanisms for perceptual and reward-related decision-making." *Progress in Neurobiology* (2012).
- Peters, Jan, and Christian Büchel. "Episodic future thinking reduces reward delay discounting through an enhancement of prefrontal-mediotemporal interactions." *Neuron* 66.1 (2010): 138-148.
- Vlaev, Ivo, et al. "Does the brain calculate value?." *Trends in cognitive sciences* 15.11 (2011): 546-554.

#### Choice under Risk and Uncertainty

- Bach, Dominik R., and Raymond J. Dolan. "Knowing how much you don't know: a neural organization of uncertainty estimates." *Nature Reviews Neuroscience* 13.8 (2012): 572-586.
- Burke, Christopher J., et al. "Neural Integration of Risk and Effort Costs by the Frontal Pole: Only upon Request." *The Journal of Neuroscience* 33.4 (2013): 1706-1713.
- FitzGerald, Thomas HB, et al. "Differentiable neural substrates for learned and described value and risk." *Current Biology* 20.20 (2010): 1823-1829.
- Nieder, Andreas, and Stanislas Dehaene. "Representation of number in the brain." *Annual review of neuroscience* 32 (2009): 185-208.

#### Social Preferences

- Baumgartner, Thomas, et al. "The mentalizing network orchestrates the impact of parochial altruism on social norm enforcement." *Human brain mapping* 33.6 (2012): 1452-1469.
- Lin, Alice, Ralph Adolphs, and Antonio Rangel. "Social and monetary reward learning engage overlapping neural substrates." *Social cognitive and affective neuroscience* 7.3 (2012): 274-281.
- Morishima, Yosuke, et al. "Linking brain structure and activation in temporoparietal junction to explain the neurobiology of human altruism." *Neuron* 75.1 (2012): 73-79.
- Wright, Nicholas D., et al. "Neural segregation of objective and contextual aspects of fairness." *The Journal of Neuroscience* 31.14 (2011): 5244-5252.

#### Decision Making and Emotion

- De Martino, Benedetto, Colin F. Camerer, and Ralph Adolphs. "Amygdala damage eliminates monetary loss aversion." *Proceedings of the National Academy of Sciences* 107.8 (2010): 3788-3792.

- Leotti, Lauren A., and Mauricio R. Delgado. "The inherent reward of choice." *Psychological science* 22.10 (2011): 1310-1318.
- Martin, Laura N., and Mauricio R. Delgado. "The influence of emotion regulation on decision-making under risk." *Journal of cognitive neuroscience* 23.9 (2011): 2569-2581.
- Sokol-Hessner, Peter, Colin F. Camerer, and Elizabeth A. Phelps. "Emotion regulation reduces loss aversion and decreases amygdala responses to losses." *Social cognitive and affective neuroscience* 8.3 (2013): 341-350.
- Starcke, Katrin, and Matthias Brand. "Decision making under stress: a selective review." *Neuroscience & Biobehavioral Reviews* 36.4 (2012): 1228-1248.

### **Psychopharmacology of Decision Making**

- Churchland, Patricia S., and Piotr Winkielman. "Modulating social behavior with oxytocin: how does it work? What does it mean?." *Hormones and behavior* 61.3 (2012): 392-399.
- Crockett, Molly J., et al. "Serotonin modulates striatal responses to fairness and retaliation in humans." *The Journal of Neuroscience* 33.8 (2013): 3505-3513.
- Eisenegger, Christoph, Johannes Haushofer, and Ernst Fehr. "The role of testosterone in social interaction." *Trends in cognitive sciences* 15.6 (2011): 263-271.
- Seymour, Ben, et al. "Serotonin selectively modulates reward value in human decision-making." *The Journal of Neuroscience* 32.17 (2012): 5833-5842.
- Wright, Nicholas D., et al. "Testosterone disrupts human collaboration by increasing egocentric choices." *Proceedings of the Royal Society B: Biological Sciences* 279.1736 (2012): 2275-2280.

### **Context-Dependent Valuation**

- Louie, Kenway, Mel W. Khaw, and Paul W. Glimcher. "Normalization is a general neural mechanism for context-dependent decision making." *Proceedings of the National Academy of Sciences* 110.15 (2013): 6139-6144.
- Soltani, Alireza, Benedetto De Martino, and Colin Camerer. "A Range-Normalization Model of Context-Dependent Choice: A New Model and Evidence." *PLoS computational biology* 8.7 (2012): e1002607.
- Louie, Kenway, and Paul W. Glimcher. "Separating value from choice: delay discounting activity in the lateral intraparietal area." *The Journal of neuroscience* 30.16 (2010): 5498-5507.

### **Social Valuation and Choice**

- Dvash, Jonathan, et al. "The envious brain: the neural basis of social comparison." *Human brain mapping* 31.11 (2010): 1741-1750.
- Fan, Yan, et al. "Is there a core neural network in empathy? An fMRI based quantitative meta-analysis." *Neuroscience & Biobehavioral Reviews* 35.3 (2011): 903-911.
- Krach, Sren, et al. "Your flaws are my pain: linking empathy to vicarious embarrassment." *PloS one* 6.4 (2011): e18675.
- Leiberg, Susanne, Olga Klimecki, and Tania Singer. "Short-term compassion training increases prosocial behavior in a newly developed prosocial game." *PloS one* 6.3 (2011): e17798.
- Steinbeis, Nikolaus, Boris C. Bernhardt, and Tania Singer. "Impulse control and underlying functions of the left DLPFC mediate age-related and age-independent individual differences in strategic social behavior." *Neuron* 73.5 (2012): 1040-1051.

## 5 Schedule of the Meetings

Week	Day	Date	Tasks
6	Thu	Feb 6	<i>Introductory Meeting</i>
7	Wed	Feb 12	<i>Presentations</i>
9	Wed	Feb 26	<i>Presentations</i>
12	Wed	Mar 19	<i>Presentations</i>
16	Wed	Apr 16	<i>Presentations</i>
19	Wed	May 7	<i>Presentations</i>
21	Wed	May 21	<i>Presentations</i>
23	Wed	Jun 4	Presentation by Mark Dean (Brown University) Title: TBA
24	Wed	Jun 11	<i>Presentations</i>
26	Wed	Jun 25	<i>Presentations</i>

The horizontal lines separate the meetings by weeks. There are two types of meetings: lectures (L-xx) where I will present new material and tutorials (T-xx) where students will make presentations.

## 6 Contact Information

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Contact me by email to schedule a personal meeting.