Mini Course on The Dynamics of Economic Decision Making

Graduate School of Decision Sciences Konstanz, July 2017

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• Course Description

– The target group of the course are students who are interested in understanding the processes underlying decision making.

– The course will introduce students to sequential sampling models (also known as evidence-accumulation or drift-diffusion models) and how they have been used in psychology and neuroscience.

– We will then discuss applications to economics, reviewing related work in experimental economics and neuroeconomics.

– Finally, we will go over how to code sequential sampling models and explore existing software packages that implement them.

• Tentative Plan for the Course

– Lecture 1 (19.7., Room D201, 13:30 – 15:00): Introduction to Sequential Sampling Models

– Lecture 2 (19.7., Room D201, 15:15 – 16:45): Variants of Sequential Sampling Models

– Lecture 3 (20.7., Room H301, 11:45 – 13:15): Neural Mechanisms Underlying Sequential Sampling Models

– Lecture 4 (21.7., Room C421, 11:45 – 13:15): Applications to Economic Decision Making

– Lecture 5 (21.7., Room D430, 15:15 – 16:45): Hands-on Coding and Toolboxes for Implementing Sequential Sampling Models

• References

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– Usher & McClelland (2001) The time course of perceptual choice: The leaky, competing accumulator model. *Psychological Review* 108(3) 550-592

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– Hare et al. (2011) Transformation of stimulus value signals into motor commands during simple choice. *Proceedings of the National Academy of Sciences* 108(44) 18120-18125

– Polania et al. (2014) Neural oscillations and synchronization differentially support evidence accumulation in perceptual and value-based decision making. *Neuron* 82 709-720

– Pisauro et al. (2017) Neural correlates of evidence accumulation during value-based decisions revealed via simultaneous EEG-fMRI. *Nature Communications* 8 15808

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– DeMartino et al. (2013) Confidence in value-based choice. *Nature Neuroscience* 16(1) 105-110

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– Krajbich et al. (2015) A common mechanism underlying food choice and social decisions. *PLoS: Computational Biology* 11(10): e1004371

– Fudenberg, Strack, Strzalecki (working paper) Stochastic Choice and Optimal Sequential Sampling. *SSRN*

– Woodford (working paper) Optimal Evidence Accumulation and Stochastic Choice. *http://www.columbia.edu/~mw2230/DDMASSA2.pdf*

– Konovalov & Krajbich (working paper) Revealed Indifference: Using Response Times to Infer Preferences. *http://www.econ.ohio-state.edu/pdf/krajbich/wp16-01.pdf*

– Frydman & Krajbich (working paper) Using response time to infer others' beliefs: An application to Information Cascades *SSRN*

– Clithero (working paper) Improving out-of-sample predictions using response times and a model of the decision process. *SSRN*