

COURSE SYLLABUS

Joint Action

WEDNESDAY 1:30pm (unless specified otherwise)

Instructor: Natalie Sebanz and Günther Knoblich

Department of Cognitive Science

Central European University

Fall 2019

Course level: PhD

2 Credits

Course e-learning site: <https://ceulearning.ceu.edu/course/view.php?id=10271>

Office hours: Appointment by email to sebanzn@ceu.edu, knoblichg@ceu.edu

Course Description

This course will cover recent theories and empirical research on joint action. The focus will be on ongoing research in our lab. Specific topics include the role of thinking and planning ahead as well as research focusing on basic perceptual and motor processes that allow people to perform highly coordinated actions such as playing a piano duet together. We will discuss behavioral and neuroscience experiments with a focus on studies that have been conducted by members of our lab. The course will also include experimental demonstrations to provide an overview of different research methods that are used in joint action research.

Learning Outcomes

By the end of this course, students will:

- ✓ know philosophical, psychological, and neuroscience accounts of joint action
- ✓ be familiar with experimental methods used in joint action research
- ✓ be able to evaluate experimental designs and their implications for theory
- ✓ be able to identify open research questions in joint action research

Course Requirements (for Pass)

- (1) Presentation of a research idea related to joint action research. This will be a short presentation (15 minutes + discussion) of a research idea that turns a theoretical question in joint action research into an experiment testing a specific hypothesis. The presentation will specify the link between theory and data, the study design, the material and/or apparatus used, the measures recorded, and the predicted results.
- (2) Contributions to discussion, lab demos. Attendees are expected to be present during all sessions and to contribute with questions and comments to the discussions.

The course schedule indicated below is preliminary and will be updated according to the specific interests and needs of the participating students.

COURSE SCHEDULE

18th September 2019. Introduction

This session will give a brief history of joint action research, introduce the main research questions in the field, and provide an overview of the different topics to be covered in the course.

Reading:

Knoblich, G., Butterfill, S., & Sebanz, N. (2011). Psychological research on joint action: theory and data. In B. Ross (Ed.), *The Psychology of Learning and Motivation*, 54 (pp. 59-101), Burlington: Academic Press.

25th September 2019. Task Co-representation

This class will provide an overview of the literature on task co-representation: When do individuals form representations of a co-actor's task and which aspects of another's task do they represent? We will discuss the role of task co-representation in social settings that do or do not require interpersonal coordination.

Reading:

Schmitz, L., Vesper, C., Sebanz, N., & Knoblich, G. (2018). Co-actors represent the order of each other's actions. *Cognition*, 181, 65-79.

Sebanz, N., Knoblich, G., & Prinz, W. (2003). Representing others' actions: Just like one's own? *Cognition*, 88, B11-B21.

2nd October 2019. Facilitatory behavior in joint action

This session will introduce participants to research providing evidence that co-actors facilitate each other's task performance in a range of object manipulation tasks.

Reading:

Rosenbaum, D. A., Chapman, K. M., Weigelt, M., Weiss, D. J., & van der Wel, R. (2012). Cognition, Action, and Object Manipulation. *Psychological Bulletin*, 138(5), 924-946.

9th October 2019. Role of reciprocity in joint coordination

This session will explore the cognitive, behavioral and motor processes involved in joint actions. We will focus on the effects of sharing task knowledge, visuomotor information and task constraints on the strategies people apply to solve coordination problems. Arianna Curioni will describe the project she has developed to investigate the role of reciprocity in joint action learning.

Reading:

Noy, L., Dekel, E., & Alon, U. (2011). The mirror game as a paradigm for studying the dynamics of two people improvising motion together. *Proceedings of the National Academy of Sciences*, 108(52), 20947-20952.

Konvalinka, I., Vuust, P., Roepstorff, A., & Frith, C. D. (2010). Follow you, follow me: continuous mutual prediction and adaptation in joint tapping. *The Quarterly Journal of Experimental Psychology*, 63(11), 2220-2230.

Richardson, M. J., Harrison, S. J., Kallen, R. W., Walton, A., Eiler, B. A., Saltzman, E., & Schmidt, R. C. (2015). Self-organized complementary joint action: Behavioral dynamics of an interpersonal collision-avoidance task. *Journal of Experimental Psychology: Human Perception and Performance*, 41(3), 665.

16th October 2019. Joint efficiency

This session will give an introduction into decision-making in coordination, focusing on action planning and the question of efficiency. Often, people may have multiple available means for executing a joint action to achieve a shared goal: some more, others less efficient. It is not evident how people make decisions between the available options. Starting from the efficiency of individual actions, both from the perspective of observer and actor, we will look at some of the research addressing efficiency in joint action. Gina will present the results of her experiments on the topic, which suggest that people prioritize the efficiency of a dyad over the individual efficiency of its constituent members.

Reading:

Santamaria, J. P., & Rosenbaum, D. A. (2011). Etiquette and effort holding doors for others. *Psychological Science*, 22(5), 584-588.

Dötsch, D., & Schubö, A. (2015). Social categorization and cooperation in motor joint action: evidence for a joint end-state comfort. *Experimental Brain Research*, 233(8), 2323-2334.

30th October 2019. Sensorimotor communication

This class will explore how people modify instrumental actions in order to facilitate coordination and discuss the relation between joint action and teaching as well as applications in robotics.

Reading:

McEllin, L., Sebanz, N., & Knoblich, G. (2018). Identifying others' informative intentions from movement kinematics. *Cognition*, 180, 246-258.

Pezzulo, G., Donnarumma, F., Dindo, H., D'Ausilio, A., Konvalinka, I., & Castelfranchi, C. (2018). The body talks: Sensorimotor communication and its brain and kinematic signatures. *Physics of Life Reviews*.

6th November 2019. Memory in Joint Action

This session will give an introduction into the interconnectedness of social cognition and declarative memory. Emphasis will be given to how dyadic social interactions influence memory performance for both the content of events and their source.

Reading:

Miles, L. K., Nind, L. K., Henderson, Z., & Macrae, C. N. (2010). Moving memories: Behavioral synchrony and memory for self and others. *Journal of Experimental Social Psychology*, 46(2), 457-460.

Eskenazi, T., Doerrfeld, A., Logan, G. D., Knoblich, G., & Sebanz, N. (2013). Your words are my words: Effects of acting together on encoding. *The Quarterly Journal of Experimental Psychology*, 66(5), 1026-1034.

13th November 2019. Joint EEG

This session will provide an overview on recent research addressing the neural processes involved in interpersonal coordination using dual-brain EEG. The session will discuss the advantages and limitations of dual-brain EEG

methodology, and highlight uses of dual-brain EEG to probe the neural correlates of action co-representations and rhythmic entrainment processes.

Reading:

Konvalinka, I., & Roepstorff, A. (2012). The two-brain approach: how can mutually interacting brains teach us something about social interaction? *Frontiers in Human Neuroscience*, 6, 215.

Loehr, J. D., Kourtis, D., Vesper, C., Sebanz, N., & Knoblich, G. (2013). Monitoring individual and joint action outcomes in duet music performance. *Journal of Cognitive Neuroscience*, 25(7), 1049-1061.

Tognoli, E., Lagarde, J., DeGuzman, G. C., & Kelso, J. S. (2007). The phi complex as a neuromarker of human social coordination. *Proceedings of the National Academy of Sciences*, 104(19), 8190-8195.

20th November 2019. A look behind the scenes

This class will provide an insight into the running of our lab. How do we recruit participants? How do we collect and store data? What other tasks need to be taken care of? What are challenges for running a lab like ours?

27th November 2019. Student presentations

In this session, each student will give a short presentation (10-15 minutes + discussion) of a research idea that turns a theoretical question in joint action research into an experiment testing a specific hypothesis.

4th December 2019. Student presentations

In this session, each student will give a short presentation (10-15 minutes + discussion) of a research idea that turns a theoretical question in joint action research into an experiment testing a specific hypothesis.