COURSE SYLLABUS

##### Joint Action

**Instructors**: Natalie Sebanz and Günther Knoblich  
Department of Cognitive Science

Central European University

Fall 2015

Course level: PhD

2 Credits

Course e-learning site: http://ceulearning.ceu.edu/course/view.php?id=4001

Office hours: Appointment by email ([sebanzn@ceu.edu](mailto:sebanzn@ceu.edu) or knoblichg@ceu.edu)

**Course Description**

This course will cover recent theories and empirical research addressing the human ability to perform actions together. We will review research highlighting 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 dancing a tango together. We will discuss articles reporting 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**

1. Presentations of current joint action research. This will be one or two short (15-20 minutes) presentations of recent research papers. Grading criteria: Quality of content, structure, and exposition.
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.

### COURSE SCHEDULE

## 23rd September 2015. Topics in joint action research

This session will give a brief history of joint action research, introduce the different topics to be covered, and address practical issues related to the course.

General 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.

**30th September 2015. Task co-representation**

This session will review studies addressing when, how, and to what extent people represent their co-actor’s task.

General reading:

Atmaca, S., Sebanz, N., & Knoblich, G. (2011). The joint flanker effect: sharing tasks with real and imagined co-actors. *Experimental Brain Research, 211(3-4)*, 371-385.

Reading for presentation:

Baus, C., Sebanz, N., de la Fuente, V., Branzi, F. M., Martin, C., & Costa, A. (2014). On predicting others' words: Electrophysiological evidence of prediction in speech production. *Cognition, 133*, 395-407.

**7th October 2015. Planning for interpersonal coordination**

This session will discuss how joint action partners prepare for each other’s actions and how they achieve coordination.

General reading:

Wolpert DM, Doya K & Kawato M (2003). A unifying computational framework for motor control and social interaction. *Philosophical Transactions of the Royal Society, 358*, 593-602.

Reading for presentation:

Kourtis, D., Knoblich, G., Woźniak, M., & Sebanz, N. (2014). Attention allocation and task representation during joint action planning. *Journal of cognitive neuroscience, 26(10)*, 2275-2286.

## 14th October 2015. Joint Music Performance

Making music together is a paradigm case of joint action, and studies on joint music performance are an important source for expanding our understanding of the processes involved in coordination. This session will look at some key findings from the music domain.

General reading:

Keller, P.E., Novembre, G., & Hove, M.J. (in press). Rhythm in joint action: Psychological and neurophysiological mechanisms for real-time interpersonal coordination. *Philosophical Transactions of the Royal Society B*.

Reading for presentation:

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*, 1049-1061.

## 21st October 2015. Group level task representation

How do we plan actions that we can only realize through the contributions of others (e.g., couple dancing)? Does such planning imply that a representation of ‘our task’ dominates a representation ‘my task’?

General reading:

Gallotti, M., & Frith, C. D. (2013). Social cognition in the we-mode. *Trends in cognitive sciences, 17(4)*, 160-165.

Reading for presentation:

Ramenzoni, V. C., Sebanz, N., & Knoblich, G. (2014). Scaling up perception–action links: Evidence from synchronization with individual and joint action. *Journal of Experimental Psychology: Human Perception and Performance, 40(4)*, 1551-1565.

## 28th October 2015. Interpersonal integration of perceptual information

In this session we will discuss how people integrate perceptions to arrive at joint judgments.

General reading:

Bahrami, B., Olsen, K., Latham, P. E., Roepstorff, A., Rees, G., & Frith, C. D. (2010). Optimally interacting minds. *Science*, *329*(5995), 1081-1085.

Voinov, P., Sebanz, N., & Knoblich, G. (under review). Interpersonal integration of perceptual judgments: Are two better than one at locating objects in space?

Reading for presentation:

Fusaroli, R., Bahrami, B., Olsen, K., Roepstorff, A., Rees, G., Frith, C., & Tylén, K. (2012). Coming to terms quantifying the benefits of linguistic coordination. *Psychological Science, 23*, 931-939.

## 4th November 2015. Joint action and perspective taking

This session addresses the relationship between joint attention and joint action. When do people compute what others see?

General reading:

Creem-Regehr, S. H., Gagnon, K. T., Geuss, M. N., & Stefanucci, J. K. (2013). Relating spatial perspective taking to the perception of other's affordances: providing a foundation for predicting the future behavior of others. *Frontiers in Human Neuroscience, 7*.

Reading for presentation:

Freundlieb, Kovacs, & Sebanz (in press). When do humans spontaneously adopt another’s visuospatial perspective? *Journal of Experimental Psychology: Human Perception and Performance*.

## 11th November 2015. Signaling

This session will explore how signaling is used to support joint action coordination. In particular, we will look at evidence suggesting that people modify the way they perform instrumental, goal-directed actions to convey information to others about action goals and object properties.

General reading:

Pezzulo, G., Donnarumma, F., and Dindo, H. (2013). Human Sensorimotor Communication: A Theory of Signaling in Online Social Interactions *PLoS ONE 8 (11)*, e79876

Reading for presentation:

Vesper, C. & Richardson, M. (2014). Strategic communication and behavioral coupling in asymmetric joint action. *Experimental Brain Research, 232(9)*, 2945-2956.

## 18th November 2015. Sense of Commitment

Many joint actions require that two people stay involved until it is finished. Does this requirement create an implicit ‘sense of commitment’? Could such a sense of commitment explain findings on young childrens’ behavior during joint action?

General reading:

Michael, J., Knoblich, G., & Sebanz, N. (Under Review) *A minimal approach to commitment.*

Reading for presentation:

Gräfenhain, M., Behne, T., Carpenter, M., & Tomasello, M. (2009). Young children’s understanding of joint commitments. *Developmental Psychology, 45(5)*, 1430-1443.

## 25th November 2015. Development of joint action abilities

This session will give an overview of existing literature on children’s ability to collaborate with a partner. What can they do, how do they do it and can their behaviors be compared to adults’?

General reading:

Brownell, C. A. (2011). Early developments in joint action. *Review of Philosophy and Psychology, 2*, 193-211.

Reading for presentations:

Warneken, F., Grafenhain, M. & Tomasello, M. (2012). Collaborative partner or social tool? New evidence for young children’s understanding of joint intentions in collaborative activities. *Developmental Science, 15(1)*, 54-61.

Milward, S., Kita, S. & Apperly, I. (2014). The development of co-representation effects in a joint task: Do children represent a co-actor? *Cognition, 132*, 269-279.

## 2nd December 2015. Autism and joint action

Autism is a developmental disorder that is generally associated with disorders of social cognition. How does autism impact on individuals’ abilities to engage in joint action?

General reading:

Hamilton, A. F. D. C. (2013). Reflecting on the mirror neuron system in autism: a systematic review of current theories. *Developmental Cognitive Neuroscience, 3*, 91-105.

Reading for presentation:

Stoit, A. M., Van Schie, H. T., Riem, M., Meulenbroek, R. G., Newman-Norlund, R. D., Slaats-Willemse, D. I., ... & Buitelaar, J. K. (2011). Internal model deficits impair joint action in children and adolescents with autism spectrum disorders. *Research in Autism Spectrum Disorders, 5(4),* 1526-1537.

## 9th December 2015. Brain and physiological coupling

This session will discuss how performing particular types of joint actions may affect physiological and brain processes. It will also demonstrate an experimental paradigm that allows us to study the coupling of breathing and heart rate.

General reading:

Hasson, U., Ghazanfar, A. A., Galantucci, B., Garrod, S., & Keysers, C. (2012). Brain-to-brain coupling: A mechanisms for creating and sharing a social world. *Trends in Cognitive Science, 16*, 114-121.

Reading for presentation:

Konvalinka, I., Xygalatas, D., Bulbulia, J. Schjødt, U., Jegindø, E. M., Wallot, S., Van Orden, G., Roepstorff, A. (2011). Synchronized arousal between performers and related spectators in a fire-walking ritual. *Proc Natl Acad Sci U S A 108*:8514-8519.