

Research Seminars in General Psychology and Cognitive Neuroscience
 ("Forschungskolloquium für Absolventen, Doktoranden, und Mitarbeiter")

„General Psychology and Cognitive Neuroscience“

(Prof. Dr. Stefan R. Schweinberger)

Winter Term 2014/15

Place: Am Steiger 3/EG, SR 009

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<http://www2.uni-jena.de/svw/allgpsy/researchseminars.htm>

Event Schedule

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|------------|---|---|
| 09.02.2015 | Marlena L. Itz, Jena | Effects of caricatured shape or color on the perception of famous and unfamiliar faces |
| 02.02.2015 | Jürgen M. Kaufmann, Jena | Evaluation of a face recognition training: Interim report |
| 26.01.2015 | Verena G. Skuk, Jena | Acoustic cues to age perception in male and female voices |
| 19.01.2015 | Carolin S. Altmann, Jena | Recognition memory for faces of average attractiveness |
| 12.01.2015 | Juliane Bräuer, Leipzig/Jena | Social Cognition in dogs and apes - a comparative approach |
| 15.12.2014 | tbc | tbc |
| 08.12.2014 | Romi Zäske, Jena | Neuroimaging of voice learning and recognition |
| 01.12.2014 | Helene Kreysa, Luise Kessler, Jena | Pupil responses in attractiveness judgment tasks |
| 24.11.2014 | Tobias Schuwerk, Ludwig-Maximilians-Universität München | The neurocognitive basis of belief reasoning |
| 17.11.2014 | Prof. Dr. Andreas Jansen, Marburg | Network Models of Face Processing |
| 13.11.2014 | Hideki Kawahara, Wakayama, Japan | Making speech tangible, flexible tools for speech communication research based on interference-free representations |
| 10.11.2014 | Sascha Frühholz, Swiss Center for Affective Sciences, Geneva, Switzerland | Perceiving and producing human affective vocalizations |
| 03.11.2014 | Matthias Schurz, University of Salzburg, Austria | Fractionating Theory of Mind. |
| 27.10.2014 | | Lab Meeting |
| 20.10.2014 | Stefan R. Schweinberger, Jena | Initial Scheduling Meeting/Lab meeting |

Juliane Bräuer

Leipzig/Jena

Social Cognition in dogs and apes - a comparative approach

Comparative psychology refers to the study of the behavior, and mental processes of non-human animals, especially as these relate to the phylogenetic history, adaptive significance, and development of behavior. In my talk I will present a number of experimental studies on great apes and domestic dogs following this comparative approach. I am especially interested to investigate what cognitive skills different species have evolved in order to survive in their ecological niche. Apes are of course particularly interesting because they are our closest relatives but live in a different environment. Domestic dogs are especially interesting because of their special niche – the human environment. I will try to give a broad overview of different studies that I have done on social cognition, in particular on perspective taking, cooperation and mental time travel. I will also present studies that I am planning to do about the perception of odours, in that field I am especially curious about the critical comments of the audience.

Helene Kreysa & Luise Keßler

Jena

Pupil responses in attractiveness judgment tasks

Following on from previous work, we will present data from two new pupillometry studies. The first study re-used the attractive and unattractive face photos from Kreysa, Blatz & Schweinberger (2013; see also Kloth, Altmann & Schweinberger, 2011), but with a simulated gaze shift towards or away from the participant. In addition, each image was presented in brightness-controlled greyscale and preceded by a Fourier phase-randomised mask to avoid confounding the pupil signal. Despite the improved design, the results resemble our previous study, supporting the conclusion that an individual's pupil response to particular face depends not only on the attractiveness of this face, but also on the respective gender of both the face and the participant. The second study compared pupil responses to photos vs. paintings of faces and investigated the role of a judgment task: Participants rated the attractiveness and likeability of photographic stimuli, as well as the attractiveness and aesthetic qualities of painted portraits. Interestingly, pupil dilations occurred for negatively rated photos, but for positively rated portraits. The latter finding ties in with the idea of a u-shaped relationship between arousal and pupil dilation (Ho & Lu, 2014), but could also be explained through the different types of material and different judgment tasks. Both studies generate interesting further research questions and add to our understanding how pupil responses can contribute to our understanding of person perception.

Tobias Schuwerk

Ludwig-Maximilians-Universität, München

The neurocognitive basis of belief reasoning

Successful social interaction requires taking into account that another person's interpretation of the world may, but does not necessarily have to, correspond to our own perspective. Theory of Mind (ToM) reasoning enables us to efficiently switch between another's and one's own perspective. However, the neurocognitive basis of processing other people's mental states such

as beliefs (i.e. belief reasoning) that are incongruent with one's own perspective remains poorly understood. Although a set of brain regions that have consistently been related to ToM reasoning is labeled "ToM network", little is known about which brain region subserves which cognitive processes and how these processes are underpinned by the interplay of the involved brain regions. I will present a line of studies with the aim to specify the neurocognitive basis of belief reasoning, employing an adapted object transfer false belief task. Findings from a fMRI study combined with dynamic causal modelling highlight an inhibitory influence of the posterior medial prefrontal cortex (pmPFC) on the bilateral temporoparietal cortex during the computation of diverging beliefs. Further, a subsequent rTMS study supports the pmPFC's causal role in establishing a perspective difference. The findings will be discussed with respect to their implications for impaired ToM reasoning in psychiatric disorders, focusing on autism spectrum disorders and major depressive disorders.

Hideki Kawahara

Wakayama, Japan

Making speech tangible, flexible tools for speech communication research based on interference-free representations

A set of flexible research tools are being developed for investigating various aspects of human speech communications, based on a set of interference-free representations of periodic sounds. Recent advances in computational power of digital devices such as tablets and smart phones make these computation-intensive tools applicable to such devices. This talk starts from a brief introduction of physical aspects of speech production and underlying auditory information processing followed by interactive demonstrations of voice information visualization, speech parameter manipulation and resynthesis, and speech morphing. Discussions on prospective applications of these tools will be planned. Participation of audience to this discussion is highly appreciated.

Sascha Frühholz

Swiss Center for Affective Sciences, Geneva, Switzerland

Perceiving and producing human affective vocalizations

Human vocalizations convey socially important information during auditory communication. Affective cues in voices are one type of this social information, and they represent important cues, which speakers use to encode their emotions during the production of vocalizations, and from which listeners infer the emotional state of the speaker when perceiving this vocalizations. Concerning the latter, the primate and especially the human brain seems to have developed a distributed network of brain regions that is involved in the perceptual and neural decoding of affective vocalizations. Using new methodical approaches in neuroimaging and data analysis techniques we recently began to understand this network in more details in terms of a functional description of brain regions, but also in terms of neural network dynamics. Recent data from our group point to a distributed cortico-subcortical functional network that might transpose acoustic cues of voices into a cognitive representation of their affective meaning. Social communication usually involves a perception-action cycle such that vocalizations are often produced in response to perceived vocalizations, and this cycle is supposed to support the understanding of others' vocalizations in terms of embodied representations of perceived

affect. We therefore recently also investigated the neural network dynamics, which underlie the production of human affective vocalizations using neuroimaging. Neural data from two recent studies in human individuals point to a distributed brain network that largely overlaps with the neural network during perception. This recent data also critically extends recent models of vocal production derived from animal studies by specifically highlighting the importance of auditory feedback during the production of vocal output.

Matthias Schurz

Universität Salzburg

Fractionating Theory of Mind.

In this talk I want to present results from three related studies on brain activation for theory of mind (ToM) and visual perspective taking (VPT). In the first study (Schurz et al., 2014) we meta-analyzed imaging studies on ToM and formed individual task-groups based on stimuli and instructions. Overlap in brain activation between all task-groups was found in the mPFC and in bilateral posterior TPJ. This supports the idea of a core network for ToM that is activated whenever we are reasoning about mental states, irrespective of the task- and stimulus-formats (Mar, 2011). In addition, we found a number of task-related activation differences surrounding this core-network. For the TPJ, we found a dorsal/posterior versus ventral/anterior functional dissociation related to tasks presenting subjective mental perspectives versus more overt mental states that are implied by some behavior. This functional dissociation for the TPJ was reflected in different networks of task co-active areas found in our meta-analyses, which is consistent with recent works that ground the functional specialization of the TPJ in the connectivity-networks in which it is implicated (e.g., Mars et al., 2012). To clarify some of the neurocognitive processes linked to the functional dissociation in the TPJ, we performed a second meta-analysis (Schurz et al., 2013) which compared brain activation for visual perspective taking (VPT) and ToM (i.e. false belief reasoning). Meta-analytic results on VPT are complemented by results from a recent fMRI study (Schurz et al., in preparation) where we shed light on issues of spontaneity and domain-specificity of VPT, and how these factors explain previous inconsistencies between imaging findings on ToM and VPT.