

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

„General Psychology and Cognitive Neuroscience“

(Prof. Dr. Stefan R. Schweinberger)

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

Event Schedule

16.02.2006	Thomas Straube, Jena	Brain activation to threat-related stimuli
09.02.2006	Christian Dobel, Münster	Kognitive und neuronale Aspekte der kongenitalen Prosopagnosie
02.02.2006	Markus Kiefer, Ulm	Conceptual object representations in the sensory and motor systems
19.01.2006	Werner Sommer, Berlin	Language perception under task load
12.01.2006	Jan De Houwer, Gent	Problems with dividing the realm of psychological processes
08.12.2005	Carolin Ligges, Jena	Functional brain correlates of processing deficits in dyslexia
01.12.2005	Holger Wiese, Jena	False recognition
24.11.2005	Jürgen M. Kaufmann, Jena	Cross-modal priming in person recognition
03.11.2005	Stefan R. Schweinberger, Jena	General Psychology and Cognitive Neuroscience - Initial Meeting

Thomas Straube

University of Jena

Brain activation to threat-related stimuli

Phobic subjects show hypersensitivity to threat-related stimuli. The functional neuroanatomy that is associated with abnormal information processing and fear symptoms in phobics was investigated in several experiments by means of functional magnetic resonance imaging. The results of these experiments propose a critical role of the amygdala during rapid, but not sustained, processing of phobia-related stimuli. While the amygdala seems to be relevant for the automatic detection of threat, activation of areas such as the insula and anterior cingulate cortex (ACC) requires sufficient attentional resources. These areas might be associated with the detailed evaluation of danger and with subjective emotional experiences. A functional relevance of the insula and ACC for phobic symptoms is supported by the observation that successful cognitive-behavioral therapy strongly reduces hyperactivity within these brain regions. The talk describes and discusses these and other findings within the context of the distinction between automatic and controlled modi of threat processing.

Christian Dobel

Universität Münster

Kognitive and neuronale Aspekte der kongenitalen Prosopagnosie

Prosopagnosie ist eine Beeinträchtigung der Gesichterwahrnehmung, die in unterschiedlichen Facetten auftreten kann. Die Mehrzahl der in der Literatur vorgestellten Fälle leidet unter dieser Beeinträchtigung auf Grund von Hirnläsionen. In jüngerer Zeit mehren sich jedoch die Berichte, die nahe legen, dass diese Schwäche auch seit frühester Kindheit vorhanden sein kann und vermutlich angeboren ist (kongenitale Prosopagnosie). In einer diagnostischen Studie konnten wir zeigen, dass unsere Gruppe von Probanden gekennzeichnet ist durch intakte Gesichtererkennung, aber Defiziten beim Erkennen von spezifischen Personen. Andere Aspekte der Gesichterwahrnehmung, wie Erkennen von Alter, Geschlecht und Emotion sind weitestgehend unbeeinträchtigt. In einer Eyetracking Studie hatten Prosopagnostiker besonders beim Lernen von Gesichtern Schwierigkeiten, die sie nicht zeigten, wenn Objekte vorlagen oder wenn es sich um Gesichter mit vielen Merkmalen außerhalb des Augenbereichs handelte (Puppen). Beim Lernen und Wiedererkennen dieser Objekttypen widmeten die Prosopagnostiker im Vergleich zu Kontrollen diesen Merkmalen mehr Aufmerksamkeit, wobei die Kontrollen vorrangig Augen und Nasen von Gesichtern fixierten. In einer MEG Studie fanden wir, dass die M170 verzögert oder z.T. gar nicht erscheint. Diese Resultate deuten darauf hin, dass bei kongenitaler Prosopagnosie die „holistische“, konfigurale Verarbeitung von Gesichtern beeinträchtigt ist.

Markus Kiefer

University of Ulm, Section for Cognitive Electrophysiology

Conceptual object representations in the sensory and motor systems

It is debated whether conceptual knowledge is represented in a modality-specific or in an abstract format. Modality-specific theories of conceptual knowledge propose functionally and neuroanatomically distinct subsystems that store features derived from a particular sensory or motor channel. Evidence suggestive for modality-specific conceptual representations comes from neuroimaging studies, in which category-related brain activation was obtained in visual and motor areas for objects from natural (e.g., animals) and artifactual (e.g., tools) categories, respectively. It has been suggested that visual features are more relevant for representing natural objects whereas action-related features are more relevant for representing artifacts. We assessed the specificity of category-related brain activation as an index of modality-specific conceptual representations by investigating the effects of task demands, stimulus format and priming on category-related brain activity. The neurophysiological correlates of conceptual object representations for natural and artifactual categories were determined in space and time using event-related potentials (ERPs). Natural categories elicited greater activity in visual brain areas and artifacts greater activity in motor areas for both picture and word stimuli. This category-related activity was specifically reduced by repetition priming. It was strongest and started as early as 160 ms after stimulus onset when the conceptual features relevant for a given category were also task-relevant. Most notably, we observed comparable category-related brain activation in a training study with novel objects in which visual and action-related knowledge was acquired under controlled conditions. These results substantiate category-related brain activity as an index for conceptual processes and strengthen the notion of modality-specific conceptual representations.

Werner Sommer

Humboldt-Universität zu Berlin

Language perception under task load

Research is reviewed that shows language perception at the semantic level – as indicated by the N400 component in the event-related brain potential – to be severely delayed in time when additional tasks are performed concurrently. This interference can be explained by a central processing bottleneck or by attention shifts elicited by the additional tasks. Recent tests of the attention shift account indicate that language perception is unimpaired by exogenously triggered visuo-spatial attention shifts, lending further support to the bottleneck account of concurrent task effects.