

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

30.01.2012	Christoph Klein, Bangor/Freiburg	Intra-Subject Variability in Attention- Deficit Hyperactivity Disorder. Specifying the Phenotype and its Electrocortical Correlates
23.01.2012	Olaf Dimigen, Berlin	Saccade- and fixation-locked analysis of EEG data during active vision
16.01.2012	Marlena Itz, Jena	The influence of caricatured shape and texture on the acquisition of new face representations
19.12.2011	Verena Skuk, Jena	Familiar voice identification
12.12.2011	Tandra Ghose, Kaiserslautern	Recovering shape and metric object properties through spatiotemporal interpolation: What effects seeing an object that is never present in the stimulus?
05.12.2011	Markus F. Neumann, Jena	Identity averaging in famous face sets
28.11.2011	Christian Walther, Jena, Regensburg	Priming and adaptation in familiar face perception
21.11.2011	Christian Dobel, Münster	On the fast acquisition of novel information and its neural correlates
14.11.2011	Nicole Wolff, Jena	The own-gender bias in face recognition memory
07.11.2011	Viktoria Ritter, Frankfurt/Erfurt	Spieglein, Spieglein an der Wand - Wahrnehmungsprozesse bei Körperdysmorpher Störung
17.10.2011	Stefan R. Schwein- berger, Jena	Initial meeting

Olaf Dimigen

Humboldt-Universität zu Berlin

Saccade- and fixation-locked analysis of EEG data during active vision

Event-related brain potentials (ERPs) to visual stimuli are usually recorded while subjects maintain a steady fixation. This procedure has many advantages, but differs clearly from natural vision, which consists of an active sampling of the environment with two or three saccadic eye movements per second. An alternative approach to EEG analysis, summarized in the present talk, is to align the EEG not to stimulations, but to the onsets of saccades or eye fixations while subjects are allowed to move their eyes freely (saccade- and fixation-related potentials). This approach requires simultaneous high-resolution eye tracking and the handling of several data-analytical problems. To exemplify that it is nevertheless a useful addition to standard ERP methodology, I will present data from two lines of research: In the first line, we have investigated how visual-cortical potentials evoked by involuntary micro-saccades influence EEG data even in traditional EEG paradigms that require steady fixation. In a second line of research, we recorded fixation-related potentials during sentence reading to study the time course of visual word recognition under natural conditions. In particular, I will focus on the theoretically relevant question whether readers can extract the meaning of a parafoveal word before they fixate it.

Prof. Dr. Tandra Ghose

Technical University of Kaiserslautern

Recovering shape and metric object properties through spatiotemporal interpolation: What effects seeing an object that is never present in the stimulus?

Spatiotemporal interpolation (STI) refers to perception of complete objects from fragmentary information across gaps in both space and time. Palmer, Kellman & Shipley (2006) found that STI for both illusory and occluded objects produced performance advantages in a discrimination paradigm. In my talk I will describe this process followed by empirical studies that show that metric properties can be accurately perceived in representations obtained through STI. Then I will cover some of the recent studies from my lab where we study interaction between contour-based and surface-based processes for STI. Contour-based processes interpolate between visible edge fragments and surface-based processes interpolate regions across gaps in visual information based on similar surface properties, such as, color, texture, etc. They are complementary mechanisms that provide information for unit-formation from fragmentary visual information available for object-formation. The goal of this study is to investigate the nature of spatio-temporal object formation when contour and surface-based processes are either congruent or incongruent.

Christian Walther

Jena/Regensburg

Priming and adaptation in familiar face perception

Priming (P) and adaptation related aftereffects (AE) are two phenomena when recent perceptual experiences alter face perception. While AE are often reflected in contrastive perceptual biases, P typically leads to behavioural facilitation, and from previous studies we know that both P and AE modulate several components of the event-related potentials (ERPs). In order to disentangle the underlying neural mechanisms of P and AE, we induced both effects within the same subjects and a single paradigm. To this end we presented pairs of faces, where the first face (S1) was a famous face (identity A, B or C) or a Fourier-phase randomized face and the second face (S2) was drawn from morph continua between A and B. Behaviourally, *ambiguous* S2 faces exhibited contrastive AE and were more likely perceived as identity B following the presentation of A and vice versa. *Unambiguous* S2 faces, however, showed P, with significantly shorter response times for identity-congruent than for incongruent S1-S2-pairs. Analyses of the simultaneously recorded ERPs revealed clear categorical adaptation effects at around 155-205 ms post-stimulus onset. We also found an amplitude attenuation for identity-congruent S1-S2-pairs, related to P, starting at 90 ms, and pronounced at around 205-255 ms. Our data show that face AE and P are present simultaneously within a single paradigm, depending on the ambiguity of test faces. Our results suggest that (1) exclusive mechanisms, subserved by identical neuron populations, might underlie both AE and P, and that (2) object-category and identity processing might run parallel during face processing.

Christian Dobel

Institute for Biomagnetism und Biosignalanalysis, Westfälische Wilhelms-Universität Münster

On the fast acquisition of novel information and its neural correlates

I will present a series of studies in which we investigated the acquisition of novel information within very short periods of learning. Our neurolinguistic studies demonstrate that language related information can be acquired in adulthood in a way that novel stimuli become integrated in existing language networks like stimuli of one's native language. For this purpose, we targeted the N400 component as an index for the effectiveness of the interplay between (novel) words and semantic representations. We demonstrated for different word classes that newly acquired words possess the capability to evoke brain responses very similar to native words. Using even shorter learning experiences, spanning only a few seconds, we showed that combining faces with olfactory stimulation (malodors or pheromones) led to enhanced processing of faces as seen in biologically motivated stimuli. Such changes in processing were seen as soon as 50 ms in regions associated with emotion processing. I will show in the last part of my talk how we currently use these approaches to understand processing and learning of neutral and emotional information in clinical research settings.

Viktoria Ritter

Frankfurt

Spieglein, Spieglein an der Wand - Wahrnehmungsprozesse bei Körperdysmorpher Störung

Die Körperdysmorphie Störung kennzeichnet die exzessive Beschäftigung mit einem imaginierten oder allenfalls minimal erkennbaren Makel in der äußeren Erscheinung. Die häufigsten Beschwerden beziehen sich auf einen Makel im Gesicht, hier vor allem Asymmetrien, Größe oder die Form bestimmter Gesichtsteile. Kognitive Erklärungsmodelle postulieren bei Personen mit KDS eine fehlerhafte Wahrnehmung und Verarbeitung von Gesichtsstimuli. Kognitive Faktoren wie z.B. eine selektive Aufmerksamkeit für Details, eine verbesserte visuelle Diskriminationsfähigkeit ästhetischer Abweichungen und die negative Bewertung des „hässlichen“ Defekts spielen bei der Entstehung und Aufrechterhaltung der Störung eine wesentliche Rolle. Es bleibt bislang unklar, welche Mechanismen der fehlerhaften Gesichterwahrnehmung zugrunde liegen. Neuropsychologische und funktionelle MRI-Studien verweisen auf einen detailorientierten analytischen Wahrnehmungsstil. Der Vortrag wird sowohl Überblick als auch Ausblick geben auf bisherige - und künftige - Forschungsbemühungen.