

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

**„General Psychology and Cognitive Neuroscience“**

(Prof. Dr. Stefan R. Schweinberger)

Summer Term 2008

Place: Am Steiger 3/EG, SR 009

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

Event Schedule

14.07.2008	Tamara Rakic, Jena	<a href="#">To see or to hear - that is the question! Influences of visual and auditory cues on social categorization</a>
07.07.2008	Grit Herzmann, Berlin	<a href="#">Individual differences in face cognition: Using ERPs to determine relationships between neurocognitive and behavioral indicators</a>
30.06.2008	Nadine Kloth, Jena	<a href="#">Adaptation in face perception</a>
23.06.2008	Eva-Maria Pfütze, Bochum	<a href="#">Traurige Gesichter: Ein besonderer Reiz für Depressive?</a>
16.06.2008	Jürgen M. Kaufmann, Jena	<a href="#">Faces you don't forget: ERP correlates of learning caricatures.</a>
02.06.2008	Matthias Gondan, Regensburg	<a href="#">Integration and Segregation of auditory-visual signals</a>
26.05.2008	Julia Föcker, Hamburg	Integration of human faces and voices: An event-related potential study of person identity priming
19.05.2008	Henning Holle, Jena	Neural correlates of the integration of gestures and speech
06.05.2008	Stefan R. Schweinberger, Jena	<a href="#">Die Wahrnehmung vertrauter und unbekannter Menschen</a>

**Tamara Rakic**

*Jena*

**To see or to hear - that is the question! Influences of visual and auditory cues on social categorization**

“Categorical thinking is a natural and inevitable tendency of the human mind” (Allport, 1954). The starting point for this research project was the question how language in general and pronunciation in particular affect the process of social categorization. In the first two studies, we wanted to see how people categorize target persons by separately testing the effects of auditory and visual cues on social categorization. The third study combined the first two, in order to directly compare the influences of visual and auditory cues. Study 1 was designed as a

replication of the original Taylor et al. (1978) “Who Said What” paradigm, that can be used to indirectly assess the social categorisation of given target persons. I used pictures of typical Italian and German looking men. The results showed that in the matching task (i.e. deciding which target person made which statement) participants tended to confuse two Italian (German) looking men more often than Italians with Germans. This type of confusion was a clear indication of category activation through visual cues. Study 2 tested the role of language pronunciation on social categorization. Participants were presented with target persons speaking accent free German vs. German with an Italian accent. In this case results showed clear activation of a social category based on the auditory cues. Study 3 combined the first two studies, resulting in crossed categories, e.g. Italian (German) looking men speaking German without (with) Italian accent. In this way it was possible to directly confront the two cues (visual and auditory) and see which one is more important in the process of social categorization. Results showed much stronger influence of accent (auditory cues) than of looks (visual cues) on social categorization. In sum, results show that not only the look but also the accent of a person plays an important role in how that person is socially categorized.

**Grit Herzmann**

*Berlin*

### **Individual differences in face cognition: Using ERPs to determine relationships between neurocognitive and behavioral indicators**

Individual differences in perceiving, learning, and recognizing faces swiftly and accurately were shown on the behavioral and neural level but were rarely related to one another. On the behavioral level, three component abilities of face cognition were established: face perception, face memory, and the speed of face cognition. On the neurocognitive level, event-related brain potentials (ERPs) were used to examine the neurocognitive underpinnings of individual differences in face cognition by determining relationships between neural processing of faces and face cognition abilities. P100, N170, the so called difference due to memory (Dm) as well as early and late repetition effects (ERE and LRE) were measured in 85 participants in addition to face cognition abilities. ERP components showed high psychometric quality, and were thus used in structural equation models to investigate their contribution to the component abilities of face cognition. In contrast to processes of early vision (P100), the neural effort of structural face encoding (N170 amplitude), and memory encoding of faces (Dm), individual differences in the time course of structural encoding of a face (N170 latency), the re-activation of both stored facial structures (ERE) and person-related knowledge (LRE) accounted for variance in face cognition performance. Thus, faceselective regions in the fusiform gyrus together with temporal brain areas seem to play an important role for normal variations in face cognition. The obtained relationships however were small to moderate indicating that the network of mental functions interacting to successfully perceive, learn, and recognize faces can not be reduced to a few neural subprocesses.

**Nadine Kloth**

*University of Jena*

## Adaptation in face perception

Whereas the investigation of perceptual aftereffects has a very long tradition in low-level vision research, the report and analysis of face-related high-level aftereffects is only a relatively recent line of research. Webster et al. (2004) first showed a visual aftereffect on the perception of face gender when finding that adaptation to male faces biased the classification of androgynous faces towards female gender. Similar adaptation effects have also been observed for one of the most important visual social signals: Human eye gaze. Jenkins et al. (2006) found that adaptation to gaze into one direction virtually eliminated participants' ability to perceive smaller gaze deviations into the same direction. In a series of four experiments we further analysed these aftereffects. In Experiment 1 and 2 we investigated the neural correlates of eye gaze adaptation and found that direction-specific ERP-modulations to test faces were found no earlier than ~250-350 ms. In Experiment 3 we determined the temporal characteristics of eye gaze adaptation effects and found the aftereffect to be surprisingly long lasting while its decay followed an exponential decay function. Finally, we analysed the neural correlates of gender adaptation effects (Experiment 4), applying methodological improvements developed in Experiments 1 and 2, and extended the existing knowledge about ERP-correlates of gender adaptation.

**Eva-Maria Pfütze**

*LWL-Universitätsklinik Bochum der Ruhr-Universität Bochum*

## Traurige Gesichter: Ein besonderer Reiz für Depressive?

Ausgehend von verschiedenen Depressions- und Emotionstheorien wurde überprüft, ob die Wiedererkennungslleistung depressiver Patienten vom emotionalen Gehalt der zu merkenden Gesichter abhängt. Dazu sollten sich 16 depressive Patienten und 16 gesunde Kontrollprobanden in einer Lernphase traurig oder glücklich gezeigte Personen einprägen, die sie glücklich, neutral und traurig dargeboten in der anschließenden Testphase wiedererkennen sollten. Die Aufgabe in der Testphase bestand darin, durch Tastendruck zu signalisieren, ob es sich um eine neues oder ein zuvor gelerntes Gesicht handelte. Die gesunden Kontrollpersonen erinnerten sich besser an glücklich gelernte als an traurig gelernte Gesichter. In der Gruppe der depressiven Patienten zeigte sich tendenziell das umgekehrte Bild. Gruppenunabhängig wurden die in der Testphase glücklich gezeigten Gesichter langsamer erkannt als die neutral oder traurig gezeigten, unabhängig davon, ob sie zuvor traurig oder glücklich gelernt wurden. In einer zu Kontrollzwecken eingesetzten Emotionseinschätzungsaufgabe zeigte sich außerdem, dass die depressiven Patienten zu einer etwas traurigeren Einschätzung der gezeigten Gesichtsausdrücke neigten. Durch den Nachweis, dass das Gedächtnis depressiver Patienten bei depressionskongruenten Inhalten (in diesem Fall traurige Gesichter) nahezu uneingeschränkt funktioniert, könnten erstens Sorgen depressiver Patienten hinsichtlich ihrer kognitiven Leistungsfähigkeit entkräftet und zukünftig eventuell eine bessere Abgrenzung depressiver Störungen von dementiellen Erkrankungen erfolgen.

**Jürgen M. Kaufmann**

*Jena*

## **Faces you don't forget: ERP correlates of learning caricatures.**

Recent research suggests that implicit learning of caricatured faces results in enhanced amplitudes of N170 and N250. These results have been attributed to more efficient face learning from caricatures (Kaufmann & Schweinberger, in revision). In this talk I will present ERP data resulting from explicit learning of caricatured and veridical previously unfamiliar faces.

**Matthias Gondan**

*Regensburg*

## **Integration and Segregation of auditory-visual signals**

In a typical redundant target experiment, participants receive either unimodal or bimodal redundant signals from different modalities. A well known finding is that responses for bimodal stimuli are substantially faster than for unimodal stimuli (redundant signals effect, RSE). I present a stochastic model of the RSE (diffusion superposition model, DSM, Schwarz, 1994, 2006) which allows nearly perfect prediction of the mean and variance of response times in auditory-visual stimuli with different onset asynchrony. According to the DSM, the basic integration mechanism is a linear superposition of neural signals. In three experiments, the basic RSE paradigm was extended to include simple, go/nogo, and choice responses (Exp. 1), spatial attention (Exp. 2), and judgements of temporal order (Exp. 3). In all experiments, the model prediction was excellent, underlining the role of additive neural interactions in audiovisual integration. Integration of human faces and voices: An event-related potential study of person identity priming Julia Föcker, Anna Kusmirek & Brigitte Röder The goal of the present study was to investigate auditory and audio-visual person recognition. In the unimodal condition, two successive voices (S1-S2) of the same or of two different persons were presented. In the crossmodal condition, the S1 consisted of a human face instead. Participants had to decide whether the S2 was from an old or a young person. Reaction times to the S2 were shorter when stimuli were person-congruent, both in the unimodal and crossmodal condition. ERPs recorded to the person-incongruent S2 revealed an enhanced negativity at early (N100) and later processing stages (250-450 ms) in the crossmodal condition. The second negative effect was seen in the unimodal condition as well. These results suggest that auditory and visual features characterizing a person interact at early perceptual and later semantic processing stages.

**Stefan R. Schweinberger**

*University of Jena*

## **Die Wahrnehmung vertrauter und unbekannter Menschen**

Die effiziente Analyse und Repräsentation personengebundener Informationen ist eine der anspruchsvollsten und wichtigsten Aufgaben der sozialen Wahrnehmung des Menschen. Eine effiziente Wahrnehmung *unbekannter* Personen gelingt hier vor allem durch Kategorisierung (z.B. alt vs. jung, männlich vs. weiblich, eigene vs. andere ethnische Zugehörigkeit etc.). *Vertraute* Personen werden demgegenüber nicht kategorisiert, sondern unwillkürlich erkannt und individuell verarbeitet. Neue Untersuchungen lassen vermuten, dass mentale Repräsen-

tationen vertrauter Personen „sinlich“ multimodal sind, also beispielsweise Informationen zum Gesicht und der Stimme der vertrauten Person integrieren. Störungen der Personenwahrnehmung verdeutlichen eindrucksvoll, dass jeweils unabhängige Gehirn-mechanismen einerseits für das kognitive Erkennen einer persönlich vertrauten Person, und andererseits für das mit dem Erkennen normalerweise verbundene affektive Vertrautheits-gefühl verantwortlich sind.