

PERSON PERCEPTION
WAHRNEHMUNG VON PERSONEN

DFG RESEARCH UNIT | FSU JENA - GERMANY



Person Perception Preserved and Impaired
Neuroscientific, Clinical, Experimental and
Computational Evidence

Programme and Abstracts for the 7th PPRU
Workshop

April 26-27, 2013

Place: Großer Rosensaal, Fürstengraben 27
Friedrich Schiller University Jena



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Atena Sazegar, Claudia Menzel, Sven Kachel, Jessika Golle, Stefanie Hechler, Franz J. Neyer, Romi Zäske, Kathrin Wiese, Svanlje Puls, Pascal Belin, Claudia Schulz, Salvatore Campanella, Isabelle Klickenberg, Stefan Schweinberger, Hideki Kawahara, Verena Schulz, Gyula Kovács, Stella Faerber, Christian Dobel, Mareike Grotheer, Helene Kreysa, Adrian P. Simpson, Nadine Schimpf, Christoph Redies, Gregor Hayn-Leichsenring, María-Antonieta Bobes León, Holger Wiese, Jessica Komes, Joachim Denzler, Christian Walther, Wolfgang H. R. Miltner, Kristin Oehler, Carolin S. Altmann, Jürgen M. Kaufmann

Person Perception Preserved and Impaired: Neuroscientific, Clinical, Experimental and Computational Evidence

April 26-27, 2013 - Place: Großer Rosensaal, Fürstengraben 27

EVENT SCHEDULE

FRIDAY, APRIL 26, 2013

1 ST SESSION:		DISORDERS OF PERSON PERCEPTION
09.00	– 09.40	Dissociation of neural circuitry for conscious and unconscious processing of personally significant faces <i>Maria A. Bobes-Leon (Cuban Neurosciences Center, Havana, Cuba)</i>
09.40	– 10.20	Patients with facial palsy: interaction of motion and emotion <i>Orlando Guntinas-Lichius (University Hospital Jena)</i>
10.20	– 10.40	Coffee Break
2 ND SESSION:		FACE PERCEPTION AND SOCIAL ANXIETY
10.40	– 11.20	The Processing of LSF-Information in Social Anxiety <i>Oliver Langner (University of Jena)</i>
11.20	– 12.00	Automatic threat processing in Social Anxiety Disorder? <i>Martin Mothes-Lasch (University of Münster)</i>
12.00	– 13.30	Lunch Break
3 RD SESSION:		AUDITORY AND AUDIOVISUAL PERSON PERCEPTION
13.30	– 14.10	Towards emotional cross-modal designs in ERP studies on psychiatric populations <i>Salvatore Campanella (Vrije Universiteit Brussel, Belgium)</i>
14.10	– 14.50	Norm-based coding of voice identity in human auditory cortex <i>Pascal Belin (University of Glasgow)</i>
14.50	– 15.10	Coffee Break



4TH SESSION: COMPUTATIONAL APPROACHES TO PERSON PERCEPTION

- 15.10 – 15.50 New dimensions of voice attributes modification for exploratory research on person related information
Hideki Kawahara (Wakayama University, Japan)
- 15.50 – 16.30 FACS classification using AAM with applications in facial paralysis analysis
Joachim Denzler (University of Jena)

16.30 – 18.30 POSTER SESSION

SATURDAY, APRIL 27, 2013

5TH SESSION: NEUROIMAGING AND NEUROPHYSIOLOGY OF FACE PERCEPTION

- 09.00 – 09.40 Age-related changes in memory for faces and familiar names
Jessica Komes (University of Jena)
- 09.40 – 10.20 Repetition probability effects in the temporal cortex: another face specific phenomenon?
Gyula Kovács (Budapest University of Technology, University of Jena)
- 10.20 – 10.40 Coffee Break

6TH SESSION: EYE MOVEMENTS AND EVENT-RELATED POTENTIALS IN FACE AND BODY PERCEPTION

- 10.40 – 11.20 How Men and Women Scrutinize the Body of the Opposite Sex and How Attention Towards Specific Body Parts Becomes Affected in Females Striving for Thinness
Wolfgang H.R. Miltner (University of Jena)
- 11.20 – 12.00 Neurophysiological correlates of face perception
Stefan R. Schweinberger (University of Jena)

12.00 END OF THE WORKSHOP'S PUBLIC PART

13.30 – 17.30 PERSON PERCEPTION RESEARCH UNIT MEETING (INTERNAL)



ABSTRACTS – ORAL PRESENTATIONS

1 DISSOCIATION OF NEURAL CIRCUITRY FOR CONSCIOUS AND UNCONSCIOUS PROCESSING OF PERSONALLY SIGNIFICANT FACES

MARÍA ANTONIETA BOBES-LEÓN

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Face recognition models postulate two independent streams of processing, one for personal semantic information and another for affective reaction to this identity. This idea comes mainly from double dissociation between conscious identity recognition (overt) and unconscious emotional response (covert) to familiar faces present in prosopagnosia and Capgras syndrome. However, the neural circuitry underlying overt and covert face recognition is still barely known. Two pathways, one (ventral) linking the Occipital and Fusiform Face Areas (OFA/FFA) and Anterior-Inferior Temporal (AIT) cortex and another (dorsal) linking OFA/FFA with more anterior areas of the emotional system, such as insula and orbitofrontal cortex could be candidates for underlying these processes. Here we use multimodal neuroimaging (VBM, fMRI and DTI tractography) to explore the integrity of the neural pathways underlying face processing system both in typical observers and in two patients: one case with prosopagnosia (showing signs of covert recognition), and another patient exhibiting Capgras syndrome, in whom the affective responses to consciously recognised familiar faces was absent. In the prosopagnosic patient, the ventral path was impaired, whereas the dorsal path to pre-frontal regions was preserved. The opposite pattern was present in the Capgras patient. These dissociated pathways could respectively support conscious and unconscious processes in these patients and possibly in normal face recognition. Finally, multivoxel pattern analysis (MVPA) was used in typical observers to decode emotional valences and familiarity in target areas of the two pathways. Valence was decoded accurately in areas of the posited covert pathway, whereas familiarity was decode accurately in areas of the posited overt pathway. These results provided neurophysiologic support for a dual path model of face processing.

2 PATIENTS WITH FACIAL PALSY: INTERACTION OF MOTION AND EMOTION

ORLANDO GUNTINAS-LICHIUS

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Facial palsy is not only a movement disorder. It can lead to an emotional and communicative disorder in chronic stage but also in some patients already during the acute phase of the disease. Nonetheless, this non-motoric component of facial palsy is often neglected and so far the armamentarium to explore this part of facial palsy is very limited. Special treatment strategies are not yet developed. The lecture will illuminate the current knowledge on the disturbed interaction between impaired facial movement and emotional processing and communicative skills of the patient. The ability to express emotions seems to be reduced. Moreover, the patients feel to be perceived negatively. In fact, most of the expressions of patients with facial palsy are associated with a negative affect even when the patients are smiling. Patients with facial palsy react with negative stress, anxiety and depression. The patients avoid social contacts. The lecture will end with an appeal to the audience to develop diagnostics and therapy concepts helping to treat the emotional context of facial palsy.



3 THE PROCESSING OF LSF-INFORMATION IN SOCIAL ANXIETY

OLIVER LANGNER

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Social anxiety is marked by persistent fears to be negatively evaluated by others, and socially anxious individuals have regularly been reported to be particularly sensitive to potentially threatening or rejecting social information. One example of this sensitivity is an often-reported visual attentional bias for faces with threatening (e.g., angry) expressions. Here, I will report a series of studies demonstrating that socially anxious individuals differ already in how they process low-level visual information of faces. In particular, we found anxious individuals to utilise low spatial frequency (LSF) information of faces more than non-anxious individuals. Further, I present initial evidence that attentional biases in anxiety may be driven primarily by LSF information.

4 AUTOMATIC THREAT PROCESSING IN SOCIAL ANXIETY DISORDER?

MARTIN MOTHES-LASCH, CLAUDIA SCHULZ & THOMAS STRAUBE

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Individuals suffering from social anxiety disorder (SAD) are excessively concerned about being negatively evaluated by others. Etiological and cognitive models suggest that automatic information processing biases resulting in hypersensitivity to signals of social threat (such as faces and voices) and avoidance of these stimuli are central for the development and maintenance of the disorder. In previous studies we have shown limits of automatic neural processing of threat-related stimuli in healthy participants. Thus, the question about the nature and extent of neural automatic processes in SAD arises and not at least whether automatic brain responses can be modified by successful psychotherapy. In my talk I will discuss current evidence and give suggestions for future studies.

5 TOWARDS EMOTIONAL CROSS-MODAL DESIGNS IN ERP STUDIES ON PSYCHIATRIC POPULATIONS

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The classical way for using event-related potentials (ERP) oddball task is to focus on one single sensory modality, i.e. visual or auditory. With this method, in healthy individuals, the P300 component, which is associated with a decisional "response-related stage", indexing diverse functions such as memory updating or cognitive closure mechanisms, occurs following the presentation of the target stimulus, and is of maximum amplitude over the parietal area with a peak latency of about 300-350 ms when auditory stimuli are used, and 350-450 ms in the visual modality. This procedure has proved to be useful to show P300 abnormalities in clinical psychiatric populations. However, although differences in P300 amplitude and latency can indicate the severity of a clinical state and its possible evolution, its clinical value as a diagnostic index is low. We will present some recent data suggesting that oddball designs using emotional and cross-modal stimulations may display more sensitive P300 differences.



6 NORM-BASED CODING OF VOICE IN HUMAN AUDITORY CORTEX

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Human listeners possess a remarkable ability to distinguish and individuate different voices, exploiting minute inter-individual variations around a generic acoustical structure. The human temporal lobe is known to contain 'temporal voice areas' (TVA) which preferentially respond to vocal sounds as well as areas involved in processing speaker identity cues, yet how different voices are coded within these areas is unclear. Here we show that voices are represented in human auditory cortex as a function of their distance to a gender-specific voice prototype. Using fMRI in normal adult listeners, we measured activity in the TVA during auditory stimulation with a large number of voices from different speakers. Each voice stimulus was represented as a point in a 3-dimensional 'voice space' (dimensions: f₀; formant dispersion; harmonic-to-noise ratio) and its 'distance-to-mean' defined as the Euclidean distance to a gender-specific voice prototype (the morphing-generated average of all same-gender voice). Across three experiments, we find that activity in a localised region of right mid-STS shows a strong correlation with distance-to-mean. The result was observed both for simple syllables (Exp 1, 3) and for more complex words (Exp 2), and is not simply a consequence of either short-term (trial-to-trial) or medium-term (block-level) neuronal adaptation during scanning. This result provides important new insight in the neuronal representation of individual exemplars of auditory categories and highlight similarities with coding strategies involved in face processing.

7 NEW DIMENSIONS OF VOICE ATTRIBUTES MODIFICATION FOR EXPLORATORY RESEARCH ON PERSON RELATED INFORMATION

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Several new physical attributes are introduced to manipulate voice identity in addition to well know factors, such as F₀, vocal tract length and speaking rate. They are rapid variations of F₀ and spectral envelope around 70Hz in terms of modulation frequency. A new F₀ extractor based on low-pass filtered waveform symmetry enabled efficient analyses of these new attributes. The talk starts from a brief introduction to an exploratory research tool STRAIGHT and morphing followed by discussion on the vocal tract length information embedded in speech sounds and its relation to personal identity. Finally, an on-going research based on the new attributes is introduced.



8 FACS CLASSIFICATION USING AAM WITH APPLICATIONS IN FACIAL PARALYSIS ANALYSIS

JOACHIM DENZLER

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The Facial Action Coding System describes a set of 44 ordinal scaled action units (AUs), which are used to create facial expressions. In medical applications such as the therapy of a facial paralysis, automatically finding the activation intensity of each AU is of main interest. In such a medical application context, existing works feature several drawback. For instance, the majority of approaches concentrate on analyzing the presence or absence of AUs instead of finding their underlying activation levels. In this talk we present a new approach based on so called Active Appearance Models (AAMs). AAMs are well known from their application in facial feature analysis. While all current AAM-based studies rely on derived redundant high-dimensional features, we propose to use a compact low-dimensional representation. Exhaustive experiments using three widely-used datasets and several prediction methods demonstrate the benefits of our approach. While retaining the state-of-the-art recognition accuracy, our approach is substantially faster and thus perfectly suited for analyzing large-scale databases. We also present first qualitative results in the analysis of facial paralysis, for which our method could be the basis for an online therapy system in the future.

9 AGE-RELATED CHANGES IN MEMORY FOR FACES AND FAMILIAR NAMES

JESSICA KOMES

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The talk entails two strands of research: The first strand addresses differential effects of aging on face memory, by assessing memory biases (own-race bias, ORB; own-age bias, OAB) in various subgroups of older adults. The second strand highlights the role of fluency on source memory for familiar names in both young and older adults. In study 1, event-related brain potential (ERP) correlates of the ORB in groups of high- and low performing older adults were assessed to investigate potential dedifferentiation in face processing with older age. Our results suggest a neural mechanism compensating for age-related decline in high-performers, and demonstrate that even a less efficient face processing system can exhibit preserved expertise-related specialization towards own-race faces. Study 2 systematically tested for the influence of daily-life contact on the occurrence of an OAB and underlying neural mechanisms in the aged, since the effect has been less reliably found in older as opposed to younger adults. The results reveal that differences in daily-life contact account for discrepant results in previous studies regarding the emergence of an OAB in older participants. The second strand taps into a current debate on how fluency-based processes can contribute to source memory. We tested for effects of long-term repetition priming on source decisions for familiar names. Across a series of experiments, we consistently identified an N400-like ERP effect differentiating between sources in both younger and older adults. Importantly, this effect occurred for correct source decisions only. It presumably indexes a fluency mechanism arising from within-modality priming, informing correct source decisions.

**10 REPETITION PROBABILITY EFFECTS IN THE TEMPORAL CORTEX: ANOTHER FACE SPECIFIC PHENOMENON?**

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One of the most exciting cognitive neuroscience findings of the last years was that the magnitude of neural Repetition Suppression (RS) is not entirely due to bottom-up processes but it can be modified by top-down effects, such as stimulation probability, prediction or expectation (Summerfield et al. 2008; Larsson and Smith, 2011; Kovács et al, 2012). However all these previous studies used human faces as stimuli. Furthermore, the issue of category specificity is supported by a macaque single cell recording experiment (Kaliukhovich & Vogels, 2012) that found no proof of such top-down effects on the RS of inferior temporal neural activation for everyday objects. In the present talk I will review the available results from both the acoustic and visual modalities regarding the possible expectation effects of RS in various EEG, MEG and fMRI paradigms for various stimulus categories and will discuss the possible role of learning in determining the neural mechanisms of RS.

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11 HOW MEN AND WOMEN SCRUTINIZE THE BODY OF THE OPPOSITE SEX AND HOW ATTENTION TOWARDS SPECIFIC BODY PARTS BECOMES AFFECTED IN FEMALES STRIVING FOR THINNESSWOLFGANG H.R. MILTNER¹, JOHANNES HEWIG², SPRING COOPER³, RALF H. TRIPPE¹, HOLGER HECHT¹ & THOMAS STRAUBE⁴

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The goal of the present two studies was to assess gender differences in gaze patterns while looking at the body of men and women and to examine differences between participants scoring high versus low on a drive for thinness construct concerning their visual attention toward specific body parts. In study one, participants were exposed to 30 pictures of 15 male and 15 female models in casual clothing. The individual scan paths were recorded using an eye-tracker. The results show that both male and female observers primarily gaze at people's face. Only after this initial face-scan, men look significantly earlier and longer at women's breasts, while women look earlier at men's legs. These observations uncover important aspects of the pattern of the human gaze at others and particularly reveal important gender differences. In study two, we hypothesised that participants scoring high on the Drive for Thinness Subscale of questionnaire assessing Eating Disorders would show increased attention to body regions, which are important in the assessment of body weight and thinness like the waist, hips, legs, and arms. We examined eye-gaze behaviour of a nonclinical sample of 51 male and female college students with an eye-tracking system as they were looking at pictures of young, attractive males and females. In addition, we used the Eating Disorder Inventory to measure drive for thinness. Participants with increased scores on the drive for thinness subscale looked longer and more often to the waist, hips, legs, and arms as compared with low scorers. In addition, they showed decreased attention toward the head or face. The results indicate that participants scoring high on drive for thinness show an attentional bias toward body regions that are associated with assessing changes in weight. However, they neglected the face, which is the most important source of social and affective information when looking at others.



12 NEUROPHYSIOLOGICAL CORRELATES OF FACE PERCEPTION

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Face recognition can be conceived as a complex facility, requiring the orchestrated activity of multiple neurocognitive subroutines. Here I will argue that a substantial part of past electrophysiological research has seen a strong focus on the N170, at the expense of other face-sensitive ERP components including those that were shown to relate more specifically to individual face recognition. I will discuss current evidence for multiple face-sensitive ERPs which suggests that (a) the N170 is related to face detection and structural encoding, but not recognition, (b) the occipitotemporal P200 is sensitive to second-order spatial configuration, and may index processes related to unfamiliar face learning and population expertise, (c) the posterior temporal N250(r) is highly sensitive to face familiarity and relates to individual face recognition, and (d) a centroparietal N400 systematically relates to domain-independent access of semantic information about people. I will argue that because other aspects of face perception (e.g., gender, age, attractiveness, eye gaze, emotional expression, trustworthiness etc.) also depend on multiple neurocognitive subroutines, future progress in electrophysiological research necessitates appreciating a range of ERP components and other neurophysiological markers that relate to different functional components of face perception.



ABSTRACTS – POSTERS

1 SCENT OF A MAN – CHEMOSIGNALS ENHANCE THE PROCESSING OF MALE FACES

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Chemosignals are defined as body odors which serve as social signals between individuals, yet their existence in humans is still under debate. We hypothesised that chemosignal-associated social stimuli draw emotional attention, which might lead to prioritised processing of these stimuli reflected by increased brain responses. In a MultiCS-conditioning study with 20 females, we paired 78 neutral male faces with either a glycol dissolved metabolite of testosterone ($\Delta 4,16$ -androstadien-3-one; AND), glycol dissolved vanillin or the pure solvent glycol and measured neural activity by magnetoencephalography during re-exposure to faces only. We showed increased visual evoked fields (VEFs) for AND but not glycol-associated faces. Timing (130-290 ms) and field topography of the VEFs corresponded to the Early Posterior Negativity, an event-related field/potential component associated with amplified emotional attention towards affective pictorial stimuli. Inverse modelling revealed sources localised in brain structures processing visual social stimuli and emotion (right temporo-parietal junction and left orbito-frontal cortex). Convergent to the interpretation of an enhanced emotional connotation, AND-associated faces also received superior pleasantness ratings. Both neurophysiological and behavioural effects emerged although participants could not explicitly identify the contingency of the face-odor pairings. Our data demonstrate that the role of chemical cues as social signals in humans might have hitherto been underestimated.

2 NOT ONLY THE FACE MATTERS: INFLUENCE OF RANDOM NOISE BACKGROUNDS WITH DIFFERENT STATISTICAL PROPERTIES ON FACE ATTRACTIVENESS

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The human visual system is adapted to processing the scale-invariant higher-order statistics of complex natural scenes efficiently. Previous studies found that man-made aesthetic images, such as visual art, art portraits and cartoons, share scale-invariant properties with natural scenes. Here, we investigated the influence of different random noise backgrounds on the subjective evaluation of face attractiveness. To this aim, we presented face images in front of backgrounds with five different slopes of the log-log Fourier power spectrum (slope 0, -1, -2, -3 and -4), in which high or low spatial frequencies were enhanced or attenuated, respectively. A slope of -2 indicates scale invariance. We found a significant quadratic influence of the background slope on the attractiveness ratings. Participants rated the same faces in front of an approximately scale-invariant background as more attractive than on the other backgrounds. This result shows that perceived attractiveness of faces can be modulated by higher-order image statistics that may be processed at early stages of visual perception. This modulation was observed even if the image of the face itself was not modified and, consequently, evolutionary adapted indicators of attractiveness, such as symmetry, averageness and secondary sexual characteristics, remained constant.

(Abstract submitted at ECVF Bremen 2013)



3 GENDER EFFECTS ON ATTENTION TO EMOTIONAL FACES

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In stereotype literature, it is typically found that gender categories are associated with specific emotions, e.g. anger is easier ascribed to males than females, whereas fear is easier ascribed to females than to males. Here, we tested whether these gender-emotion associations also have an impact on the allocation of spatial attention. Therefore, we conducted a double-cueing experiment using pictures of neutral and emotional male and female faces as task-irrelevant cues. We, indeed, found a significant interaction between cue gender and cue emotion: For female pictures, angry faces were more strongly attended than neutral ones, while the opposite was true for male pictures. Further, this pattern was in trend reversed for fearful faces, with fearful male faces capturing attention and fearful female faces systematically not capturing attention. Several explanations are likely.

4 PERCEIVING VOCAL AGE AND GENDER: AN ADAPTATION APPROACH

ROMI ZÄSKE¹, VERENA G. SKUK¹, JÜRGEN M. KAUFMANN^{1,2}, & STEFAN R. SCHWEINBERGER^{1,2}*DFG Research Unit Person Perception, Friedrich Schiller University, Jena, Germany**And Department of General Psychology and Cognitive Neuroscience, Friedrich Schiller University, Jena, Germany*■ romi.zaeske@uni-jena.de

Aftereffects of adaptation have revealed both independent and interactive coding of facial signals including identity and expression or gender and age. By contrast, interactive processing of non-linguistic features in *voices* has rarely been investigated. Here we studied bidirectional cross-categorical aftereffects of adaptation to vocal age and gender. Prolonged exposure to young (~20 yrs) or old (~70 yrs) male or female voices biased perception of subsequent test voices away from the adapting age (Exp. 1) and the adapting gender (Exp. 2). Relative to gender-congruent adaptor-test pairings, vocal age aftereffects (VAAEs) were reduced but remained significant, when voice gender changed between adaptation and test. This suggests that the VAAE relies on both gender-specific and gender-independent age representations for male and female voices. By contrast, voice gender aftereffects (VGAEs) were not modulated by age-congruency of adaptor and test voices (Exp. 2). Instead, young voice adaptors generally induced larger VGAEs than old voice adaptors. This suggests that young voices are particularly efficient gender adaptors, likely reflecting more pronounced sexual dimorphism in these voices. In sum, our findings demonstrate how high-level processing of vocal age and gender are partially intertwined.



5 EFFECTS OF BIMODAL ADAPTATION ON VOICE GENDER PERCEPTION

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Repeated exposure to male voices biases the perception of subsequent androgynous voices towards female and vice-versa. This contrastive voice gender aftereffect (VGAE) was attributed to high-level perceptual adaptation. However, it is unclear whether the VGAE is purely acoustically-based or driven by the perception of adaptors as male or female. Here we combined videos of articulating male and female face adaptors (F♂ and F♀) with either gender-congruent voices (V♂ and V♀), or perceptually androgynous voices (V?) as determined individually. Voice gender classification was perfect for gender-congruent adaptors (F♂V♂ and F♀V♀), but was biased towards female for androgynous voices when paired with male faces (F♂V?), indicating a simultaneous contrast effect. Bimodal adaptation to gender-congruent adaptors caused a VGAE in subsequent test voices. Crucially, voice-ambiguous adaptors (F♂V? and F♀V?) – rather than eliciting contrastive aftereffects in reference to face gender – elicited a VGAE according to the biased perception of these voices in bimodal adaptors. This is reminiscent of linguistic aftereffects for place of articulation (Bertelson et al., 2003). As the VGAE was elicited by physically androgynous voices when perceived as more female, it appears to result from perceptual rather than low-level acoustic voice representations.

6 THE INFLUENCE OF ACCENTS AND RELIGIOUS CLOTHING SYMBOLS ON PERSON PERCEPTION

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Women with a Muslim headscarf speaking standard German are part of reality in Germany. However people perceiving these women are confronted with two different indicators: their standard pronunciation of German indicates that they belong to the ingroup of Germans, but the headscarf is seen as a symbol of foreignness. In this study it was investigated whether one of these cues dominates social categorisation. The hypothesis was that due to the salience of the headscarf, appearance might dominate social categorisation. By using the “Who Said What?” paradigm a set of pictures and voices were presented to 37 participants in Jena. Analyses were based on multinomial modelling. Results show that accent and appearance are equally strong cues for categorisation, underlining the importance of accent in social categorisation.



7 COOPERATION IN SOCIAL GROUPS: CHEATER PERCEPTION AND MEMORY IN INTERGROUP CONTEXTS

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Approaches in Evolutionary Psychology assume that person-related information-processing in social-exchange situations is characterised by a special effectiveness. Until now researchers found evidence for an enhanced memory for faces of cheaters in interpersonal interactions linked to emotional evaluation and expectancy incongruence (i.e., Bell et al., 2012). But cheater detection is also important to ensure high levels of cooperation within large-scale groups. Cheaters threaten group functioning by taking benefit without incurring costs. Generally ingroup members are remembered more individually whereas outgroup members are processed categorically (i.e., Brewer et al., 1995). Hence we assume that different cognitive mechanisms cause distinct cheater memory for in- and outgroup members. In two experiments we extended empirical findings on cheater perception and memory, adding an intergroup context and scanning for individual differences. Both experiments state that the behavioural description is crucial for encoding-phase likability ratings. Testing-phase results show an enhanced source memory for persons with a history of cheating or trustworthiness compared to irrelevant behaviour. There are controversial outcomes concerning a memory advantage for faces of ingroup cheaters.

8 HOLISTIC FACE PROCESSING OF OWN- AND OTHER-AGE FACES IN YOUNG AND OLDER ADULTS: ERP EVIDENCE FROM THE COMPOSITE FACE TASK

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Participants more accurately remember own-age relative to other-age faces (own-age bias, OAB). The present study tested whether this effect is related to more efficient holistic processing of own-age faces. Young adult and older participants performed a composite face task with young and old faces, in which they indicated whether the upper half of two subsequent composite faces was identical or not. The lower half of the second face was always different, and face halves were horizontally misaligned in 50% of the trials. Both participant groups were more efficient to correctly identify same upper halves in the misaligned relative to the aligned condition, and this composite face effect (CFE), a marker of holistic face processing, was stronger for young faces. Analysis of event-related potentials revealed strong misalignment effects in the N170, which were more pronounced for young faces in both groups. Critically, in the subsequent N250r a stronger misalignment effect for young faces was detected in young participants only. Since N250r may reflect the facilitated access of a perceptual representation of a previously presented face, this finding is interpreted to reflect young participants' more efficient representation of own-age faces as a whole, which may contribute to their OAB in memory.



9 IN- AND OUT-GROUP FACES IN THE BRAIN: FUSIFORM GYRUS PREFERENTIALLY CODES OWN-AGE AND OWN-GENDER FACES

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The present study used fMRI adaptation (fMRIa) to test whether own- versus other-gender (and own- versus other-age) faces are processed differentially by the fusiform face area (FFA) and occipital face area (OFA) in female and male participants. During scanning we presented various blocks (20 sec., 40 stimuli, 2 Hz presentation rate) containing only young female, young male, old female, or old male faces, as well as a baseline condition, in which faces varying both with respect to age and gender were depicted. In female participants, we observed strong fMRIa in both FFA and OFA for young and old male, but not for female faces relative to the baseline. In male participants, no corresponding effect was observed. These findings suggest that face-sensitive regions in females are specifically tuned to code other-gender faces.

10 INDIVIDUAL DIFFERENCES IN FACE LEARNING AND RECOGNITION

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In everyday life, the ability to recognise faces is an important prerequisite for successful social interactions. More recently, individual differences in this ability receive increasing scientific attention, but the functional mechanisms underlying these differences are still largely unknown. Apart from extreme groups such as “super-recognisers” (Russell, Duchaine, & Nakayama, 2009) and individuals with prosopagnosia (Behrmann & Avidan, 2005), large variations in face recognition ability in the normal population are becoming evident (Bate, Parris, Haslam, & Kay, 2010). Recently, it has been hypothesised that face perception represents a specific part of social cognition. Systematic research, however, is still in its infancy. Using factor analytic techniques, Wilhelm et al. (2010) showed that individual differences in face perception are represented by three replicable factors (face memory, face perception, and speed of face recognition). In the present study we further investigated the relationship between different aspects of face perception and recognition and other personal characteristics. We present data from 175 participants that had participated in a test battery including different measures of face recognition, matching, learning, expression recognition, personality traits and intelligence. Overall, the data suggest a large degree of independence between different face related tasks and personal traits.



11 THE INFLUENCE OF CARICATURED SHAPE AND TEXTURE ON FACE LEARNING: AN ERP STUDY

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It has been shown that spatially caricatured faces and naturally distinctive faces benefit the acquisition of new mental face representations. Furthermore, recent research suggests that shape plays a prominent role in the encoding of unfamiliar faces, but that shape information may be less important for the recognition of familiar faces. This raises the possibility of an increase in the role of texture-based information for the recognition of familiar faces. Here we assessed effects of selective caricaturing either in shape or in texture on face learning. High resolution images exported from a 3D camera system were learned across variable images and different images were used at learning and at test. Performance (accuracies and reaction times) and event-related potentials (ERPs) were assessed for both learned and novel faces. We found performance advantages for both types of caricatures, but these were modulated by familiarity: Importantly, benefits for learned faces were significantly larger for texture than shape caricatures, whereas benefits for novel faces were numerically larger for shape than texture caricatures. At test, we found significant modulation of N170, P200, N250, and LPC ERPs for both types of caricatures. Overall, our results imply that distinctive shape and texture facilitate face learning, with distinctive texture contributing in particular to recognition of learned faces.

12 UNCOMMONLY TYPICAL – ATTRACTIVENESS BIASES RECOGNITION MEMORY FOR FACES IRRESPECTIVE OF DISTINCTIVENESS: AN ERP STUDY

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There is an ongoing debate about the influence of attractiveness on face recognition performance. Most previous studies, however, neglect relationships between facial attractiveness and distinctiveness. Importantly though, distinctive faces are generally better memorised than typical faces. Here we tried to control the influence of distinctiveness on recognition memory for faces varying in attractiveness. A rating study and a recognition experiment were conducted to assess memory for attractive and unattractive faces, respectively, while employing a dimensional matching procedure and statistical control of two common distinctiveness measures (based on face-in-the-crowd versus deviation-based rating instructions). Event-related brain potentials (ERPs) were also analysed, focussing on components thought to reflect processes of face perception, affective processing and recognition memory. Poorer memory for attractive than unattractive faces was found in d' scores. Attractive faces elicited smaller P2 amplitudes, as well as larger N250 and LPC modulations. Importantly, attractiveness effects were not accounted for by deviation-based distinctiveness, although our findings also suggested differences between both measures of distinctiveness. We discuss the results in the context of Multidimensional Face Space models, and propose that encoding and retrieval during the recognition task are accompanied by simultaneous motivational and affective processing of attractiveness that may in turn influence memory performance.

**13 UNI-, BI- AND CROSSMODAL ADAPTATION AFTEREFFECTS IN VOCAL EMOTION PERCEPTION**VERENA G. SKUK¹ & STEFAN R. SCHWEINBERGER^{1,2}*1 DFG Research Unit Person Perception, Friedrich Schiller University, Jena, Germany**2 Department of General Psychology and Cognitive Neuroscience, Friedrich Schiller University, Jena, Germany*■ verena.skuk@uni-jena.de

The perception of emotions is often suggested to be multimodal in nature, and bimodal as compared to unimodal (auditory or visual) presentation of emotional stimuli can lead to superior emotion recognition. In previous studies, contrastive aftereffects in emotion perception caused by perceptual adaptation have been shown for faces and for auditory affective vocalization, when adaptors were of the same modality. By contrast, crossmodal aftereffects in the perception of emotion have not been demonstrated yet. In three experiments we investigated the influence of emotional voice as well as dynamic facial video adaptors on the perception of emotionally ambiguous voices morphed on an angry-to-happy continuum. Contrastive aftereffects were found for unimodal (voice) adaptation conditions, in that test voices were perceived as happier after adaptation to angry voices, and vice versa. Bimodal (voice + dynamic face) adaptors elicited numerically larger contrastive aftereffects. Importantly, crossmodal (dynamic face) adaptors also elicited substantial aftereffects in male, but not in female participants. Our results (1) support the idea of contrastive processing of emotions, (2) show for the first time crossmodal adaptation effects under certain conditions, consistent with the idea that emotion processing is multimodal in nature, and (3) suggest gender differences in the sensory integration of facial and vocal emotional stimuli.

14 FACE LEARNING: EVIDENCE FOR AND AVERAGE AND INSTANCE BASED REPRESENTATIONSJÜRGEN M. KAUFMANN^{1,2}, KATHARINA SCHIERZ¹ & STEFAN R. SCHWEINBERGER^{1,2}*1 Department of General Psychology and Cognitive Neuroscience, Friedrich Schiller University, Jena, Germany**2 DFG Research Unit Person Perception, Friedrich Schiller University, Jena, Germany*■ juergen.kaufmann@uni-jena.de

How are familiar faces represented in the brain? The concept of “Face Recognition Units (FRUs)” containing abstract (as opposed to pictorial) information has proven useful to explain the observation that familiar faces are recognized across a range of previously unseen images. It has been suggested that image independent representations are achieved by forming a mental average across instances seen during learning. But although averages are recognized better than single images on average, some instances are recognized best. Using a learning paradigm we investigated average and instance based contributions to face recognition and its neural correlates. Participants learned novel identities displaying six expressions in two intensities and from six views. Each identity displayed one expression more frequently than others. At test, participants performed a familiarity task on frequently and non-frequently presented instances, weighted and non-weighted expression averages and neutral faces. In behaviour, compared to neutral faces we found advantages for instances and averages, with largest benefits for frequent exemplars and weighted averages, which did not differ. Whereas the identity sensitive ERP component N250 was overall larger for learned compared to novel faces, this effect was not further modulated by face type. We conclude that in contrast to the classical FRU concept, the results provide evidence for efficient face representations containing both prototypical and instance based information, which is used flexibly depending on the demands of the test situation.



15 ATTRACTED TO FRACTALITY? SUBJECTIVE FACIAL ATTRACTIVENESS IS CORRELATED WITH LOW-LEVEL PROPERTIES OF IMAGES

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Several properties of faces have been proposed to contribute to subjective ratings of attractiveness. In particular, high-level properties such as symmetry, secondary sexual characteristics and several ratios and distances (e.g., between eyes and mouth) affect attractiveness ratings. The aim of the present study was to investigate whether other (low-level) properties of face images also correlate with attractiveness ratings. We analyzed low-level statistical properties of face images that were rated for attractiveness and found that attractiveness correlated negatively with self-similarity (measured by Fourier transform and PHOG analysis) and positively with complexity and anisotropy. Furthermore, we found positive correlations of self-similarity with the age of the depicted person. In a follow-up experiment, we changed the slope ratio in log-log plot of radially averaged Fourier power (an established measurement for self-similarity) of face images. Participants rated a version of the same face, which was rendered less self-similar, as significantly less attractive. This result can be explained if one assumes that high correlations of self-similarity with age mask the negative correlation with attractiveness. In conclusion, we demonstrated a relation between low-level image properties, such as self-similarity, complexity and anisotropy, on judgments on attractiveness as well as on the age of faces.

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