



Person Perception

Human Communication:

From Person Perception to Social Action

Programme and Abstracts for the 11th PPRU
Workshop

April 9-10, 2015

Place: Großer Rosensaal, Fürstengraben 27
Friedrich Schiller University Jena



Person Perception – Human Communication: From Person Perception to Social Action

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EVENT SCHEDULE

THURSDAY, APRIL 9, 2015

SESSION 1-3: OPENING EVENT OF THE VOICE RESEARCH UNIT IN JENA (VRU)

1 ST SESSION:	VOICE PERCEPTION I
09.00 – 09.05	Welcome <i>Stefan R. SCHWEINBERGER and Adrian SIMPSON (Univ. Jena, DE)</i>
09.05 – 10.00	Entrainment and accommodation during interaction <i>Sarah HAWKINS (Centre Music a. Science, Univ. of Cambridge, UK)</i>
10.00 – 10.20	Unisensory and multisensory person perception <i>Julia FÖCKER (Dept. Psychol. & Educat. Sciences, Univ. Geneva, CH)</i>
10.20 – 10.40	Coffee Break

2 ND SESSION:	VOICE PERCEPTION II
10.40 – 11.20	Making a difference: enhancing the size of linguistic contrast as a function of gender and sexuality <i>Adrian SIMPSON (Inst. German Ling., Univ. Jena, DE)</i>
11.20 – 12.00	Neural mechanisms for the acoustic decoding of affective voices <i>Sascha FRÜHHOLZ (Swiss Cent. Affect. Sciences, Univ. Geneva, CH)</i>
12.00 – 13.20	Lunch Break



3RD SESSION: VOICE PERCEPTION III

- 13.20 – 14.00 Path modeling of vocal emotion communication
Klaus SCHERER (Univ. Geneva, CH & Ludwig-Maximilian-Univ. Munich, DE)
- 14.00 – 14.40 Neural correlates of voice learning
Romi ZÄSKE (Dept. Gen. Psychol., Univ. Jena, DE)
- 14.40 – 15.20 Person Perception from Voice and Face
Stefan R. SCHWEINBERGER (Dept. Gen. Psychol., Univ. Jena, DE)
- 15.20 – 15.40 Coffee Break

4TH SESSION: SOCIAL PERSON PERCEPTION

- 15.40 – 16.20 Neural correlates of perceiving and recognising facial expressions
Andrew W. YOUNG (Dept. Psychol., Univ. York, UK)
- 16.20 – 16.40 First impressions of faces: Gender and cultural groups
Clare SUTHERLAND (Dept. Psychol., Univ. York, UK)
- 16.40 – 17.00 ERP Evidence for Gender-based Categorization
Tamara RAKIĆ (Dept. Psychol., Univ. Lancaster, UK)

17.00 – 19:00 POSTER SESSION

FRIDAY, APRIL 10, 2015

5TH SESSION: DISORDERS

- 09.00 – 09.40 Neural correlates of social anxiety disorder
Thomas STRAUBE (Inst. Med. Psychol. & Systems Neurosci., Muenster, DE)
- 09.40 – 10.20 Resting state functional connectivity, interoceptive awareness and the insula in anorexia nervosa
Stephan EHRLICH (Dept. Child & Adolesc. Psychiat., TU Dresden, D)
- 10.20 – 10.40 Coffee Break

6TH SESSION: SOCIAL JUDGMENTS OF FACES

- 10.40 – 11.20 Being Sherlock Holmes: Making judgments about others from clues in behaviour
Peter MITCHELL (School Psychol., Univ. Nottingham, UK)
- 11.20 – 11.40 Lost in the middle - the influence of graded attractiveness on face recognition memory
Carolin ALTMANN (Dept. Gen. Psychol., Univ. Jena, DE)
- 11.40 – 12.00 Noise can be good: Noise adaptation affects the neural correlates of face processing
Claudia MENZEL (Inst. Anatomy I, Univ. Hosp. Jena, DE)
- 12.00 – 13.30 Lunch Break

7TH SESSION: REPRESENTATION AND MEMORY

- 13.30 – 14.00 PPRU Meeting
- 14.00 – 14.40 Individual differences in face recognition
Jürgen M. KAUFMANN (Dept. Gen. Psychol., Univ. Jena, DE)
- 14.40 – 15.20 Effects of aging on accessing person representations: Evidence from behavioural priming and event-related brain potentials
Holger WIESE (Dep. Psychol., Durham Univ., UK)
- 15.20 – 15.40 Neural correlates of semantic and episodic autobiographical memory retrieval - Effects of aging and the role of the BDNF Val66Met polymorphism
Jessica KOMES (Dep. Psychol., Durham Univ., UK)
- 15.40 – 16.00 Coffee Break
- 16.00 – 16.30 Plenary Discussion

16.30 END OF WORKSHOP

ABSTRACTS – ORAL PRESENTATIONS

1 ENTRAINMENT AND ACCOMMODATION DURING SPOKEN AND MUSICAL INTERACTION

SARAH HAWKINS

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Starting from evidence in the social psychology and sociolinguistic literature that people's behaviour accommodates to others during social interaction, this paper will discuss similar processes in phonetics and in music-making, using a range of data on plasticity of speech perception and production, and some recent evidence for temporal entrainment in musical and spoken interaction. It will then consider evidence for general processes that might underlie such adaptive behaviour.

2 UNISENSORY AND MULTISENSORY PERSON PERCEPTION

JULIA FÖCKER

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The perception of facial and vocal information is essential in order to draw reliable conclusions about a person's identity. However, everyday situations suggest that we are not always able to identify a person through the integration of both modalities, especially, when we are in a noisy or dark environment. A question of interest would be to investigate whether blind individuals, who have to rely on auditory cues, have enhanced auditory abilities in identifying a person. The first part of this talk explores the effects of visual deprivation since birth or adulthood on vocal person-identity processing. Congenitally blind, late blind and sighted controls were trained to discriminate a set of voices. After fulfilling a specific learning criterion, behavioral, EEG and fMRI experiments were conducted. Results showed that congenitally blind and late blind individuals had superior voice learning skills compared to sighted controls. Congenitally blind, but not late blind individuals revealed earlier priming effects compared to sighted controls, which were distributed over posterior clusters in both blind groups. Moreover, brain imaging data revealed an enhanced activation in the right anterior fusiform gyrus in congenitally and late blind compared to sighted controls. The second part of this talk addresses multisensory interactions in person identification. We asked when human faces modulate the processing of human voices by extending the paradigm mentioned in Part 1. Early face-voice interactions were observed in the time range of the N1 and at later processing stages (>270 ms). The general discussion integrates the results in the broader context of person-identification.

3 MAKING A DIFFERENCE: ENHANCING THE SIZE OF LINGUISTIC CONTRAST AS A FUNCTION OF GENDER AND SEXUALITY

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Speakers produce a range of phonetic patterns that correlate with categories such as gender, sexual orientation or masculinity/femininity (e.g. Munson & Babel 2007, Simpson 2009). Some of the patterns are biophysical inevitabilities relating to factors such as anatomy (e.g. vocal tract length, vocal fold length), others are socially acquired differences. So, for instance, males speak on a lower pitch than females, males have lower formant frequencies than females (Henton 1995), female speakers have been shown to use more breathy voice than males (Henton 1985), and straight and gay men have been found to exhibit differences in the spectral characteristics of /s/ (Munson et al. 2006). However, when studying the acoustic and articulatory correlates of categories, such as gender or sexual orientation, it is easy to neglect the fact that the same phonetics serve to encode and differentiate linguistic categories, such as long vs. short vowels, fortis vs. lenis plosives or /s/ vs. /ʃ/. Indeed, studies have shown that linguistic and extralinguistic factors are closely intertwined, leading, for instance, to the same stretch of fricative noise being given a different linguistic classification by listeners depending on whether the stimulus was identified as being male or female (Strand & Johnson 1996). In the present study we combine the findings from two projects examining the acoustic and articulatory correlates of gender and sexual orientation to show how speakers enhance the phonetic magnitude of a phonological contrast to different degrees as a function of gender, sexual orientation and masculinity/femininity. We show that although absolute values (e.g. fundamental frequency, formant frequencies) may differ between groups, it is equally important to examine the phonetic magnitude of a particular phonological contrast, whether it be the durational contrast between long and short vowels, the voice onset time between fortis and lenis plosives or spectral differences between different vowel qualities or sibilants.

4 NEURAL MECHANISMS FOR THE ACOUSTIC DECODING OF AFFECTIVE VOICES

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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, from which listeners infer the emotional state of the speaker when perceiving these vocalizations. The human brain has a distributed neural network that underlies this acoustic and emotional decoding of affective cues in voices. Using new methodical approaches in functional 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 their 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. I will specifically highlight the specific roles of the auditory cortex, the amygdala, and the basal ganglia for the decoding of certain acoustic cues in affective voices that support the discrimination and categorization of voices according to their emotional value.

5 PATH MODELING OF VOCAL EMOTION COMMUNICATION

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I will advocate the use of a modified Brunswikian lens model for the comprehensive analysis of encoding, transmission, and decoding processes in the vocal communication of emotion. Two data sets, based on corpora of emotion portrayals from two different cultures and languages specifically designed to study the role of arousal in emotional expression, are used to illustrate the utility of the model for understanding the contributions of distally measured acoustic cues and proximal ratings of perceived voice cues to listener recognition of four emotion families (fear, anger, happiness, and sadness). Lens model equations, hierarchical regression, and multivariate path analysis are used to compare the relative contributions of acoustic cues and perceived voice cues to the variance in emotion perception and inference from vocal expression. Based on these data I will demonstrate the utility of applying an extended Brunswikian framework by pointing out unique combinations of the distal cues and proximal percepts carrying information about specific emotion families, independent of arousal. I also discuss the need to develop more sophisticated acoustic to explain the distal underpinnings of subjective voice quality percepts that account for much of the variance in emotion inference, in particular voice instability and roughness.

6 NEURAL CORRELATES OF VOICE LEARNING AND RECOGNITION

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Listeners can recognize familiar voices from variable utterances, suggesting the acquisition of speech-invariant representations during speaker familiarization. However, the neurocognitive mechanisms and neural substrates mediating learning and recognition of voices from natural speech are currently unknown. We investigated how representations are formed during intentional learning of unfamiliar voices that were later recognized among novel voices, using electrophysiology (Exp. 1) and fMRI (Exp. 2). To probe the acquisition of speech-invariant voice representations, we compared a “same sentence” condition, in which speakers repeated the study utterances at test, and a “different sentence” condition. Although recognition performance in both experiments was higher for same compared to different sentences, substantial voice learning also occurred for different sentences. In experiment 1, event-related potentials elicited by voices during the study phase were predictive of subsequent voice recognition: voices subsequently remembered elicited a larger sustained parietal positivity (~250–1400 ms) compared to voices subsequently forgotten. This difference due to memory was unaffected by test sentence condition, and may thus reflect the acquisition of speech-invariant voice representations. At test, voices correctly classified as “old” elicited a more positive LPC (300–700 ms) at Pz than voices correctly classified as “new”. This ERP OLD/NEW effect was limited to the same sentence condition, and may thus reflect speech-dependent retrieval of voices from episodic memory. Importantly, a speech-independent effect for learned compared to novel voices was found in beta band oscillations (16–17 Hz) between 290–370 ms, at central and right-temporal sites. In experiment 2, studied voices correctly classified as “old” activated the right middle frontal gyrus to a lesser extent than novel voices correctly classified as “new”. Similarly, voices perceived as old activated the right anterior insula less than voices perceived as new. These results suggest a role of the right MFG in explicit recognition of learned voice identity and a role of the right anterior insula in the perception of voice familiarity independent of speech content. These results are a first step towards elucidating the neural correlates of voice learning and recognition.

7 PERSON PERCEPTION FROM VOICE AND FACE

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Although humans use their voice mainly for communicating information about the world, paralinguistic cues in the voice convey rich dynamic information about a speaker's arousal and emotional state, and extralinguistic cues reflect more stable speaker characteristics including identity, biological sex and social gender, socioeconomic or regional background, and age. Here I discuss how methodological progress in voice analysis, morphing and synthesis techniques has recently promoted research that is directly relevant for current theoretical questions, such as how voices are mentally represented in the human brain. I will report experiments that support the distinction between the recognition of familiar and unfamiliar speakers, and other experiments that illustrate the processes and representational changes that accompany the learning of new voices. I will also describe how specific impairments and individual differences in voice perception could relate to specific brain correlates or to other impairments in high-level auditory perception, such as auditory agnosia. Finally, I consider that voices are produced by speakers who are often visible during communication, and present evidence that shows how speaker perception involves dynamic face-voice integration. Overall, the representation of para- and extralinguistic vocal information plays a major role in person perception and social communication, could be neurally encoded in a prototype-referenced manner, and is subject to flexible adaptive recalibration as a result of specific perceptual experience.

8 NEURAL CORRELATES OF PERCEIVING AND RECOGNISING FACIAL EXPRESSIONS

ANDY YOUNG

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The status of functional brain imaging data has been controversial, with some eminent researchers maintaining that whilst neuroimaging addresses interesting questions about the brain, it cannot be used to resolve theoretical issues in psychology (for example Coltheart, 2006). In contrast to this line of reasoning, I will present examples of functional brain imaging studies addressing key questions concerning how we perceive and recognise facial expressions. These include: how information from facial expressions is integrated with other cues to emotion; the relative contributions of different sources of visual information (feature shapes and surface reflectances) to the perception of facial identity and expression; whether facial expressions are perceived as continua or as discrete categories; the role of holistic processing of facial expressions. In each case, functional neuroimaging offers important insights.

9 FIRST IMPRESSIONS OF FACES: GENDER AND CULTURAL GROUPS

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When we meet a person for the first time, we can gain a wealth of information from perceiving their face - for example, their age, sex, ethnicity and level of attractiveness. However, we also make more subjective facial judgements of the character or personality of the person depicted as well, and these facial first impressions can



have important consequences. In this talk, I will first outline an approach that attempts to describe the key dimensions underlying facial first impressions, and show that three dimensions subserve impressions made to (highly varying) ambient image faces: approachability, dominance and youthful-attractiveness. I then examine how universal these dimensions are across gender and culture, finding that while impressions are highly similar for the approachability dimension regardless of the face and perceiver group, the other two dimensions show more variability across the social groups studied. This indicates that while the dimensional approach has been a useful framework in guiding facial first impressions research, these facial impressions models also need to take social categories into account.

10 ERP EVIDENCE FOR GENDER-BASED CATEGORIZATION

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Understanding how social categorization occurs is important because mere categorization can lead to stereotype activation, which in return can result in discrimination against given groups. In order to understand more about the neural correlates of person categorization in the current study we aimed at investigating gender - based categorization by means of the “Who Said What?” - paradigm (WSW) while measuring event-related potentials. Similarly to the original WSW paradigm, participants first observed video clips showing a discussion” of 8 targets (4 female and 4 male). Subsequently they were shown individual statements from earlier, after which a face would appear and participants needed to decide whether this was the correct person, while we measured participants’ ERP. The random presentation of faces was manipulated so that on a third of the trials it was correct person, a third was wrong person – correct gender, and one third was opposite gender (wrong) person. The results revealed that with regard to explicit responses participants were more likely to say “yes” for the correct person than for a wrong person of the same gender; more importantly, they were more likely to choose “yes” for a wrong person of the correct gender than for an opposite gender person. Hence participants were mostly correct in their responses and false positives were much more likely for the same rather than the other gender targets, indicating gender---based categorization. Relatedly ERP, analysed in a 300-400 ms time window at occipito-temporal sites, indicated for both a correct person and an opposite gender person that correct responses were more negative (i.e., “yes” and “no” respectively). On the contrary no effects were found for a wrong person of same gender. These results further support gender-based categorization.

11 BRAIN ACTIVATION DURING THREAT PROCESSING IN SOCIAL ANXIETY DISORDER

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Patients suffering from social anxiety disorder (SAD) show information processing biases and altered brain responses during the processing of disorder-related stimuli such as angry faces. However, it is widely unknown to what extent brain activation to social threat signals in SAD depends on modulating factors such as task demands and stimulus modality. This talk focuses on actual studies that investigated brain activation to different disorder-related stimuli, including faces and voices, in patients with SAD. Findings revealed neural activation patterns associated with specific modes of information processing and with specific symptoms of

SAD. The talk addresses these findings and discusses neurobiological models of altered information processing in patients with SAD.

12 RESTING STATE FUNCTIONAL CONNECTIVITY, INTEROCEPTIVE AWARENESS AND THE INSULA IN ANOREXIA NERVOSA

STEFAN EHRLICH, DANIEL GEISLER, JOSEPH KING, SABINE CLAS, JULIANE HANTKE, FRANZISKA RITSCHER, MARIA SEIDEL, JESSIKA WEISS, VEIT RÖSSNER, AND ILKA BOEHM

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The etiology of anorexia nervosa (AN) is poorly understood. Results from functional brain imaging studies investigating the neural profile of AN have found either increased or decreased task-associated neural responses in the insula. Task-related imaging studies often require a high level of compliance and can only partially explore the distributed nature and complexity of brain function. In this study, resting state functional connectivity imaging was used to investigate brain networks potentially relevant to mechanisms underlying the symptomatology and etiology of AN. Resting state functional magnetic resonance imaging data was obtained from 35 unmedicated female acute AN patients and 35 closely matched healthy controls female participants (HC) and decomposed using spatial group independent component analyses (ICA). Using validated templates, we identified components covering the default mode network (DMN) and other well-characterized resting state networks. Group comparison revealed an increased functional connectivity between the anterior insula and DMN in AN in comparison to HC. Anterior insula connectivity was associated with self-reported problems with interoceptive awareness. This study, shows that acute AN is associated with abnormal brain connectivity in a major resting state network. The finding of an increased functional connectivity between anterior insula and the DMN may reflect the high levels of self- and body-focused ruminations when AN patients are at rest.

13 BEING SHERLOCK HOLMES: MAKING JUDGMENTS ABOUT OTHERS FROM CLUES IN BEHAVIOUR

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This talk summarises research into people's ability to guess things about someone (a target) from clues in their behaviour. People are surprisingly good at guessing which photographs of emotional expressions targets are looking at (because the targets naturally and spontaneously mimic the expression in a very subtle way), they are effective in guessing which gift (out of a set of three possibilities) that the experimenter offered to the target (because they react in different ways to different gifts), they are good at guessing what the experimenter said to the target (for example, if the experimenter paid a compliment) and they are good at guessing whether the target is alone or observed while they (the targets) are watching moving clips. People are also effective in making guesses about the personality of the target after observing them read aloud a joke for ten seconds; people are especially good at guessing targets who are at the extremes of personality traits but not so good at guessing those who are "normal". People with autism, in contrast, are not very effective in guessing things about a target after observing their behaviour. The evidence suggests that people have a highly adapted faculty that allows them to make psychological inferences based on scant clues in behaviour. This faculty might not be so highly developed in people with autism.

14 LOST IN THE MIDDLE - THE INFLUENCE OF GRADED ATTRACTIVENESS ON FACE RECOGNITION MEMORY

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Accurate memory for faces is important for numerous social interactions, but is modulated by physiognomic characteristics. Recently, it was shown that attractive faces are remembered less accurately than unattractive faces when distinctiveness is controlled for (Wiese, Altmann, & Schweinberger, 2014). It is still unclear, however, if this effect is constituted by a disadvantage for attractive faces, a benefit for unattractive faces, or both. To clarify, we conducted a recognition memory experiment including attractive, mid-attractive and unattractive faces, matched for deviation-based distinctiveness (Wickham & Morris, 2003). In addition to behavioural measures, event-related potentials were analysed. Memory was most accurate for unattractive faces, followed by attractive faces, with poorest performance for mid-attractive faces. Item analyses confirmed that this effect remained significant when emotional valence was taken into account. Neural correlates for these attractiveness effects in memory were identified in the P2 amplitudes over occipito-temporal electrodes at test. Furthermore, participants responded less conservatively to attractive compared to both mid- and unattractive faces. This attractiveness effect in the response criterion correlated significantly with an attractiveness effect in the early posterior negativity (EPN) during learning, with larger amplitudes for attractive than unattractive faces. Higher amplitudes with increasing attractiveness were found both in the EPN at test and in the late positive component (LPC) during both experimental phases. Finally, an old/new-effect with larger amplitudes for hits than correct rejections (Rugg & Curran, 2007) was found between 500-700 ms at test, but did not interact with attractiveness. Our findings show an effect of attractiveness on face memory beyond distinctiveness and emotional valence. As the EPN is typically enhanced for affective stimuli, processing of emotionally relevant attractive faces during learning could hamper their encoding into memory. This, however, cannot explain poor performance for emotionally neutral mid-attractive faces. We suggest an explanation based on a modified face-space model, in which mid-attractive faces are more frequent, and hence less well distinguishable, than both attractive and unattractive faces.

15 NOISE CAN BE GOOD: NOISE ADAPTATION AFFECTS THE NEURAL CORRELATES OF FACE PROCESSING

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In most studies, adding noise to a stimulus makes perceptual decisions more difficult. Here, we investigated the different effects of added noise on face processing in a two-alternative forced choice age-discrimination task. First, we were interested in a potential competition between a target face and noise surrounding it. Second, we tested the effect of adaptation to noise on the neural correlates of face perception and the interaction of adaptor and surrounding noise. Finally, we tested the effects of noise with different slopes in the Fourier power spectrum. We used noiseless faces as targets, either surrounded by noise or presented on a uniform grey background. In addition, the target faces were either preceded by noise or not. Additionally the slope of the

Fourier phase randomisation was varied in three levels either matching that of the target faces or being steeper or shallower. Results of parallel ERP recordings show that surrounding noise reduces the amplitude of the N170 while enhancing the P200 amplitude, indicating impaired face processing as the result of surrounding noise. Adaptation to noise, however, led to an increased N170 and decreased P200 amplitude as well as to a better performance. In addition, the effect of adaptation depended on the surrounding noise of the target: the enhancement of the N170 and the reduction of the P200 amplitudes were larger when noise surrounded the faces. A single-trial analysis of the ERP data suggests that the differences in mean amplitude were due to an altered peak latency jitter. Finally, noise that was more similar to natural scenes (shallower slope) elicited the biggest effects whereas noise that deviate from the statistics of faces and natural scenes showed the smallest effects (steeper slope). Our data show for the first time that noise adaptation has a beneficial effect on the electrophysiological correlates of face perception and leads to a better behavioural performance in a face task. This effect is presumably due to the selective adaptation of noise-sensitive neurons, thereby enhancing the signal-to-noise-ratio. The results also indicate that the sensory system is adapted to natural viewing situations in which faces are rarely viewed in isolation.

16 INDIVIDUAL DIFFERENCES IN FACE RECOGNITION

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Face learning and recognition abilities appear to be stable person characteristics with remarkably large inter-individual differences - even within the "normal" population. The basis for these differences is still poorly understood. Here I will present data from behavioral and neurophysiological studies that investigated individual differences with respect to the use of shape and reflectance information for face identification and matching. Overall, our data revealed higher diagnosticity of reflectance compared to shape for both matching and identification, particularly for familiar faces. Moreover, individuals with above average familiar face recognition skills relied more on reflectance. Furthermore, we tested individual differences in the flexibility of stored face representations by exploring immediate repetition priming effects for famous faces and lookalikes. Repetition priming effects in the N250r and N400 event-related potential components for lookalike primes were more reliable for participants with high face recognition skills, suggesting that i) mental representations in good recognizers are characterized by a larger flexibility, and ii) that high and low performers also differ at the level of post-perceptual access to semantic information about familiar persons. Finally, and I will evaluate a face learning training program which uses caricatures derived from 3D photographs.

17 EFFECTS OF AGING ON ACCESSING PERSON REPRESENTATIONS: EVIDENCE FROM EVENT-RELATED BRAIN POTENTIALS

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Recognition of a familiar target face is substantially facilitated if it is directly preceded by a related prime stimulus. This prime can either be the face or name of the same person (within-/cross-modality immediate repetition priming), or the name or face of a highly related different person (semantic priming). The present series of experiments examined to what degree these forms of priming are affected by cognitive aging. In three

experiments, behavioural priming as well as neural correlates measured with event-related brain potentials (ERPs) were examined in young and older adult participants. We observed more efficient behavioural within- and cross-modality repetition priming in young relative to older adults. By contrast, older adults demonstrated stronger semantic priming effects. Moreover, whereas N250r and N400 ERP priming effects were more pronounced in younger relative to older adults during within- and cross-modality repetition priming, the N400 effect during semantic priming was similar for the two groups. These findings are discussed in the context of person recognition and cognitive aging models. They may reflect less efficient perceptual bottom-up processing but highly interconnected semantic representations in older adults, which is in line with theories of cognitive aging emphasizing the perpetuation of crystallized knowledge.

18 NEURAL CORRELATES OF SEMANTIC AND EPISODIC AUTOBIOGRAPHICAL MEMORY RETRIEVAL - EFFECTS OF AGING AND THE ROLE OF THE BDNF VAL66MET POLYMORPHISM

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Remembering personal information entails both episodic and semantic memory. However, the question, whether distinct neural mechanisms support retrieval of episodic versus semantic autobiographical memories remains largely unaddressed. Therefore, we used event-related brain potentials (ERPs) in an ecologically valid photo-paradigm, and aimed at identifying the neural signature of episodic versus semantic autobiographical memory retrieval in a series of experiments. In the initial experiment with younger adults, at mid-frontal sites and in a time window from 300-500 ms, photos taken by the participants (episodic autobiographical condition) a few days ahead of testing elicited relatively more positive amplitudes than photos from familiar locations taken by the experimenters (semantic autobiographical condition). These, in turn, evoked more positive amplitudes than photos from unknown locations. This graded pattern likely reflects an N400 effect, indicating facilitated access to semantic representations of known locations, with stronger effects for those more recently visited. Importantly, between 500 and 800 ms, photos taken by the participants selectively elicited more positive amplitudes relative to both other conditions at parietal sites, resembling a recollection-based old/new effect (Komes & Wiese, under review). In a second experiment examining both a younger and an older group using the same paradigm, we successfully replicated these results in younger adults. Interestingly, preliminary data analyses suggest a largely absent N400, but intact later recollection-related ERP effect in the older adults. So far, our findings reveal that accessing semantic autobiographical contents is facilitated by conceptual fluency in younger participants, whereas episodic autobiographical memory requires an additional and distinct mechanism in both younger and older age. This mechanism is most probably related to recollection, enabling the reliving of a personal episode. Currently, we are testing a second group of older adults to take into account life-style and personality differences that have been shown to modulate other memory functions and elucidate their importance for age-related variability in autobiographical memory retrieval. In addition, we aim at identifying the role of the Val66Met single nucleotide polymorphism in younger and older adults. Despite the relatively large and growing body of literature of the BDNF Val66Met polymorphism on different memory functions (e.g. Chaieb et al, 2014; for a review, see Kambeitz et al., 2012,) and on cognition during aging (e.g. Nemoto et al., 2006; Li et al., 2010; Gajewski et al., 2011), its relationship to autobiographical memory has been investigated rarely. We hypothesize that the Val/Val homozygotes and Met carriers will differ both in performance and in the neural mechanisms supporting retrieval of autobiographical contents.

ABSTRACTS – POSTERS

1 DIVING INTO THE DEPTH OF PRIMARY MOTOR CORTEX: A HIGH-RESOLUTION INVESTIGATION OF THE MOTOR SYSTEM USING 7TESLA FMRI

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Human behaviour is grounded in our ability to perform complex tasks. While human motor functions have been studied for over a century, the cortical processes underlying motor behaviours are still under debate. Central to the execution of action is the primary motor cortex (M1), which has previously been considered to be responsible for the execution of movements planned by the premotor cortex. Nevertheless recent studies point to the more complex role of M1 in orchestrating motor-related information. Also, several conflicting theories and findings have been suggesting different features regarding the finger somatotopy in M1. More importantly, in order to understand the functioning of the cortex it is fundamental to know this structure at its basic architectural, columnar level. The spatial resolution made possible by using an ultra-high field magnet allows us to investigate the existence of cortical column structures, the functional organization pattern for single fingers in different cortical relative depths of M1 and the involvement of M1 in motor imagery and observation. Functional and anatomical high resolution images were acquired for 13 subjects. Four functional scans were acquired for the different tasks: motor execution; motor imagery; movement observation and rest. The subjects performed a randomized finger tapping task. Using the novel high resolution cortical grid sampling analysis tools (Brainvoyager QX program), different cortical laminas of human M1 were examined. Our results reveal a distributed pattern (intermingled with somatotopic “hot spots”) for single fingers’ activity in M1. Furthermore we show novel evidences of columnar structures in M1 and show that non-motor tasks such as motor imagery and action observation also activate this region. We conclude that the primary motor cortex has much more unexpected and complex roles regarding the processing of movement related information, not only due to their involvement in tasks that do not imply muscle movement, but also due to their intriguing organizational pattern.

2 COMBINING CHANGE BLINDNESS AND INATTENTIONAL BLINDNESS TO MODULATE ATTENTIONAL CAPTURE

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In their influential paper New et al (2007) proposed that ancestrally derived attention selection is a robust, spontaneous recruitment of attention to humans and to non-human animals in comparison to categories of less ancestral relevance. According to this Animate Monitoring Hypothesis, automatic algorithms operate independently from executive functions, thus important changes in non-humans and humans can be detected rapidly, even when they are unexpected or irrelevant to the current goals or activities of the observer. In contrast, goal-derived attention selection is a volitional response to an internally represented momentary cognitive goal. In this case, arbitrary but task-relevant objects may command more attention than task-irrelevant ones. In this study we aimed at investigating the assumption that the automatic and autonomous ancestrally derived attention selection takes precedence before the supposedly volitional goal-derived

attentional capture mechanisms. For this purpose, we have developed a combined change blindness – inattention blindness paradigm. Subjects participated in a training phase, comprising 9 change blindness trials where the target element was invariably a window within a complex natural scene, either with at least one human person present or absent in the image. The participants were not informed of the fact that the only changing object in each trial will be window. In the 10th, critical trial, both the window, and a person was changing. In addition to these two experimental conditions, three control conditions were used where only the window changed, or only the person changed, or both elements changed without any previous training. Replicating the results of New et al (2007), we have found a pronounced bias for detecting the changing person in the No Training, Both Window and Person Changes conditions and by comparing the RTs between the No Training, Body Changes and No Training, Window Changes conditions. In both With Training conditions, however, almost all participants recognized solely the window as the changing element, indicating that goal derived attention selection can override ancestrally derived attentional capture, irrespective of whether the irrelevant distractor (Person) was present during training, or it was new to the Critical Trial. These results indicate that the animate monitoring mechanisms might not in every case provide the robust and autonomous interrupt circuitry for ancestrally relevant feature detection proposed by New and colleagues.

3 FOCUSING ON ISOLATED FEATURES DOES NOT IMPROVE FACE MATCHING PERFORMANCE: EVIDENCE FROM A WINDOWS CONTINGENT PARADIGM

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Matching unfamiliar faces is an important task in security and forensic contexts but research has shown that it is error prone. In this study, we used a windows contingent paradigm to explore the efficacy of focusing on isolated features during face matching. A pair of faces was presented at the same time and observers had to indicate whether they depict the same identity or two different identities. In the windows condition, only a single fixated facial feature was available at a time. This condition was compared with a mask condition, whereby the fixated facial feature was masked while making the rest of the face visible and a control condition, whereby full faces were presented. Results showed that observers were better in the control condition than in the windows or mask condition. Furthermore, performance in the mask condition was significantly better than in the windows condition. These data showed that focusing on isolated features does not help face matching.

4 PERSONAL TRAITS AND LOW-LEVEL IMAGE PROPERTIES IN ARTIFICIAL FACE IMAGES

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In previous studies, low-level statistical properties of images have been associated with facial properties like emotions, attractiveness and age. Here, I investigated these properties according to their association with personality traits of faces in seven databases of artificial face images. Each database included images of 25 maximally distinct face identities that were manipulated on different traits (Attractiveness, Competence, Dominance, Extraversion, Likeability, Threat, and Trustworthiness) for shape and reflectance in the positive and the negative direction, respectively (as introduced by Todorov et al. 2013). I used established measures for low-level image properties that have been associated with aesthetics, like Fourier power and slope, and PHOG self-similarity and complexity, amongst others. Interestingly, there were similar patterns of correlations with low-level image properties for Extraversion, Threat and Dominance, as well as for Attractiveness and Likeability.

Therefore, I hypothesize that a certain combination of low-level image properties is associated with specific impressions of personality traits in faces.

5 EVIDENCE FOR A REVERSE CARICATURE EFFECT FOR NEWLY LEARNED CARICATURES OF SHAPE OR REFLECTANCE

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Recent findings show benefits for learning and subsequent recognition of caricatures in shape or reflectance, but there is little evidence on whether this caricature learning advantage generalizes to recognition of veridical versions of faces learned as caricatures. The aim of the present study was to examine whether learning a face as a caricature improves subsequent recognition of its veridical version compared to when the face had been learned as a veridical (reverse caricature effect). Here, images of faces derived from a 3D camera system were caricatured selectively in either shape or reflectance by 50%. Faces were learned across different images either as veridicals, shape caricatures, or reflectance caricatures. At test, all faces (learned and novel) were presented as veridicals, and participants performed a speeded old/new task on learned and novel faces. We assessed accuracies, reaction times, as well as face-sensitive event-related potentials (ERPs). At performance, faces learned as caricatures were recognized more accurately than faces learned as veridicals. In the ERP data at learning, we found significant modulation of a late-positive component (LPC) by both types of caricatures, suggesting encoding advantages of distinctive facial shape and reflectance. Overall, our findings suggest learning benefits of distinctive shape and reflectance that generalize to recognition of veridicals.

6 EFFECTS OF GAZE DIRECTION ON PERCEIVED TRUSTWORTHINESS

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Directed eye gaze is an important non-verbal communication channel, providing useful information in social interactions (Emery, 2000; Jones, DeBruine, Little, Conway, & Feinberg, 2006; Frischen, Bayliss, & Tipper, 2007). The present study investigated whether direct eye gaze of a speaker affects the likelihood of listeners believing a truth-ambiguous statement. Participants were presented with videos in which a speaker produced thirty-six such statements with direct or averted gaze (e.g., “sniffer dogs cannot smell the difference between identical twins”). They responded using a four-point scale (“definitely not true”, “probably not true”, “probably true”, “definitely true”). The statements were selected from a rating study to ensure that our student participants were unlikely to know a-priori whether they were true or not. Indeed, participants were significantly more likely to believe statements when the speaker looked at them directly (57 %) than when she averted her gaze (42 %; $p < .001$). Interestingly, while they were generally slower to respond in the direct gaze condition than for averted gaze, they were particularly slow to disagree with a statement uttered with direct gaze ($p < .05$), suggesting that direct gaze rendered statements more believable. We will present additional analyses of participants’ pupil dilation depending on whether they believe a statement or not.

7 THE ROLE OF AUDIOVISUAL INTEGRATION IN VOICE LEARNING

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Audiovisual integration of faces and voices facilitates the recognition of personally familiar speakers' voices, particularly when voices are combined with dynamic articulating faces. However, it is unclear if learning unfamiliar voices also benefits from the simultaneous presentation of the speaker's face. Here we compared recognition of newly-learned voices following unimodal voice learning and bimodal face-voice learning with either static faces (Exp. 1) or dynamic articulating faces (Exp. 2). While recognition performance did not differ between voice-only and face-voice learning conditions, reaction times were increased when voices had been studied with faces relative to voices only (Exp. 1 and 2). This contradicts our hypothesis that audiovisual integration facilitates the acquisition of speaker representations. Instead we suggest that the present results reflect the simultaneous operation of two opposing mechanisms during bimodal face-voice learning: first, audiovisual integration with a beneficial effect on voice learning and second, attentional capture by faces with a detrimental effect on voice learning.

8 HOW GENDER STEREOTYPES FACILITATE FACIAL EMOTION PERCEPTION

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Gender-stereotyping is a well-known process that modulates experience and thought in order to reduce the complexity of the world. In our study, we explored how emotion-related gender-stereotypes affect perceptual processes and thereby maintain or even amplify themselves. We supposed that gender stereotypes are utilized as cues for modulating spatial frequency perception in order to focus the system on the most probable emotional expressions. In a dual task-paradigm participants saw a neutral face of a certain gender that either changed into an emotional face or into a grating stimulus. Emotion-classification and grating-tilt-classification showed the same theory-consistent pattern. Maleness lead to faster classification of angry faces compared to fearful ones and to faster reactions on low spatial frequency gratings compared to high spatial frequency patterns. The opposite was true for femaleness. A context-dependency suggests that this is in fact happening top down rather than just bottom up.

9 THE VOICE OF PARKINSON'S DISEASE: THE STOP-IT-STUDY

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Parkinson's disease (PD) is a progressive neurological disorder which impairs all aspects of speech and voice resulting in hypophonic dysarthria in more than 80% of patients. The loss of intelligibility considerably impacts on activities of daily life and thereby also on the desire to communicate. The present study compares the effectiveness of two related speech therapy methods in improving voice and articulation in PD patients with

dysarthria. Patients with advanced PD and dysarthria were included in a randomized controlled study. They received either two weeks of a daily treatment with focus on phonation, respiration, articulation and prosody (articulation-based treatment) or two weeks of a daily treatment following fundamentals of oral interpretation and performance (performance-based treatment). Different assessment methods of intelligibility such as word identification (e.g. Münchner Verständlichkeitsprofil (MVP)), transcription and scaling techniques (e.g. National Technical Institute for the Deaf (NTID) -scale) were used. Additionally, acoustic parameters were measured. Both analyses were conducted at word and sentence level as well as in read and spontaneous speech. Scores were taken before and immediately after treatment, and also after three months. First results reveal that: articulation-based speech therapy significantly enhances intelligibility at sentence and text level in the majority of individuals but not at the level of individual words; performance-based speech therapy significantly improves patients' self perception and communication-related quality of life (assessed by Parkinson's Disease Rating Scale (UPDRS), Parkinson's Disease Questionnaire (PDQ) and Voice Handicap Index (VHI)); literary text based speech therapy (for both groups) changes acoustic parameters: increased F1 in /a:/, increased Euclidean distance for /a:/-/u:/ in post-treatment data of male speakers. This could result from a lower tongue position and/or increased jaw opening. Reduced F1 and F2 values in /u:/ for individual speakers also suggest a more peripheral tongue position and tighter lip rounding in post-treatment recordings. Additional analyses and recruitment of further patients are necessary to evaluate whether articulation or performance-based speech therapy represent possible new treatment strategies to improve intelligibility and communication-related quality of life in advanced PD-patients with hypophonic dysarthria.

10 THE RELATIVE IMPACT OF ACOUSTICAL CUES ON VOCAL AGE PERCEPTION

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A number of acoustical cues have been found to differentiate between young and older adult voices. The vocal fold vibration rate (F0), which is approximately 120 Hz for young adult male (YM) and 220 Hz for young adult female (YF) speakers, has been found to be increased in older male (OM) and decreased in older female (OF) speakers. Further, formant frequencies tend to lower during aging in the voices of both sexes, and phonation becomes less stable in older voices, resulting in a more hoarse and breathy voice quality. Other cues that change with aging relate to timing information in voices (such as voice onset time or speaking rate). However, as comparably little is known on the relative importance of acoustical cues for perceptions of age, we used a novel parameter voice morphing approach based on Tandem-STRAIGHT. Specifically, we measured the relative impact of acoustical cues relating to the voice source (SRC, represented by a combination of Tandem-STRAIGHT parameters F0 and aperiodicity), the vocal tract filter characteristics (FILTER, represented by a combination of Tandem-STRAIGHT parameters frequency and spectrum level) and timing (T) information contained in young and older voices of both sexes. Study I involved age ratings performed by 24 listeners (12 female) for different utterances of 123 speakers (31 YF, M = 21.7 yrs; 30 YM, M = 21.9 yrs; 31 OF, M = 67.6 yrs; 31 OM, M = 67.7 yrs), in order to select stimuli of 32 speakers (8YF, 8YM, 8OF, 8OM) for Study II. The general idea of Study II was then to morph only specific TANDEM-STRAIGHT parameters along the sex-congruent young-old morph-continua, while keeping the residual parameters constant at an intermediate ("middle-aged") morph level. Thus, the resulting stimuli varied only the cue of interest (SRC, FILTER, or T) along the respective young-old morph continua; 24 different listeners (12 females) judged the age of the morphed test voices. In line with earlier research, Study I revealed that young voices's age was overestimated and elderly voices were underestimated. However, this result was qualified by the fact that female listeners were more accurate in judging elderly voices compared to male listeners. We further found a significant positive correlation of increasing F0 and increasing age estimation in the OM, but not in the OF group. Conversely, for voices of YF, but not in YM, a higher F0 was attributed with a younger voice. Most importantly, Study II revealed that the listener age estimation judgments were primarily based on information contained in the FILTER parameter, followed by SRC and T - with smaller differences in the relative role of SRC information for male and female voices.