



Foundations of Person Perception

Trends in Cognition and Neuroscience

Programme and Abstracts for the 8th PPRU Workshop

October 10-11, 2013

Place: Großer Rosensaal, Fürstengraben 27
Friedrich Schiller University Jena



Foundations of Person Perception - Trends in Cognition and Neuroscience

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EVENT SCHEDULE

THURSDAY, OCTOBER 10, 2013

1ST SESSION: VOICE PERCEPTION

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|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| 09.00 – 09.40 | Foundations of voice studies
<i>Diana Van Lancker Sidsis (New York University, USA)</i> |
| 09.40 – 10.20 | Electrophysiological correlates of voice learning and recognition
<i>Romi Zäske (University of Jena, Germany and University of Glasgow, UK)</i> |
| 10.20 – 10.40 | Coffee Break |

2ND SESSION: SEXUALITY AND MATING

- | | |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.40 – 11.20 | Doing gay, doing straight - Acoustic correlates of sexuality
<i>Adrian Simpson and Sven Kachel (University of Jena and University of Koblenz-Landau, Germany)</i> |
| 11.20 – 12.00 | Recognising facial qualities important for mate selection
<i>David I. Perrett (University of St. Andrews, UK)</i> |
| 12.00 – 13.20 | Lunch Break |

3RD SESSION: SOCIAL COGNITION AND BEHAVIOUR

- | | |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13.20 – 14.00 | The social brain: efficient mind representation
<i>Dana Schneider (University of Queensland, Australia, and University of Jena, Germany)</i> |
| 14.00 – 14.40 | Long-term consequences of interpersonal and intergroup aggression on perspective taking. Evidence from the UK and Rwanda
<i>Christine Mohr (University of Lausanne, Switzerland)</i> |
| 14.40 – 15.00 | Coffee Break |



4TH SESSION: FACE FAMILIARITY AND MEMORY

- 15.00 – 15.40 What is the link between deficits in configural processing and the Other-Race Effect in face perception?
William G. Hayward (University of Hong Kong, China)
- 15.40 – 16.20 What drives own-race, own-age, and mere categorization biases in face memory? Evidence from event-related brain potentials
Holger Wiese (University of Jena, Germany)
- 16.20 – 17.00 Timing and tuning for familiarity of cortical responses to faces
María A. Bobes-León (Cuban Neurosciences Center, Havana, Cuba)

17.00 – 19.00 POSTER SESSION

FRIDAY, OCTOBER 11, 2013

5TH SESSION: FACE PERCEPTION AND IMAGE CHARACTERISTICS

- 09.00 – 09.40 'Beauty = -2?' - The Higher-Order Image Statistics of Facial Attractiveness and Age
Gregor Hayn-Leichsenring and Claudia Menzel (University Hospital Jena, Germany)
- 09.40 – 10.20 The Processing of LSF-Information in Social Anxiety
Oliver Langner (University of Jena, Germany)
- 10.20 – 10.40 Coffee Break

6TH SESSION: REPRESENTATIONS OF FAMILIAR FACES

- 10.40 – 11.20 Distorting images: a challenge to the configural-processing view of familiar face recognition
A. Mike Burton (University of Aberdeen, UK)
- 11.20 – 12.00 The influence of shape and surface reflectance on face recognition: Implications for the configural processing hypothesis
Stefan R. Schweinberger (University of Jena, Germany)
- 12.00 – 13.30 Lunch Break

7TH SESSION:

MEMORY FOR CHEATERS

13.30 – 14.10

How adaptive is memory for cheaters?

Raoul Bell (University of Düsseldorf, Germany)

14.10 – 14.50

Ingroup Cheater Memory: Cognitive Mechanisms and Cooperation in Large-scale Groups

Stefanie Hechler (University of Jena, Germany)

15.00

END OF WORKSHOP



ABSTRACTS – ORAL PRESENTATIONS

1 FOUNDATIONS OF VOICE STUDIES

DIANA VAN LANCKER SIDTIS

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Study of sound and investigation of the ear appeared late in the development of acoustic, physiological, and psychological sciences. Faces commanded the interests of researchers. In spite of this asymmetry, faces and voices have much in common and face studies provide a beneficial analogy to those interested in voice. Studies of sound have become sophisticated, but the complexity of vocal patterns in terms of acoustic cues and levels of meaning remains challenging. Acoustic material in the signal is decomposable, but cues to information and identity form a very large interactive array with multiple layers of meaning. Human vocal patterns can be best visualized on two dimensions: vertically, levels of information signal indexical, physical, psychological, personal, linguistic and affective information. Horizontally, styles, tasks, contexts, and vocal modes further condition constellations of cues. Studies of the effects of speech task reveal distinct vocal parameters for conversation versus repetition, and for language in bilingual speakers. This complexity may account in part for observed individual differences. Personal familiarity, an important, but often neglected, feature of cognitive function, was explored among the “agnosias” in behavioral neurology, leading to the notion of familiarity as an independent, dissociable parameter in cognition. But personal familiarity is only recently and peripherally appreciated in biology, evolution, and in speech and voice research. In understanding the relationship between voices and listeners, a crucial distinction arises between personally familiar recognition and unfamiliar voice discrimination. While unfamiliar voices are probably perceived primarily through featural analysis, familiar voices are likely processed as highly integrated, holistic auditory patterns, with adventitious attention to a non-additive constellation of features, such that analytic and Gestalt perceptual processes interact to cue vocal identity as well as personal, linguistic and affective meanings.

2 ELECTROPHYSIOLOGICAL CORRELATES OF VOICE LEARNING AND RECOGNITION

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Listeners can recognize familiar speakers from a large variety of utterances, suggesting the existence of relatively speech-invariant voice representations. Using EEG we investigated how these representations are formed during voice learning. In each of two blocks, participants studied 6 unfamiliar voices uttering short sentences in 12 study phases. After each study phase they classified test voices as “old” or “new”. In the “same sentence” block, speakers repeated the study sentences at test; in the “different sentence” block, they uttered different sentences. Above-chance recognition (d') increased across study-test-cycles, indicating significant voice learning. Importantly, voices were recognized more accurately in the same sentence condition than in the different sentence condition. During study, voices that were subsequently remembered elicited larger mean amplitudes at parietal sites (P3, Pz, P4) than voices subsequently forgotten, both in the P3 (250–400 ms) and the late positive complex (LPC, 400–800 ms). This difference due to memory effect (Dm) was unaffected by test sentence condition, and may thus reflect the establishment of relatively speech-invariant voice representations. During test, voices correctly classified as “old” elicited a more positive LPC (300–700 ms) at Pz than test voices correctly classified as “new”. This OLD/NEW effect was only observed in the same sentence



condition, suggesting that it reflects processes related to speech-dependent retrieval of voices from episodic memory.

3 DOING GAY, DOING STRAIGHT - ACOUSTIC CORRELATES OF SEXUALITY

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With regard to different social categories, like gender and sexual orientation, socially powerful speech stereotypes do exist. Stereotypically, gay men speak in a high, soft voice, use a larger pitch range, articulate more precisely and hence exhibit speech characteristics that are stereotypically ascribed to women. Speech patterns of actors playing gay roles have been found to reflect this stereotype (Cartei & Reby 2012). By contrast, empirical findings, mainly centred around Anglo-American speech communities, have only reported few, and partly contradictory, speech differences between gay and straight men (Rendall et al. 2008; Baeck et al. 2011). The findings of Kachel, Simpson and Steffens (in prep.) on a sample of women differentiated with respect to sexual orientation suggested that a) potential differences between straight and non-straight persons are not primarily due to sexual orientation, but other psychological characteristics, like gender-role self-endorsement and psychosocial affiliation with the ingroup, and b) that only a subgroup of exclusively gay men produce acoustical values that are clearly delimitable from straight men and could therefore serve as a basis for stereotype formation. These hypotheses are tested using a sample of 23 gay and 23 straight men. In this talk we will outline the benefits of interpreting the details of acoustic phonetic differences between speakers against the background of a fine-grained measurement of a range of psychological variables to develop a more fundamental understanding of the sociophonetic interplay of gender and sexual orientation.

4 RECOGNISING FACIAL QUALITIES IMPORTANT FOR MATE SELECTION

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Prior research on facial attributes that are relevant to mate choice has focused on sexual dimorphism and symmetry which are thought to provide long-term developmental cues to heritable immunity. There are, however, many other factors relevant to mate choice. Health, for example, is indicative of direct benefits to the partnership and to offspring. Adiposity provides a valid index of current and future health, and is readily visible in face shape. Skin colour also provides multiple health cues. Skin redness reflects blood perfusion and oxygenation which together signal current health. Skin yellowness reflects carotenoid antioxidants and can provide indices of diet quality and oxidative stress (including that from illnesses). Recently it has become apparent that the male face provides shape cues to strength, body height and trustworthiness, all characteristics that may influence mate selection. Thus despite the decades of research on attractiveness and mate choice, the role of facial cues continues to be a fertile area of research.



5 THE SOCIAL BRAIN: EFFICIENT MIND REPRESENTATION

DANA SCHNEIDER

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An individual's ability to understand others' mental states (e.g., their beliefs, emotions or intentions), or the use of one's Theory of Mind (ToM), reflects complex and dynamic cognitive processes implicated in social competency and social function outcomes across the human lifespan. It is increasingly recognized that when we use ToM for decoding and reacting to the mental states of others' we may only have limited awareness of engaging in this operation. However, we understand little about how this implicit ToM operates as most research to date has focused on our ability to make conscious/explicit ToM inferences. I present a series of studies employing behavioural and neuroimaging techniques in healthy participants and those with an autism spectrum disorder, which investigated the cognitive and neural system mechanisms that underpin unconscious/implicit ToM processing. Throughout, I highlight whether it is justifiable to think of ToM as divisible into distinct implicit and explicit systems.

6 LONG-TERM CONSEQUENCES OF INTERPERSONAL AND INTERGROUP AGGRESSION ON PERSPECTIVE TAKING. EVIDENCE FROM THE UK AND RWANDA

CHRISTINE MOHR¹ & ANGELA C. ROWE²

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Interpersonal histories of aggression are thought to be accompanied by empathy deficits. Such deficits, however, could be general or victim-specific. Only general deficits would support a trait explanation of empathy, and violence in broader terms. We here present results from two studies that showed perspective taking deficits to be victim-specific, contradicting the trait explanation. We measured individuals' perspective taking (cognitive component of empathy) as a function of their former experiences of interpersonal (bullying in UK sample) or intergroup (perpetrators versus survivors of the 1995 Rwandan genocide) aggression using a computer task rather than bias-prone self-report measures. Victim-specificity was manipulated by subliminally presenting participants with word primes (name of persons involved in bullying; name of groups involved in the Rwandan genocide) prior to each perspective taking trial. Showing relative impaired performance for trials primed by the victim concept, we provide evidence for victim-specificity in perspective taking deficits and an objective means i) to examine victim-perpetrator relationships even in remote and computer illiterate communities, ii) to test interpersonal perspective taking in situations in which direct inquiry might be unethical, and iii) that avoids response biases when honest responding (e.g. admitting lack of empathy towards a victim) may have serious social or legal consequences (e.g., social rejection or imprisonment). We showed that similar patterns of victim-specific perspective taking deficits can be observed very different populations. As far as we are aware of, we here report for the first time on implicit psychological data obtained with individuals with experience of genocide.



7 WHAT IS THE LINK BETWEEN DEFICITS IN CONFIGURAL PROCESSING AND THE OTHER-RACE EFFECT IN FACE PERCEPTION?

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Face perception is characterized by a high sensitivity to configural relationships between face features. In recent years a number of researchers have proposed that such configural processing may be most highly specialized for faces that we have the most experience at perceiving, such as those from our own ethnic group, and that configural processing of faces from other ethnic groups might be weaker. In this talk, I will assess these claims by reviewing work from my lab and those of other researchers. I will specifically examine research using four different face perception paradigms; (i) inversion, (ii) part-whole effect, (iii) composite effect, and (iv) scrambling/blurring. The case for weaker configural processing of other-race faces is relatively weak in most of these paradigms, though relatively consistent results were found for inversion and face blurring. In addition, a case can also be made for stronger processing of individual face features in own-race faces. These results suggest that different tasks tap distinct aspects of configural processing, and only some of these are affected by one's expertise with face ethnicity.

8 WHAT DRIVES OWN-RACE, OWN-AGE, AND MERE CATEGORIZATION BIASES IN FACE MEMORY? EVIDENCE FROM EVENT-RELATED BRAIN POTENTIALS

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Faces from an observer's social group, such as own-race or own-age faces, are typically remembered more accurately than respective other-group faces. These own-race (ORB) and own-age biases (OAB) are classically explained by increased perceptual expertise for own- than other-group faces. Alternatively, the mere categorization of faces into social in- versus out-groups, independent of expertise, may underlie such effects. Accordingly, memory biases for faces arbitrarily assigned to ad-hoc categories have been observed. Importantly, while recent theoretical approaches acknowledge that partly different processes may drive the different memory biases, the exact contributions of perceptual expertise and social categorization to the ORB, the OAB, and mere categorization biases are largely unknown. Here, I present evidence from event-related potentials, which demonstrate (i) that early processing stages reflected in the N170 component, and thus differences in perceptual expertise, underlie the ORB, (ii) that the processing of own-race/own-age faces arbitrarily assigned to ad-hoc in- versus out-groups does not result in similar perceptual effects, and (iii) that the OAB is not affected by experimental manipulations typically interpreted as supporting socio-cognitive accounts (such as increasing the participants' motivation to individualize out-group faces), and most likely manifests at post-perceptual stages of encoding faces into memory.



9 TIMING AND TUNING FOR FAMILIARITY OF CORTICAL RESPONSES TO FACES

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Different kinds of known faces activate brain areas to dissimilar degrees. However, the tuning to type of knowledge, and the temporal course of activation, of each area have not been well characterized. Here we measured, with functional magnetic resonance imaging (fMRI) and event related potentials (ERPs), brain activity elicited by unfamiliar, visually familiar, and personally familiar faces. The fMRI response was modelled using flexible hemodynamic response functions and we assessed response amplitude and duration as well as the tuning to face type, of regions within the face processing system. Core face processing areas (occipital and fusiform face areas) responded to all types of faces with only small differences in amplitude and duration. In contrast, most areas of the extended face processing system (medial orbito-frontal, anterior and posterior cingulate) had weak responses to unfamiliar and visually-familiar faces, but were highly tuned and exhibited prolonged responses to personally-familiar faces. The availability over time of different type of knowledge was evaluated using the time-course of P3 event related potentials. Visually familiar and personally familiar faces both elicited a P3b, maximal over centro-parietal sites, and a latency of 500 ms, which probably indicate the access to explicit face information. Personally familiar faces elicited an additional component, an early P3 maximal over frontal sites: with a latency of 350 ms, probably related to the access to emotional-social information. Source analysis demonstrated that the component related to emotional-social information was generated in areas of the extended system, including the medial orbito-frontal. These results together indicate that the neural processing of different types of familiar faces not only differs in degree, but is probably mediated by qualitatively distinct mechanisms, which must operate in parallel.

10 'BEAUTY = -2?' - THE HIGHER-ORDER IMAGE STATISTICS OF FACIAL ATTRACTIVENESS AND AGE

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Previous studies revealed correlations between higher-order image statistics and aesthetic judgment. Of particular interest are two properties, scale-invariance in the Fourier domain and high self-similarity, which artworks share with images of natural scenes. Here, we investigated these higher-order statistics in face images and correlated them with ratings of attractiveness and age perception. We found significant correlations for unaltered face images (Study 1) and modified face images (Study 2 and 3). Unexpectedly, the images of unattractive (older) faces resulted in log-log plots of radially averaged Fourier power that were more shallow than for attractive (younger) faces (Study 1). However, when we manipulated the face images directly, images with Fourier plots that were shallower were preferred by observers (Study 3). Images of natural scenes and artworks, such as portraits, also possess shallower slopes in Fourier plots. Additionally, the attractiveness of unaltered faces was affected by the spatial frequency spectrum of a random-noise background around the images (Study 4). We conclude that facial attractiveness ratings are affected by specific higher-order image properties, perhaps because they might be processed more efficiently and/or fluently in the human visual system.

**11 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.

12 DISTORTING IMAGES: A CHALLENGE TO THE CONFIGURAL-PROCESSING VIEW OF FAMILIAR FACE RECOGNITION**A. MIKE BURTON & ADAM SANDFORD**

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Face recognition is widely held to rely on ‘configural processing’, an analysis of spatial relations between facial features. However, this concept is never operationalised – no theory describes which spatial relations are used to recognise a face. We present three experiments in which viewers were shown distorted faces, and asked to resize these to their correct shape. Based on configural theories, we reason that this should be an easier task for familiar than unfamiliar faces (whose subtle arrangements of features are unknown). In fact, we found large errors in this task, with no advantage for familiar faces: in one experiment participants were more accurate with unfamiliar faces, and in two experiments there was no difference. These findings were not due to task difficulty – participants were able to resize other stimuli quite accurately. If configural processing does underlie face recognition, these results place severe constraint on the definition of ‘configural’. Alternatively, face recognition might rely on more complex criteria – based on tolerance to within-person variation rather than highly specific measurement.

13 THE INFLUENCE OF SHAPE AND SURFACE REFLECTANCE ON FACE RECOGNITION: IMPLICATIONS FOR THE CONFIGURAL PROCESSING HYPOTHESIS**STEFAN R. SCHWEINBERGER**

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Face recognition is often believed to be based on some sort of “configural” or “holistic” processing. Although these terms are not always defined clearly in the literature, an influential hypothesis is that the recognition of individual faces depends, to a considerable extent, on shape in terms of metric distances between features (so-called second-order configural information). Here I will argue that this idea is not easily reconciled with a number of empirical findings. First, I will show evidence that familiar faces are well recognized even when

idiosyncratic shape has been eliminated by shape normalization – suggesting a strong role of texture/surface reflectance for recognition. I will then present several face learning experiments that examined the impact of selective photorealistic caricaturing of either shape or texture information on face recognition and its neuronal correlates in event-related brain potentials. These experiments also confirm that shape is of little importance for the recognition of familiar faces, whereas shape enhancement was shown to facilitate the encoding of new faces. Moreover, distinctive texture/reflectance information was found to be particularly important for the recognition of learned faces. Overall, the present experiments underline the importance of face familiarity for mental representations of faces. Crucially, the configural processing hypothesis in its traditional form does not well account for the findings reported, and thus should be reconsidered.

14 HOW ADAPTIVE IS MEMORY FOR CHEATERS?

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Theories in evolutionary psychology assume that highly specialized cognitive modules support social exchange by facilitating the detection of cheaters. Given that reciprocal strategies in social exchange rely heavily on memory, it has been argued that people should be especially good at remembering cheaters because doing so would help them avoid social exploitation. Early studies showed enhanced source memory for faces of cheaters (i.e., enhanced memory for the association between a face and cheating behavior). However, more recent study show that memory for social exchange partners depends on people's social expectations. When cooperation is expected, cheating is better remembered than cooperation. However, when cheating is expected, this pattern is reversed. These results are inconsistent with a cheater detection module, and can be explained by a more general expectancy violation mechanism. Focusing on expectancy-incongruent information may represent a more flexible, general, and hence more adaptive memory strategy for remembering social information than focusing only on cheaters would.

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

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Cheater detection and memory serve social functions regarding the maintenance of future interaction and cooperation within large-scale groups. There is broad evidence for an enhanced source memory for non-cooperative behavior in interpersonal exchange, due to valence and incongruences of target and content. Regarding the intergroup context, we assume differential cognitive processes for ingroup cheaters and outgroup cheaters. This hypothesis is supported by two lines of argumentation. First, outgroup homogeneity effects in perception and memory imply that the complexity of information processing differs according to group contexts. Secondly, positive differentiation of in- and outgroup members suggests expectancy violations regarding only ingroup cheaters and outgroup trustworthy persons. In our experiments we extended the recent findings on cheater memory altering the group membership (ingroup vs. outgroup) of target faces. Multinomial models revealed no difference between the recognition parameters of the groups. However, we observed distinct patterns of source memory for negative and positive (but not for irrelevant) behavior associated with in- and outgroup members. In addition, the guessing bias, that a face belonged to a cheater, was increased for outgroup members. We conclude that memory advantage for emotional and unexpected information seems to be supported in intergroup contexts.



ABSTRACTS – POSTERS

1 DIFFERENT NEUROFUNCTIONAL MARKERS FOR ACCESS TO AND RETRIEVAL OF “PURE” FACE AND FACE-RELATED VERBAL INFORMATION TRIGGERED BY FACES.

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We investigated the neural correlates of the access to and retrieval of “pure” structural face information in contrast with those of face-related biographical nature triggered by faces. Stimulus’s familiarity was induced experimentally in our participants via a systematic learning procedure that included faces with and without associated verbal-semantic information. Then, ERPs were recorded in both face-feature and face-occupation matching tasks while N400-like responses were elicited by incorrect eyes-eyebrows completions and occupations, respectively. Application of the Bayesian source reconstruction plus conjunction analysis of group effects revealed that the “pure” face N400 seemed to be generated in right posterior brain regions encompassing mainly OFA and, in some extent, FFA, likely reflecting neural operations triggered by structural incongruities. In turn, the N400 of occupations was related to more anterior left-sided fusiform and temporal inferior activity, paralleling the activity described previously for the classic linguistic N400. Regarding earlier latencies, the N170s generated in both cases were of similar amplitude but seemed to have different neural support. Thus, whereas the facial N170 was associated to FFA and OFA, the N170 of occupations was associated to a bilateral very posterior activity, suggestive of basic perceptual processes. Relevantly, the right-sided perceptual P200 and the identity-related N250 were exclusively evoked in the pure face-feature task, with sources in OFA and extensive fusiform region, respectively. All these results support the existence of differentiated neural systems for pure facial and face-related verbal information processing, which can be activated according to the stimulus-associated knowledge and specific task demands.

2 THE TEMPORAL DYNAMICS OF REPETITION SUPPRESSION AND PERCEPTUAL EXPECTATION ELUCIDATED BY HUMAN EEG RECORDINGS.

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Recently, several functional magnetic resonance imaging (fMRI) studies have pointed towards an interaction of perceptual expectations and neuronal repetition suppression in determining human face-related brain activity (Summerfield et al. 2008). An ongoing challenge, however, is to disentangle the relative contribution of the fulfilled perceptual expectation and the altered quantity of repetitions itself. To address this problem, we varied the amount of face/house category repetitions during an adaptation event, while subjects had to make a categorical decision about subsequent ambiguous face/house targets. Orthogonal to these variations, the subjects’ perceptual expectation was oriented randomly towards either faces or houses (Egner et al. 2010). We found significant effects of both expectation and number of repetitions in simultaneously recorded human event related potentials (ERPs). Crucially, the temporal dynamics of these two effects differed from each other. While the quantity of repetition acted early after stimulus onset (> 215 ms), the amount of repetitions interacted with expectation in the medium timeframe (315 - 615 ms) and expectation only demonstrated a



main effect in the late time frame (> 565 ms). These results support those findings stating that the effects of adaptation and expectation are temporally separated.

3 EVIDENCE FOR DOMINANCE OF SURFACE REFLECTANCE AND TOLERANCE FOR VIOLATIONS OF SHAPE IN FACE MATCHING AND RECOGNITION

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Both shape and surface reflectance (texture) contribute to face recognition. Recent evidence suggests a decreasing diagnostic value of shape with increasing familiarity, and stronger reliance on shape in poor recognizers. In two experiments we compared contributions of both dimensions to matching and recognizing unfamiliar, newly learned, and familiar faces. Within each familiarity condition, 3D faces were morphed selectively in either shape or texture. Experiment 1 consisted of an identity matching task using unaltered S1 followed by morphed S2 stimuli. In Experiment 2, newly learned and familiar faces had to be recognized from morphs. We assessed % of same responses (Exp.1) and % of original identity responses (Exp.2). Additionally, for each familiarity condition within each experiment we calculated a quotient, indicative of which dimension was more diagnostic. To assess individual differences, quotients were correlated with performance in face perception tests. Overall, we found higher dominance of texture. In Exp.1 this effect was further specified by familiarity, with a stronger reliance on shape in unfamiliar and on texture in familiar faces for intermediate morph levels. These effects were only weakly modulated by individual differences. Overall, our results suggest that facial texture plays a larger role than shape in face matching and recognition.

4 PUPILLARY RESPONSES TO PERCEIVED GAZE DIRECTION AND FACIAL ATTRACTIVENESS

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In interpersonal communication, pupil size has been shown to increase when perceiving eye gaze contact with a conversational partner (Porter, Hood, Troscianko, & Macrae, 2006; Honma, Tanaka, Osada, & Kuriyama, 2012). There is also evidence that the perception of facial attractiveness interacts with the perception of eye contact (Kampe, Frith, Dolan, & Frith, 2001; Ewing, Rhodes, & Pellicano, 2010; Kloth, Altmann, & Schweinberger, 2011). Here we investigated whether perceived eye contact and attractiveness elicit additive or interactive effects on pupil dilation, which is generally assumed to be independent of conscious awareness (Laeng, Sirois, & Gredeback, 2012). Based on previous ratings, we selected a total of 36 attractive and unattractive faces (9 male and 9 female faces of each type) and manipulated their eye regions to achieve an impression of direct or averted gaze. We excluded confounds between facial attractiveness and eye regions by using identical sets of eye regions for both conditions. All faces were presented in pseudo-randomised order on a black background for 3000 ms, with an inter-stimulus interval of 3000 ms. Participants rated the perceived attractiveness of each face by pressing one of four horizontally aligned keys. Pupil dilation was recorded with an SMI iViewX Hi-Speed tracker. Attractiveness consistently affected ratings, response times, and mean pupil dilation. In particular, we found a three way interaction of attractiveness × face gender × participant gender: Female participants showed a stronger pupillary dilation in response to attractive male faces than to attractive



female faces, while male participants showed the opposite pattern. In contrast, gaze direction affected neither behavioural nor pupillary measures, nor did it interact with attractiveness.

5 EXPERIENCE WITH NATURALLY OCCURRING WITHIN-PERSON VARIABILITY IMPROVES PERCEPTUAL MATCHING OF COMPLETELY NOVEL IDENTITIES

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Despite our reliance on photo-identification, our ability to match two separate instances of a face is remarkably poor (Bruce et al., 1999). One of the reasons that we are so poor may be that the same person's face can appear dramatically different each time it is encountered, due to transient within-person variability. Precisely what makes different instances of the same person appear visually distinctive remains largely unknown; however some variability will be specific to a situation, thus affecting the appearance of faces in a similar way. An example of this is with ageing, whose influence can be generalized to novel faces (Mark & Todd, 1983). Here we ask whether active experience with within-person variability from a specific sample of variability (e.g. model photographs) for multiple identities increases the ability to differentiate between completely novel faces with this same variability. Using sorting and matching methodologies, we present three experiments that show unfamiliar face perception accuracy to increase with experience of within-person variability of a sample of additional unfamiliar faces. We consider the implication of these results for improving unfamiliar face perception performance.

6 THE N250R IS SENSITIVE TO PERCEIVED (RATHER THAN PHYSICAL) FACIAL IDENTITY

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The N250r ERP reflects increased negativity to repeated faces over inferior temporal regions of the right hemisphere around 200-350 ms, was found to originate from fusiform cortex, and has been related to the reactivation of mental representations of individual identities of familiar faces. Since the N250r effect is typically larger for same-image (compared to different-image) repetitions of a familiar face, it is debated whether it reflects physical stimulus similarity between prime and target, or reactivation of perceived representations of identity. Here, participants performed a four-choice identification task on famous target faces (1500 ms), which were always preceded by the same average face (500 ms, prime-target SOA 1500 ms). Crucially, by adapting participants to specific anti-faces (5000 ms), we aimed at inducing illusory facial identity (cf. Leopold et al., 2001) in this prime. No significant performance difference emerged between "Primed" and "Unprimed" trials (when pre-prime adaptation involved the anti-face specifically corresponding to the target, vs. a non-corresponding anti-face). Importantly, the N250r was significantly larger for "Primed" than "Unprimed" trials, and this was clear over the right but not left hemisphere. Our results emphasize the N250r as a neural correlate of perceived facial identity, even when the physical stimulus is kept constant.

**7 NEURAL CORRELATES OF VOICE LEARNING WITH DISTINCTIVE AND NON-DISTINCTIVE FACES**ROMI ZÄSKE^{1,2,3}, JÜRGEN M. KAUFMANN^{1,2} & 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**3 Institute of Neuroscience and Psychology, University of Glasgow, Glasgow, UK*■ romi.zaeske@uni-jena.de

Learning to recognize people from their voices is facilitated by voice distinctiveness, similar to what has been reported for faces. However, little is known about the neural time course of voice learning and the role of facial information. Based on evidence for audiovisual integration in the recognition of familiar people, we studied behavioural and electrophysiological correlates of voice learning with distinctive and non-distinctive faces. We presented unfamiliar voices either together with distinctive or non-distinctive faces at learning. During bimodal learning, distinctive faces increased early visual (N250) and auditory (N1) evoked potentials relative to non-distinctive faces. At test, unimodally presented voices that had been learned with distinctive faces were classified faster than voices learned with non-distinctive faces and faster than novel voices. Moreover, voices previously learned with distinctive faces elicited an N250 component similar in topography to that typically observed for face stimuli. Preliminary source localization of this voice-induced N250 was compatible with a source in the fusiform gyrus. Taken together our findings support recent evidence of an early interaction between voice and face processing areas.

8 ROLE OF VOCAL TRACT RESONANCES AND FUNDAMENTAL FREQUENCY IN VOICE GENDER ADAPTATIONVERENA G. SKUK¹, LEA DAMMANN² & 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

Prior adaptation to male (or female) voices causes androgynous voices to be perceived as more female (or male). In the current study, a selective adaptation paradigm has been used to investigate the relative impact of both fundamental frequency (F0) and vocal tract resonances (VTR) on the basic voice gender aftereffect. Stimuli were resynthesized voice morphs along 20 morph continua (10 male-female speaker pairs x 2 vowel-consonant-vowel utterances; morphed by TANDEM-STRAIGHT software). In adaptor stimuli of both F0 and VTR adaptation conditions the parameter of interest (F0 or VTR) was either male or female whereas the other parameter (VTR or F0) was kept at an empirically determined androgynous voice morph level, and was thus devoid of gender information. Aftereffects related to VTR adaptation were reduced relative to a control condition comprising male or female voices as adaptors, but were still almost twice as large compared to F0 adaptation. Gender discrimination of both VTR and F0 adaptor stimuli was comparable. Overall, these results demonstrate a prominent role of vocal tract resonances in voice gender processing. Finally, further evidence suggested that substantial individual listener differences can, at least in part, reflect pre-experimental contact to male and female voices.



9 REPETITION PROBABILITY EFFECTS FOR FAMILIAR AND UNFAMILIAR CHARACTERS

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Currently, there is an on-going debate about the mechanisms of repetition suppression (RS). While traditional theories suggest bottom-up mechanisms and single-cell results for objects support this conclusion (Kaliukhovich and Vogels, 2011) others suggest the involvement of top-down (expectation) effects for faces (Summerfield et al, 2008) in creating RS. However, our own previous results limit the top-down modulations of RS to the stimulus category of faces (Kovács et al, 2012, 2013). To test the role of experience and learning in creating RS here we tested if expectation affects the RS of the fMRI signal for another well-learned stimulus category, characters. Our results suggest that probability modulates RS of both the visual word form area as well as of the object specific LO for both roman characters and runes. This proves that the modulatory expectation effect on RS is not unique to faces. Furthermore, our results exclude experience or previous exposure as a factor determining if RS is modulated by expectation/prediction/stimulus probability or not.

10 COGNITIVE LOAD DISRUPTS IMPLICIT THEORY OF MIND PROCESSING

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Eye movements in 'Sally-Anne' False Belief tasks appear to reflect the ability to implicitly monitor the mental states of others ('Theory of Mind' - ToM). It has recently been proposed that an early developing, efficient and automatically operating ToM system subserves this ability. A surprising omission in the literature however, is an empirical test of the influence of domain-general executive processing resources on this implicit ToM system. Here, a dual-task method was employed to investigate the impact of executive load on eye movements in an implicit 'Sally-Anne False Belief' task. Under 'No-load' conditions, adult participants displayed eye-movement behavior consistent with implicit belief processing, whereas evidence for belief processing was absent for participants under cognitive load. These findings indicate that the cognitive system responsible for implicitly tracking beliefs draws at least minimally on executive processing resources. Thus, even the most low-level belief analysis process appears to reflect a capacity-limited operation.



11 DECISION-DEPENDENT AFTEREFFECTS FOR FACES

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In previous studies, we could show that ambiguity and physical similarity play a role in determining face identity aftereffects (AEs). Here, we manipulated the task context to test the role of ambiguity while keeping the physical similarity constant. We created two continua from quadruplets of unfamiliar faces (identities A, B, C, D), spanning three identities each (A-B-C and B-C-D). Subjects were familiarized with faces A and C and then tested for the A-B-C continuum in an AE paradigm. Following adaptation to A or C, we observed contrastive AEs for the ambiguous target identity B but not for the unambiguous identities A or C. At least 24 hours later, the same subjects were familiarized with faces B and D. This was followed by tests of AEs for the B-C-D continuum. We again observed contrastive AEs but only for target identity C (ambiguous) and not for B or D (unambiguous). Therefore, the task-context determined whether AEs are induced or not for the same stimuli present in both sessions (B-C). Our results replicate AEs in the perception of pre-experimentally unfamiliar faces and suggest the influence of ambiguity as given by the task context on the occurrence of AEs, irrespective of the physical image.