Symposium Gesichtsverarbeitung DGPS 2004 Göttingen
Chair: Claus-Christian Carbon

1. Stauch, J., Korell, M., Schwarzer, G.
   Verarbeitung von Gesichtsidentität und emotionalem Ausdruck im Entwicklungsverlauf

2. Dörr, P., Engst, F.M. & Sommer, W.
   Are face recognition units viewpoint-dependent? An ERP priming study with newly learned faces

3. Werheid, K., Schacht, A., & Sommer, W.
   Affective evaluation of faces as measured by event-related brain potentials

4. Sporer, S. L.
   Justus-Liebig-Universität Gießen
   Recognizing Out-group Faces: Resumé of a Research Program on Testing an In-group/Out-group Model

5. Schwaninger, A., Schumacher, S., Wallraven, C., & Bülthoff, H.H.
   Component and configural information in view-based face recognition by human and machine

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Gesamtabstract zum Symposium "Gesichtsverarbeitung"

Im Symposium "Gesichtsverarbeitung" werden verschiedene Forschungsansätze zur Verarbeitung von Gesichtern vorgestellt.

1) Eine entwicklungspsychologische Fragestellung entwirft der Beitrag von Stauch, Korell und Schwarzer, welcher den Entwicklungsverlauf von Leistungen beim Gesichtserkennen und beim Identifizieren von emotionalen Gesichtsausdrücken untersucht.
2) Der Beitrag von Dörr, Engst und Sommer stützt sich auf neuropsychologische Experimentaldaten. Es wird demonstriert, dass sog. FRUs (face recognition units) blickwinkelabhängig verankert sind.
3) Der Beitrag von Werheid, Schacht und Sommer stützt sich ebenfalls auf neuropsychologischen Verfahren. Es wird gezeigt dass dass attraktive Gesichter mehr Aufmerksamkeit auf sich ziehen als nicht-attraktive Gesichter.
4) Eine praktische Auswirkung menschlicher Gesichtsexpertise demonstriert Sporer mit Experimenten zum in-group/out-group Phänomen: Gemäß seiner Kontakthypothese können Gesichter von Ethnien mit hoher Kontaktfrequenz schneller und akkurater individualisiert werden.
5) Last but not least untersucht der neu hinzugekommene und im Programm nicht angekündigte Vortrag von Schwaninger, Schumacher, Wallraven und Bülthoff, welche Informationen wesentlich für die Erkennung von Gesichtern sind, wenn sich der Blickwinkel für die Expositionen verändert.

1) Johanna Stauch, Monika Korell, ***Universität Tübingen***
und Gudrun Schwarzer, ***Universität Gießen***

Verarbeitung von Gesichtsidentität und emotionalem Ausdruck im Entwicklungsverlauf

Für Erwachsene ist bekannt, dass sie die Identität eines Gesichts unabhängig vom emotionalen Ausdruck, den emotionalen Gesichtsausdruck dagegen gekoppelt an die Gesichtsidentität verarbeiten (Schweinberger & Soukup, 1998). Unklar ist jedoch, ob diese asymmetrische Verarbeitung auch schon bei Kindern auftritt und welche Rolle dabei das für Kinder typische Beachten externer Gesichtsmerkmale spielt. Ein Beachten externer Gesichtsmerkmale würde nämlich die unabhängige Verarbeitung der Gesichtsidentität generell erleichtern.
In Anlehnung an das Paradigma der selektiven Aufmerksamkeit (z.B. Garner, 1974) sollten Kinder (5-11 Jahre) und Erwachsene in drei Reaktionszeitexperimenten Gesichter ohne oder mit Kopfbedeckung (zur Verhinderung der Fokussierung der Haare als externes Merkmal) anhand von Gesichtsidentität oder emotionalem Ausdruck klassifizieren. Unter drei Bedingungen wurde ein zusätzliches, jedoch irrelevantes Merkmal (emotionaler Ausdruck oder Identität) so variiert, dass dessen Einfluss auf die Verarbeitung des relevanten Merkmals getestet werden konnte.
Die Ergebnisse zeigten, dass auch unter Ausschalten des Beachtens externer Gesichtsmerkmale schon 5-11jährige Kinder eine den Erwachsenen ähnliche asymmetrische Verarbeitung von Gesichtsidentität und emotionalem Ausdruck aufweisen. Zur Interpretation dieser frühen asymmetrischen Verarbeitung werden Erklärungsansätze zur parallelen oder seriellen Verarbeitung diskutiert.

2) P. Dörr, F.M. Engst & W.Sommer
Institute of Psychology, Humboldt Universität at Berlin, Germany

Are face recognition units viewpoint-dependent? An ERP priming study with newly learned faces

Models of face recognition postulate a processing stage containing structural representations of familiar faces (face recognition units, FRU). When familiar faces are shown repeatedly, event-related brain potentials (ERP) around 250-300 ms are more positive at fronto-central and more negative at occipito-temporal sites for the second presentation (early repetition effect, ERE). It has been suggested that the ERE reflects the access to FRUs. Here we investigated, whether FRUs are object-centered or viewpoint-dependent by comparing the repetition effect for faces that have been newly learned from different perspectives. We used a Prime-Target-Paradigm with backward-masking. 16 participants learned the home towns of 64 faces, always shown either in a frontal or profile view. Memory for the learned faces was assessed by a recognition task (studied vs. unstudied) and by a semantic task (home town classificaton). In the priming condition each face was preceded by the portrait of the same person from the same or from the other perspective. The repetition effect was measured by comparing the ERPs from the primed conditions with a condition where a different face preceded the target.
There was a sizeable ERE for faces learned with the profile view, which was, however, smaller than to faces learned with frontal views. The results indicate that the viewpoint is important for the activation of FRU´s. Task-dependent processes (semantic vs. recognition task) are discussed.

3) Werheid, K., Schacht, A., & Sommer, W.
Institut für Psychologie, Humboldt-Universität zu Berlin

Affective evaluation of faces as measured by event-related brain potentials

Faces are among the most important social signals in everyday life, and the mere aspect of an unfamiliar face provokes evaluative judgments about the person depicted. Among these, judgments of attractiveness seem to play a key role, as they are substantially correlated with inferences about personality characteristics. Previous research has revealed dissociable event-

related brain potentials (ERPs) in response to artificial line drawings of faces judged as highly attractive or non-attractive.
The present study investigated if these ERP alterations also occur in response to realistic facial photographs, and whether this effect can be modulated by an immediately preceding face. ERPs were recorded from 20 student participants while classifying faces as attractive or non-attractive. The stimuli had been selected on the basis of a previous rating study. Each target face was either preceded by a portrait belonging to the same or opposite attractiveness category.
Analysis of the ERPs revealed an enhancement of the attention-related late positive potential for attractive as compared to non-attractive target faces. This effect was not influenced by the immediately preceding face. Our results are in line with previous ERP research on affectively connotated words and pictures. Attractive faces capture the viewer's attention to a greater extent than non-attractive faces. This effect is seemingly unaltered by the attractiveness of faces occurring in the immediate temporal context.

4) Siegfried L. Sporer
Justus-Liebig-Universität Gießen
Recognizing Out-group Faces: Resumé of a Research Program on Testing an In-group/Out-group Model
The focus of this project was on the cross-race effect which denotes an own-group advantage in the recognition of faces of one's own ethnic group (in-group) in comparison to faces of another ethnic group (out-group). The primary focus has been on the role of perceptual expertise in the recognition of faces of African-Americans, Mexican-Americans, Tur ks and Germans, as well as of horses, by Turks (living in Germany), Germans, children in Austria, and airport customs officers. We summarize the results of a series of experiments with recognition, face classification, as well as matching and delayed matching paradigms. Rival theoretical accounts, in particular Valentine's face space model, and Sporer's in-group/out-group model are tested. In line with the contact hypothesis, the own-group advantage is only found with German but not with Turkish participants. An asymmetry in inversion effects suggests that in-group faces are likely to be encoded configurally while out-group faces more likely by features. The classification and matching results indicate that the effect is not just a memory phenomenon but already operates at a perceptual level. Confirmation of the in-group/out-group model is also obtained from other researchers' findings of own-age and own-sex recognition advantages.

5) Adrian Schwaninger (1, 2), Schumacher Sandra (2), Wallraven Christian (1), Bülthoff, Heinrich H. (1)
(1) Max Planck Institute for Biological Cybernetics, Tübingen, (2) Department of Psychology, University of Zürich
Component and configural information in view-based face recognition by human and machine
In this study we used the inter-extra-ortho paradigm from Bülthoff & Edelman (1992) in order to investigate what kinds of information are used for recognizing faces across viewpoint. In Experiment 1, ten face-stimuli were presented in frontal view and 45° side view. At test they had to be recognized among ten distractor faces from 13 different viewpoints. We found systematic effects of viewpoint (recognition performance: inter > extra > ortho). In Experiment 2 and 3 we investigated the relative importance of component and configural information for view-based recognition. In Experiment 2, participants learnt 10 intact faces. At test, configural information was destroyed by scrambling faces (10 target faces and 10 distractor faces). The results suggest that faces can be recognized on the basis of isolated featural information. In Experiment 3, 10 previously learnt intact faces were shown among 10 distractors in low-pass filtered versions. This eliminated local features contained in the facial

parts resulting in a stimulus containing only configural information. The blurred versions could be recognized reasonably well, which suggests an important role of configural information. Furthermore, we found systematic effects of viewpoint for both isolated configural information and isolated component information. In addition to the psychophysical experiments, systematic differences between the effects of viewpoint are discussed in a computational framework based on key frames.