(voxel: 1.4x1.4x2mm) to see which cortical regions were activated. In the scanner, the subjects performed a motion 1-back task on stimuli created by combining two trained line-drawings that can be translated to real words (RW), pseudo-words (PW), and consonant strings (CS), plus stimuli created with novel line-drawings (NV). We found a left fusiform region in all 10 subjects that responded more strongly to RW than to NV. The location of this region was either overlapped with (4 subjects) or adjacent to (6 subjects) the VWFA. Further, the functional profile of this region was similar to that of the VWFA, as it responded equally to RW, PW and CS, but significantly less strongly to NV. Our data suggests that the selectivity of newly-learned objects is developed near the region responsive to experientially associated but not visually similar stimuli.

C282

ACUTE ALCOHOL AND THE RAPID DETECTION OF VISUAL CHANGE *J. Leon Kenemans, Wendelien Hebly, Eveline H.M. Van den Heuvel, Tineke Grent-'t Jong; Utrecht University, Deps. of Psychonomics and Psychopharmacology* – Moderate doses of alcohol (BAC of about 0.5 %) may result in acute impairments at various levels of information processing. A number of reports have documented detrimental effects of moderate alcohol on the Mismatch Negativity (MMN), the electrocortical manifestation of a rapid (100 ms post-stimulus) mechanism dedicated to the detection of unexpected auditory change (e.g., Jääskeläinen et al. (1995), Alc Clin Exp Res, 19, 607-610). Recently, we and others identified a partial visual counterpart of the MMN, sometimes called the Rareness-Related Negativitity (RRN). Analogous to the MMN, the RRN evolves at about 100 ms after the unexpected change, and was localized in visual cortex (Kenemans et al. (2003), NeuroRep 14 (1243-1246). Rapid detection of unexpected events is important for everyday-life conditions like driving, prompting the question whether the visual RRN shows sensitivity to moderate alcohol similar to the MMN. In the present study the designs of Jääskeläinen et al. (1995) and of Kenemans et al. (2003) were both applied in 16 subjects, either under moderate alcohol or under placebo. Unexpected visual change was implemented by presenting 2.4 versus 0.6 c/d gratings in pseudo-random sequences according to a deviant (10 %)/ standard (90 %) schedule. The alcohol effects on MMN reported before were replicated. Furthermore, the RRN, defined as the difference between deviant and standard ERPs between 140 and 170 ms at Oz, was present under placebo, but not under alcohol. It is concluded that moderate alcohol does indeed impair the rapid detection in visual cortex of unexpected changes.

C284

LEARNING TO RECOGNIZE FACES THROUGH NOISE: AN FMRI STUDY *Ke Zhou, Jia Liu; The Key Lab of Cognitive Science, Graduate School & Institute of Biophysics, Chinese Academy of Science, Beijing, P.R. China* – If an object embedded within noise is encountered repeatedly, our initial vague impression will be replaced by a concrete percept. What are the neural correlates of this perceptual improvement? To address this question, here we used fMRI to track the changes of neural activities of the Fusiform Face Area (FFA) when subjects were learning faces. Specifically, in training sessions subjects learned to match a cue face, which was phase-scrambled into three levels of visibility, to unscrambled faces via feedback. In fMRI sessions, stimuli used as the cue faces in the training sessions were presented in an event-related fashion, jittering to different directions, and the subjects reported either their identities (Attend-to-Face) or their motion directions (Attend-to-Motion). The fMRI scans were alternated with the behavioral training sessions until the subjects' behavioral performance reached asymptote in all three levels. As expected, the accuracy of identifying scrambled faces improved with learning, while the magnitude of the FFA responses elicited by those stimuli increased monotonically. Second, the performance of identifying the least-scrambled faces was improved first, while the largest attentional effect (Attend-to-Face minus Attend-to-Motion) in the FFA was first observed on the same stimuli. Both behavioral improvement and attentional modulation were then gradually shifted to the most-scrambled faces. The coupling between behavioral and neural changes suggests that attention resources are allocated in a way to match learning progress. In conclusion, our data suggests that perceptual learning improves our ability of processing objects by increasing the sensitivity of object-selective cortical regions and efficiently allocating attention resources.

C286

WHAT IS SPECIAL ABOUT EXPERTISE? SELECTIVE NEURAL RESPONSE TO OBJECTS OF EXPERTISE IN EXPERTS' VENTRAL VISUAL PATHWAY *Assaf Harel[1], Yulia Golland[1], Rafael Malach[2], Department of Neurobiology, Shlomo Bentin[1]; [1]The Hebrew University of Jerusalem, Jerusalem, [2]Weitzman Institute of Science, Rehovot* – Expert object recognition occurs when one learns through experience to identify quickly and accurately individual exemplars of a homogenous class, a process putatively associated with qualitative changes in perceptual processing. Since expertise has been mainly invoked as an alternative to the domain-specificity of face processing (Gauthier and co-workers), most neuroimaging studies of expertise are limited to face-selective regions of the ventral visual pathway, especially the fusiform face area. In contrast, the present study examined what the spatial extent of the neural activity to objects of expertise is, and how early in the visual processing stream can expertise-related selectivity be found. Car experts and novices were presented with three object categories: cars, airplanes and faces, while being scanned in a 1.5T MRI scanner. A one-back memory task was performed by all subjects. Differential BOLD-fMRI responses were found in car experts in response to cars compared to car novices. Whereas in car novices, activation for cars was restricted to medio-occipital regions, car experts showed a more widespread preferential activation, distributed over a large portion of the occipital and temporal cortex. We suggest that expert object recognition modulates visual perception, and that this modulation is reflected by neural activity in the experts' visual cortex for objects in their domain of expertise, starting from early retinotopic areas of the visual stream to form a hypothesized distributed expert object recognition network

C288

SPECIFICITY OF VISUALLY EVOKED NEURAL RESPONSES TO LIVING AND NON-LIVING STIMULI *Meike Ramon, Denise Minnebusch, Boris Suchan, Irene Daum; Institute of Cognitive Neuroscience, Department Neuropsychology, Ruhr University Bochum, Bochum Germany* – Agnosia following brain injury may be linked to recognition of distinct semantic categories. Studies of prosopagnosia patients yielded ambiguous results with respect to co-morbid impairments of perception / recognition of object categories other tha human faces. To assess potential dissociations between different visual categories, an event related potential (ERP) study of visual perception was carried out using photographs of faces, man made and manipulable objects insects and animals (in sum 16 different object-categories). Category-specificity effects yielded differences at parieto-occipital electrode positions with a latency of 180 ms. Results demonstrate stimulus category specific differences in ERP components which may allow further insight in mental processing of visual stimuli.

C290

THE ROLE OF THEORY OF MIND IN AFFECTIVE PRIMING. *Tjeerd Jellema, Anna Pecchinenda; Hull University, Department of Psychology, United Kingdom* – The perception of (the affective valence of) a facial expression can automatically recruit attentional resources in the observer and may prioritize stimulus processing. Using concurrent presentation of static facial expressions and words of positive and negative value in an evaluative task, affective priming effects were observed due to the automatic processing of the distracter face (Pecchinenda et al., submitted). The present study investigated the mechanism underlying these effects and tested the hypothesis that they result from the automatic recruitment of the Theory of Mind (ToM) capacity (i.e. the attribution of mental states to others). Hereto we concurrently presented dynamic displays of posi-

gory similarity. This suggests a novel way of overcoming the category and similarity confound in investigations of category specific disorders, even with pictures of real living and non-living things. Shapiro, L. R. & Olson, A. C. (in press). Does normal processing provide evidence of specialised semantic subsystems? Language and Cognitive Processes.

C272

READ WHAT YOU FEEL: DIFFERENTIAL NEURAL ACTIVITY IN THE HUMAN AMYGDALA IMPLICITLY EVOKED BY EMOTIONAL WORDS *Stephanie Ortigue, Christoph M Michel, Theodor Landis, Francesco Bianchi-DeMicheli, Margitta Seeck; University Hospital of Geneva* – Recent evidence has suggested that evoked activity in the human visual cortex reflects modulatory processes from the amygdala in response to emotional visual stimuli. Moreover, a variety of authors have demonstrated that the amygdala may play a crucial role in selective attention mechanisms. It has thus been assumed that amygdalo-cortical feedback projections could act on visual information processing by adequately directing visual attention towards emotional stimuli. In light of this and based on hemispheric specialization theories, one could expect activation of the amygdala controlateral to the visual field wherein emotional stimuli are presented. However this question remained unresolved. Here, we recorded visual evoked potentials through depth electrodes placed bilaterally in the amygdala of two pharmaco-resistant epileptic patients, while they were performing a bilateral simultaneous lexical decision task. In this paradigm, emotional and neutral words were presented for 13 ms to the left or right visual field simultaneously with a non-word in the other visual field. The patients, without being aware of the emotional connotation of the stimuli, had to indicate by button press as fast as possible the visual field in which a word was presented. Although their behavioral performances were at chance level, differential activities were observed in both amygdalae. Critically, an early response of the left amygdala was observed when emotional words were presented to the right visual field. Hence, we discuss the temporal dynamic of emotional word processing in term of amygdalo-cortical feedback projections, which occurs at a pre-conscious level. Grant No. 31-65096.02

C274

"SORRY, DO I KNOW YOU?" THE ROLE OF FEATURES AND CONFIGURATION IN FACE PROCESSING *Pia Rotshtein[1], Jon Driver[2], Raymond J. Dolan[1]; [1]Wellcome Department, Institute of Neurology, University College London, UK, [2]Institute of Cognitive Neuroscience, University College London, UK* – The aim of this study was to investigate processes mediating the ability to distinguish between individual faces and their correlates with face recognition skills. Using a pair repetition paradigm, we tested sensitivity to repetition of facial features and configuration (2nd-Conf). In a factorial design we manipulated repetition of features (i.e. eyes, mouth, nose) or 2nd-Conf (i.e. spatial relation between these features). Behaviourally (n=31), both features and 2nd-Conf change affected subjects' tendency to distinguish between two faces, with features having a greater effect. Interestingly, subjects' sensitivity to 2nd-Conf change positively correlated with subjects' self rating of face recognition skill and with performances' sensitivity in unfamiliar face recognition and fame judgement tasks. Sensitivity to featural change correlated only with performances in fame judgement task. In fMRI (n=14), sensitivity to features change was expressed in right lateral occipital sulcus and right fusiform gyrus. Sensitivity to 2nd-Conf change was observed in left middle occipital gyrus. Bi-lateral inferior occipital gyrus and right fusiform gyrus sensitivity to 2nd-Conf change were positively correlated with subjects' perceived sensitivity to 2nd-Conf change. These results suggest that individuation processes of unfamiliar faces relies more on featural than on configural information and that these two types of processes can be dissociated in posterior occipital cortices. However, individuals who show sensitivity to 2nd-Conf information of a face, by recruiting additional occipital regions for the task, show overall better ability to recognize faces.

C276

UNCONSCIOUS FACE PROCESSING EVOKES ACTIVITY IN THE RIGHT ANTERIOR FUSIFORM GYRUS *James P Morris, Kevin A Pelphrey, Gregory McCarthy; Brain Imaging and Analysis Center, Duke University* – Functional magnetic resonance imaging (fMRI) and field potential recordings from subdural electrodes have revealed focal regions of the fusiform gyrus (FFG) that respond to faces but not other objects. Field potential recordings have indicated that these face-specific processes are relatively immune to task manipulations, suggesting that face processing is invoked automatically. In contrast, both PET and fMRI neuroimaging studies have indicated that face activation is strongly influenced by attention and task demands. We hypothesized that these neuroimaging studies may be integrating activity over a large temporal window, and thus may be sensitive to sustained and recurrent activation evoked by task-related and strategic processing. Masking provides the ability to test for automatic processes by eliminating conscious perception and thus strategic processing. In visual masking, a stimulus is presented for a brief duration and is preceded and followed by a dissimilar visual pattern. Here, using event-related fMRI at 4T, we investigated brain activity in response to viewing masked and unmasked faces and objects. Unmasked faces engaged a network of brain regions including the right FFG, right superior temporal sulcus, and bilateral amygdala. Masked faces evoked a much more restricted activation pattern, with prominent activity in a region of the right FFG. These findings reveal an automatic, domain-specific face processing region in the right FFG.

C278

THE VISUAL WORD FORM AREA: ACTIVATION FOR ABSTRACT MEANING *Karen S. Reinke[1], Myra Fernandes[2], Graeme Schwindt[3], Kathleen M. O'Craven[3], Cheryl L. Grady[3]; [1]Southern Illinois University, [2]University of Waterloo, [3]Rotman Research Institute, Baycrest Centre for Geriatric Care* – The functional specificity of the brain region known as the Visual Word Form Area (VWFA) was examined using functional magnetic resonance imaging (fMRI). We explored whether this area serves a more general role in visual processing, rather than being selective purely for the processing of words (Cohen & Dehaene, 2004). Specifically, we tested the hypothesis that the VWFA processes abstract visual stimuli to which people have learned to attach a meaning. For instance, we have learned to associate the concept "money" with the letters "m-o-n-e-y" as well as the symbol "$". In the present study we used fMRI to measure brain activity while participants performed a 1-back task with five different types of stimuli: English words, meaningful symbols, digits, words in a language with an unfamiliar orthographic system (Hebrew), and geometric control stimuli. Analysis of mean activity in the functionally defined VWFA, as well as a pattern of whole-brain activity identified using multivariate techniques, showed that VWFA activity did not differ between words and symbols, but could be distinguished from that seen using the other stimuli. These results support the hypothesis that the VWFA serves a more general role in extracting meaning from abstract stimuli, including, but not limited to, words.

C280

LEARNING NOVEL OBJECTS AS ENGLISH WORDS ACTIVATES A LEFT FUSIFORM REGION *Yiying Song, Jia Liu; The Key Lab of Cognitive Science, Graduate School & Institute of Biophysics, Chinese Academy of Science* – Neuroimaging studies have demonstrated that several regions within the ventral visual pathway (e.g. FFA, VWFA) respond selectively to certain object categories (faces and words, respectively). But when we learn a new object category, at which region neurons will become tuning to this category? One hypothesis proposes that the selectivity is developed near the region responsive to visually similar stimuli. Alternatively, the selectivity is developed near the region responsive to stimuli that are experientially associated with this object category. To test these hypotheses, we trained subjects to associate 16 line-drawing images that were visually dissimilar to English words to 8 consonants (e.g. 'b') and 8 vowels (e.g. 'ee') respectively, and then used high-resolution fMRI