EBBS ABSTRACTS

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in the food-aversion learning paradigm in rats, contextual (visual) stimuli of the feeding location were associated with internal malaise when a new taste or odor was offered simultaneously. Thus a less salient stimulus (place) seems to be potentiated by a more salient stimulus (taste). Recent research has shown a crucial role of the amygdaloid complex for taste-potentiated odor-aversion learning.

The goal of our present study was to examine if the amygdala is also involved in the potentiation of spatial stimuli by a new taste. It could be assumed that lateral- and basolateral amygdala are likely candidates for this special function, as these structures are connected with polysensory cortical areas. After conditioning the animals in one group were lesioned in the lateral- and basolateral amygdala in comparison to a laboratomized control group. Postoperatively, all animals were tested and the results showed an effect of the lesions in the test conditions with food location cues.

A hypothesis on the localisation of hyperacuity interpolation in the visual system

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Thresholds in the hyperacuity-range, i.e. about one order of magnitude below the photoreceptor-diameter, can be achieved for a number of perceptual tasks, both in man and in animals. Among these tasks are vernier discrimination, stereopsis, curvature detection and relative motion detection. To achieve positional localisation far below the photoreceptor diameter, some form of interpolation between the photoreceptor locations has to take place. I argue that this interpolation takes place in the visual cortex, rather than in the retina or geniculate body. Two facts support this argument. Firstly, all the information necessary for precise interpolation is implicitly present in the excitation of the photoreceptors. It would be very uneconomical to perform explicit interpolation in the retina – where it is not needed – and then to transmit it to the visual cortex. Secondly – and more importantly – the optic nerve has about 10^6 fibers in man. Also, the calculation of the number of points resolved per degree of visual angle across the visual field, based on studies of two-point acuity, leads to a number around 10^6. Hence, the number of axons in the optic nerve is just enough to transmit standard two-point resolution to the cortex. Explicitly interpolated hyperacuity-resolution would require about 10 times finer resolution in both X and Y axes, hence 100 times more fibers. From this, I conclude that hyperacuity interpolation is not achieved in the retina, but is obtained by appropriate filtering and/or interpolation in the visual cortex. Indeed, we find a close correlation between the fine organisation of the visual cortex and hyperacuity-thresholds: both show a strong nasotemporal asymmetry in the far periphery, whereas ganglion cells and two point acuity do not.

Shift of visual half-field superiority for face perception during the menstrual cycle

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In two experiments it was investigated whether for females, who are said to be less strongly lateralized for cognitive functions than men, visual field superiority might change in dependence on the phase of the menstrual cycle. Twelve normally menstruating women took part 4 times (during the menstrual phase, the follicular phase, the luteal phase and the premenstrual phase) in two experiments, one lexical decision task and an analogously constructed face-decision task.

Reaction time analyses showed that for the verbal task, visual field asymmetry remained stable, while for the nonverbal task, asymmetry linearly decreased from a large right hemisphere superiority during menstruation to a left hemisphere superiority during the premenstrual phase. These results reflect not only hemisphere-specific influences of gonadal hormones but also demonstrate a possibility of natural fluctuations in cerebral asymmetry. This has consequences for theories of functional cerebral organization, since it supports a dynamic, rather than a classical static concept of cerebral dominance.

A study of sensitivity to gratings of different orientations in newborn human infants

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It has recently been argued that the visual capacities of human infants below the age of 6–8 weeks are mediated largely by subcortical visual structures. The present study addressed this question by examining the sensitivity of newborn infants to gratings of different orientations. In adults, the presence of the 'oblique effect', i.e. higher sensitivity for vertical and horizontal than oblique gratings, has been related to different proportions of visual cortical cells selective for the different orientations.

Behavioural estimates of visual acuity for vertical or diagonal (45°) high contrast square wave gratings were obtained in 60 healthy full-term neonates with the acuity card procedure, a variant of the preferential looking technique. Mean acuity for both orientations was close to 1.0 c/deg, and not significantly different. Preliminary data on looking preferences for direct pairings of checkerboard patterns with main-axis or oblique orientations, which has provided evidence for an oblique effect in 6-week-olds, show no such effect in newborns. Since sensitivity to different orientations might be affected by astigmatic refractive errors, a subgroup of infants will be examined for astigmatism and the findings related to their behavioural performance. The results are expected to provide evidence on the proportions of cortical cells with