

Emergence of visual content in the human brain : investigations of amblyopia, blindsight and high-level motion perception with fMRI

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Stellingen bij het proefschrift

Emergence of Visual Content in the Human Brain

Investigations of Amblyopia, Blindsight
and High-Level Motion Perception with
functional Magnetic Resonance Imaging

Lars Muckli

1. Perception of motion is tightly linked to the activation of the human motion complex (hMT+).
2. There is a link between the ability to perceive the orientation of grating textures and the processing in extrastriate ventral visual areas (e.g. LO).
3. Amblyopic subjects suffer from transmission failure in the information flow from lower to higher visual areas.
4. Extrastriate cortex of blindsight subjects can be activated in the ipsi-lesional hemisphere through subcortical projections, but its activity remains insufficient for further transmission.
5. Conscious processing might involve recurrent processing loops that help organize neuronal activity into stable resonant states with millisecond precise and coherent timing of neuronal activity.
6. A close correlation between brain activity and conscious perception can be established when brain activity is studied as a function of spontaneously occurring perceptual switches.
7. To establish an area's causal role, its activity needs to be manipulated experimentally, for example, by transcranial magnetic stimulation.
8. The ventro-lateral cortex is involved not only in visual, but also in auditory object recognition.
9. Some neuroscientists in Frankfurt are confident to solve the binding problem, others are convinced that *Binding* will always cause headaches.
10. A positive correlation between BrainVoyager release numbers and experimental correlation strength might be explained by various confounding covariates such as magnetic field strength.