Dissociating analytic and holistic object recognition

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According to Hummel’s (2001) dual route model of object recognition objects are represented and processed in two different formats - analytical and holistic – that are combined into a hybrid representation in long-term memory. The analytic pathway involves explicit structural descriptions based on an object’s parts and their relations whereas the holistic pathway is view-like, implying a holistic, “all-in-one” representation of object features in a quasi-pictorial format. An important characteristic of Hummel’s model are the different attentional demands of the two processing routes and their different invariance properties. The analytical route is assumed to require visual attention and to be invariant to transformations like mirror (left-right) reflection. By contrast, the holistic pathway is considered to operate independently of attention and to rely on representations that are sensitive to mirror reflection. Previous empirical support for the dual-route model and the dissociable nature of visual object representations has come mainly from behavioural (e.g., Stankiewicz et al., 1998; Thoma et al., 2004) and neuroimaging (e.g., Thoma & Henson, 2011) studies involving manipulations of spatial visual attention. However, visual attention has long been shown to also have an object-selective quality (e.g. Duncan, 1984). Indeed, we have recently found evidence for a dissociation of analytic and holistic object processing under manipulations of object-based attention. The current project continues this line of investigation focusing particularly on the nature of holistic object recognition, its time course, and its dependency on long term memory representations.

This PhD project offers the opportunity to tackle an exciting and original research question, comprehensive practical research experience, and excellent support through all project stages through its two supervisors, Dr Martin Jüttner and Dr Luc Boutsen.