

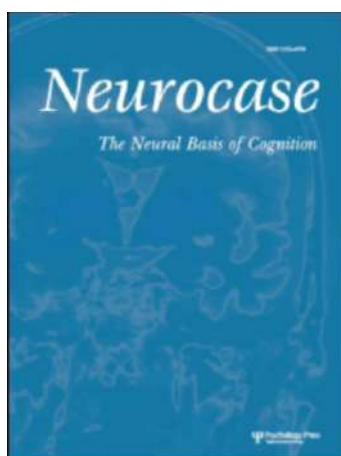
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On: 24 April 2009

Access details: Access Details: [subscription number 789998286]

Publisher Psychology Press

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## Neurocase

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title-content=t713658146>

## Abstracts of the British Neuropsychological Society Spring 2008 Meeting 8th-9th April 2008

First Published: October 2008

**To cite this Article** (2008) 'Abstracts of the British Neuropsychological Society Spring 2008 Meeting 8th-9th April 2008', *Neurocase*, 14:5, 451 — 459

**To link to this Article:** DOI: 10.1080/13554790802305689

**URL:** <http://dx.doi.org/10.1080/13554790802305689>

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and cognitive performance on a response inhibition task (the stop-signal task) in all participants. Using partial least squares (PLS), a multivoxel analysis method, we found large-scale brain systems where anatomical variation was associated with performance variation on the stop-signal task. Prolonged stop-signal reaction time (SSRT), indicating impaired motor inhibition, occurred predominantly in patients and relatives and not in unrelated healthy volunteers, and was associated with reduced grey matter in orbitofrontal and right inferior frontal regions and increased grey matter in cingulate, parietal and striatal regions. We used a novel permutation test to identify significant familial effects on variation of these brain-based indices of inhibitory processing, providing support for the validity of these brain structural systems as endophenotypes of OCD. In conclusion, structural variation in large-scale brain systems important for motor inhibitory control could signify genetic risk for OCD, representing the first evidence for a neurocognitive endophenotype of OCD. Endophenotypes identified using Diffusion Tensor Imaging (DTI) in the same sample are also reported, providing further preliminary evidence that OCD may be mediated by a large-scale dysconnectivity.

#### **Interaction between emotion and cognitive processes during the formation of emotional memories**

DEBI TALMI

Wellcome Trust Centre for Neuroimaging, University College London, UK

The emotional impact of experience is represented in the amygdala, which then modulates the consolidation of the hippocampal memory traces of these events, leading to emotionally enhanced long-term memory. In animals this process requires hours to unfold, but humans show emotionally enhanced memory even in immediate memory tests. In a series of studies I asked whether the unique cognitive processes that emotional items evoke underlie their immediate memory advantage. We documented that emotional items are better attended and organized relative to neutral ones, but their memory advantage was maintained even when we controlled for organizational and attentional processes. The enhanced attention emotional items received had limited impact on free recall and recollection but a larger effect on familiarity memory, and was expressed in the brain as a spatial overlap

in the fusiform gyrus between activation associated with emotionally enhanced attention and subsequent recognition memory. The memory advantage was only eliminated when we additionally controlled the relative distinctiveness of emotional items. Ongoing pharmacological and neuropsychological studies will assist in integrating animal and human data on emotional memory.

#### **The time-course of emotional voice processing**

DISA SAUTER (In collaboration with Martin Eimer)

School of Psychology, Birkbeck College, University of London, UK

Research using event-related brain potentials (ERPs) has demonstrated an early differential effect in fronto-central regions when processing emotional, as compared to affectively neutral facial stimuli (e.g., Eimer & Holmes, 2002). In this talk, data demonstrating a similar effect in the auditory domain will be presented. ERPs were recorded in a one-back task where participants had to identify immediate repetitions of emotion category, such as a fearful sound followed by another fearful sound. The stimulus set consisted of non-verbal emotional vocalisations communicating positive and negative sounds, as well as neutral baseline conditions. Similarly to the facial domain, fear sounds as compared to acoustically controlled neutral sounds, elicited a frontally distributed positivity with an onset latency of about 150 ms after stimulus onset. These data suggest the existence of a rapid multi-modal fronto-central mechanism discriminating emotional from non-emotional human signals.

#### **Close encounters of the fear kind**

DEAN MOBBS

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Critical to an organism's survival is the ability to switch flexibly between defensive states in response to threat. Within behavioral ecology, a prominent theory of defensive switching is the 'threat imminence continuum' where distinct threat-states are configured according to whether a predator is distal or proximal to the prey. Using this model, we predicted that detection of distal threat would elicit activity in brain regions associated with anxiety