

Brain study could lead to new understanding of depression

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(PhysOrg.com) -- Brain scientists have moved a step closer to understanding why some people may be more prone to depression than others.

Dr Roland Zahn, a clinical neuroscientist in The University of Manchester's School of Psychological Sciences, and his colleagues have identified how the brain links knowledge about social behaviour with moral sentiments, such as pride and guilt.

The study, carried out at the National Institutes of Neurological Disorders and Stroke in the US with Dr Jordan Grafman, chief of the Cognitive Neuroscience Section, and Dr Jorge Moll, now at the LABS-D'Or Center for Neuroscience in Rio de Janeiro, Brazil, used functional magnetic resonance imaging (fMRI) to scan the brains of 29 healthy individuals while they considered certain social behaviours.

The findings – published in the journal *Cerebral Cortex* – for the first time chart the regions of the brain that interact to link knowledge about socially appropriate behaviour with different moral feelings, depending on the context in which the social behaviour occurs.

“During everyday life we constantly evaluate social behaviour and this largely affects how we feel about ourselves and other people,” said Dr Zahn. “But the way we store and use information about our own and other people's social behaviour are not well understood.

“This latest study used functional brain imaging to identify the circuits in the brain that underpin our ability to differentiate social behaviour that conforms to our values from behaviour that does not.”

The team observed that social behaviour not conforming to an individual’s values evoked feelings of anger when carried out by another person or feelings of guilt when the behaviour stemmed from the individuals themselves.

The fMRI scans of each volunteer could then be analysed to see which parts of the brain were activated for the different types of feeling being expressed. Of particular interest to Dr Zahn were the brain scans relating to feelings of guilt, as these have particular relevance to his current work on depression.

“The most distinctive feature of depressive disorders is an exaggerated negative attitude to oneself, which is typically accompanied by feelings of guilt,” he said.

“Now that we understand how the brains of healthy individuals respond to feelings of guilt, we hope to be able to better understand why and where there are differences in brain activity in people suffering from, or prone to, depression.

“The brain region we have identified to be associated with proneness to guilt has been shown to be abnormally active in patients with severe depression in several previous studies, but until now its involvement in guilt had been unknown.”

“By translating these basic cognitive neuroscience insights into clinical research we now have the potential to discover new key functional anatomical characteristics of the brain that may lie behind depressive disorders.

“The results will hopefully make an important contribution to our understanding of the causes of depression that will ultimately allow new approaches to find better treatments and prevention.”

The current clinical study, being carried out with professors Matthew Lambon-Ralph, Bill Deakin and Alistair Burns at The University of Manchester, will last four years.

Provided by University of Manchester

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