Have we met before? Scientists show why the brain has the answer

August 4 2011

The research, led by Dr Clea Warburton and Dr Gareth Barker in the University's School of Physiology and Pharmacology and published in the *Journal of Neuroscience*, has investigated why we can recognise faces much better if we have extra clues as to where or indeed when we encountered them in the first place.

The study found that when we need to remember that a particular object, for example a face, occurred in a particular place, or at a particular time, multiple brain regions have to work together - not independently.

It has been known for some time that three brain regions appear to have specific roles in memory processing. The perirhinal cortex seems to be critical for our ability to recognise whether an individual object is novel or familiar, the hippocampus is important for recognising places and for navigation, while the medial prefrontal cortex is associated with higher brain functions.

These most recent studies, however, are the first to look at situations where these brain regions interact all together, rather than considering each one individually.

Dr Warburton said: "We are very excited to discover this important brain circuit. We're now studying how memory information is processed within it, in the hope we can then understand how our own 'internal library' system works."

The researchers investigated the neural basis of our ability to recognise different types of stimuli under different conditions. Of specific interest were two types of recognition memory: 'object-in-place recognition memory' (remembering where we put our keys), and 'temporal order recognition memory' (when we last had them).

Neither 'object-in-place' or 'temporal order recognition' memories could be formed if communication between the hippocampus and either the perirhinal cortex, or the medial prefrontal cortex, was broken. In other words, disconnecting the regions prevented the ability to remember both where objects had been, and in which order.

Finding that these regions must all act together has important implications for understanding memory and helping treat people with memory disorders such as Alzheimer's disease.

Provided by University of Bristol

Citation: Have we met before? Scientists show why the brain has the answer (2011, August 4) retrieved 20 April 2024 from https://medicalxpress.com/news/2011-08-met-scientists-brain.html