Researchers find link between seeing and thinking

November 12 2008

(PhysOrg.com) -- Researchers at UQ's Queensland Brain Institute (QBI) have discovered an important new link between how we see an action – and the way our mind processes that visual stimulation.

For more than a decade, scientists have hypothesized that the brain contains a system of ‘mirror neurons', which help an observer to mentally correlate perceived actions with pre-learned movements.

For the first time, QBI scientists Professor Jason Mattingley and Associate Professor Ross Cunnington and their colleagues have demonstrated the human brain does indeed have a mechanism to capture observed and executed actions as a type of generic neural code.

“Until now, evidence for such a mechanism has been lacking,” Professor Mattingley said.

“The mirror-neuron system has received much interest in recent years because it is thought to have an important role in a range of human responses such as empathy and observational learning.

“Dysfunction of the mirror system has been linked with such clinical disorders as apraxia, autism and schizophrenia.”

While monitoring their subjects using functional magnetic resonance imaging (fMRI), researchers asked a group of volunteers to make a series of simple hand gestures.

Participants first performed a set of two-to-five pantomimed hand actions, and subsequently observed an equivalent number of actions that were either the same or different from those in the preceding set.

“Data gathered from these experiments show that a particular part of the brain encodes specific actions, regardless of whether those actions are executed or passively observed,” Professor Mattingley said.

As the mirror-neuron system is also linked with new developments in the so-called “theory of mind”, Professor Mattingley's research will have implications for investigations into a wide range of human cognitive processes.

The research results, “fMRI adaptation reveals mirror neurons in human inferior parietal cortex”, were published in *Current Biology*.

Provided by University of Queensland