

Brain splits to handle two jobs at once

April 16 2010, by Lin Edwards

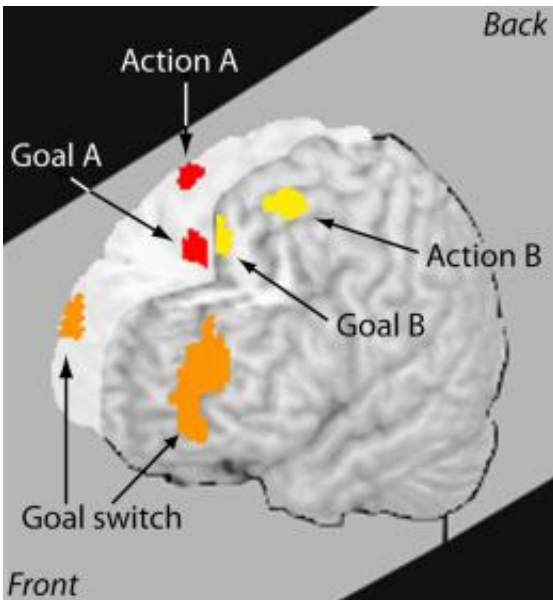


Image credit: Etienne Koechlin, INSERM-ENS

(PhysOrg.com) -- New research has shown that the brain handles two tasks at once by dedicating half the brain to one task, and the other half to the second. This means it may not be able to effectively handle more than two complicated tasks simultaneously.

The medial frontal cortex is a part of the front of the brain above the eyes, and is thought to control the pursuit of rewards for successfully carrying out a task. Scientists at the National Institute for Health and Medical Research (INSERM) in Paris wondered what happens when a person is asked to do two jobs at once. To find out, they used [functional](#)

[magnetic resonance imaging](#) (fMRI) to monitor the [brain activity](#) of 16 male and 16 female volunteers, all aged 19 to 32, and all right-handed, as they simultaneously performed two related tasks. The volunteers were offered a monetary reward that reduced if they made errors.

The tasks were to match upper case letters and to match lower case letters, switching back and forth between the two tasks. Rewards for each task were calculated separately and depended on the numbers matched without error. The researchers, neuroscientists Sylvain Charron and Etienne Koechlin, found that when the volunteers tackled only one task, both halves of the medial frontal cortex worked on it, but when they tackled both tasks simultaneously, the left side of the frontal cortex corresponded to one of the tasks and the right side corresponded to the other, with the two sides working independently. Results improved as the monetary reward increased, and there was no significant difference in the results of the men and women volunteers.

Professor Koechlin said the results suggest the [brain](#) could only effectively handle two tasks simultaneously because it has only two hemispheres. To test this, the scientists took a further 16 volunteers and added a third task to the previous two: matching letters of the same color. This group consistently forgot one of the three jobs, and also made triple the errors of the dual-tasking subjects. This means that, as Koechlin explained, if you try to tackle three jobs at once, the [frontal cortex](#) will always neglect one of them.

The research paper was published online in the April 15 issue of *Science*. The findings could have practical applications in areas in which people routinely multi-task, such as air traffic control, and in neurological conditions in which the ability to multi-task is lost.

More information: Divided Representation of Concurrent Goals in the Human Frontal Lobes, *Science* 16 April 2010: Vol. 328. no. 5976,

pp. 360 - 363. [DOI:10.1126/science.1183614](https://doi.org/10.1126/science.1183614)

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