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Brain scan can detect lies, researchers find

Tracks blood flow: New technique could replace polygraph

Mary Vallis
National Post

A new lie detection test could supplant the polygraph as the most accurate measure of whether someone is telling the truth, researchers say.

Using a new technique for recording brain activity, psychiatrists at the University of Pennsylvania have found the human brain operates differently during deception and honesty. The technique essentially gives scientists a window on a person's innermost thoughts.

For the study, the researchers gave each of 18 volunteers the five of clubs from a deck of cards and asked them not to reveal which card they had received. The volunteers were told to hide the card in one of their pockets. Each person was then placed in a functional magnetic resonance imaging machine, or fMRI, which tracks the brain at work. An fMRI measures brain function, whereas a regular MRI measures brain anatomy. A computer then interrogated volunteers using a method known as the "guilty knowledge test," a procedure commonly used during polygraph tests, while they were inside the fMRI. The computer displayed a series of cards and repeatedly asked the volunteer, "Do you have this card?"

The researchers found parts of the volunteers' prefrontal and premotor cortex and the anterior cingulate gyrus became significantly more active when they denied the five of clubs was in their pockets.

"The fact that deception requires extra work in a number of brain regions may indicate that deception involves inhibition of the 'default' response, for example, the truth," said Dr. Daniel Langleben, the psychiatrist who led the study.

"Interestingly, this agrees with the traditional definition dating back to Saint Augustine: 'Deception is the denial of truth.' "

Functional magnetic resonance imaging, tracks the blood flow in the brain. Neurons consume oxygen when they fire, so hemoglobin-rich blood flows to the region experiencing heightened activity.

The fMRI tracks the magnetic movement of the hemoglobin and provides scientists with a peculiar map of what changes are taking place in the brain.

If future studies confirm the findings, scientists could be on the verge of a new "gold standard" for lie detection, he added.

But a leading Canadian expert in functional neuro-imaging warned such a test could be controversial because it invades the privacy of a person's mind.

"While it's often possible to beat a polygraph, it would be pretty hard to beat an fMRI scanner, I suspect," said Dr. Ravi Menon, Canada Research Chair in functional neuro-imaging at the John P. Robarts Research Institute in London, Ont.

An fMRI lie detection test could also have its own pitfalls. The parts of the brain identified by the researchers do not work the same way in all patients: The brains of schizophrenics, the elderly and children with attention deficit/hyperactivity disorder could inadvertently send inaccurate responses to the test criteria, Dr. Menon explained.

Dr. Langleben will present his team's findings at a meeting of the Society for Neuroscience in San Diego on Wednesday.

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