

Study: Your brain can't handle the lies

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Lying is harder than telling the truth, and that may be the key to a better lie detection test.

That's what scientists at the University of Pennsylvania discovered when they watched brain scans of volunteers as they gave honest answers or told lies.

The brain's frontal lobe, the region that regulates thinking, puts out a lot more effort to devise a lie than to tell the truth, and brain scans document that activity.

The finding, in the journal *Human Brain Mapping* and discussed in an article in today's issue of the journal *Nature*, advances the science of detecting deception.

Brain imaging offers the possibility of a more exact way to tell whether an individual is telling the truth. The standard today is the polygraph, which measures cardiovascular and sweat gland activity. In many states, including New York, polygraph results are not admissible in court.

A more accurate device might change those laws. Dr. Daniel Langleben, an assistant professor of psychiatry, found that a functional MRI scan could discriminate between a lie and a truth, and scientists can actually see where the signal is coming from in the brain.

"It's the most advanced way of correlating brain activity to behavior," Langleben said.

Testing an act of deception is tricky, he added. His first study involved instructing participants to lie. But he realized he needed to create a test that added secrecy to the mix. "Otherwise it's more like theater than deception," he explained.

In his latest study, two playing cards were given to volunteers and Langleben told them to pick one and offered them money to deny having it once inside the scanner. Moments later, the

scientist hooking them up to the scanner told them to tell the truth. Then, the volunteer, choosing between conflicting instructions, answered questions about the cards while brain activity was recorded.

Other studies using brain mapping have made a strong case for its potential usefulness in criminal investigations, but the brain differences were gathered using group data. The Penn researchers devised a study documenting changes in the individual brain.

"It's an important study," said Dr. Monte Buchsbaum, a professor of psychiatry at Mount Sinai School of Medicine in Manhattan. "But whether it will be of practical significance is still unproven. Considering what to say when lying is a complicated mental process. There may be other things going on that we just don't know about."

The frontal lobe changes are indicative not of lying, per se, but a person's mental activity when telling a lie. The frontal lobe is not as metabolically challenged when telling the truth.

Some scanning applications have already excited intelligence agencies, Buchsbaum said. MRI scans have been used to study truth-telling among spies trying to fool investigators into believing that English is their native language. Brain areas activated by speaking one's native language are different from those seen when speaking a second language.

The Penn scientists said they were accurate in deciding whether the volunteers were lying or telling the truth anywhere from 85 percent to 99 percent of the time.

Langleben said it's still not known whether the test results will fall apart when those tested are actively trying to defeat the system. But he said the scanning tests are ready for field testing in criminals. "It's possible it might work," he said. "At this point, it is not for sale."

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