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Commentary

Use of Polygraph Test and Brain Scan as Lie Detectors

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DESCRIPTION

Researchers say a functional MRI is more accurate than a polygraph. However, more research required to be done before judges will permit the tests to be used as evidence. Finding for the truth is the very explanation of what happens in criminal court. Forensic science has long assisted in that mission. However, other scientific tools polygraphs, brain scans, and functional Magnetic Resonance Imaging (fMRI) remain completely inacceptable as evidence of guilt or innocence. Some medical experts believe that could change if greater trials are conducted outside the laboratory in real-world conditions, using strict procedures that yield reproducible results. The polygraph, presented more than 50 years ago, displays a person's heart rate, electrical skin conductivity, and respiration during a series of questions.

The assumption is that upward or downward spikes in those measurements specify that the person is lying. While polygraph consequences have been judged to be prohibited as legal evidence in most U.S. jurisdictions, they have been used for approximately 30 years in the business world as a device for pre-employment screenings. Polygraphs are also used broadly in government background checks and security clearances.

"Polygraph measures reflect complex movement of the peripheral nervous system that is decreased to only a few parameters, while fMRI is observing at thousands of brain clusters with higher resolution in both space and time," Langleben said. "While neither type of activity is unique to lying, we predicted brain activity to be a more precise marker, and this is what I believe we found." However, some legal experts remain skeptical about brain scans as a lie-detection tool.

Current neuroimaging methods reveal both form and function. They disclose the brain's anatomy, including the truth of brain structures and their interconnections. They clarify its physiology, chemistry, and electrical and metabolic activity. The newest tools express how different regions of the brain connect and communicate. They can even show with split-second timing the order of events during a specific process, such as remembering or reading.

Psychologists employ these tools across the level of the discipline. Social cognitive neuroscientists, for instance, are capturing the psychological and neural processes involved in emotion, pain, self-regulation, self-perception, and perception of others. Psychologists have used neuroimaging technology to reveal how white americans show differences in brain activity in the amygdala (a structure involved in emotional learning) when they look at pictures representing people of different racial groups. Positive emotions are also studied. Psychologists have compared functional images occupied when students looked at pictures of their partner versus pictures of a friend. When students looked at their beloved, two deep-brain areas that connect as part of a circuit showed augmented levels of activity. Those areas help to control the neurotransmitter dopamine, which overflows the brain when people anticipate a reward.

Neuroimaging is also serving us understand how the brain grows from infancy through adulthood. Developmental neuroscientists study the neurobiological foundations of cognitive development. Combining useful measures of brain activity with behavioral measures, they discover how subtle early insults to the nervous system affect cognitive and emotional function later in life. For example, the effects of maternal illness or initial childhood neglect on learning, memory, and attention later in life. Imaging tools can pay off in the classroom, too: Using such tools, literacy experts have shown that a year of intensive, systematic reading instruction makes the brains of high-risk children look and function like those of more skilled young readers.

CONCLUSION

Critics have claimed that while neuroimaging may be exciting and flashy, its contributions to psychological theory are, so far, limited. Even with advanced technologies and tools, it turns out that understanding the brain isn't as perfect cut as researchers might have hoped. In the starting days of brain scanning, researchers often focused on finding regions for different emotions in the brain. Over time, it became evident that emotions don't map neatly onto exact brain regions, but rather stem from a complex network of interconnected brain regions.

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