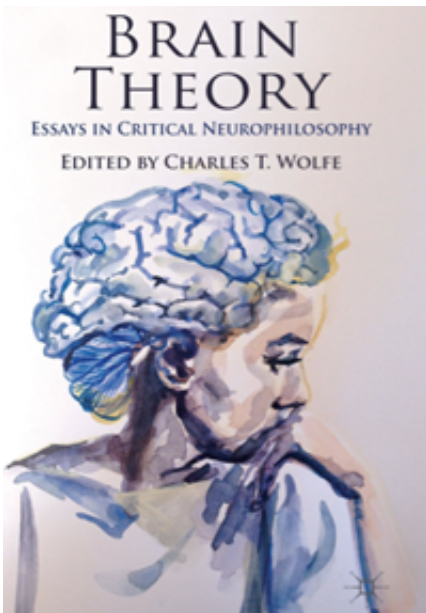


More study needed on interrogation techniques that measure brain waves

April 30 2014, by George Diepenbrock



(Medical Xpress)—When police in Spain tried to locate two murder victims last year, they sought assistance on places to search from a tool that measured the brain activity of the convicted and confessed killers.

The technology, known as Brain Fingerprinting, developed by the American-based company Government Works Inc., basically seeks to use brain wave data in response to certain stimuli or details to determine whether a person is telling the truth. U.S. courts have sparingly allowed

the higher-tech version of the traditional polygraph test or lie detector, and it has aided in both exoneration and conviction in American cases.

As the use of Brain Fingerprinting has expanded beyond the United States, a University of Kansas researcher argues the technology is based on an incorrect assumption about how human memory works.

"At the very least, we need to ask them to do several more methodological checks and make sure that whenever these technologies are used in legal contexts, we make clear the limitations of that technology," said Sarah Robins, an assistant professor of philosophy who studies the philosophy of neuroscience and related issues in neuroethics. "Maybe there's a stronger claim here that this should never make it into court, but my stance is to say: 'Let's think about the technology and the assumptions behind it.'"

Robins details the theoretical issues surrounding Brain Fingerprinting in her essay "Memory Traces, Memory Errors, and the Possibility of Neural Lie Detection," which will appear in "Brain Theory," edited by Charles Wolfe. Also in Wolfe's book, John Symons, a KU professor of philosophy, has co-authored the chapter "Computing with Bodies: Morphology, Function, and Computational Theory."

Wolfe, a research fellow of the Department of Philosophy and Moral Sciences at the University of Ghent in Belgium, is scheduled to speak at 7 p.m. Friday, May 2, at the Kansas Room of the Kansas Union.

Robins said the key issue with Brain Fingerprinting is that the technology presumes the mind works as an archive or "mental Rolodex" in which someone essentially retrieves a memory from his or her brain when needed.

"This is a default, traditional view, and it looks like the more we study

memory, that that's not the right way to think about it," Robins said. "If we're designing technologies, perhaps even using them in a legal context, that rely upon that view of what memory is like, then we're actually making a mistake."

She said scientific research has supported a view the brain works more in a constructive or reconstructive way when trying to recollect things.

"Memory isn't focused on archiving the past. It keeps track of general patterns in the past but with an eye toward the future," Robins said. "So it favors patterns over particular, and to that end, there's no incentive to keep these particular, discreet perfect records."

This makes it more difficult for people to recall specific details about events in the past, which is what authorities are trying to uncover as part of an interrogation in a criminal case or examination of a potential eyewitness.

"When trying to remember, I'm focused on patterns not particulars, and when I need to recall something when you ask me about a specific past event, I reconstruct it. I build a representation on that event based upon what was likely to have happened," she said.

Robins said scientific evidence about how memory works should introduce caution into how Brain Fingerprinting is used. The chief function is to monitor brain waves during a given time window after a stimulus has been presented—a P300 response. Brain Fingerprinting is designed on the assumption that an elevated P300 response is a measure of recognition. If, for example, the technology detected an elevated P300 when a suspect was presented with information that only the perpetrator of a crime would know, such as showing a photo of the murder weapon, then investigators could assume that the suspect recognizes the murder weapon.

"As an interrogator, I assume you recognize the murder weapon, so now I've got good evidence to say you've seen this weapon before. Therefore, you were probably at the scene of the crime," she said. "But without that assumption of recognition, I do not get the same conclusion. Say I assume it's a measure of familiarity. It could look very similar to a hunting knife your uncle owns, so that's why I have that response from your brain. Now the conclusion that the P300 shows evidence of guilt looks unwarranted."

She said the Brain Fingerprinting measurements wouldn't give investigators an indication of why the photo of the weapon could be familiar to the suspect. The technology cannot reveal whether suspects recognize the item, or only something that resembles it in one way or another.

"The theoretical assumption behind the whole apparatus, that what is being measured is recognition, is what is flawed," Robins said.

Instead she said looking at the nature of constructive memory reveals techniques investigators should avoid, like asking leading questions, because it can prime a person's memory in a way he or she wouldn't be able to take back.

"We need to have stricter rules about how those questions can be asked and how people can be interrogated so that we only probe their memories in ways that are as neutral as possible," she said.

Robins said as technology continues to improve and make brain scanning more accessible to law enforcement agencies, researchers should still continue to examine the methodological issues behind the technology.

"There's a huge trend in this direction, toward the idea that the brain will solve various legal, social and ethical issues," Robins said. "Maybe if I

can just get to your brain, I can find out what's really going on. I think that's intriguing, and there are certain things we can figure out this way, but in most cases it's not going to be quite so simple. It's not as if when you are lying to me, and the truth is just hidden in your brain, if only we can unlock it."

More information:

www.palgrave.com/products/title.aspx?pid=565601

Provided by University of Kansas

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