

ARE YOU SURE YOU HAVEN'T FIDDLED YOUR EXPENSES?

A US scientist claims he can use brain-scanning technology to tell whether you are telling the truth or not. Mark Harris tries to forget his dodgy secrets as he volunteers to take the test



Polygraph tests as used by Robert De Niro on Ben Stiller in the film *Meet the Parents* can be fooled

It sounds like something from a science-fiction novel: a machine that scans your brain and reads your mind, detecting with almost 100% accuracy whether you are telling the truth.

This is no polygraph, the type of contraption familiar from films, with sensors attached to a person's hands and chest, which plots its data on a spidery graph. Those machines relied on subtle changes in the subject's pulse, perspiration levels and breathing to try to detect whether the truth was being told. They may look good on screen but they are far from reliable and easily hoodwinked.

The new device, pioneered by a team of scientists in San Diego, California, incorporates a magnetic resonance imaging (MRI) scanner, similar to those used in hospitals, to measure the flow of blood around the brain. The patterns of blood flow show up differently when the subject is lying from when they are telling the truth.

The device is made by a company called No Lie MRI, which claims it is 93% accurate. It says traditional polygraph tests are about 60% accurate. "The mechanism in your brain is the same regardless of whether you tell a big lie or a little lie," says Joel Huizenga, founder and CEO of

in my head and attempt to read my mind.

The whirring begins and questions flash up on the screen: "Have you ever hit a car and driven away without leaving a note?"; "In the past year, have you had sexual contact with someone other than your wife?"; "Have you ever cheated in a card or board game?"; "Have you ever over-claimed on your expenses?" Mixed in are control questions ("Is your name Mark Harris?") that allow the software to see what my brain looks like when it's being honest. The questions are repeated, then changed subtly during the test, which lasts about five minutes. I am hauled out, feeling drained and a little concerned about the results.

The history of MRI lie detection began in the 1990s, when neuroscientists noticed that different mental states correlated with increased blood flow across the brain, and the field of functional MRI (fMRI) was born. Some scientists came to believe they could pinpoint the areas responsible for specific emotions and beliefs.

Huizenga says his computerised MRI analysis, developed from research at Pennsylvania University, can reveal our innermost thoughts. "I can tell whether you're in love or not and what kind of love you're in," Huizenga says. "But is that commercial? Being able to tell when someone is lying, on the other hand, is of real economic value. When polygraphs were more believable, they were doing 2m tests a year. The market today could be worth more than \$2 billion."

Huizenga is nothing if not ambitious. His claims for the machine are bold and he already envisions a commercial application for it. He talks of his "truth verification" service being used whenever the \$5,000 (£3,110) fee for a half-hour session might save customers many times that amount in legal fees or fraud. He

foresees a time when charities will not hand over funds, or venture capitalists invest in a start-up, without the recipients passing an fMRI brain scan for honesty. He is also keen to set up testing centres in Europe.

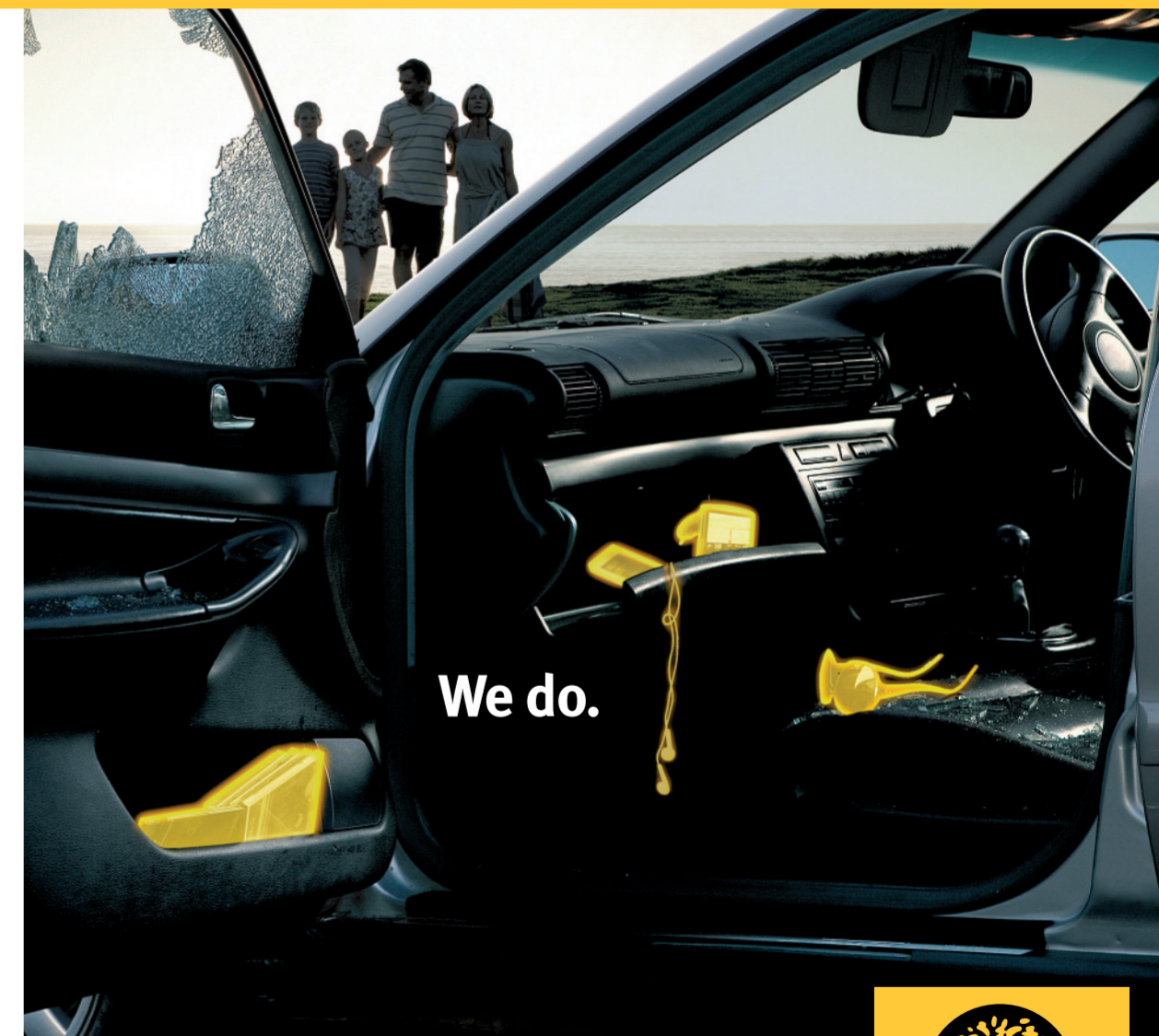
No Lie MRI's clients have in-

cluded a shop owner wanting high-tech corroboration that he did not set fire to his premises for the insurance money, a woman trying to convince her husband that she had not been unfaithful and a father denying child-abuse allegations.

In none of those cases were the results legally binding. Evidence involving fMRI has yet to be declared admissible in any court anywhere in the world, and many lawyers and neuroscientists remain wary. Which brings us back to my

results. Standing beside the huge MRI machine, I lean forward to cross-check the answers — especially the one about my expenses. It has got them all right. Apart from one. And as far as the expenses go, it was all a long time ago.

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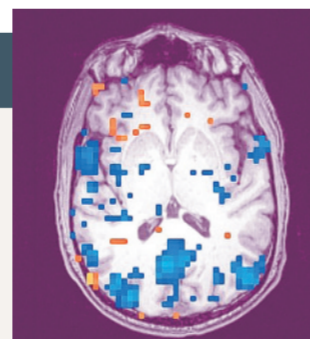
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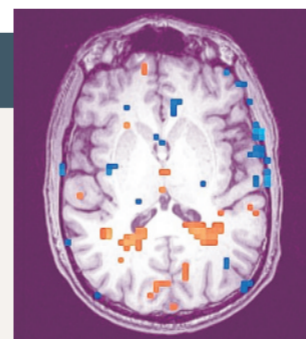
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TRUTH OR LIE?

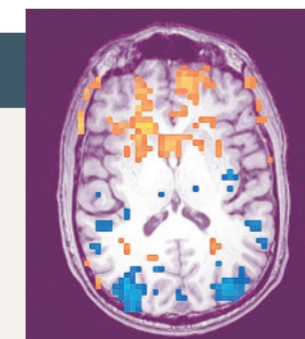
These are front-to-back cross-sections through my brain, with my eyes at the top, captured as I gave answers to three questions. Red areas indicate "activation" — a surge in blood flow caused by an increase in nerve cell activity. Blue areas show the opposite — deactivation. The primary areas of interest are the frontal lobes — home to the higher mental functions — which are at the top of each image. Because lying requires processes such as decision-making and calculation, increased activity in these frontal areas suggests I am planning to deceive.



Question: Have you ever copied material from the internet?
My answer: No.
The expert says: Although there is slightly more activation across the frontal cortex, there is little increase in blood flow.
Conclusion: You are telling the truth.
The truth: Correct. I use the web for reference only.



Question: Have you ever called in sick to avoid work?
My answer: No.
The expert says: The inferior frontal cortex shows no activation. This question isn't something that you feel strongly about.
Conclusion: You are telling the truth.
The truth: Who hasn't? This is the only one it got wrong.



Question: Have you ever over-claimed on your expenses?
My answer: No.
The expert says: The inferior frontal cortex shows marked activations. This finding is consistent with deception.
Conclusion: You are lying.
The truth: Ahem. In my defence, it was a long time ago and I really did think the ducks deserved a better house.

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