

The Polygraph

The polygraph, or so-called lie detector, was one of those quack effusions of American turn-of-the-century inventions that might understandably have suckered a gullible public in an earlier era of electrical wonders, but that by 1952 was obviously pure bunkum to anyone with even a modicum of scientific knowledge. J. Edgar Hoover refused to allow the machine to be used in investigations, noting its complete unreliability in detecting truth from falsehood.

The national academy of sciences, have affirmed the elementary fact that there is no physiological response unique to lying for all of their pseudo-scientific poring over squiggly traces ... polygraphers did little better than flipping a coin. (Pg. 63, "the Code Warriors" by Steven Budiansky)

Sheppard v. Maxwell, 231 F. Supp. 37 (1964). The results of lie detector tests are inadmissible because the tests lack sufficient reliability to justify the admission of expert testimony based upon those results.

United States v. Pitner, 969 F. Supp. 1246 (1997). The results of polygraph tests may not be admitted in trial. Polygraph tests have intrinsic flaws.

The polygraph was invented in 1921 by John Larson, and later improved with Leonarde Keeler.

Veripol

A lie detector that works by scrutinizing the wording of statements, invented by Rodriguez Mega. But ... everyone has a unique experience in vocabulary, education, accents, and culture, so that words and phrases could mean different things to different people. Veripol uses an A.I. algorithm.

There is no such thing as an "impartial" expert witness. You can find an expert witness to support any agenda or ideology. This includes polygraph test questions.

Note: An A.I. algorithm will say anything it is told to say. An algorithm is a reliable, consistent, and predictable. Algorithms say what they are told to say, no matter what the input may be. An algorithm is just a mathematical skeleton fleshed out by the input data which just shapes the adjectives or adverbs of the pre-set output. Humans franchise the work to an A.I. machine, having first told the machine what to do.

Dependence on A.I. technology leaves us ripe for exploitation. When we limit ourselves to the kind of problems that can be solved by A.I. machines, we lose our creativity, imagination, and innovation that make us human. A.I. machines have no curiosity.

We learn to lie as children, between the ages of two and five. By adulthood, we are prolific. We lie to our employers, to our partners, to ourselves, and most of all, one study has found, to our mothers. The average person hears up to 200 lies a day, according to research by Jerry Jellison, a psychologist at the University of Southern California. The majority of the lies we tell are "white", the inconsequential niceties – "I love your Dress!" – the grease the wheels of human interaction. But most people tell one or two "big" lies a day, says Richard Wiseman, a psychologist at the University of Hertfordshire. We lie to promote ourselves, to protect ourselves, and to hurt or avoid hurting others.

The mystery is how we keep getting away with it. Our bodies expose us in every way. Hearts race, sweat drips, and micro-expressions leak from small muscles in the face. We stutter, stall, and make Freudian slips. “No mortal can keep a secret,” wrote the psychoanalyst in 1905. “If his lips are silent, he chatters with his fingertips. Betrayal oozes out of him at every pore.”

Even so, we are hopeless at spotting deception. On average, across 206 scientific studies, people can separate truth from lies just 54% of the time – only marginally better than tossing a coin. Some people stiffen and freeze when put on the spot; others become more animated. Liars can spin yarns packed with color and detail, and truth-tellers can seem vague and evasive.

Humans have been trying to overcome this problem for millennia. The search for a perfect lie detector has involved torture, trials by ordeal, and, in ancient India, an encounter with a donkey in a dark room. In 1730, the English writer Daniel DeFore suggested taking the pulse of suspected pickpockets. “Guilt carries fear always about it,” he wrote. “There is a tremor in the blood of a thief.” More recently, lie detection has largely been equated with the juddering styluses of the polygraph machine. But none of these methods has yielded a reliable way to separate fact from fiction.

That could change. In the past couple of decades, the rise of cheap computing power, brain-scanning technologies, and artificial intelligence has given birth to what many claim is a powerful new generation of lie-detection tools. Startups, racing to commercialize these new developments, want us to believe that a virtually infallible lie detector is just around the corner. Their inventions are being snapped up by police forces, state agencies, and nations desperate to secure themselves against foreign threats. They are also being used by employers, insurance companies, and welfare officers. “We’ve seen an increase in interest from both the private sector and within government.” Said Todd Mickelson, CEO of Converus, which makes a lie detector based on eye movements and subtle changes in pupil size.

Converus’ technology, Eyedetector, has been used by FedEx in Panama and Uber in Mexico to screen out drivers with criminal histories, and by the credit-ratings agency Experian, which tests its staff in Colombia to make sure they aren’t manipulating the company’s database to secure loans for family members. In the U.K., police are carrying out a pilot scheme that uses Eyedetector to measure the rehabilitation of sex offenders. Other Eyedetector customers include the government of Afghanistan, McDonald’s, and dozens of local police departments in the United States. Soon, large-scale lie-detection programs could be coming to the borders of the United States and European Union, where they would flag potentially deceptive travelers for further questioning.

But as tools such as Eyedetector infiltrate more and more areas of public and private life, there are urgent questions to be answered about their scientific validity and ethical use. Nothing provides a clearer warning about the threats of new generation of lie detectors than the history of the polygraph, the world’s most widely used deception test. John Larson, the inventor of the polygraph, came to hate his creation. In 1921, Larson was a 29-year-old rookie police officer working the downtown beat in Berkeley, California. But he had also studied physiology and criminology, and when not on patrol he was in a lab at the University of California, developing ways to bring science to bear in the fight against crime.

In the spring of 1921, Larson built an ugly device that took continuous measurements of blood pressure and breathing rate, and scratched the results onto a rolling paper cylinder. He then devised an interview-based exam that compared a subject’s physiological response to questions relating to a crime with the subject’s response to

control. Questions such as “Is your name Jane Doe?” As a proof of concept, he used the test to solve a theft at a women’s dormitory.

Larson refined his invention over several years with the help of an enterprising young man named Leonarde Keeler, who envisioned applications for the polygraph well beyond law enforcement. After the Wall Street crash of 1929, Keeler offered a version of the machine concealed inside an elegant walnut box to large organizations so they could screen employees suspected of theft.

Not long after, the United States government became the world’s largest user of the exam. During the red scare of the 1950’s, thousands of federal employees were subjected to polygraphs designed to root out communists. The United States Army, which set up its first polygraph school in 1951, still trains examiners for all the intelligence agencies at the National Center for Credibility Assessment at Fort Jackson in South Carolina.

Companies also embraced the technology. Through much of the last century, about a quarter of U.S. corporations ran polygraph exams on employees to test for issues including histories of drug use and theft. By the 1980’s, there were up to 10,000 trained polygraph examiners in the United States, conducting two million tests a year.

The only problem was that the polygraph did not work as advertised.

In 2003, the U.S. National Academy of Sciences published a damning report that found evidence on the polygraph’s accuracy across 57 studies was “Far from satisfactory.” History is littered with examples of known criminals who evaded detection by cheating the test. Aldrich Ames, a KGB double agent, passed two polygraphs while working for the CIA in the late 1980’s and early ‘90s. With a little training, it is relatively easy to beat the machine. Floyd “Buzz” Fay, who was falsely convicted of murder in 1979 after a failed polygraph exam, became an expert on the test during his two and a half years in prison and started coaching other inmates on how to defeat it.

The polygraph remained popular, though – not because it was effective, but because people thought it was. “The people who developed the polygraph machine knew that the real power of it was in convincing people that it works,” said Dr. Andy Balmert, a sociologist at the University of Manchester who wrote a book called “Lie Detection and the Law.”

The threat of being outed by the machine was enough to coerce some people into confessions. One examiner in Cincinnati in 1975 left the interrogation room and reportedly watched, bemused, through a two-way mirror as the accused tore 6 feet of paper charts off the machine and ate them. You didn’t even need to have the right machine: in the 1980’s, police officers in Detroit extracted confessions by placing a suspect’s hand on a photocopier that spat out sheets of paper with the phrase “He’s lying!” pre-printed on the paper.

Other people were pushed to admit to crimes they did not commit after the machine wrongly labeled them as lying. The polygraph became a form of psychological torture that wrung false confessions from the vulnerable. Many of these people were then charged, prosecuted, convicted, and sent to prison, - whether by unscrupulous police and prosecutors or by those who believed (wrongly) in the polygraph’s power.

Some people believe an accurate lie detector would have allowed border agents to stop the 9/11 hijackers. As a result, the front lines, for much of the new government-funded lie-detection technology has been the borders of

the U.S. and Europe. In 2014, travelers flying into Bucharest were interrogated by a virtual border agent called Avatar, an on-screen figure in a white shirt with blue eyes that introduced itself as “The Future of Passport Control.” In addition to an e-passport scanner and a fingerprint reader, the Avatar unit has an infra-red eye-tracing camera, and an Xbox Kinect sensor to measure body movement. It is one of the first “multi-modal” lie-detectors – one that incorporates a number of different sources of evidence – since the polygraph.

But the “secret sauce,” according to David Mackstaller, who is taking the technology in Avatar to market via a company called Discern Science, is in the software, which uses an algorithm to combine all of these types of data. The machine aims to send a verdict to a human border guard, within 45 seconds, who can either wave travelers through or pull them aside for additional screening. Mackstaller said he is in talks with governments – he wouldn’t say which ones – about installing Avatar permanently after further tests at Nogales in Arizona, on the U.S. – Mexican border, and with federal employees at Reagan Airport near Washington, D.C. Discern Science claims accuracy rates in its preliminary studies, including the one in Bucharest, have been between 83 percent and 85 percent.

Mackstaller said Avatar’s results will improve as its algorithm learns. He also expects it to perform better in the real world, because the penalties for getting caught are much higher, so liars are under more stress. But research shows that the opposite may be true: lab studies tend to overestimate real-world success.

The accuracy rates of 80 to 90 percent claimed by the likes of Eyedetector and Avatar sound impressive, but applied at the scale of a border crossing, these tools would lead to thousands of innocent people being wrongfully flagged for every genuine threat they identified. It might also mean that two out of every ten terrorists would easily slip through.

History suggests that such short comings will not stop these new tools from being used. After all, the polygraph has been widely debunked, but an estimated 2.5 million polygraph exams are still conducted in the United States every year. It is a \$2.5 billion dollar industry. In the U.K., the polygraph has been used on sex offenders since 2014, and in January 2019, the government announced plans to use it on domestic abusers on parole. The test “cannot be killed by science because it was not born of science,” writes historian Ken Alder in his book “The Lie Detectors.”

A consensus of select subjective opinions will never add up to a constitutional objective fact.

New technologies may be harder than the polygraph for unscrupulous examiners to deliberately manipulate, but that does not mean they will be fair. AI-powered lie detectors prey on the tendency to put faith in science’s supposedly all-seeing eye.

And lie detectors often get aimed at society’s most vulnerable: women in the 1920’s, suspected dissidents and homosexuals in the 60’s, welfare claimant’s in the 2000’s, asylum seekers and suspected sex offenders today.

In an era of fake news and falsehoods, it can be tempting to look for certainty in science. But lie detectors tend to surface at “pressure-cooker points” in politics, when governments lower their requirements for scientific rigor, said Balmer. In this environment, dubious new technologies could “slip neatly into the role polygraph once played,” Adler predicts.

One day, improvements in artificial intelligence could find a reliable pattern for deception by scouring multiple sources of evidence, or more detailed scanning technologies could discover an unambiguous sign lurking in the brain. In the real world, however, practiced falsehoods – the stories we tell ourselves about ourselves, the lies that form the core of our identity – complicate matters. “We have this tremendous capacity to believe our own lies,” Dan Ariely, a renowned behavioral psychologist at Duke University, said. “And once we believe our own lies, of course we don’t provide any signal of wrongdoing.”

A polygraph test is an invasion and a violation of an individual’s Fifth Amendment right not to incriminate themselves.

Algorithms are reliable, consistent, and predictable. Algorithms will say what they are told to say. An algorithm is a mathematical skeleton, fleshed out by the input data. The input data just alters the adjectives describing the output. An A.I. algorithm just uses a bigger adjectives dictionary than normal.

Research has shown that hidden bias can be inadvertently (or intentionally) coded into any algorithm, A.I. or otherwise. Illegal bias can also result from the selection of data, questions asked, and social or gender bias, all unconstitutional.

Arrogant narcissistic polygraphists enjoy exaggerated opinions of their omniscience and their omnipotence.

Artificial Intelligence created and designed by humans will never be more intelligent than any group of humans. A.I. has no curiosity or imagination of its own: necessities needed to find the truth. A.I. algorithms will always have limits. A better A.I. machine is just a different algorithm that handles a specialization better than a human. Any so-called lie detector must test subjectivity, context, culture, and the totality of circumstances – things that are still beyond human control, including human-designed machines.

Federickhouse v. Nelson, 210 F. Supp. 2d. 993 (2002). There is no case that rules that a parolee must take a lie detector test to remain, or gain, his liberty.

Sheppard v. Maxwell, 231 F. Supp. 37 (1964). The results of lie detector tests are inadmissible in court because they are unreliable.

United States v. Pitner, 969 F. Supp. 1246 (1997). Polygraph tests have intrinsic flaws.