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EXCLUSIVE:
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A new contender takes on the polygraph

By Rebecca Kanable

The truth surrounding lie detection technology

To look at truths relating to lie detection seems ironic. Machines designed to detect human deception have for one reason or another kept innocent people free and led to criminal confessions and convictions. How or why has caused much debate. Yet, applications of these machines have broadened. As polygraph and voice stress analysis technologies continue to advance, they bring with them controversy and concern.

Law enforcement has been using a machine to help detect lies since 1920 when John Larson, a Berkeley (Calif.) police officer with a Ph.D. in physiology used a machine to simultaneously chart breathing and blood pressure. Modern-day polygraphs also record physiological activities as "many writings." The American Polygraph Association (APA), founded

in 1966, describes today's polygraph examination: "Convoluted rubber tubes are placed over an examinee's chest and abdominal area to record respiratory activity. Two small metal plates are attached to fingers to record sweat gland activity. And a blood pressure cuff, or similar device, records cardiovascular activity."

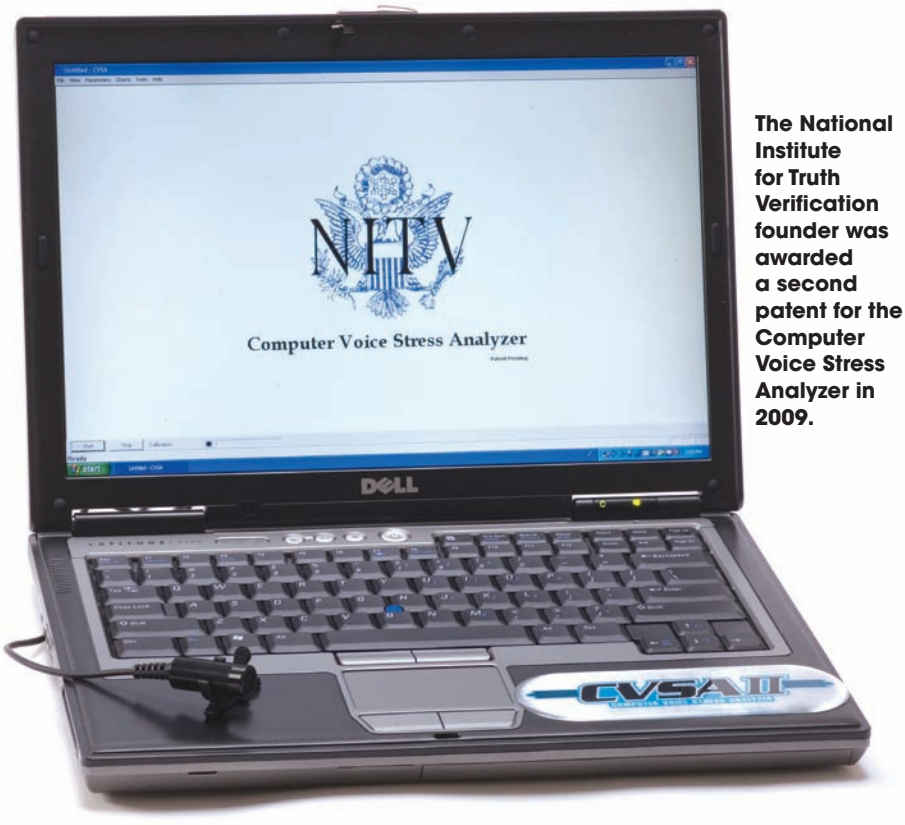
APA emphasizes that a valid examination requires the combination of a properly trained examiner, a polygraph instrument that records cardiovascular, respiratory and electrodermal activity, and the proper administration of an accepted testing procedure and scoring system.

APA President Daniel Sosnowski has been doing polygraph examinations for 30 years and witnessed the polygraph evolve from an analog to a more efficient and accurate digital instrument.

The polygraph is used by law enforcement agencies, the legal community and the private sector. More than 2,800 people from 25 countries are APA members. In law enforcement, the polygraph assists in the investigation of criminal conduct. For the purposes of general admissibility at trial, polygraph evidence is not typically admissible. New Mexico is the exception, says APA general counsel Gordon Vaughan, and many other states accept polygraph evidence, but only by stipulation of the parties.

The polygraph is also used to screen police candidates. The Employee Polygraph Protection Act of 1988 generally prevents employers from using lie detector tests for pre-employment screening or during the course of employment. Federal, state and local governments, however, are excluded.

Increasingly, Vaughan says he is seeing courts accept polygraph evidence not only in pre-trial matters, but in the monitoring of convicted criminals, often sex offenders, under probation and parole restrictions. Sosnowski was recently asked to give a polygraph examination in a federal death penalty case. The accused said he was innocent and passed the exam. Based on that and other circumstantial evidence, the man was spared the death penalty. "That's what we constantly strive for," Sosnowski says.



The National Institute for Truth Verification founder was awarded a second patent for the Computer Voice Stress Analyzer in 2009.

Often the news media report on bad polygraph exams, but he says, "what we don't hear about is the polygraph saving someone from being fired or going to jail." Even in 2010, Sosnowski says there are many misconceptions about the polygraph. Addressing one, he explains: "You're never going to fail the polygraph just because you're nervous, because nervousness is going to be consistent throughout the entire process."

Another misconception is based on TV, where a polygraph examination may only take 5 minutes. He says the reality is examinations take a minimum of 2 to 3 hours.

The polygraph continues to face controversy and adversaries: anti-polygraph Web sites claim to teach people how to cheat the polygraph and accuracy rates given for polygraph exams often are disputed. APA's compendium of research studies with 80 research projects support accuracy rates beginning at 80 percent.

The 2003 National Academy of Sciences (NAS) report looked at some of those studies. In "The Polygraph and Lie Detection," NAS found the majority of polygraph research was unreliable, unscientific and biased. APA points out NAS' effort was confined to a review of the research on polygraph testing and in particular, polygraph testing as it relates to personnel screening. APA says NAS relied on only 57 of the more than 1,000 research studies available. In a chart looking at security

screening, NAS comes up with a false positive rate of almost 16 percent.

Among its overall findings, NAS says, "Almost a century of research in scientific psychology and physiology provides little basis for the expectation that a polygraph test could have extremely high accuracy. The physiological responses measured by the polygraph are not uniquely related to deception."

While NAS says the expectation for polygraph test accuracy may not be extremely high, it is higher than using only human judgment, which is close to chance, says Maria Hartwig, who holds a Ph.D. in psychology and is an assistant professor of psychology at John Jay College of Criminal Justice in New York. She says polygraph results are typically around 75 percent accurate.

Hartwig, who emphasizes she does not think the polygraph is the ultimate lie-detecting tool, adds accurate, higher-than-chance results are possible when a trained polygraph examiner uses a standardized approach and accepts the results for what they are.

Discrepancies occur when looking at polygraph effectiveness, because different polygraph tests have different question protocols. Another reason for discrepancies: Inconclusive test results are sometimes classified as errors. APA says in real life, an inconclusive result — meaning an examiner is unable to render a definite diagnosis — is not typically included by polygraph examiners when measuring accuracy.

Knowing the polygraph is not perfect and has had high-profile cases in which criminals who passed the polygraph were later found guilty, APA says it welcomes the NAS recommendation for additional research and greater innovation in the field. Commenting on potential alternatives to the polygraph, NAS says, "Some show promise, but none has yet been shown to outperform the polygraph. None shows any promise of supplanting the polygraph for screening purposes in the near term."

> ***"Remember: not all are guilty and we are looking for the truth."***
>
> *— James Chapman, education and standards director at NACVSA*

Polygraph vs. voice stress

Polygraph examiners and voice stress examiners often find themselves commenting on the other.

For years, polygraph examiners have been saying voice stress does not work, and have been accused of doing so to protect their turf. Sosnowski says that's not the reason. "If research clearly showed that voice stress worked, that it truly stood up to scientific scrutiny, we would embrace it," he says. "We would make it an additional parameter to the polygraph test."

One of the most critical and most recent papers opposing the use of voice stress analysis was published in the *International Journal of Speech, Language and the Law* in 2007. The article states there is no scientific evidence to support the idea that micro-tremors in the 10 Hz region occurs in muscles involved in speech production for voice stress analysis. But since a company (not named in this article) alleging defamation requested a retraction, the journal's publisher, Equinox Publishing, has removed the article from its Web site.

Despite the arguments, the National Institute for Truth Verification (NITV) estimates about 1,800 local, state and federal law enforcement agencies are using its patented Computer Voice Stress Analyzer (CVSA) products. As with the polygraph, results of voice stress analysis are not normally used in court, but help eliminate individuals as suspects, and voice stress analysis is being required for probation and parole, particularly with sex offenders. In addition, NITV has trained more than 400 military CVSA examiners, and the CVSA is still being used by military units in combat zones.

James Chapman, education and standards director of the National Association of Computer Voice Stress Analysts, (NACVSA) asks: How can all these agencies and people be wrong?

Chapman is professor emeritus and former director of the Criminal Justice Program and Forensic Crime Laboratory at the State University of New York in Corning. Prior to his career in education, he served in law enforcement and the U.S. Marine Corps.

While others may argue there is not enough scientific evidence to demonstrate voice stress analysis is a science, Chapman emphatically states the debate is over. He says VSA technology is an accurate, reliable and legally sound truth verification tool. And, he adds, CVSA has no inconclusive results.

Voice stress analysis has its origins in the work of three former U.S. Army commanding officers. The first system became commercially available in 1971 and Chapman has been using voice stress analysis since then. As a criminologist, he had been looking for an investigative tool applying to both natural and behavioral science.

Specifically, he was looking for a testing platform to evaluate the spoken word, not yes or no (like the polygraph), but multi-utterances. He also wanted a test that would treat fellow human beings with dignity and respect, which he says would not involve "wiring people up" or touching them. "Remember: not all are guilty and we are looking for the truth," he adds.

After 39 years of conducting voice stress analysis and a 19-year study, Chapman's work has resulted in a confession rate of more than 95 percent. In five cases where there were 18 homicides and one suicide, the suspects passed a polygraph examination and were cleared. They were then re-tested using voice stress analysis and the suspects did not pass the exam. All cases and suspects were successfully adjudicated. "Most importantly," he says, "VSA testing was able to accurately identify innocent individuals who were suspected of wrongdoing, thus removing them from suspicion."

The results, he says, are not surprising when you understand what voice stress analysis can do. While the polygraph displays only relative stress, Chapman says voice stress analysis displays absolute stress. He explains voice stress analysis detects levels of significant emotional stress from human voice utterances. The benefits to not having attached sensors are eliminating any stress they might cause and being able to do remote analysis.

Chapman has conducted numerous examinations in person and using tape recordings, communication intercepts and telephone interviews. He has published his findings in medical and forensic journals and is working on publishing the results of 19 years of field study.

"There was tremendous oversight to the research process I utilized — namely in the form of legal, constitutional guarantees," he describes. "From reasonable suspicion to investigation, to probable cause to arrest and indictment, to trial and conviction or acquittal, I know of no other longitudinal field study with such a seamless, intense oversight mechanism to assure an impartial and legally valid outcome."

John Trice retained Chapman on many different cases when Trice was district attorney for Chemung County (N.Y.) from 2000 to 2008, and was an assistant DA from 1984 to 1998. He says he has a lot of confidence in the machine because he's seen it work in many cases. He describes one case that stands out in his mind: Person A, a bank robbery suspect, told police that Person B was the robber. A CVSA exam resulted in Person A admitting he lied and he, Person A, was the one who robbed the bank. CVSA results, along with corroborating evidence, exonerated Person B and all criminal charges against him were dropped. Trice adds he's never seen it fail, and he knows of no known counter measures.

On the NITV Web site, detectives list case after case solved with the help of the CVSA. NITV has been selling voice stress analysis technology since 1988. From that time up until 1997, only an analog version of the instrument was available. The first software-based CVSA was introduced in 1997 and the CVSA II came out in 2007 with the addition of the Final Analysis Confirmation Tool Scoring System, the simplification of examiner interfaces to reduce the time required for conducting examinations, and the capability to record live and telephonic examinations directly to the hard drive.

NACVSA was created to offer training and representation to law enforcement and others who use the CVSA to conduct truth verification examinations. CVSA examiners are required to recertify every two years. NACVSA members also assist each other with cases. For example, examiners who join NACVSA's L-List can ask for help with charts, question formulation and examination formats.

Real jeopardy

To those in the academic community who say the science of voice stress does not work, Chapman says the crux of the matter is real jeopardy, which is what he's using, vs. artificial jeopardy found in the laboratory setting.

The instrument was never designed to measure artificial jeopardy, stress measurements of game situations, so scientists will not be successful with the instrument in a laboratory setting. As a laboratory scientist, Hartwig is not sympathetic to the argument that the nature of deception or real stress can't be replicated in the laboratory.

She says the criticism that labs can't be used to capture real-life deception is based on a strange idea that as stakes increase, it becomes difficult to lie. Hartwig says the truth-telling person is under the same pressure as someone who is lying. Chapman maintains that's not right because a person lying about having picked the two of spades from a deck of cards cannot produce the same level of stress as a woman suspected of cutting the throat of her 3-month-old baby.

The best research model for testing lie detection is operational research, he says.

He explains: "Operational research is one of those ways, and can differ from both hard and soft science measurement in analyzing primary data in

case studies. That research approach is more suited to the CVSA than any other, and it can literally make the case for the CVSA through proper analytic presentation and interpretation. Traditional academic statistical research methodology is too often based on secondary analysis that cannot demonstrate the primary personal technology nexus that's required in testing VSA. An example of marksmanship, in the analogy of hitting the truth target, the accuracy of the weapon depends upon the skill of the person using it."

It is here, somewhere along these lines and graphs, that voice stress and polygraph agree.

APA points out NAS and APA recognize the field of lie detection is a difficult one to quantify or measure in terms of real-world effectiveness. NAS reports real-world conditions are difficult, if not impossible, to replicate in a mock crime or laboratory environment for the purpose of assessing effectiveness.

As a result, APA says, "A paradigm for research into the validity and efficacy of lie detection has always been, at best, a difficult challenge." ■

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