

New Mexicans for Science and Reason

LIE DETECTORS AND POLYGRAPHS

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N.M. Supreme Court says Polygraphs CAN be used as evidence...

KOB TV reported on July 14th, 2004 that "The state Supreme Court has ruled that polygraph test results can continue to be used as evidence in New Mexico courts. New Mexico has allowed the use of lie detector results in courts for decades. However, the Supreme Court has been considering whether to change its rule. In a 30-page ruling, the court reaffirmed its rule and said polygraph test results are sufficiently reliable to be used as evidence in trials. The state attorney general's office had argued that polygraph tests were unsound science and should be excluded as evidence. The Supreme Court makes rules for other New Mexico courts to follow. The court's ruling came in five consolidated criminal cases. In a trial, polygraphs are sometimes used to verify the truthfulness of witnesses and their testimony. ..."

Source: <http://kobtv.com/index.cfm?viewer=storyviewer&id=12324&cat=HOME>

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Polygraphs Are Slammed, and Slammed Some More!

In an editorial titled "DOE Polygraph Shift Doesn't Go Far Enough" published on Sept. 7th, the Albuquerque Journal stated that "The spy-hunting polygraph program put in place by then-Energy Secretary Bill Richardson in 1999 is being downsized. Instead of testing more than 20,000 scientists, the Department of Energy will do 4,500. It's a step in the right direction. But DOE doesn't go far enough, considering polygraph tests essentially were discredited and deemed useless by a scientific panel last year. ... Widespread use of 'lie-detector' tests in the nation's nuclear weapons program is a waste of taxpayer money with dangerous implications for DOE workers and for national security -- precisely because it offers a false sense of security. The DOE policy of screening for spies with polygraphs shouldn't be just downsized; it should be reversed. ..."

Source: <http://www.abqjournal.com/opinion/1OP9-07.HTM> (subscription required)

Then, on Sept. 10th, Scott Sandlin of the Journal, in an article titled "Judge Tells N.M. Courts To Ban Polygraphs," explained that "New Mexico, the only state to routinely permit the use of lie detector tests in the courtroom, is considering a change to that practice. **District Judge Richard Knowles of Albuquerque has recommended to the state Supreme Court that lie detector results be disallowed from use in court after finding the tests too unreliable.** Polygraphs, known commonly as lie detectors, are widely used in employment screening, especially by the military and law enforcement. Their results have been admitted into evidence in New Mexico courtrooms for 30 years. But allowing polygraph evidence at trials is a practice frowned on by most states, though they have taken varying approaches to the issue. ..."

Source: <http://www.abqjournal.com/news/82941news09-10-03.htm> (subscription required)

And finally, on Sept. 12th, the Journal published an editorial with the title "Unproven Polygraphy Gets Its Day in Court." The Journal commented "*District Judge Richard Knowles' recommendation that the state Supreme Court disallow polygraph results as evidence is a welcome impetus for getting this important reform under way. Despite previous attempts to ban so-called 'lie detector' tests, **New Mexico remains the only state** where courts routinely confer such unwarranted credibility on polygraphs. Knowles was asked by the state's highest court to examine the issue and forward a recommendation. He reached the same, inescapable conclusion as a recent National Academy of Sciences report: **Polygraphs are unreliable.** ...The Knowles report pulls back the curtain to expose the wizards of polygraphy. Junk science has no place in a system where justice is pursued by determining the facts. ...*"

Source: <http://www.abqjournal.com/opinion/1OP9-12.HTM> (subscription required)

More info: <http://www.nmsr.org/polygraf.htm>

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April 2003 NMSR Meeting: Lies, Damn Lies, and Polygraphs

New Mexicans for Science & Reason (NMSR) heard Dr. Alan Zelicoff (Sandia Nat'l Labs) speak on "Lies, Damned Lies, and Polygraphs." The meeting was held on Wednesday, April 9th, in the New Mexico Museum of Natural History and Science's Honeywell Theatre. Zelicoff's articles on polygraphs have appeared in the Albuquerque Journal and the Washington Post..

Al began by pointing out that New Mexico's Supreme Court is the only one in the nation that allows polygraphs in open court. What is a "polygraph" anyway? As the "poly" (many) indicates, it is an amalgam of recordings. It consists of measurements of: Pulse, Respirations, Blood Pressure, Skin resistance (1/conductance), all allegedly to determine: Deception or deceptive "indicators," Consistency, or Truth(?). It is not called a "diagnostic" test, and so there is no review, conveniently for professional polygraphers.

Zelicoff said that if you asked almost any polygrapher what the test is, and they will not answer that it's a "lie detector." However, when all is said and done, the tests end up being used to "detect lies." Al observed that most polygraphers say the truth is for someone else to find.

He gave a brief history of polygraphs. In 1895, Cesar Lambroso posited a link between deception and changes in blood pressure. In 1902, James McKenzie invented the polygraph. In 1915, William Marston popularized polygraph tests. In 1938, the "modern" polygraph was introduced, with four observables: blood pressure, pulse, respiration, and skin resistance. In 1938 also, the same William Marston introduced his character Wonder Woman, who made her debut in "All Star Comics" No. 8. And of course, Wonder Woman possessed a gold lasso that would trip up anyone telling a lie. In 1988, Congress banned polygraphs for civilian employment use. In 1995, Aldrich Ames, who had passed five polygraphs during his long career in intelligence, was arrested for spying. In 1998, Wen Ho Lee of Los Alamos passed and failed the same polygraph. And in 1999, Defense Authorization Bill I mandated polygraphs in Department of Energy (DOE) labs.

There are a couple of main variants of polygraph tests. In a "specific incident" polygraph, or "guilty knowledge test" (GKT), the suspect is asked about details that only the perpetrator of a specific crime would know. This kind of test actually produces results better than chance (but certainly less than 100%), even if the test-takers tried to cheat. That's not the situation at DOE labs like Sandia, where polygraphs are used to screen a large population, most of whom are absolutely innocent of aiding and abetting espionage or sabotage. Then DOE secretary (now Governor) Bill Richardson said back in 1999 that 99.99% of lab employees were probably honest; that means one in ten thousand might be a Spy. So, lab workers are questioned, not about the details of a specific crime, but just general questions relating to espionage or sabotage. The screening procedure employs a "control question test" (CQT), wherein certain "control" questions are used to establish a "baseline." Then, the subject is asked "relevant" questions, dealing (vaguely) with espionage or sabotage. If the response to "relevant" questions is higher than the response to the "control" questions, the subject is deemed to be deceptive. However, polygraphers are very tight-lipped about just what qualifies as a "higher response." But Zellicoff really slammed an obvious fatal flaw in such "control-question" tests. In "control" questions, the subject is instructed to lie about something innocuous, such as the identity of a chosen playing card. But, a real lie is a misstatement with intent to deceive, while the "control" question is a misstatement with intent to comply.

The "relevant" questions involve commission of acts of sabotage, of espionage, of providing classified material to an unauthorized person, and having unauthorized contact with a foreign national. Other questions are asked, including (formerly) questions about medications. While some studies claim no effect of medications on polygraphs, others indicate that alcohol or diazepam increase the false positive rate (thus incorrectly labeling an honest lab worker as a spy). Be that as it may, delving into medications brings up a host of privacy issues; these questions were discontinued in 2000.

Alan mentioned one detailed study by Reed (online at www.antipolygraph.org/documents/tes-briefing.shtml) with 304 subjects, 105 of whom were "programmed guilty." Overall, the percentage of correct determinations of innocence ran from 88 to 93 percent for various polygraph methods (meaning that 7 to 12% of determinations of innocence were wrong - FALSE NEGATIVES). The percentage of correct determinations of guilt ran from 52 to 81 percent (meaning that 19 to 48% of determinations of guilt were wrong - FALSE POSITIVES).

Zellicoff explained why polygraphs are so poor at screening for rare cases (the one in 10,000 spy). He used a medical analogy. Stress tests can tell you about your heart's condition. If someone has NO symptoms of heart trouble - no chest pains - then a Stress Test will increase your confidence in your overall status by a little, maybe 5 to 10%. Here, a positive test might be real, but it might just be a fluke (false positive). However, if you do have chest pains (which straight away ups your confidence level that there's a problem to about 40%), then adding on a Stress Test can increase your confidence level up to 80% or so. A positive test would indicate prompt action (surgery), while a negative stress test would ease concern over the chest pains. This contrasts specificity (how confident you are that a positive result indicates that a problem exists) with sensitivity (how confident you are that a negative result means you're OK). Al called attention to the 1983 Office of Technology Assessment (OTA) report "Scientific Validity of Polygraph Testing: A Research Review and Evaluation." This report concluded "that the mathematical chance of incorrect identification of innocent persons as deceptive (false

positives) is highest when the polygraph is used for screening purposes [emphasis added]. The reason is that, in screening situations, there is usually only a very small percentage of the group being screened that might be guilty." (OTA Report, Nov. 1983, p. 8 <http://www.wws.princeton.edu/~ota/disk3/1983/8320.html>).

The United States Supreme Court cited "doubts and uncertainties" plaguing polygraphs in *U.S. v. Scheffer*, 523 U.S. 303 (1998), and former Secretary of State George Schultz called polygraphs "management through fear and intimidation."

Zelicoff pointed out that subjects are required to sign a waiver declaring "No threats or promises have been used against me to obtain my consent to the use of the polygraph," but that this waiver requires them to lie. Of course there's a "threat" - you must take the polygraph, or you will lose your job. All in all, polygraphs are a much better tool for sowing angst and contempt at the labs than they are of actually turning up spies. By forcing innocent people out of important high-security positions, whether by false positive or by fear, polygraphs seriously damage the national security of the United States.

Zelicoff mentioned the efforts of New Mexico Senators Domenici and Bingaman to curtail polygraph screening at the labs, and how these have been stalled in committee for two years. He also discussed the National Academy of Sciences October 2002 report, which was highly critical of polygraphs for security screening.

Al wrapped up his talk with three main conclusions:

- o the polygraph is not a lie detector;
- o the polygraph has insufficient specificity to be used in a screening mode, given the potential consequences of a false positive and low pre-test probability;
- o the polygraph is a tool of interrogation used for extracting confessions in a physically and psychologically uncomfortable environment wherein the subject's livelihood and sensibilities are threatened.

NMSR thanks Al Zelicoff for a superb presentation.

ADDENDUM: A few days after Al's talk, on April 15th, 2003, John Fleck of the Albuquerque Journal reported that "The Department of Energy wants to continue polygraphs to hunt for spies, bucking a report from federal science advisers who said the technique is flawed. In a notice published Monday, the department announced it wants to keep its polygraph program, which screens nuclear weapons workers in a blanket hunt for spies. That runs counter to advice last October from the prestigious National Academy of Sciences, which concluded the polygraphs the DOE was using were unscientific, missing spies while implicating the innocent. 'I can hardly believe this decision,' said Sen. Jeff Bingaman, D-N.M. It ignores the scientific evidence marshaled by the National Academy, Bingaman said in a statement Monday afternoon. ...Critics, led by Sandia National Laboratories scientist Al Zelicoff, complained that the polygraphs are unscientific, ensnaring innocent workers while missing spies. ... The decision outraged Zelicoff. 'Where's their science?' the Sandia scientist asked of the DOE's conclusion. 'They have none.' ..."

Source: <http://www.abqjournal.com/scitech/858487scitech04-15-03.htm>

And the Albuquerque Tribune has this to say in an editorial on April 17th: "It's like the sequel to a goofy movie: 'DOE - Dumb, Dumber, Dumbest.' Sometimes - even giving it the vast benefit of the doubt - the U.S. Department of Energy is infuriating and needs the equivalent of a national security slap upside its bungling, bureaucratic head. If the White House refuses to do it, Congress should deliver the blow without delay. ... Congress, led by New Mexico Sen. Jeff Bingaman, the ranking minority member of the Senate Energy and Natural Resources Committee, should call the secretary of energy on the congressional carpet, issue a clear legal order countermanning the decision and/or withhold budget funds from DOE until it rejects polygraphs for counter-espionage. Congress should do whatever it takes to get the agency under control and to adhere to the fundamental rule of science. A miffed Bingaman this week said, 'I can hardly believe this decision.' Believe it, and send the message to DOE. It should be short and simple: Get out of the polygraph business now - or else. ..."

Source: http://www.abqtrib.com/archives/opinions03/041703_opinions_edthr.shtml

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Lies, Lies, and More Lies...Polygraphs Debunked by NAS

Posted on October 11th, 2002 by Dave Thomas

Maggie Fox of Reuters reported on Oct. 8th that "Lie detectors may sometimes work in specific cases with specific questions, but they are of little use in general screening, for government employment for example, an independent panel said on Tuesday. after interviewing polygraph experts at the CIA, FBI and other agencies, the panel of the National Academy of Sciences (NAS) determined that it is possible to fool a lie detector, especially if the subject is being screened for general criminal or spy activity and not for some specific act. The academy committee, appointed at the request of the Department of Energy (news - web sites), decided that polygraphs cannot be relied on for mass screening of federal employees because they can falsely suggest an honest employee is lying and can be fooled by someone who is trained to do so. ..."

Source: http://story.news.yahoo.com/news?tmpl=story&u=/nm/20021008/hl_nm/lie_dectors_dc_1

The NAS press release on the report is at

<http://www4.nas.edu/news.nsf/isbn/0309084369?OpenDocument>

Here's an excerpt: "The report concludes that the polygraph's accuracy is not good enough for security screening for two reasons. First, accuracy is almost certainly lower when the tests are used this way rather than in the investigation of specific incidents. Second, the large groups of people being checked include only a tiny percentage of individuals who are guilty of the targeted offenses; tests that are sensitive enough to spot most violators will also mistakenly mark large numbers of innocent test takers as guilty. Tests that produce few of these types of errors, such as those currently used by several federal agencies, will not catch most major security violators - and still will incorrectly flag truthful people as deceptive. 'National security is too important to be left to such a blunt instrument,' said Stephen E. Fienberg, chair of the committee that wrote the report, and professor of statistics and computer science, Carnegie Mellon University, Pittsburgh. ..."

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New Mexico only state that allows polygraphs in court!

From <http://www.howstuffworks.com/lie-detector.htm> :

"The Legalities of Polygraphs"

" Polygraphs are rarely admissible in court. ***New Mexico is the only state in the United States that allows for open admissibility of polygraph exam results.*** Every other state requires some type of stipulation to be met prior to admitting polygraph exams into record. In most cases, both sides of a legal case have to agree prior to the trial that they will allow polygraphs to be admitted. On the federal level, the admissibility criteria are much more vague and admission typically depends on the approval of the judge. "

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Zelicoff Blasts Polygraphs!

Al Zelicoff of Sandia took aim on polygraphs in the April 4th, 2001 [Albuquerque Tribune](#).

He wrote "Protecting secrets is a challenging task. Spies, particularly those operating within the national security establishment, are very difficult to find. But certainly we should not make their task easier with measures like the polygraph that are, in the end, self-defeating. The scientists at the national laboratories are willing to sacrifice some of their constitutional protections for meaningful benefits to security, but they are unwilling to do so for nonsense. It is time to relegate the polygraph -- the fanciful creation of a comic book writer -- to the ash heap of bad ideas and misplaced belief. "

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Sandia Scientists REFUSE Polygraphs!

CBS News reports on 29 March that "Scientists at Sandia National Laboratory in Albuquerque, New Mexico, one of three nuclear weapons labs run by the Department of Energy are in revolt, threatening not to take required lie detector tests, because they include personal questions which have nothing to do with protecting secrets..."What has precipitated the crisis within the Department of Energy is that the polygraphers are asking individual subjects what medications they're taking despite their promises not to do so,' explained Sandia employee Al Zelicoff. According to Zelicoff, one of 20,000 people throughout the nuclear weapons complex now required to take periodic lie detector tests, some key technicians have already refused and are now barred from working on nuclear weapons." Zelicoff spoke to NMSR on various topics, including polygraphs, in March of 2000.

Source: <http://www.cbsnews.com/now/story/0,1597,282238-412,00.shtml>

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How to BEAT Polygraphs!

Doug Williams offers a manual for sale that teaches you how to beat polygraphs. Williams claims that "The polygraph test has a built-in bias against a truthful person. It is certainly not capable of determining truth or deception. It can be beaten rather easily." Click on <http://www.polygraph.com/> for more details.

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Office of Technology Assessment of Polygraphs...

The Office of Technology Assessment, in report OTA-TM-H-15 (November 1983), entitled "[Scientific Validity of Polygraph Testing: A Research Review and Evaluation](#)," noted in the [conclusion](#) that "*The instrument cannot itself detect deception. ... The conclusion of previous congressional inquiries has been that there is little or no scientific basis for the use of polygraph testing. Prior scientific reviews, on the other hand, have contradicted each other, some concluding that polygraph testing is almost 100 percent accurate, others that it is little better than chance. ... Also, previous scientific reviews have not been conducted systematically. ... OTA concluded, therefore, that no overall measure or single statistic of polygraph validity can be established based on available scientific evidence. ... **OTA concluded that there is at present only limited scientific evidence for establishing the validity of polygraph testing. Even where the evidence seems to indicate that polygraph testing detects deceptive subjects better than chance (when using the control question technique in specific-incident criminal investigations), significant error rates are possible, and examiner and examinee differences and the use of countermeasures may further affect validity.***"

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NMSR Gives Award to Bill Richardson for Polygraph Test Recommendations

One of NMSR's "Best & Worst of 1999" Awards went to Energy Secretary Bill Richardson. We've had several letters about this topic. Before getting on to the letters, here's the award text for background:

- Secretary of Energy (and New Mexican) Bill Richardson has been awarded the Man of La Mancha Award for his recommendation of mandatory polygraph (lie-detector) testing for employees in national labs. In the Oct. 15th Science, Michael Phillips notes in a letter that he and others analyzed polygraph tests in a report published by A. S. Brett, M. Phillips, J. F. Beary III, in Lancet i (no. 8480), 544 (1986). Writes Phillips in Science, "If the polygraph were merely useless, it would not be so bad. Unfortunately, it is harmful because it generates a large number of false-positive test results that may incriminate people who are telling the truth. Suppose 1000 people were screened, and 50 of them were liars. The polygraph would generate positive results in 38 out of 50 liars and in 351 of 950 truth tellers, that is, more than nine false positives for every true positive. The polygraph gives the wrong answer 9 times out of 10, and who would want to use a fire alarm or cancer test that was wrong 90% of the time?"

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Brannon on False Positives...

ATTN: David E. Thomas, Editor, NMSR Reports

Dear Dave,

Being a supporter of science and reason, I naturally deplore the use of faulty logic to promote an incorrect conclusion. Perhaps more insidious, however, is the use of faulty logic to support a CORRECT conclusion. The advertising industry has mastered the use of legally CORRECT, but ethically misleading statistics. No matter what they are trying to sell, they can furnish true statistics that APPEAR to support their desired conclusion. As scientists and reasonable thinkers, we should not sink

to this level even when we approve of the product or idea being sold. For this reason, I was disappointed that the NMSR newsletter recently used lie-detector "false positives" as a reason to oppose such tests as part of the Department of Energy (DOE) security investigation procedures. I vehemently oppose the use of polygraphs by the DOE, but I would never oppose them because of false positives.

The NMSR article provided a hypothetical scenario in which polygraphs were administered to 1000 people, of which 50 were liars. According to the article, the hypothetical lie-detection test generated positive results in 38 out of 50 liars and 351 out of 950 truth tellers. The article correctly noted that this implied that over 90% of the positives were WRONG. From there, however, the NMSR article appealed to emotion (rather than reason) by asking us whether we would be willing to take a cancer test that was wrong 90% of the time. This rhetorical question WRONGLY implies that the false positive rate is a good measure of a test's accuracy. For simplicity, let's graciously suppose that all results are either positive or negative (e.g., inconclusive results could be considered to be negative) and that the lie detector results are statistically repeatable. Then from the above hypothetical numbers, the test produced negative results in 12 of 50 liars and 599 of 950 truth tellers. Hence, out of the 611 negative results, only 12 were false negatives. In other words, the false negative rate of the test is less than 2%. Someone who FAVORS polygraphy could follow NMSR's lead by rhetorically asking, "Who could possibly object to a cancer test that's wrong only 2% of the time?"

If DOE officials had any sense of mathematics, they could legitimately defeat objections to polygraphs when those objections cite false positive rates. The DOE polygraphy policy essentially claims that anyone who tests negative will be presumed honest. This part of the policy is sensible in light of our hypothetical scenario because a negative result is 98% reliable. The DOE policy claims that a POSITIVE test result will merely serve as a "red flag" warranting further investigation. Based on the above hypothetical scenario, in which most positives were actually false, this DOE policy is perfectly appropriate. From a purely mathematical perspective, false positives have no place in an argument against the DOE polygraph policy. The policy per se promises to handle positive results appropriately. This "vindication" of DOE policy assumes (erroneously, of course) that testing for liars is just as innocuous as testing for poor eyesight and that the accuracy of the test is unaffected by psychological factors such as bias and nervousness. As reasonable thinkers, we must stop objecting to polygraphy because of the false positive rate - even the best medical tests generally have high false positive rates. We must present OTHER arguments against polygraphy, perhaps emphasizing the irreproducibility of the tests due to tester bias and testee nervousness (which become aggravated upon re-testing). The DOE policy is MATHEMATICALLY appropriate, but its implementation is flawed because the investigator who coordinated the (failed) polygraph ALSO performs follow-up investigations. Even if polygraphy were 100% accurate, an excellent argument against it would focus on its frightening potential as a tool of intimidation.

The NMSR article wrongly implies that the false positive rate of a test is somehow a measure of its accuracy. Looking back at the hypothetical polygraph numbers, note that the test gave the right answer for 38 out of 50 liars. Thus, for liars, the test is correct 76% of the time. Similarly, the test is correct 63% of the time when examining truth tellers. These percentages are the only sensible measures of the test's accuracy. False positive rates depend on the demographics of the test group and are therefore not

valid measures of test accuracy. Suppose, for example, that the test group consists of 10,000 people of which 50 are liars. This new group contains a larger percentage of honest people (as a national laboratory might have more truth tellers than the general population). As before, 38 of the 50 liars test positive. Using the same test accuracy from the first scenario, 3676 of the 9950 truth tellers will test positive. Hence, the false positive rate for this more honest group is $3676 / (38 + 3676) = 99\%$. Among those people who test to be liars, 99% of them will in fact be truth tellers! In both scenarios, the test accuracy was the same. The false positive rate increases with the overall honesty of the test group. This is why the false positive rate of a test should never be confused with its accuracy. An HIV test given to a group of celibate nuns would have a much higher false positive rate than the SAME TEST given to a group of male hemophiliac gay intravenous drug users from Haiti. A nun who tests positive can be fairly certain that she is actually fine (though she should follow up with additional testing). The higher false positive rate for nuns does not mean that the HIV test is somehow ineffective when used on nuns! "False negatives" work opposite as false positives. The false negative rate goes down for low-risk groups. A nun who tests negative for HIV can be far more confident of the result than a drug user who also tests negative.

In general, if you ever test positive for a disease, you should always demand a re-test before allowing doctors to wheel you off for exploratory surgery. Having tested positive once, there is an excellent chance that you are actually NEGATIVE. For the re-test, you are now a member of a higher-risk group (people who have once tested positive). Consequently, a second positive result is more likely to be correct, and you should make that surgery appointment. If the second test is negative (as it usually will be), then you're back to square one and should test a third time. The process of testing and re-testing will exponentially approach truth even if the test has marginal accuracy. This assumes, of course, that erroneous test results arise from unknowable memoryless random influences (such as a technician's eyelash falling in a lab crucible). Retesting won't approach truth if the bad results result from a persistent influence such as consistently eating poppy seed muffins before drug testing.

As a final dig against lie detectors, I reiterate that psychological factors make the accuracy of a polygraph decrease as the number of re-tests increases. It is not a scientifically sensible tool for divining truth. Nor is it ethically sensible. It is so personally offensive that using it could result in the loss of numerous great scientists at our national laboratories.

Sincerely,

Rebecca Brannon

January 16, 2000

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Michael Phillips Responds....

To the Editor, NMSR Reports

Dear Sir:

In order to evaluate any diagnostic test, such as a polygraph test for lying or a blood test for cancer, we need to know two key indicators of performance: the sensitivity and the specificity of the test. Sensitivity is the percentage of people with the disorder who have a positive result on the test, and specificity is the percentage of people without the disorder who have a negative result. Allen Brett and John Beary and I described a "thought experiment" in which the polygraph was used to screen a hypothetical population of 1000 people containing 50 liars. We calculated the predictive value of a positive test result based on the published values for the sensitivity and specificity of the polygraph, and found that it was very poor: for every ten positive results, nine of them would be false positives (1).

But what about the predictive value of a negative polygraph test? If it is high, does that mean that we are maligning the polygraph unjustly? The best way to answer that question is to ask: how well does the polygraph compare to a random result? So let us return to our hypothetical population and screen them thus: I shall flip a coin and conclude that every time it comes down tails, that person is telling the truth. I would expect to see tails in 25/50 liars and in 475/950 truth tellers. Hence the predictive value of the negative test is $475/(475+25)$ i.e. 95% accuracy. Not bad for flipping a coin!

All of which goes to show that the results of polygraph testing are worthless and potentially harmful when they are positive and no better than coin flipping when they are negative. Despite this, many senior administrators in government and business persist in their child-like faith in the polygraph, while those who operate the machinery are making a nice living at their trade.

Yours sincerely,

Michael Phillips MD, FACP

Department of Medicine

Sisters of Charity Health Care System, St. Vincent's Campus

355 Bard Avenue, Staten Island, NY 10310

1. Brett AS, Phillips M and Beary JF III: Predictive power of the polygraph: Can the "lie-detector" really detect liars? Lancet 1986;1(8480):544-547

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More from Rebecca Brannon...

19 Jan 2000

Dave:

Michael's excellent discussion does not contradict my original assertion. Specifically, the false positive rate of a test is NOT a good measure of its accuracy. Even a good test will generally have a high false positive rate. The only sensible measure of the merit of a test is what Michael calls "specificity." A polygraphy is not much better than flipping a coin, so I agree that it has virtually no scientific value. I earlier tried to emphasize, however, that we are shooting ourselves in the foot if we root our arguments

against polygraphy on its poor accuracy. Suppose that neurologists have a breakthrough leading to a polygraph test that is 99.99% accurate. If a perfect polygraph is developed, then the Department of Energy could exclaim that our original complaints about accuracy had been solved, so we should therefore now quietly submit to polygraphs without further complaint. The greatest problem with polygraphy is not its low reliability. It is simply invasive and offensive. Granted, this is not very scientific thinking, but it is reasonable thinking.

Rebecca Brannon

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Manaster weighs in...

Dear Editors:

I agree that the use of polylygraphs to test employees at the national labs may generate a false sense of security concerning national defense secrets. At the same time, the problem of national defense secrecy at the weapons labs deserves more serious attention.

The Wen Ho Lee incident raises all kinds of serious problems. These include how to handle secret info in an essentially academic environment, and the possibility of racism in connection with his indictment.

Tom Manaster