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The Art of Deception: Polygraph Lie Detection
By Michael Lawrence Langan, M.D.

"I'd swear to it on my very soul, If I lie, may I fall down cold."
- Rubin and Cherise
(Hunter/Garcia)

The accuracy of polygraphic lie detection is slightly above chance. Nevertheless, state and local police departments and law enforcement agencies across the United States are devoted proponents of this unscientific and specious device. In addition, the American public seems to lend an implicit credence to the "lie detector" as evinced by its ubiquitous use on television crime shows and in "whodunit" literature. It is given overt attributions of credibility on tabloid type talk shows and news shows. For example, in the highly publicized case of Tanya Harding a reporter stated, not with removed objectivity but with sardonic grin and mocking emphasis, that the accused had failed two polygraph tests. The implied assumption is that if the person has failed the polygraph test, then therefore he or she is guilty regardless of other evidence. Bottom line. Guilta ex machina. End of story.

Lie detection by the polygraph is based on the premise that the act of telling a lie causes specific, universal, and reproduce physiological responses as manifested by the autonomic nervous system. (Saxe, 1991) These physiological responses, which are largely outside the influence of voluntary control, are then measured by the polygraph instrument. The polygraph itself is simplistic in design. It consists of several devices which are attached to the subject to record blood pressure, pulse, respiration, and galvanic skin response (which is related to perspiration). The results are then recorded on a moving paper by a "kymograph." Hence any change of one of the autonomic nervous system variables will be recorded on the paper as a change from baseline. The polygraph examiner then interprets the tracing. A characteristic change from baseline on a relevant question is interpreted as a lie.

In fact, the polygraph test does measure autonomic nervous system activity. The role of the autonomic nervous system with its sympathetic and parasympathetic branches is well defined within the field of medicine, and was well described by the French physiologist Claude Bernard over a century ago. The primary role of the autonomic nervous system is to maintain bodily homeostasis to allow the individual to exist in a changing environment.

Simplistically described, the autonomic nervous system is a part of the peripheral nervous system which consists of a variety of outgoing nerve pathways that regulate important physiological functions generally outside of voluntary and conscious control. Thus, respiration, body temperature, heart rate, digestion, sweating, and blood pressure are all, partly or entirely, regulated by the autonomic nervous system. It is divided into sympathetic and parasympathetic branches which have contrasting functions in terms of effect. The sympathetic branch increases heart rate, respiratory rate, blood pressure, and perspiration. It is active at all times but varies with the constantly changing environment, and is especially active during rage or fright and prepares

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been a single scientific study that demonstrated evidence that a cognitive phenomenon (such as love, hatred, truth, altruism, jealousy) could be measured. Since, in the complex realm of truth and deception, there is no known physiological response that correlates with lying, then there is no validation to the test. Although the act of lying can elicit fear and anxiety via the sympathetic nervous system, so can multiple other confounding and complex emotional factors including stress, embarrassment, anger, and fear. "Deception itself cannot be measured directly." (Steinbrook, 1992) In addition, each individual differs in autonomic lability. Some people stay calm with a gun at their head. While others get autonomically excited, with heart thumping and palms sweating at simply shaking someone's hand.

In reality, the examination itself is inherently designed to elicit fear and anxiety. It is an interrogation. If this fear and anxiety are recorded on a relevant question, then you have failed that question according to the polygraph experts.

The polygraph technique begins with a pre-test. After a sixth-grade level lecture on the nervous system and a proclamation of the tests infallibility, the examiner will go over all of the questions that have been formulated.

These questions consist of control questions, relevant questions, and irrelevant questions. The subject will then be attached to the polygraph equipment and the formal testing begins.

The most crucial questions on the polygraph examination, or "Control Question Test," are the control questions and relevant questions. The control questions are garnered from the suspect by asking him an innocuous question which could not be truthfully denied. For example, "Have you ever thought of hurting someone?" or "Have you ever lied to anyone?" The responses to the control questions will elicit some degree of autonomic activity which can then serve as a baseline for which to compare subsequent questions. The relevant questions pertain to the actual investigation at hand. The magnitude of responses to relevant questions and control questions as compared with the irrelevant questions is then interpreted, in a non-blinded manner, by the examiner. The assumption is, that if you are prevaricat-

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a sensitivity of 76 percent and a specificity of 52 percent. (Horvath, 1977) This means that out of 100 liars 76 of them will be detected by the polygraph. What is astonishing though is the specificity of 52 percent. This means that out of 100 people who are not lying, 52 will be identified as telling the truth while 48 of the honest individuals will be branded as liars. The odds are similar to that of a coin toss which would have a specificity of 50 percent. Barland and Raskin’s study actually demonstrated a specificity of 45%. Worse than a coin toss. (Barland and Raskin, 1976) Multiple other studies have shown similar results. (Brett, et. al., 1986, Kleinmuntz and Szucko, 1984, Lykken, 1984).

The polygraph examiner likens his “skill” to that of the radiologist reading a chest X-Ray or a cardiologist interpreting an EKG. (Barefoot, 1974) This analogy is not only ridiculous but, in fact, if a medical test had a similar sensitivity and specificity to that of the polygraph examination it would simply not be used in the field of medicine. They will cite the fact that the polygraph has been used in the United States for greater than 70 years as if longevity is directly related to validity. They will state that they have personally administered hundreds or thousands of these tests, and have almost never been wrong, as if total number of tests given constitutes accuracy.

They are so convinced of the accuracy of the polygraph that they regard opponents of polygraphy as communists and do-nothing professors. (Arther, 1986) It doesn’t occur to them that someone with a Ph.D. and years of research experience, in the very subjects they ignorantly dabble in, may know something more than they do.

It is astounding that the criminal justice system has institutionalized and perpetuated a so called “technology” that lacks scientific evidence and is in fact rejected by the scientific community. It is as ludicrous as procuring the so called “love meter” machine from the amusement park which measures galvanic skin response and placing it in the courtroom. But in a backward legal system which has been known to use psychics to help with unsolved murders and has allowed the mentally retarded to serve as jurors, it is not entirely surprising. The tool is useful to them, however, in that 25 to 50 percent of examinees will, under the tense psychological pressure of the exam, confess to the misdeed at hand. (Lykken, 1981, Lykken, 1991) Persuaded that they have been proven dishonest by “scientific” means they give up hope. It is usual for the polygraph examiner to interrogate the subject who has failed the test. They will state that there is no way now to deny the objective guilt demonstrated by this impartial and unbiased scientific device, and that the only available option is to confess.

The assessment by the polygrapher is genuinely convincing because, sadly, he believes it himself. Thus the instrument is clearly useful as a confession inducing device. One wonders, over the past 70 years, how many false confessions have been obtained in this way from innocent persons.

In summary, the polygraph is a ludicrous implementation of pseudo-science at its worst. The members of the APA are non-scientists practicing science, and the consequences are often dire. Lykken reports the cases of three men who were convicted of murder largely due to the polygraph examiners testimony that in their “expert opinion” they had failed the test. All three were subsequently found to be innocent. (Lykken, 1991) Polygraph examiners ignore such cases or rationalize that they are due to the rare incompetence of some examiners.

The continued use of polygraphic lie detection has the potential to cause much harm to those who are judged dishonest by its results. The specificity and sensitivity are not dissimilar to that of a coin toss. Innocent suspects have about a 50/50 chance. One failure is all it takes to ruin your life. Since the 1923 Federal Court decision of Frye vs United States (293 F 1013 [DC Cir 1923]), polygraph evidence has not been admissible in federal court cases because there was deemed a lack of scientific validity to the test. This travesty however is still used widely by the state court system. Furedy characterizes the continued use of polygraphy as a serious
There is simply no rational basis for a machine to detect liars.


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