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A Response to Donald Krapohl's 'Assessment of the Total Chart Minutes Concept'

Cleve Backster[1]

This is in response to Donald Krapohl's article entitled "An Assessment of the Total Chart Minutes Concept with Field Data" published in the October 2000 issue of The Police Polygrapist, the quarterly journal of the American Association of Police Polygrapists.

The Total Chart Minutes Concept was initially introduced to the polygraph profession by me in 1960 through polygraph school handouts with limited circulation. The concept was later explained in an article published in the October 1963 issue of Law and Order magazine. During the eight year period of 1958-1965 I had been reappointed each year as Chairman of the Research and Instrument Committee of the Academy for Scientific Interrogation, the then largest national polygraph association. In this capacity my most important priority was that of attempting to achieve a degree of polygraph examination technique uniformity.

Problems then existed relating to conflicts occurring basically among three polygraph examiner factions: Those utilizing the Relevant-Irrelevant Technique, those utilizing the Reid Control Question Technique, and those utilizing the Zone Comparison Technique. During that time period those incorporating in their technique the Reid reviewed control (comparison) questions found the respiration tracing extremely productive very early in their sequence of charts. Although initially introduced in the second edition (1948) of Lie Detection and Criminal Interrogation, by Fred E. Inbau, the Reid Control Question Technique appeared not to be adequately understood by most examiners then primarily using the Relevant-Irrelevant Technique.

It is also noted that John Reid in his 1966 book, *Truth and Deception*, did not acknowledge the galvanic skin response (GSR) parameter as being important enough to be included in 182 of a total of 188 figures displaying actual charts. This was the then featured textbook for the polygraph profession. During my 1958-1965 research activity the GSR parameter was not even required on approved polygraph instrumentation. In 1958 I presented a paper at the Annual Seminar of the American Academy of Polygraph Examiners entitled "Why is the GSR Neglected?"

This somewhat chaotic condition relating to the then-current polygraph activity served as a backdrop for my introduction in February 1960, through limited circulation, of the "Backster Total Minutes Concept". The concept was presented as a possible clarification of the divergence of views concerning polygraph parameter productivity. As I previously mentioned, the first more widely published article was in the October 1963 issue of Law and Order magazine, not exactly a scientific journal. In that article, referring to the six parameter productivity curves, I stated the following: "In this schematic diagram I have attempted to portray the important concept involved, rather than to compile a table indicating exact results of a statistical survey." I further defined Total Chart Minutes as the accumulation of time that the examinee has been balanced in on the activated polygraph, computed by adding together the duration of each chart thus reflecting the accumulating time involving subject vs. instrumentation.

[1] This article is reprinted with permission from the January 2001 issue of *The Police Polygraphist.*

During the accumulation of chart time it was felt that the earlier chart minutes would logically reflect a degree of heightened emotionality, followed by a more stable emotional level with habituation then becoming a consideration due to question repetition and finally emotional fatigue. This definition, along with the more general characteristics of heightened emotionality, habituation and emotional fatigue has been taught in schools directed by me for the past 40 years. What Donald Krapohl is apparently unaware of relates to my informing all of my classes during at least the past 20 years that the sequence of parameter productivity is no longer predictable as depicted on the 1963 Total Chart Minutes schematic.

In 1964 the House of Representatives Committee on Government Operations conducted hearings on the use of polygraphs by the Federal Government. John Reid, Fred Inbau and I were among those who testified during those hearings. Following the hearings funds were made available for additional government research, with emphasis on the refinement of polygraph instrumentation. Included was a major focus on the comfort factor as related to the polygraph's cardio component. This eventually led to the development of electronic cardio units which were designed to allow testing at much lower cardio cuff pressures.

When using a mechanical tambour the blood pressure cuff needed to be inflated to "mean blood pressure," most often requiring around 90 mm Hg pressure. At these higher pressures the subject appeared aware of reactions resulting from short term blood pressure changes. I concluded that far more dramatic respiration reactions were being manifested while the subject remained focused upon changes felt in the upper arm encased by the blood pressure cuff. I had observed as early as 1960, during a period of testing utilizing an infant blood pressure cuff on the subject's wrist, that the dramatic breathing reactions that I had observed while using the traditional arm cardio cuff, had greatly dissipated. On an October 31, 1960 school handout I had noted the following; "Limited arm cuff discomfort prolongs initial heightened emotionality and GSR overactivity - but appears to cause more dramatic breathing response and extended period of breathing value." By 1979 many examiners were replacing their polygraphs with instrumentation containing electronic cardio units which produced a cardio pattern at significantly lower arm cuff pressures. At these lower pressures it appeared that deceptive polygraph subjects no longer felt blood pressure changes and appeared to focus upon displaying breathing uniformly.

Also during this same time period I felt that another factor significantly changed the sequence of parameter productivity. This involved the easy access to tranquilizers by the potentially deceptive polygraph subjects which appeared to allow the GSR tracing to stabilize earlier in the accumulation of Total Chart Minutes. GSR tracing productivity also appeared to decrease earlier than previously observed.

Donald Krapohl has produced a detailed tracing productivity study from six separate sets of data collected during research projects all occurring during the period of 1989 through 1999. His efforts as related to this 10-year period tend to confirm that which I have been teaching in excess of twenty years, namely that you can no longer be guided by the tracing productivity sequence depicted on the "total chart minutes" schematic. This schematic is now being referenced as an historical item successfully serving the limited purpose of arbitrating the rather heated differences relating to technique effectiveness at the time of its introduction.

If conclusions such as those presented by Donald Krapohl are to be supported by scientific inquiry, the least that might be expected is an assessment of the then current time period, namely polygraph examinations conducted prior to 1960. Also, as long as the originator of the Total Chart Minutes Concept is still alive, and reasonably well, it would seem to have been appropriate that Donald Krapohl contact me prior to preparing such a critical assessment. This was not done.

Regarding the 'Acknowledgments" at the end of his paper, Donald Krapohl states that

"The writer is grateful to Dr. James Matte for data he supplied." Dr. Matte did not supply him with the Virginia State Police data for the purpose implied. This data involved an entirely unrelated research project. I do appreciate Krapohl's disclaimer stating that "The views expressed in this report do not represent those of the Department of Defense Polygraph Institute, or the U.S. Government." There are still survivors of this earlier history of polygraph usage who have experienced and understand the uncertainty of the period under discussion.

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Professional Ethics and Polygraph Examiners

Randal F. Mueller[1]

Abstract

"Integrity is universal to the human experience; it can be considered the measure of an individual, an agency, an institution, a discipline, or an entire nation. Integrity is a yardstick for trust, competence, professionalism, and confidence. Deep within every human being is the subconscious ability to interpret behavior and events as a mark of integrity or a violation of trust" (U.S. Department of Justice, January 1997, p. iii). Polygraph is a discipline measured by integrity. Polygraph examiners must demonstrate the highest standards of integrity, truthfulness, honesty and fortitude.

For the most part, polygraph examiners are a highly educated, ethical bound community. Dr. William J. Yankee (1989), former Director of the Department of Defense Polygraph Institute (DoDPI) remarked, "(t)he public expects anyone who is called a professional to be competent, responsible and have a desire to serve the public."

Cayer (1986) wrote what he believed important in regards to ethics and public employees, "(o)ne of the reasons that ethical considerations are so important to public administration is that its employees are entrusted with a great deal of discretion to decide on numerous issues that can benefit or hurt differing parties. Public employees often find themselves on the spot, and it is up to them to decide what is right and what is wrong" (p. 123).

Indeed, government and private polygraph examiners are "entrusted with a great deal of discretion" and "must decide what is right and what is wrong" in connection with various investigative duties. Polygraph examiners are expected to administer ethical examinations to ensure that those persons whom they are testing are guaranteed all the basic freedoms afforded them whether the polygraph test is being conducted by the private sector in pre-employment screening, by the law enforcement community as a forensic tool, or by a U.S. intelligence agency screening counterintelligence and counterespionage activities.

Legislation and Ethics

Mace and Yoder (eds) (1996) noted, "Executive Order 12674 of April 12, 1989, modified by Executive Order 12731 of October 17, 1990, sets forth fundamental principles of ethical conduct for all (U.S.) executive branch employees" (p. 155). Obviously, anyone employed by the U.S. government as a polygraph examiner is subjected to these listed mandates. Fundamental principles cited are: (1) public service is a public trust, requiring employees to place loyalty to the (U.S.) Constitution, the laws, and ethical principles above private gain; (2) employees shall put forth honest effort in the performance of their duties; and (3) employees shall not use public office for private gain (p. 158) (Mace & Yoder, eds, 1996).

A reader of this article will be able to weave an intricate web of improprieties when comparing the principles listed above and the section set forth labeled Unethical Behavior. Another point to be made is that because the U.S. federal government is often looked upon as a benchmark in U.S. public policy, it would only stand to reason that local and state governments would have similar laws governing employees' activities.

[1] The author is a Federal polygraph examiner with the Office of the Secretary of the Air Force. He is also a member of the American Polygraph Association (APA). The conclusions expressed in this paper do not represent the views of the US Government or the APA. For reprints, write to Randal F. Mueller, 122 Brenda Court, Warrenton, VA 20186.

Several U.S. states have polygraph licensing requirements for polygraph examiners (government or private). The following standards were extracted from the Alabama Board of Polygraph Examiners. In Section 740-X-5-.04 it is stated, "No examiner will knowingly issue a polygraph examination report or render a verbal or written conclusion or opinion which is misleading, biased, or falsified in any way. Each polygraph report will be a factual, impartial, and objective account of the pertinent information developed during the examination, and the examiner's professional opinion based on analysis of the polygraph charts" (see *http://www.alabamaadministrativecode.state.al.us/docs/poly/index.html* for Alabama Administrative Code).

Unethical Behavior

In one of the first authoritative publications on polygraph, Dr. William Moulton Marston (1938) recognized the potential of unethical behavior on the part of a polygraph examiner. Speaking on corrupt politics and polygraph he believed some examiners could perhaps, " ... be bought up, or frightened into ..." manipulating test results. However, Dr. Marston contends, "(t)he psychological chances that men of scientific training and practice can be corrupted are relatively small because such individuals have formed a life-long habit of finding and reporting true facts. False findings do not get a scientist anywhere – they are bound to be checked up and refuted by other scientists. Therefore, your typical scientific investigator is by nature a truth-seeker who is exceedingly hard to influence" (pp. 142-143).

There is little doubt that Dr. Marston or the general public believes that an overwhelming majority of professional polygraph examiners are ethically bound. Despite this, there are those who have violated the polygraph profession's standard of conduct. Some examples follow: "(a) noted brewery company was conducting loyalty exams of its corporate members and asked questions concerning deviant sexual activity to include adultery; a private polygraph firm in south Florida conducted tests for a pornography ring in attempts to identify Miami police vice officers; private examiners in Kentucky, Georgia, Florida and North Carolina were used by a large drug dealer to screen for Drug Enforcement Administration (DEA) agents as possible buyers; a New York polygraph firm was screening a large prostitution ring for suspected Federal Bureau of Investigation (FBI) informants; a private examiner in Ohio was having female examiners take a sponge bath prior to the examination so he could observe them in the nude."

Federal government examiners are not immune to such behavior. "A senior examiner of an intelligence polygraph unit confessed to wrongfully manipulating test tracings to produce conclusive test results; a criminal examiner admitted to throwing away polygraph charts to change exam opinions" (Yankee, 1989).

By manipulating tracings or throwing away tests, an examiner violates his own integrity and that of the agency with whom he is employed. Abrams (1989) wrote, "(t)here is no question an unethical examiner can cause a chart to appear truthful or deceptive by manipulating the situation in some manner. The inflection of the polygraphist's voice will affect the subject's physiological response as much as an over discussion of the control (comparison) question can result in a deceptive person appearing truthful. The number on the questions can be changed so that the relevant question will appear to be control (comparison) questions, and even sensitivity and centering can be manipulated during the test to appear to produce a particular response. Other than relying on the ethics of the examiner, only videotaping the entire process can guard against this deception and prove to the courts that it did not occur" (p. 70).

Reasons for Unethical Behavior

Ethical behavior is influenced by both internal individual factors and external controls. The internal factors are the degree to which individuals perceive themselves as responsible for their actions. Theoretically, employees who are carefully chosen and who embrace democratic and professional values will control their own conduct because of their dedication to the public, their professional group standards,

and peer pressure. Unfortunately, the pressures faced by public servants are too complex and too contradictory to allow an easy formulation of right and wrong responses. Because internal controls are (sometimes) inadequate, external controls are necessary and may be grouped into three categories: individual acts of leadership, codes of conduct, and legislation" (Cayer, 1986, p. 123).

James Bowman described individual acts of leadership as, " ... a superior who will serve as a model for his or her subordinates. Furthermore, he wrote that codes of conduct commonly regulate behavior ..." (quoted in Cayer, 1986, p. 123). Lastly, legislation encompasses specific laws passed to regulate certain behaviors. These categories greatly influence ethical behavior.

Because most polygraph examiners are put through rigorous pre-entry screening, should meet high education requirements, and must display elevated intelligence, it is difficult to understand why an examiner would become involved in unethical behavior. Institutional pressure (external controls) may help to explain unethical behavior.

Institutional pressure is defined as "a factor inherent in an organizational environment that can influence moral reasoning and moral behavior." Examples of institutional pressure include: 1) statements made by a superior about conduct; 2) performance standards; 3) the system of rewards and punishment; 4) unit directives, policies and procedures; 5) customs, traditions and precedents; 6) available resources; and 7) time limitations (Yankee, 1989).

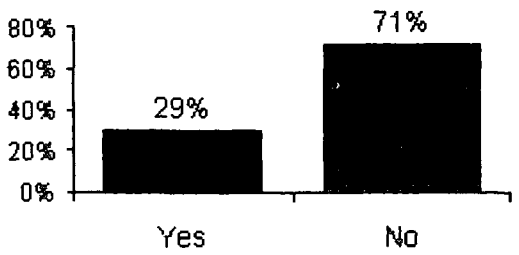
Samples of institutional pressure have involved discriminatory practices. Jussim (1987) wrote that black people were singled out to fail the polygraph so that they would not be hired for employment. Private examiners elected to succumb to the pressure of their employer who did not want black people working within their business (p. 82).

Hypothetically, institutional pressure involving time limitations would be easy for anyone to understand when visiting government agencies that are understaffed with overburdening workloads. A government manager could conceivably be heard saying, "We have eleven more polygraphs to conduct this week; you need to speed up testing." The polygraph examiner ultimately feels the pressure to perform, judgement is impaired, and an unethical act occurs.

Professionals must be able to function in an ethical climate which includes leadership, communications, trust and confidence, and rewards and punishments (Yankee, 1989). If professionals are managed improperly, unethical behavior may occur. Denhardt (1995) stated for the record, "(a)s a manager ... the most important message you can send is that communicated by your own actions. If you seem to attach great importance to ethical concerns, others in the organization will attach similar importance. The model you provide can make an important difference in the ethics of your organization" (p. 134).

How often does an unethical act occur in the polygraph industry? Research may be able to address this question, however, research directed specifically towards polygraph in non-existent. Some insight into this subject matter may be gleaned from a survey conducted by the Ethics Resource Center (ERC) in 1994 called the National Business Ethics Survey (NBES). "Questionnaires were distributed to a sample of employees and managers from a variety of industries to examine their attitudes toward ethical issues and programs in their own companies. The survey measured attitudes, knowledge and beliefs in key areas such as pressures to engage in misconduct ... This survey was the first of its kind to examine business ethics comprehensively at the national level. The following graph represents answers provided by respondents to the following question; Do you ever feel pressured by management to compromise your company's standards of ethical business conduct to meet business objectives?"

Pressure to Commit Misconduct



Note. (See http://www.ethics.org/ 1994 survey.html).

The polygraph industry can only hope that 30% of its examiners are not feeling pressured by managers to compromise standards and practices.

In a recent article written by Wygant (2000), he reminded us that there are those persons who would stoop low enough to engage in unethical practices. Briefly, a murder took place some 10 years ago. A suspect was administered a polygraph examination. Initially the polygraph examiner deemed this suspect no deception indicated, however, because of his concern that the suspect may have engaged in countermeasures in an effort to bring about the wrong conclusion, he withdrew his opinion. Recently it was learned that the suspect, " ... went to another state where he was allowed to practice with an examiner (former private examiner practicing in Southern California) who instructed him in sphincter muscle control. A second retired examiner, the suspect's former father-in-law (claiming to be a former federal examiner with an U.S. intelligence agency), also gave him advice." Both individuals advised the suspect on how to "beat" the test utilizing countermeasures.

Discussion

In a dialogue of police and professionalism, Albert Reiss is particularly interested in the relationship of the professional with clients. He provided some insight as to the sincere import of police functions, which includes the use of polygraph, and their use with the general population. "The client relationship, moreover, is moral and ethical. But its central feature is a decision about the client in which the professional decides something relating to the future of the client" (quoted in Radelet, 1980, p. 62). This feature of the professional-client relationship is especially critical when one's livelihood is held in the hands of a polygraph examiner and the decision rendered.

During an interview, Donaldson-Evans (2000) with FOX NEWS questioned Edward Gelb, former president of the American Polygraph Association (APA) about whether or not he would polygraph O. J. Simpson concerning the death of his former wife. Mr. Gelb claims he would without doubt choose not to polygraph O. J. Simpson on cable television if asked (see http://www.foxnews.com/national/oj/oj_evans.sml). Most would agree that this decision was ethically correct. Appearance of any impropriety should be considered in deciding whether or not the profession would be served by administering such a polygraph examination. A television airing of a most sensitive issue would not be proper.

Questions linger as to whether or not the polygraph profession was served in the Ramsey murder case in which Mr. Gelb administered polygraphs. Debate will likely go on for years. Again, the appearance of impropriety must be considered. Why did the Ramsey's wait for such a length of time before requesting a polygraph? Who benefited by administering polygraphs to John and Patsy Ramsey - the polygrapher, the polygraph profession, justice and/or the Ramsey's themselves?

As with any true profession there is normally a code of ethics. The APA, in their By-Laws section taken from page 1, addresses the issue of ethics:

Maintain the highest standards of professional, moral and ethical conduct by assuming the responsibility for conduct and behavior designed to serve the cause of truth and justice. Respect the dignity of all persons and be just, fair and impartial with each individual in discharging professional duties and objectives. Hold themselves apart from influences intended to benefit their political, personal or financial well-being while exercising their professional responsibilities.

Above all else, "(f)airness is a value to which citizens expect government to assign maximum importance. One standard justification for the existence of government is that it protects and enforces the civil and political rights of all individuals" (Peters, 1996, p. 452).

"Fairness" is to be applied in all polygraph testing, whether it is a private or government examination. Lying about or manipulating polygraph results in any manner is simply wrong and should never be excused.

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Spontaneous Countermeasures During Polygraph Examinations: An Apparent Exercise in Futility

Kimberly D. Otter-Henderson, Charles R. Honts [1], and Susan Amato

Abstract

The frequency and effects of spontaneous countermeasures against a polygraph examination were examined in a mock employment screening study. Eighty subjects were debriefed concerning their use of spontaneous countermeasure following the completion of their Relevant-irrelevant employment screening polygraph examination. Overall, 53.8% of the participants reported the use of at least one spontaneous countermeasure. In a departure from other studies in this area, 30% of the truthful subjects reported trying some intervention in an effort to make themselves look more truthful. ANOVA revealed neither main effects nor interactions involving the use of a spontaneous countermeasure.

Polygraph tests are used to assess the veracity of criminal suspects, witnesses and job applicants. The payoff matrix associated with identifying truthfulness may vary with the context of the situation, but regardless of the situation, it is imperative that the polygraph identify those individuals who are attempting deception. Research has examined the influence of a number of factors on the validity of polygraph exams, including the physiological bases (i.e., psychophysiology and psychophysiological measurement issues), antisocial personality disorders, and countermeasures.

Countermeasures are anything that a subject does in a deliberate effort to defeat or distort a polygraph test (Honts, Hodes, & Raskin, 1985). Countermeasures can be implemented in two ways: premeditatedly (with or without training) or spontaneously without forethought or training. Although a number of studies have examined the use of premeditated countermeasures (e.g., Ben-Shakhar & Dolev, 1996; Honts, Raskin, & Kircher, 1994; Iacono & Cerri, 1992; and see the review by Honts, 1987), only one published study has examined the use of spontaneous countermeasures (Honts, Raskin, Kircher, & Hodes, 1988). Honts et al. (1988) found that although 65% percent of their guilty subjects reported the use of spontaneous countermeasures, such countermeasures were ineffective. None of the deceptive subjects who used spontaneous counter-measures were able to produce a truthful outcome, nor were inconclusive rates increased. Honts et al. also reported that none of the innocent participants made any attempt to utilize countermeasures during their examinations. Honts, Amato & Gordon (2001) replicated Honts et al., (1988) in a large sample and found similar results, except that a substantial number of innocent subjects reported attempts to alter their physiological responses.

The frequency of spontaneous countermeasure use and their effects were also examined in the present study. This research was conducted as supplement to a project that examined the effects of automation on Relevant-Irrelevant tests in the context of a mock job-screening examination (Honts & Amato, 1999) and extends the study of spontaneous countermeasures to that technique.

Method

Participants

Participants were 80 paid subjects who were solicited through a temporary employment advertisement in the local newspaper.

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The ad stated that the participants would be paid $15.00 per hour for two hours work and there was the possibility of a $50.00 bonus. The ad also stated a list of criteria that needed to be met in order to participate. Each participant: (a) must have completed at least one semester of college, (b) had to be 18 years of age or older. When interested parties responded to the ad, there were further screened regarding the following participation criteria: (c) there were not under the care of a psychologist or psychiatrist, (d) did not have any medical problems requiring prescription medication, and (e) had never previously taken a polygraph test. These criteria were selected to protect the more vulnerable (physically and emotionally) candidates, weed out any possible physiological response issues, and to obtain a subject pool that would accurately reflect the possible job applicants for positions at a government facility. Of the eighty participants accepted into the study, 69% (n=55) were female and 31% (n=25) were male. Participant ages ranged from 18 to 68 ($\underline{M}$ = 33).

Apparatus

A CPS-LAB system (Scientific Assessment Technologies, Salt Lake City, UT) was used to control hardware data acquisition. The CPS-LAB specified the hardware configuration, storage rates, and the data collection protocol. CPS V. 2.20 (Kircher & Raskin, 1998) was used to edit artifacts from the physiological data.

The physiological acquisition subsystem (PDAS) of the CPS-LAB generated analog signals for thoracic and abdominal respiration, skin conductance, cardio, and finger pulse amplitude. The DC output from the cardio channel was routed to a DC coupler on the PDAS to monitor changes in the amplitude of cardio pulses. Each of the six analog channels was digitized at 1000 Hz with a Metrabyte DAS 16F analog-to digital converter installed in a PC compatible computer.

Respiration was recorded from two strain gage respiration transducers secured with Velcro straps around the upper chest and the abdomen just below the rib cage. Palmer Skin conductance was obtained with constant voltage circuit from two AgAgCl electrodes placed on the distal phalanx of the first and middle fingers of the right hand. Changes in cardiovascular activity (cardio) were transduced from a blood pressure cuff placed around the upper left arm and inflated to approximately 45 mm Hg at the beginning of each chart. Finger pulse amplitude was obtained from a photoelectric plethysmograph placed on the palmar surface of the right thumb. The plethysmograph signal was AC-coupled with a .2-second time constant and a 2-pole, low-pass filter.

Although all channels were sampled at 1000 Hz, the data were reduced before they were stored in files on the hard disk by averaging the samples for successive epochs. Respiration and skin conductance data were stored in data files at 10 Hz. Cardio and finger pulse were stored at 100 Hz.

Procedure

When a participant would call to schedule an appointment the screening criteria were discussed and if they were met, inquires were made as to the availability of necessary documentation to coimplete the job application. There were eight documents necessary for the verification of the information provided by the participant on the job application: (a) driver's license, (b) birth certificate, (c) proof of current address, (d) socal security card, (e) current automobile registration or insurance bill, (f) check or recent bank statement, (g) college attendance, and (h) high school attendance. If the participant met the criteria and was able to present all eight pieces of information, they were scheduled for an appointment.

Upon arrival at the laboratory, a research assistant informed the participants of their role in the experiment, their rights as a participant, and informed consent. The research assistants then verified that the participants had all of the necessary documentation.

Participants were instructed to complete the first job application (see Appendix A) truthfully. The information they furnished was then correlated with the documentation they had provided. The following information was verified with documentation: last name, date of birth, college attendance, make of automobile,

current address, social security number, high school and checking account. Following the completion of the truthful application participants were given their condition in a sealed envelope, the contents of which were unknown to the research assistants and the polygrapher.

Participants in the innocent condition were instructed via written instructions and videotape to complete a second application (identical to original printed on green paper) truthfully and to place all of the contents of the envelope back into it accept the second application. Participants in the deceptive condition were instructed via video and written instructions to select one item from each of two groups (Group 1, Last name, Date of birth, College attended, & Make of automobile; Group 2, Current Address, Social Security Number, High school attended, & Bank for checking account). Participants were then instructed to develop deceptive information about the two chosen items, and to put that deceptive information on the second application. They also indicated, on a separate form, which items of information they falsified. Thus, on their second application all information with the exception of the two deceptive items were verified as truthful and replicated from the first application. Participants were further instructed to maintain innocence at all times regarding the false information they provided on the second application. They were instructed to place all of the contents back into the envelope except for the second application and to then seal the envelope.

All participants were escorted to the polygraph examiner and were introduced by their first name only (in case they had falsified their last name.) They were then given a polygraph examination regarding the information they had provided on the second application. Half of the subjects were tested by a human examiner who used representative field polygraph techniques, and half of the subjects were tested with an automated procedure. The results for the automation procedure are described elsewhere (Honts & Amato, 1999).

Following the polygraph examination, participants were debriefed by a research assistant. Information provided on the second application was verified via supporting documentation, thus, confirming the deception manipulation. Each subject was given two polygraph examinations covering the application items. Subjects were either truthful on both examinations, or attempted deception to one of the relevant questions on each of their examinations. During the post-session debriefing, both deceptive and non-deceptive participants were asked about their use of spontaneous countermeasures. The question often elicited an inquiry to the definition of a countermeasure; further explanation of a countermeasure was given by rephrasing the question as, "Did you do anything during the examination to make yourself seem more truthful? " Their responses were recorded. If they indicated that they had used some type of countermeasure they were asked what method they used and where they had learned about the use of such countermeasures.

The research assistants recorded the participant's responses verbatim and then encoded the responses qualitatively for analysis. Participant's responses were placed into one of four categories: (a) alterations in breathing, (b) mental countermeasures, (c) physical countermeasures, (d) combination (more than one of the preceding three categories reported). Responses to the countermeasures question were independently coded by two research assistants. After coding, the two assistants met and reached consensus on the few situations where they had disagreement.

Results

Overall, 53.8% (43 of 80) of the participants reported the use of at least one spontaneous countermeasure. Of these, 77.5% (31 of 40) of the deceptive subjects and 30% (12 of 40) of the truthful subjects reported the use of one or more of the following spontaneous countermeasures: altered breathing (n=12), mental countermeasures (e.g., tried to think of something other than the examination questions or situations; n=10), and physical countermeasures (e.g., applying pressure to a hurt foot or biting their tongue; n=9). Twelve

participants reported using more than one of the above countermeasures.

The following analysis was conducted: A 2 (Guilt; deception attempted vs. completely truthful) by 2 (Countermeasure; used vs. not) by 2 (Test, a within-subjects factor) was run on the largest R/I score value on Test 1 and the Largest R/I score value on Test 2. The R/I Scores generated by the computer analysis system (Honts & Amato, 1999; also see, Kircher, Woltz, Bell & Bernhardt 1998). The R/I scores variable is a weighted composite score of the physiological responses and provides a single value describing the physiological reactivity of the subject to each question on the polygraph examination. Truthful/deceptive decisions are made by evaluating the largest R/I score on a test against an absolute criterion (Honts & Amato, 1999). Larger R/I scores indicate greater response magnitude. ANOVA revealed a significant main effect of Guilt, $F(1, 76) = 8.44$, $p = 0.005$. As expected, deceptive subjects produced larger R/I Scores ($M = 2.32$, $SD = 1.68$) than did truthful subjects ($M = 1.57$, $SD = 1.55$). None of the main effects nor the interactions involving the Countermeasure use variable were significant.

Discussion

The results of this study, along with those of Honts et al. (1988; 2001), suggest that the use of spontaneous countermeasures by deceptive participants does not effect polygraph examination outcomes. However, this study, unlike Honts et al., (1988) found that a substantial number of truthful subjects (30%) also tried to "appear more innocent" through the use of spontaneous countermeasures. That finding is similar to the results reported by Honts et al., (2001). Importantly, these maneuvers by truthful participants did not make them appear deceptive. This is an important finding because it is traditional in the polygraph profession to interpret the presence of countermeasures as synonymous with guilt. Clearly in the today's population that is not the case. If the presence of countermeasures was equated with deception, then 30% of the truthful subjects in this study would have been misclassified as deceptive.

These results are supportive of the continued use of polygraph tests in applied settings. Despite the widespread availability of information concerning countermeasures, laypersons appear to be either unaware of such information or they are unable to make effective use of it.

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Appendix A

EMPLOYMENT APPLICATION

Name (First, Middle Initial, Last)_____

Social Security Number_____

Address

Street_____
City/State/Zip_____
Place of Birth _____
City/State_____

Date of Birth (MM/DD/YY)_____

Citizenship U.S.A. □ Other □
Marital Status
Single □ Divorced □
Married □ Widowed □

High School that Granted Diploma_____
College Major_____
Year/Make of Automobile_____
Auto Insurance Company_____

Place of Banking _____

Credit Cards	Expiration Date (MM/YY)
American Express	
Discover	
MasterCard	
Visa	

Collaboration Of Psychiatrist And Polygraph Examiner: John A. Larson and Robert P. Borkenstein

John G. Linehan [1]

Abstract

The Clinical Team approach to the mentally aberrant by Robert P. Borkenstein, polygraphist and John A. Larson, psychiatristis is discussed and related to the proven ability of polygraph to detect deception in psychopaths and others. Dr.Larson's memorabilia and early skepticism of ability of police officer polygraphists is also discussed.

The Lafayette Instrument Company Exhibit at July, 2001 American Polygraph Association Annual Seminar in Indianapolis, Indiana displayed a loose-leaf book containing segments of smoked chart papers of physiological tracings. These papers are of historical interest as they are the collection of John A. Larson compiled from lie detector tests of assorted, criminal suspects in his 1921-23 years with the Berkeley, California Police Department Laboratory. Inside the front cover of binder has stick-on label reading: "Effect of Preamble or Description of the Nature of the Test to the Suspect. Record of the Berkeley Police Dept. secured by J.A. Larson 1921-23". The label is slightly smudged, tenably from the chart paper "smoked" by Larsen protégé Leonarde Keeler. Further delineation of this unique collection is found on Page 104 of The Instrumental Detection of Deception - The Lie Test - by Clarence D. Lee, Captain of Detectives, Retired, Police Department, Berkeley, California Charles C. Thomas, Publisher. It sets forth: Having obtained a satisfactory normal record, subject is given final instructions, called the "preamble" by Larson in somewhat the following form: "This instrument to which you are attached is the well known lie detector, which has been used successfully for many years for detecting guilt or innocence, and I am sure it will not fail in your case. Now sit as quietly as possible and just answer my questions 'yes' or 'no'. If you have any explanations to make, you may do so after completion of the test. Page 104 goes on: "This preamble has a dual purpose, aside from the instructions it contains. It tends to reassure the innocent suspect and at the same time serves as a mild buildup to enhance fear of detection in the guilty, for we know that if there is no fear of detection there will be little if any reaction and a definite diagnosis will be difficult to make. Lee's book was published in 1953. We can assume Larson's "preamble" did not use the phrase "used successfully for many years". Larson's binder of "preambles" contains companion compilation of each subject's post-test psychophysiological chart tracings for securing a record of subject's state of mind after testing for comparison to the "preamble" state of mind. Brief comments by Larson next to some segments reflect his interest in the deviant mind.

Larson regarded the "preamble" as a form of "control"; and he illustrates this in his 1932 book, "Lying And Its Detection" as abstracted. "As to the question of control, we must emphasize the necessity of being as careful as possible, and must state in our set-up the individual is his own control. Thus, every record of the suspect obtained before any questioning is begun is assumed to represent the true normal of the individual. Whatever irregularity or tension there is in this portion of the record should be deducted from the remainder and assume to be due to the nervousness of an innocent suspect.

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Of course, if the suspect is guilty, the true normal can seldom, if ever, be obtained before a confession is elicited. Here it may be seen that the true normal differs markedly from that obtained prior to confession. However, if the suspect does not confess in spite of repeated tests, similar results are obtained from each testing if care is used to keep the conditions as constant as possible for the different tests. Knowing the questions and nature of the investigation beforehand should not vitiate the test. In no case yet has this happened. On the contrary, if anything, the disturbances during deception become intensified. Furthermore abstracted from book is the foreword of Editor Ernest W. Burge: "Larson's work on deception and the lie detector grew out of his general interest in police work, which began under the guidance and inspiration of August Vollmer, outstanding pioneer in applying science to police problems. Larson specialized in physiology working out his doctoral dissertation in endocrinology, completed his medical training at Rush Medical School, and later specialized in psychiatry at Johns Hopkins University under Adolph Meyer. Larson was assistant state criminologist in Illinois where he was in charge of research at both the State Penitentiary and the State Reformatory." Library source provided biographical information set forth: John Augustus Larson, born December 11,1892 at Shelbourne, Nova Scotia, Canadian-American. AB Degree Boston University in 1914, Ph.D. University of California in 1920, MD Rush Medical College in 1928. Died September 2 1965 Albany, Oregon.

Following his Berkeley Police Department service Dr. Larson spent a year in the mental health field as psychiatrist and superintendent of mental institutions in Illinois, Indiana and Tennessee. In August 1956 at the Eighth Annual Seminar Convention of the Academy for Scientific Interrogation at State College of Washington Dr. Larson and Robert P. Borkenstein the Director of Indiana State Police Laboratory at Indianapolis, teamed for a presentation of "The Clinical Team Approach" to polygraph examinations. This theoretical approach would be psychiatrist examination of the subject to evaluate personality and psychological environment to ascertain fitness for polygraph examination.

While at Logansport State Hospital in Indiana, Larson ran numerous tests on catatonics, patients with mental disorders characterized by muscular inactivity and appearance of mental stupor. Tests were administered to record what reactions, or lack of reactions, to be expected from this type of person. Borkenstein related these experimental tests stood him in good stead. He collaborated with Larson and found the information helpful in his polygraph cases. Borkenstein related one case in particular where a female made an assault accusation and was non-reactive in her polygraph examination, indicating truthfulness. However, he noted in her charts the same general pattern seen in the Logansport charts so he had a psychiatrist interview the girl. The psychiatrist's opinion was the girl was pre-catatonic. Further questioning gained admission the alleged assault was fictitious. Another case involved a soldier found dead in an alley from a knife wound. He had a fight with another man earlier that evening and this man was examined on polygraph and "ran a classic guilty record." A week later another man was identified as the murderer. The first man arrested was found to be amnesiac. He said, 'Fellows, I don't blame you a bit for saying I was guilty. I thought I was, because in my mind I was guilty." Borkenstein said when Larson initially suggested the Clinical Team Approach for polygraph testing he was unsure about it, as it seemed to him to be an awkward, almost impossible arrangement as proposed in its initial ideal form. They altered the plan for a more practical arrangement and this modified method worked well for them, especially in cases involving crimes of passion and violence such as murder, rape and arson where persons may be more difficult to evaluate by the polygraphist.

There were special cases where Borkenstein had officers take the suspect to Larson for evaluation and opinion as to suspect's condition and psychological environment. He said we should not hesitate to admit we can't be the polygraph examiner, the psychologist, the M.D., and everyone else that Dr. Larson described as a clinical team.

We must satisfy ourselves with doing one part of the job, doing it well, if we need to call on someone we should not hesitate to do it. Robert W. Borkenstein has a multi-talented background with lifetime interest in law enforcement, especially in collection and use of evidentiary matter in criminal cases. In the 1930's he worked in photography-related enterprises in his home town of Fort Wayne, Indiana until 1936 when hired by the Indiana State Police to establish a photographic laboratory at Indianapolis Headquarters. He was Director of ISP Laboratory 1938 to 1958. During this time he conducted polygraph examinations, many of high profile cases, in addition to his demanding forensic laboratory leadership. Also during this time he took psychology classes at Indiana University to increase his polygraph effectiveness.

Borkenstein developed an interest in alcohol-related impairment of motorists, working closely with Dr. Rollo Harger in this area. In the 1950's he became dissatisfied with the Drunkometer, a method of measuring sobriety or alcohol content in the human body. Borkenstein invented the Breathalyzer, which became the standard tool for motorist alcohol-impaired testing until 1979 when high tech electronic instruments came into use. Borkenstein's work in this area gained him the 1988 Award of Merit from the Association for the Advancement of Automotive Medicine, and other awards, such as from the Indiana Bar Association and National Safety Council.

Borkenstein retired from Indiana State Police in 1958 for Chairmanship of Forensic studies Department at Indiana University. He became Professor Emeritus in 1983 but was still active as Director of the Center For Law in Action with office in Sycamore Hall on I.U. Campus for more than a decade. He still resides in Bloomington. Doctor Larson willed his papers and polygraph memorabilia to Professor Borkenstein, who in turn donated most of it to University of California Hastings College of Law. Some items retained by Borkenstein included smoked chart paper rolls of complete polygraph examinations conducted by Larson at Berkeley Police Department, circa 1921-1923 and the aforesaid collection of Preambles.

About thirteen years ago this writer visited Professor Borkenstein at his Sycamore Hall office and he gave the smoked chart paper rolls to me. In turn the papers were given to American Polygraph Association for inclusion in Smithsonian Institution fledgling museum of polygraph history. A year or so later, while again visiting Professor Borkenstein he gave me Dr. Larson's "preamble collection"; and it has been shown at Indiana Polygraph Association and American Polygraph Association seminars.

Larson and Borkenstein collaborated efficiently as a clinical team, tenably due to their respective law enforcement scientific laboratory backgrounds, and intense interest in lie detection methods and procedures. It may be speculative whether a team, or teams, pursuing goal of truth and justice without the common bond shared by Larson and Borkenstein can work as harmoniously. Early on in the lie detection field some psychiatrists and clinicians were irked and opined many police examiners had inadequate training for their work, and advocated polygraph should be taken from them. Dr. Marcel Frym, Director of Criminological Research for the Hacker Foundation of Beverley Hills, California suggested removing polygraph from police and employing it only as facet of a larger clinical study of the liar. In a letter dated May 5,1954 to Trovillo and Chatham, Frym said: "Regarding research on the polygraph, it is my opinion that the use of the polygraph as well as the use of drugs like sodium pentothal, scopolamine, etc., in criminal interrogation should be made a part of a complete psychiatric and psychological work-up. I feel quite strongly that the use of both physiological reactions and interrogation with the help of special technical equipment as well as interrogation under the influence of drugs, can be very misleading if made by law enforcement officers, who not only lack sufficient psychological understanding but also are not in a position to evaluate the true meaning of physiological reactions and of statements made by the suspect without the help of an extensive psychological and psychiatric study.

Dr. Frym went on to say that such a study should include use of both projective and psychometric tests, including the

Rorschach, Thematic Apperception, Wecheler-Bellevue tests, a thorough neurological examination, electroencephalograms, and repeated psychiatric interviews. Such elaborate studies of a criminal suspect, as proved by innumerable polygraph examinations are unnecessary, cumbersome, costly, and a prohibitive delay to determination of truth for justice.

Sufficient numbers of psychiatrists, psychologists, clinicians and scientists supported the ability of police polygraphists to do the intended job and opposition withered away. It is not coincidence that in this 21st century many departments of the Federal Government, all branches of the military, most law enforcement agencies, as well as many private examiners use the polygraph technique, and engage in studies of deception and measurements of psychological-biological stresses. In fairness to Dr.Fyrm, it is noted his multi-faceted study of the liar was successful in unveiling some of the many "false confessors" in the infamous "Black Dahlia" orgiastic murder of a young woman in Los Angeles. Her body was found in a vacant lot on January 15,1947. The body was cut in half at the waist and throat cut ear to ear. Autopsy showed she had been tortured over several days. A rose tattooed on one thigh had been gouged out and initials "BD" carved on other thigh. Fingerprints from a misdemeanor arrest identified her as Elizabeth Anne Short, age 22. She had the euphemism "Black Dahlia" for her predilection of black dyed hair and black clothing. It is said there were over fifty, some said ten times that number, false confessors to the murder. The murder is still an unsolved mystery.

Personality and environment of Mankind is so varied and diverse there is the possibility the psychapath, the psychoneurotic, the psychotic and the normal appearing person under great stress may be occupying the polygraph examinee's chair. Circumstances may dictate collaboration in these unusual circumstances. However, the polygraph records the physiological phenomena intended with great accuracy. Instrumental tests by qualified polygraphists is sound theoretically and verified by empirical experience as well. The pathologic, the psychopathic, the nervous, the drug user, the mental manipulator, the rationalizer, the physical countermeasurer should not in itself lead to an erroneous diagnosis; although it could result in an inconclusive opinion. The correct diagnosis is contingent, of course, that proper instrumentation, technique and procedures are employed. As long as the subject understands the meaning and purpose of the questions, and relevant questions pose threat to well being, reasonable functioning of autonomic nervous system, the subject should be susceptible to polygraphic detection of deception. The pyscho-neurotic may require more careful, attentiveness chart analysis because of erratic polygrams from nervousness and sympathetic enervation but most are interpretable. Pathological abnormalities if consistent, establish a norm, and proper procedures include establishing a norm, especially in respiration.

Several decades ago Dr. Barland and Dr. Raskin conducted studies at University of Utah that showed high accuracy with polygraph use of psychopaths (Barland, 1974; Raskin, 1975). In closing, if the gravity of the matter warrants further search for truth subsequent to polygraph examination then it may be prudent to use the clinical team approach *a la* Borkenstein and Larson. It was singular that an attempt by this writer to borrow a book from Indianapolis-Marion County Library: "Severed-The True Story of the Black Dahlia Murder"; John Gilmore, 1994, re-published 1998 by Amok Books, showed in computer as all copies missing: Another unsolved mystery, perhaps?

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Hobson's Choice: The Relationship Between Consequences and the Comparison Question

Jennifer M. C. Vendemia [1]

The comparison question is one of the most enduring and hotly debated theoretical constructs within the field of polygraphy. Since its inception in 1895, through its multiple refinements, and current incarnations, the fundamental structure of the comparison question has remained unchanged (Waller, 2001). Several theories exist that attempt to account for the physiological changes in non-deceptive respondents associated with comparison questions. At this time the theories account for a great deal of the variations in physiological changes associated with the comparison question, but do not account for all of it. New concepts need to be investigated and current theoretical positions need rethinking with respect to the comparison question.

Before discussing the theories, it may be appropriate to address the concept of the comparison question. In general, comparison questions are used to elicit physiologically observable responses that can be compared with relevant questions. Comparison questions fall into two main categories: 1) Directed lie, questions to which respondents are directed to be deceptive, 2) probable lie, questions on which respondents are expected to be deceptive or to feel uncomfortable answering. There are two main types of probable lie questions. The first type, exclusionary questions overlap with the specific issue/issues of interest. The second types, nonexclusionary, questions, do not eliminate overlap with the issue/issues of interest (Krapohl & Sturm, 1997). In order to successfully use probable lie, exclusionary, and nonexclusionary questions, polygraphers must lead respondents to believe that the questions must be passed to successfully complete the test. The directed lie tactic is simpler, in that respondents are instructed to lie to specific questions.

In the interview situation, the relationship between the interviewer and respondent is pivotal. If a respondent answers a probable lie truthfully, the interviewer must refine the question until the respondent is maneuvered into a state in which they "perceive" themselves as deceptive. This delicate social interaction, or dyadic interaction, between the two individuals effectively removes the respondent's ability to make a decision. Literally, a respondent must be made to feel as if they are being deceptive in order for a comparison question to be effective.

The current models of physiological arousal related to the comparison question include: (1) psychological set, (2) conflict theory, and (3) fear of detection. Underlying all of these models are the psychological constructs of attention and arousal. In a general sense, attention represents a focusing or concentrations of mental abilities combined with increased levels of focused attention to some specific task. However, many types of attention exist, and individuals have different attentional abilities (Crawford, Knebel, Vendemia, Kaplan, & Radcliff; 1995). For example, while FA-18 pilots must have strong focused attentional abilities to deal with brief but intensely demanding situations,

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C-5 Galaxy pilots need strong sustained attention abilities to maintain a consistent level of attentional over long periods of time (with the exception of refueling which has some additional attention demands). Focused attention can be correlated with increased physiological arousal.

It is the relationship between focused attention and arousal that forms the basis of psychological set, currently the most popular theory to explain the differential arousal patterns observed with the Comparison Question Test (CQT) used in psychophysiological detection of deception (PDD) exams. Psychological set, proposed by Cleve Backster, theorizes a state of readiness (preparedness or orienting) towards the stimulus that is most threatening to a respondent. In a PDD exam, respondents allocate attentional resources to the most threatening category of questions. The Easterbrook Hypothesis (Anderson & Revelle, 1982; Easterbrook, 1959) supports the concept of psychological set. Attention represents a focusing or concentration of mental abilities, and increased levels of focused attention to threatening stimuli are correlated with increased physiological arousal. Therefore, in situations involving relevant questions and comparison questions, relevant questions are more threatening and are correlated with physiological arousal in the deceptive individuals; but the comparison questions are more threatening and are correlated with physiological arousal in the non-deceptive individuals.

The relationship defined by Backster's psychological set and the Easterbrook hypothesis can be redefined behaviorally. Learning theory uses the term salience to describe the strength of the relationship between a response and a reinforcer (or consequence). In general, as the intensity of the outcome increases, the intensity of the response increases. Strong intensity of response and consequence creates stronger learning. For example, although a child may not remember the consequence of missing the school bus, the consequence of putting a hand in fire will never be forgotten. In the framework of deception, as the threat of potential punishment increases, its salience increases, and this may result in greater arousal. However, unlike psychological set, salience is a 'learned concept' and its associations can be retained across a lifetime.

Unfortunately, arousal is a multifaceted state with both tonic and phasic aspects. The tonic aspect is correlated with states of alertness over long periods of time while the phasic aspect is associated with relatively short responses such as the orienting response (Pribram and McGuinness, 1975). Lacey (1967) proposed that three types of arousal exist 1) behavioral, 2) autonomic, and 3) cortical. Behavioral arousal can be observed in a person's outward responses, autonomic arousal can be measured by psychophysiological changes in the peripheral nervous system, and cortical arousal can be measured as EEG desynchonization and fast waves. Arousal theory states that stimuli have unique "arousal potentials" across individuals, and discrimination between deceptive and non-deceptive can be measured by the greatest "arousal potential" across questions (Krapohl & Sturm, 1997).

According to Hugdahl (pg. 44, 1995) arousal is related to "motivation and mobilization of bodily resources" towards the purpose of initiating a response. Differing environmental demands should result in differing levels of arousal (Lacey, 1958). An element of jeopardy exists during field PDD exams that do not exist in laboratory studies, and it is generally accepted that field studies create greater magnitudes of physiological arousal than laboratory based studies. However, studies comparing lab a field research have reported mixed results (Kircher & Raskin, 1988).

Psychological set has been questioned because the concept as it is described in the PDD literature is different that the concept described in psychological literature. Briefly, Krapohl has criticized psychological set on the basis of simultaneity, sufficiency, precedence, and expectancy (for review see Kraphol, 2001).

Matte and Grove (2001) defended psychological set by applying Festinger's Cognitive Dissonance theory to the process underlying the decision to deceive during PDD exams. According to the authors, cognitive dissonance increases as the stakes increase

and this creates physiological arousal; however, the construct of cognitive dissonance is misleading. The internal conflict that is associated with cognitive dissonance occurs when an individual makes a statement that is contrary to an internal belief and "no reward" is present. In other words, cognitive dissonance occurs when a person lies for no good reason.

Recent developments in the field of social psychology have found that specific conditions that must be present for an individual to experience cognitive dissonance (Cooper & Fazio, 1984). First, the behavior must produce unwanted consequences. Second, individuals must understand that they have a free choice to tell the truth or to lie, and they must be aware of the consequences of their decision. Third, individuals must experience physiological arousal, and fourth, they must attribute that arousal to their behavior. If these four conditions are met, an individual is more likely to change their internal beliefs. However, as the consequences of telling a lie increase individuals more easily self justify being deceptive. Cognitive dissonance is greatest when respondents will not benefit as the result of deception, because there is no reason to lie.

Conflict theory, which is a disused theory of the physiological substrata of the psychophysiology underlying PDD exams, is the only theory that relates to cognitive dissonance. Conflict theory refers to respondents' dual desires to tell the truth and to lie. The greater the conflict the greater the arousal; unfortunately, cognitive theory does not explain the results of silent answer tests or stimulus tests (Krapohl & Sturm, 1997). Combined cognitive dissonance theory and conflict theory could explain a substantial portion of the variance in PDD exams. Respondent's could experience "cognitive dissonance" when they lie for no good reason, and they could experience conflict when they lie and the threat level is high. However, the coexistence of these theories is unlikely as the existence of one eliminates the possibility of the other.

Another suggested defense of psychological set has been to apply the findings of forced-choice paradigms to PDD exams. Forced-choice methods require participants to make decisions between two answers: one answer that is true and one answer that is false. Unlike tests used in polygraph, the purpose of the forced-choice method is to understand the conditions under which people discriminate between a correct answer and an incorrect answer. A simple analogy of the forced-choice method is a true/false question on a knowledge exam. The test is named "forced-choice", not because of any motivational pressure, but because only two choices are available.

However, the topic of forced choice brings up an interesting point with respect to probable lie comparison questions. As stated previously, the dyadic social interaction between the interviewer and respondent is central to the psychophysiological reaction to comparison questions during the PDD exam. If a respondent answers a probable lie truthfully, the interviewer must refine the question until the respondent is maneuvered into a state in which they "perceive" themselves as deceptive. Respondent must be made to feel as if they are being deceptive in order for a comparison question to be effective, and because of this necessity an interviewer must eliminate the respondent's truthful answers.

This forces the respondent into a Hobson's Choice situation, which consists of an apparently free choice that offers no genuine alternative. It was named after Thomas Hobson, a stable owner in the 16th century, who offered customers the horse nearest the door or none at all. The issue of Hobson's choice is relevant in the sense that the examinee feels as if he/she must pass this question to pass the examination. If a respondent answers truthfully, the examiner alters the boundaries of the question. Because the examiner intentionally refines questions until the examinee deceives, the examinee has no real alternative to be truthful. The examinee's decision is not on a free choice but on a Hobson's choice. In other words, perceived control of the testing situation has been effectively removed from the respondent. Respondents are still in control of the testing situation, in the sense that the exam can be stopped at any time, but they believe they are in a Hobson's Choice situation where they

must respond deceptively to the comparison to pass the exam.

How does Hobson's Choice influence a testing situation? Current theories don't offer an explanation. However, an alternative perspective to the concepts of psychological set, cognitive dissonance, forced-choice, and conflict is offered in the field of behaviorism. Behaviorism is the most established paradigm in American Psychology, although, it was first studied in Russia at the turn of the century. It migrated into American psychology in 1913 when John Watson published a paper entitled, "Why I am a behaviorist". This area of research represents one of the longest lasting traditions within the field of psychology, and its theories are among the most extensively tested. Table 1 shows the number of publications that were published in psychology between the years of 1956 and 2001. As is shown, salience has the greatest number of publications in all levels of psychology and the greatest number of publications specifically written for scientists and professionals in the field of psychology. The date of 1956 was chosen as the starting year, because it was the first year an article about psychological set was published.

Table 1. Number of articles published between the years of 1956 and 2002 in the generalized field of psychology and specifically for scientists and professionals in psychology.

Topic	General Psychology Articles	Scientific and Professional Articles
Psychological Set	32	4
Focused Attention	903	81
Salience	3815	237

Salience, as previously discussed, refers to the strength of a learned relationship. In animals a small punishment may result in little or no learning, but an intense punishment can lead to immediate and strong learning (Azrin, Holz, & Hake, 1963). In a PDD exam, the nature of salience is similar to the fear of detection model. In the fear of detection model, respondents fear that their deceptive behavior to exam questions will be detected and adverse consequences will follow. However, the fear of consequences does not explain reactivity in cases where there are no adverse consequences for detection. Salience can explain the reactivity in the absence of consequences. Salience is based on multiple learned relationships throughout an individual's lifetime. Each instance in which an individual lies and negative consequences follow salience increases, each instance in which an individual lies and consequences do not follow salience decreases.

Before an individual sets foot inside an examination room, salience has been developed for a variety of lies and because we are human and intelligent, salience can also apply to lies we have not yet told, because we can anticipate the learned relationship. However, salience can be interfered with by personality issues and issues related to the initial interview.

If the salience of a relationship is high, but an individual has no effect on the outcome a state of 'learned helplessness' or a state of 'perceived lack of control' can occur. These are two separate types of responses. A learned helplessness response is generally associated with reactive depression and generalized suppression of peripheral responses; although, research has reported mixed findings (Abramson, Seligman, & Teasdale, 1978; Seligman, 1975). Perceived lack of control is associated with strong anxiety reactions and increases in peripheral nervous system increases (Bongard, & Hodapp, 1997; (Gatchel & Proctor, 1976; Gatchel, McKinney, & Koebernick, 1977; Steptoe, 2001; Street, Sheeran, & Orbell, 2001; Zvolensky, Lejuez, & Eifert, 1998).

Both of these reactions would confound the outcome of a comparison question test. So the goal of a polygrapher using the comparison question test should be to conduct the initial interview that respondents do not realize the Hobson's choice setup of the comparison question. However, it is unlikely that an respondent would not notice the nature of a Hobson's Choice, and that it would not affect the exam. With learned helplessness and perceived lack of control minimized in the

testing situation, the salience of the questions becomes greater.

Essentially, the comparison question backs an innocent examinee into a corner in which no alternatives beside deception exist. Based on an individual's learning history plus the anticipated consequences for detection, the magnitude of salience is modified. However, the Hobson's Choice, which is associated with a states of 'learned helplessness' and 'perceived lack of control', also may affect the psychophysiological arousal associated with the comparison question. The CQT is undoubtedly a powerful PDD tool, and the questions have always revolved around the theoretical underpinnings of the test rather than its practical application. Psychology may well provide the theoretical support necessary to generate new explorations of this construct.

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Book Review: "Examination and Cross-examination of Experts in Forensic Psychophysiology Using the Polygraph"

Gordon H. Barland,

Matté, James Allan. (2000). Examination and Cross-examination of Experts in Forensic Psychophysiology Using the Polygraph. Williamsville, NY: J.A.M. Publications. 431 pp. Hard bound, $ 94.00 + $ 6 S&H.

This is a well-organized textbook for examiners and defense attorneys seeking to get the polygraph admitted as evidence. Prosecuting attorneys will also find it of interest, particularly in terms of what to expect during a foundation hearing on this topic, though a number of penetrating questions often asked on cross examination are not mentioned and those that are asked, not surprisingly, favor Matté's Quadri-Track ZCT.

The book consists of 12 chapters covering virtually all areas needed in a Daubert hearing. After an introductory chapter, the author reviews the three key legal cases bearing on polygraph admissibility (*Frye, Daubert,* and *Scheffer*). Matté briefly discusses various test formats, then focuses on preparing for the introduction of polygraph evidence. He advocates a quality control review, and describes the criteria for selecting a scientific expert to lay the foundation for admissibility.

The bulk of the book provides a script for conducting direct and cross examinations of the expert, followed by the same for the polygraph examiner, followed by the testimony of the quality reviewer. The book concludes with six appendices, a glossary, a list of legal citations, and an index.

The book has a number of strengths and weaknesses. The organization of the book is inspired. Dr. Matté has considerable experience in testifying, and this is superbly illustrated in his recommendations for presenting a foundation. He details a list of exhibits the expert should submit in support of the testimony. These are very helpful and go a long way toward providing an adequate record for appellate review. In this regard, Matté omits mention of the fact that admissibility by the trial court is but the first step in getting the judicial system to accept polygraph testimony. It is not until trial court decisions are overturned or upheld by appellate courts that precedents are established which are binding on lower courts. The foundational hearing should be crafted not only for the trial court, but also for the appellate review. Having a scientific expert present competent testimony bolstered by exhibits which support the testimony is crucial for the testimony to withstand appellate scrutiny. If Matté's book were to do nothing else, the inclusion of the exhibits alone is enough to recommend this book for everybody interested in the admissibility of the polygraph. There are other strengths in this book. He urges examiners to videotape their examinations to allow a complete quality control review prior to trying to get the results introduced as evidence. Consistent with Matté's passion for documenting his sources, the book is meticulously footnoted with references. It is authoritative.

There are some weak points. Matté presents a biased case in favor of admissibility. For example, he implies that *Polygraph* is a peer-reviewed scientific journal. Although it has greatly improved over the years, it is more a technical journal than a scientific one. Matté uncritically accepts Ansley's compilation of statistics on validity without examining the strengths and weaknesses of the underlying studies; and of course he touts the superiority of the Matté Quadri Track test while disparaging other formats. In the cross-examination sections, for example, he sets up straw man arguments attacking some of these other formats and concepts, such as using a fixed decision threshold instead of one, which varies, according to the number of charts obtained, the use of computer algorithms, etc. He also

mischaracterizes the Ames case (pp. 262-263). He describes the fear of detection theory as if it were the sole principle underlying lie detection, without mentioning that there are other theories that have been developed more recently. Curiously, his recommended direct examination of the foundation expert does not include any discussion of the issues of countermeasures or psychopathy, leaving these topics to the rank and file examiner, who may not be familiar with the scientific literature on these topics.

Matté would have benefited from a tighter editing of his manuscript prior to self-publication. As with his earlier books, the reader is often distracted by the excessive use of pet phrases such as "his/her" (which appeared four times one sentence and six times in another), "aforesaid," and "aforementioned" sprinkled liberally throughout the book. A number of misspelled words and a mathematical error went undetected by the editing process. However, these are minor shortcomings when compared with the strengths of the book.

I heartily recommend this book for every thinking examiner, and for attorneys on both sides of the dispute over admissibility of the polygraph. It is expensive, but it's worth the money.

The Polygraph in Agent Interrogation

Chester C. Crawford[1]

Philosophers and psychologists, and indeed most of mankind, have always been fascinated with the phenomenon of lying as an aspect of human behavior. It is only during the past sixty years, however, that researchers and investigators have proceeded beyond the study of its cognitive phase (the decision to lie) and behavioral phase (the overt act which deceives) to examine its emotional phase (the ensuing bodily agitation), which is the most significant of the three for purposes of detection. It is therefore only recently that attempts to detect deception have advanced from the uncertainty of personal judgment and the brutality of primitive physical ordeals and torture to the use of scientific aids in humane interrogation. The "lie detector" or polygraph in use today, a simple but sensitive device for tracing blood pressure, respiration, and perspiration, is the most advanced instrument thus far developed for the detection of deception.

Deception is intrinsic to espionage activity: the ability of a clandestine operator to deceive his opponent is his most critical qualification. Conversely, however, the ability to detect the deceptions of the opposition is the most critical requirement of a counterintelligence force, and it was inevitable that the polygraph would become a counterintelligence aid. Although the use of this instrumental technique is associated in the popular mind primarily with criminal apprehension, the history of its application in clandestine government operations is almost as long as that of its connection with police matters.

One of the first plans for instrumental means to detect deception was in connection with clandestine operations. In October 1917, at the request of the Psychological Committee of the National Research Council, research was undertaken at Harvard University to investigate the value of using instruments in deception tests on World War I court martial cases and in Military Intelligence Department investigations of suspected enemy agents. Early in World War II an officer of the Berkeley Police Department in California advocated the use of the lie detector in the interests of national defense. In 1945 Leonarde Keeler carried out polygraphic experimentation on several hundred prisoners of war in Rhode Island with an eye to assessing the practicability of lie detection programs in government agencies.

Successes of a CIA Program

On 12 August 1948, CIA ran its first polygraph case—the routine security screening of an applicant. In 1949 it began planning the use of the technique in Europe to test the honesty of agents recruited for clandestine operations. In 1951 it conducted polygraph experiments in the Far East. By 1952, the CIA polygraph program was operating on a world-wide basis. Its effectiveness in practice has firmly established it as a valuable adjunct to clandestine operations.

Its achievements can be illustrated in three studies analyzing the results of polygraphic interrogation over sample periods of time in operational cases from particular geographical areas. The first, covering the period from inauguration to 1953, is based on the area interrogators' reports for some three hundred cases. The use of the polygraphic technique elicited not otherwise obtainable admissions of deception in the following categories from the indicated numbers of the 300 agents.

[1] This manuscript was first created in the summer of 1960 as an internal technical report for the Central Intelligence Agency. It was approved for release from that agency (declassified) in 1994. It is reprinted here for its considerable historical interest.

Falsification of vital statistics (age, birthplace, employment, education, etc.)	32
Concealment of past membership In Communist and Communist-front organizations	16
Concealment of other past Communist activities	23
Deception regarding past association with hostile or friendly foreign intelligence services	18
Deception regarding past criminal arrests	22
Concealment of past-undetected crimes	17
Concealment of aliases	11
Deception regarding security violations	23
Deception regarding medical or mental treatment	4
The filing of false reports	4
Deception regarding use of drugs	21

In addition, 21 instances of deception indicated by the polygraph but not admitted were later confirmed through other sources. Only 6 instances of indicated deception remained unconfirmed.

Thus more than one in ten of the agents and prospective agents had deliberately falsified his biographic data; honest biographic mistakes were not counted as deception. More significantly, six percent of them had hidden their past connections with other intelligence services. It is obvious that without polygraphic interrogation this sample of 300 could not have been properly assessed.

In another study 123 agent interrogation reports made in a different geographic area from January to December 1958 were carefully examined. With the aid of the polygraph the interrogators had obtained previously unknown information in the following categories from the indicated numbers of the 123 subjects:

Biographic information	61
Counterespionage information	17
Past employment by a foreign intelligence service	8
Present employment by a foreign intelligence service	4
Fabrication of reports	5
Hidden ideological affiliations	5

This time at least half the agents were shown to have practiced deception of some kind, and the percentage is still higher if the 61 listed as having misrepresented their biographies does not include all the deceivers in other categories. Six percent had worked for foreign intelligence services, and three percent were still so employed. At least ten agents were terminated as a result of these polygraph interviews. But about fifty—and this is an important positive product of the polygraph technique—were cleared of allegations that had been made against them.

The third study covers 70 agents interrogated between January and June 1959, who revealed previously unknown information as follows:

Biographic information	24
Counterespionage information	2
Past employment by another service	10
Current employment by another service	5
Fabrication of operational reports	11
Hidden ideological affiliations (usually Communistic)	6

Here, at least one agent in every three was shown to have practiced deception of some kind. One in seven was found to have had past connections with other intelligence services and one in fourteen to have current affiliations. The polygraph interrogations led to the termination of at least five of them, and twenty-three were cleared of allegations against them. In summary, out of about five hundred agents and prospects whose polygraphic interrogations were analyzed in these three studies, from ten to fifty percent revealed deceptions of some significance. A total of thirty-six agents were shown to have previously unknown connections

with other intelligence services, some of them current affiliations which presumably made them instruments of infiltration.

Procedures and Limitations

It should be strongly emphasized that these results, although unobtainable without the polygraph, must not be credited to the polygraph in vacua. They were achieved by professional interrogators using the instrument as an aid to diagnose deception in their agent subjects. The interrogator is thoroughly briefed on all aspects of the subject's personality, from sense of humor to skill at sports, on all available biographic data, on questionable and verified items in the subject's account of his background, and on the extent of his access to other intelligence services. He studies the reports from any previous medical or psychiatric examinations and from any previous interrogations, particularly any previous polygraph tests. In consultation with the case officer he determines the topics to be covered in the test and constructs questions designed to elicit information on them. He is prepared to probe for detail regarding the modus operandi, personnel, and tradecraft of a foreign intelligence service with which the subject is suspected of having past or present contacts.

The examination begins with a pre-test period in which the interrogator and the subject preview the questions for discussion and qualification. The examiner often takes advantage of this opportunity to make his own first-hand assessment of the subject, chatting about apparently unimportant matters and watching for any telltale reactions or idiosyncrasies that may be exploited in the test. The polygraph is then connected and the test itself administered—perhaps twice, four times, or on occasion many more. Then, when indicated by a study of the charts, there follows a post-test interrogation wherein an explanation, admission, or clarification of recorded emotional responses is sought.

The polygraph lays no claim to one-hundred-percent reliability. Test results can be as varied as the individuals tested, and the interpretation of the charts is not a simple question of deciding whether the subject reacted or did not react. Many charts are quite definitive; but some indicate only a probability, and from two to five percent of the cases tested end up being classified as inconclusive, with crucial areas left unresolved.

Although sources of error in the instrument itself can be eliminated—it is not hard to maintain a perfectly functioning machine—the human variables in the interrogator and the subject are less easily controlled. And while error potential in the interrogator can be reduced by careful selection and long training, the endless variety of human subjects and their endless variety of reactions to human situations will not ever be subject to measurement with infallible precision. Different subjects tend to put different weights on the value of individual questions; deceivers may show emotional disturbance only at the points where they know their fabrication is weakest, and sometimes not even then.

For all this reservation, the polygraph technique has established its place in clandestine operations. Although in many situations there is no need for polygraphic scrutiny, the problem of veracity being more easily resoluble through other sources, in many others, as these studies show, the duplicity of an agent cannot be discovered without the use of the polygraph. Add to these revelations the previously unknown information of a positive nature that is a by-product of an agent's polygraph test and the many cases of confirmed veracity that enable a project to get under way, and the value of the technique to clandestine operations becomes a thing beyond debate.

A more general dividend realized from the polygraph is its disciplinary effect on the agent. He is usually a better clandestine operator after being polygraphed. He realizes that he is working for a highly professional service, concerned about security for itself and for him. He sees that he will be expected to account for his activities. Loyal agents almost always appreciate this attitude and look with greater respect on the American service after their "ordeal."

An even greater role may be played by the technical detection of deception in clandestine operations of the future. There are indications that sensational developments are about to occur in its instrumentation, and

drastic changes in technique made possible by the utilization of new recording devices. The polygraph of the future may require no physical attachments on the subject, perhaps utilizing electronic circuitry to tap physiological phenomena far more subtle but every bit as diagnostic as the currently used blood pressure tracings, respiration recordings, etc. It is unlikely that improvements will ever fully eliminate the human variables that make any technical assessment less than infallible, but a paper written on this subject ten years from now may show the uncertainties and limitations still further reduced.

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Judicial Recognition Of The Polygraph Technique

John E. Reid [1]

Abstract

Court requirements for expert testimony in other fields compared with the current status of the polygraph profession. Polygraph results compared with accuracy of other testimony now admitted. Legal precedents discussed. Licensing and cases noted. Detection of deception is a basic art practiced daily in the courtroom by judges, lawyers, and juries. The witness' demeanor while testifying, such as his manner of speaking, his facial expression and his physical reactions are critically observed for the purpose of evaluating his truthfulness. Even cross-examination itself is designed to elicit the truth and test the trustworthiness of the witness' assertions. Considering these common legal procedures, why then do the courts as a general rule resist accepting the results of the polygraph technique as evidence? An evaluation is in order of this technique, past, present and future, as to its reliability, validity, credibility and trustworthiness.

The Past

The united States Court of Appeals for the first time ruled on deception test evidence in Frye v. United States, 293 F. 1013 (D.C. Cir . 1923). Frye was on trial for murder and offered as evidence in his behalf the results of a Marston "systolic blood pressure" test. The court refused to permit Dr. Marston to testify concerning his results and upon appeal this ruling was affirmed.

It was the opinion of the court that the Marston test was still in the experimental stage and not generally accepted among physiological and psychological authorities, the particular field in which it belongs, and therefore upheld the decision of the trial court in refusing to accept Dr. Marston's expert testimony. It is of interest to note that two years after Frye was imprisoned, another man confessed the murder and Frye was released.

The court was right in rejecting the testimony in Frye regardless of the ultimate evidence of his innocence. Among other technique deficiencies, the instrument used by Marston was crude and the method was cumbersome; it required inflating and deflating the blood pressure cuff before and after each question and also noting the systolic blood pressure recording before and after each question.

Most courts up to the present time quote Frye as a basis for rejecting polygraph test results as evidence. But it is time for a reexamination of the Frye case to determine whether the present day polygraph technique has reached the status set forth in that opinion, namely: (1) does the present technique possess a reasonable measure of precision in its indications? and (2) is it ready for acceptance in the field of science to which it belongs or by the group of specialists within the field?

Before analyzing the present-day status it must be clearly understood that the polygraph itself is not an automatic indicator of truth or deception. It is not a lie detector as such, but rather an instrument which is capable of recording physiological phenomena, i.e., respiration and blood pressure, etc., that may be used for the application of a reliable technique for diagnosing deception. Therefore, we shall consider the polygraph technique as a whole: the instrument, the questioning technique, the accuracy, and the examiner's qualifications, to determine whether or not it has attained a reasonable measure of precision --the first prerequisite of Frye.

[1] This article is reprinted from the March 1972 issue of *Polygraph*.

The Present

The polygraph instrument today is refined to the extent that it dependably records certain physiological changes that occur during deception. Compared to Marston's crude systolic blood pressure instrument, it is a highly sophisticated and accurate recording instrument. The accuracy of the polygraph using the proper instrumentation and an adequate questioning technique, can be demonstrated by reporting on two recent cases. In doing so, two types of questioning techniques will be illustrated, namely, "the control question test technique" and "the peak of tension test technique."

Before administering any test a competent examiner will explain to the subject the purpose of the test and the nature of the instrument. Also during the pretest interview, the examiner will seek to condition the subject for the test by relieving the apprehensions of the truth telling as well as satisfying the lying subject of the efficacy of the technique. Prior to each test the subject is told precisely what the questions will be and he is also assured that no questions will be asked about any offense or matter other than that which has been discussed with him by the examiner. Surprise has no part in a properly conducted polygraph test. 50 A.B.A.J. 470 (1964). The subject is also informed that several tests may be required before the examiner will attempt a deception diagnosis.

Control Questioning Technique. The control question technique consists of 10 questions, each requiring either a "yes" or "no" answer. Four of the test questions relate to the matter under investigation; four are irrelevant to the matter under investigation, such as: "Is your first name John?" "Did you ever go to school?" which are asked merely for the purpose of establishing the subject's normal pattern of responsiveness. Questions number 6 and 10 are control questions that must be answered "no." They are unrelated to the matter under investigation but are of a similar, though less serious nature, and questions to which the subject will in all probability lie or at least his answers will give him some concern with respect to their truthfulness or accuracy.

For instance, in a burglary case the control question would relate to theft, such as "Did you ever steal anything in your life?" or, if the subject made some admissions regarding stealing the question would be changed to, "Besides what you told me about, did you ever steal anything else?" The response or lack of response to the control question by a supression in the respiration or a rise in blood pressure is then compared with what appears in the tracing when the subject was asked the crucial question about the burglary. If the subject responds more to the control question than he does to the crucial question, this is considered indicative of truthtelling. On the other hand, a greater response to the crucial question in comparison to no response or only a slight response to the control question is suggestive of lying, although several other test procedures are required before a definite conclusion to that effect is permissible.

Nine States Have Licensed Polygraph Testing. The polygraph technique has reached the professional stage; nine states -- Arkansas, Florida, Georgia, Kentucky, Illinois, Mississippi, New Mexico, Texas and Virginia -- have now passed laws licensing examiners. Several more jurisdictions have declared their intention to do so. [2]Illinois for example, required a polygraph trainee to have a minimum of college degree at the baccalaureate level; to complete six months of internship training under a qualified examiner; and to pass a State Board examination as to his competency. As in all new fields that are not completely regulated by state licensing, incompetents do appear, but conscientious efforts are being made by the American Polygraph Association to disqualify inadequately prepared persons.

The following estimates indicate the necessity for a well-qualified examiner: In about 25 percent of the polygraph cases, lying or truthtelling may be so clearly disclosed by the nature of the reactions to relevant or control questions that the examiner will be able to point them out to any nonexpert and satisfy him of their significance. In approximately 65 percent of the cases, however, the indications are not that clear; they are sufficiently subtle in appearance and significance that they require expert

interpretation. In roughly 10 percent of the cases, the examiner may be unable to make any diagnosis at all due to some physical, mental or emotional defect in the subject.

In many cases the truth concerning who committed an offense may never be ascertained by confessions or subsequently developed factual evidence of guilt or innocence. Proof is often lacking, therefore, as to whether the examiner in any given case was right or wrong. My actual case experience over the years has involved the polygraph examination of over 35,000 persons suspected or accused of criminal offenses. On the basis of that experience, I am confident that the technique when properly applied by a trained, competent examiner is very accurate in its indications. The relatively few errors which do occur favor the innocent, since the known mistakes in diagnosis almost always involve a failure to detect the lies of guilty subjects rather than a finding of lying on the part of truth-telling innocent persons.

The polygraph examination should not be held to any greater degree of accuracy than any other scientific endeavor relating to the examination of a human being. Furthermore, perfection in test results is not a prerequisite to the admissibility of evidence obtainable by use of scientific instruments or techniques. Wigmore, EVIDENCE, 990 (3D ed. 1940).

Judicial recognition is given where it can be shown that the particular technique has a reasonable measure of precision in its indications. In this connection it is appropriate that some judgment be made regarding the polygraph technique in comparison to other kinds of evidence. The polygraph technique involves inconclusive reports in about 10 percent of the cases. In this regard a comparison should be made to the inability of the criminalist in other types of expert opinion evidence to develop either connective or exclusionary results of any probative value due to the evidence being insufficient, mutilated, fragmented or, in some cases contaminated. Furthermore, it is not uncommon to have experts testify in complete opposition to one another in such areas as firearms indentification, hair and fabric comparisons, and other specialized application of the physical sciences. In a document case in Ohio, four handwriting experts testified for the plaintiff and three for the defense. Even medical and psychiatric testimony shows a substantial disagreement as disclosed in everyday courtroom testimony. After Jack Ruby murdered Lee Harvey Oswald, the alleged assassin of President Kennedy, Ruby was examined extensively by 12 of the country's foremost medical authorities. The opinions of the psychiatrists, the neurologists and a psychologist varied considerably as to whether Ruby was or was not a "psychomotor epileptic variant." Five said he was and seven said he was not.

The polygraph test results have corrected many errors in other types of evidence readily accepted by the courts. For example, both a $448,000 embezzlement in one company and a $365,000 embezzlement in another were discovered by a polygraph examination, even though regular audits over a period of years failed to detect any shortage. In another case an employee's handwriting was positively identified by a document examiner as that of the forger, but the polygraph examiner cleared that person and later identified another who then confessed the forgery. Eyewitness identification is regularly accepted as evidence, and still hundreds of times the polygraph technique has established the fallacy of such identification.

In reporting these shortcomings, (and they are typical in every field dealing with the examination and observations of a human being) the writer does not imply that any of this testimony should be barred from courtroom use. Despite its inherent weaknesses, this testimony can assist a court or jury in the decision-making function and so also will the opinion of a competent, experienced polygraph examiner.

In 1940 the late Dean Wigmore, a foremost authority in the field of evidence, stated that although perfection in test results is not a prerequisite to the admissibility of evidence obtainable by the use of scientific instruments or techniques, the standard practice has been to grant judicial recognition only after the proponents of the unprecedented evidence have shown that the instrument or technique has a reasonable

measure of precision in its indications and that it is an accepted one in the particular profession or field of science to which it belongs. Wigmore, supra.

A more modern view accords judicial recognition upon the general acceptance by specialists within a profession or field of science even though the group as a whole may be completely unfamiliar with the instrument or technique. People v. Williams 164 Cal. App.2d 858, 331 P.2d 251 (1958). This group of specialists may well be, for the most part, the polygraph examiners themselves. The modern view has not yet been featured in a polygraph case although applied in a case involving the Nalline test for narcotics within the human body. The scientific witnesses in that case testified that even though the medical profession as a whole was unfamiliar with the test, its reliability was generally recognized by the relatively few members of the-profession who had made a study of the test. In Williams, supra, the court said, "In this age of specialization more should not be required" than general acceptance within the speciality itself.

Foremost legal authorities, including Wigmore, McCormick, Wicker, and Inbau advocate the admission of polygraph test results as court evidence, but admonish the courts that a competent, experienced polygraph examiner should conduct the test and submit himself and his test records for cross-examination.

Future

It is my firm belief that the polygraph will attain an enviable place in the future, both as evidence in court and especially as the most useful and least offensive interrogational and investigative device.

Rather than place a suspect under arrest, it is my suggestion for the future to invite him to take a polygraph test which, by agreement, would be video tape-recorded from beginning to end. If the suspect passes the test regarding the matter under investigation, he would be dismissed immediately and his video tape destroyed after a reasonable time. If the suspect gave deception reactions, he would also be dismissed, but a complete investigation would be made regarding his implication in the crime under investigation.

To further illustrate the substitution of a polygraph test for an immediate arrest, consider this case. A six-year-old girl was kidnapped and murdered. A handkerchief used as a gag was found with a laundry mark identifying a soldier who was then in an army camp. It was learned that the soldier formerly lived in an apartment house near the victim's home and was on leave from service at the time of the crime. When questioned he was unable to account for his whereabouts and could not supply an alibi for the night of the kidnapping. The police were convinced he was the kidnapper but agreed to allow him to take a polygraph test. He passed the test, requiring only 45 minutes, and as a result was dismissed without an arrest. One hundred and sixty-two more suspects were given polygraph tests in that case and then released in the same manner, i.e., without arrest. Six months after the soldier's test, the actual kidnapper-murder was tested and it was reported that he was not telling the truth. Later he pleaded guilty to the kidnap-murder. By taking the polygraph test the soldier in this case was not placed under arrest and was spared the necessity of spending time in jail. It is possible, based upon the facts in this case linking the soldier to the crime, that he may have been held for trial and conceivably could have been found guilty.

In order to reach the ultimate goal of polygraph achievement, it is necessary that medical and behavoral scientists become intimately interested and involved in its development. Using this scientific talent, with actual criminal case subjects, would provide better laboratory conditions for future development and progress than the simulated type of polygraph experiments of the past in which students were used as subjects.

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[1]Additional states with licensing laws are Alabama, Nevada, North Carolina, North Dakota, and Oklahoma.

A Tribute To John E. Reid
August 16, 1910 - January 11, 1982

Fred E. Inbau [1]

John E. Reid did not invent the Polygraph, nor was he the first person to use it as a so-called "lie-detector," but he did make a massive contribution to the development of what we now know as the Polygraph technique for the detection of deception. He did not originate the psychological techniques for the interrogation of criminal suspects, yet he vastly improved the ones that were in existence, and he added others during his long professional career.

At the end of forty years of dedicated effort, John E. Reid may rightly be acclaimed, in my opinion, as the most skillful Polygraph examiner and criminal interrogator of all times. He was also a very effective instructor of both skills.

To lend substance to what has been said, and also to what follows, an identification is required of my long professional and personal relationship with Reid.

Upon the transfer, in 1938, of Northwestern University's Scientific Crime Detection Laboratory to the Chicago Police Department, and my appointment as its Director, the recruitment of new staff members became vitally necessary. No one was available to us with the scientific or educational qualifications which we deemed essential, so an intensive search was made for young college graduates with the potential and the interest toward the development of the required expertise. We decided to establish a training program whereby they could receive instruction from the experts already on the staff, as well as a few from without. Our library was an additional resource. We knew, of course, this would take time, but the rewards for the wait and efforts were forthcoming.

The young man chosen for document examination became and remains, as a private practitioner, one of the country's foremost document examiners, and an author of a standard text. A comparable career was followed by the young man selected for firearms identification and comparative micrography; he later directed several of the country's largest criminalistics laboratories and subsequently became a faculty member at several universities. Why have I mentioned all this? Simply to illustrate the precautions we took and the confidence we had when we selected John E. Reid, then a Chicago police officer, for training as a Polygraph examiner.

Reid had joined the police force in 1936 out of economic necessity, despite the fact he had acquired a law degree. Not long thereafter, however, he realized that patrolling a beat in police uniform was far from challenging and that his future as a police officer was not a promising one. He decided to resign, but before he did he thought he should inquire into the possibility of becoming associated with the police department's relatively new scientific crime detection laboratory, so he requested and obtained permission from the Commissioner of Police to seek an interview at the lab. Although we had rejected a number of Chicago police applicants for various lab positions, when Reid came in it was immediately apparent that he had the basic qualifications, the potential, and the genuine interest for training as a Polygraph examiner. He was offered the position immediately. The year was 1940.

[1] This article is reprinted from the March 1982 issue of *Polygraph*.

As with the two other trainees already mentioned, Reid was a quick learner. Within several months he was conducting tests in important cases. Those were the days when the "relevant-irrelevant" test was being used, and a "card test" served a "control" purpose. It was not long after he had been conducting tests on his own that Reid sensed the inadequacy of the methods that were being used. We talked this over and he was encouraged to try out his own ideas. Shortly thereafter I left the laboratory, having fullfilled my commitment to the University and to the Police Department to supervise its reorganization. Reid continued on, but in 1947 he decided to leave and establish his own Polygraph testing service. Money was not the prime consideration. What he particularly wanted was the opportunity to experiment with and put into practice the ideas he had been developing. His move was not without risk, because of the financial obligations he had to assume. Success did come, however, on both levels.

In 1945, while still at the police laboratory, Reid wrote and published an article entitled, "Simulated Blood Pressure Responses in Lie-Detection Tests and a Method for Their Detection."[1] He had observed that muscular pressures were accountable for many responses that were mistakenly being considered as deceptive responses. He devised a unit for recording such movements during regular Polygraph tests. Then, in 1947, he published his article "A Revised Questioning Technique in Lie-Detection Tests," in which a fictitious crime question was used for "control" purposes. [2] The "card test" continued to be used, but for stimulating fear of detection during the tests rather than for control purposes. Furthermore, even while at the Crime Laboratory, Reid had concluded that the only satisfactory control questions was one unrelated to the matter under investigation but of a similar, though less serious nature, and yet one to which the subject would in all probability lie, or at least there would be concern on his part as to its truthfulness or acccuracy. The technique of using it was described in the 1948 second edition of my book, Lie-Detection and Criminal Interrogation, in the preparation of which Reid was very helpful, as acknowledged in the book's preface.[3]

As a third edition of Lie-Detection and Criminal Interrogation became necessary, I realized that my departure from the field of conducting Polygraph examinations (to practice and to teach law), coupled with the fine work and research that Reid had been conducting, fully warranted an invitation to him to join me as co-author. The result was the joint authorship of the third edition in 1953. Several years later it became apparent that the two subjects covered in the book could no longer be confined to a single publication, so we decided to divide the book into two separate ones. Moreover, it was clear to us that the title of one of them should more accurately reflect the true nature of the subject matter. No longer should examiners be relying upon a "lie-detector" instrument, but rather upon a technique for the detection of deception. The new book, therefore, became Truth and Deception: The Polygraph ("Lie-Detector") Technique. Then, too, in view of Reid's far more extensive involvement in the field and his far greater contributions to the advancement of the technique, Reid was listed as the first of the two named authors. The book was published in 1966, and a second edition followed in 1977. A third, with Reid's name remaining as senior author, is expected to be completed by 1984.

Over a period of many years, a considerable number of persons received training as Polygraph examiners at the laboratories of John E. Reid and Associates. The only ones accepted as trainees were those with college degrees who also possessed appropriate personality characteristics, and who agreed to devote six months to receiving instruction and individualized training in actual case situations under the supervision of experienced staff examiners. Until Reid's health began to fail several years ago, he was personally involved in the training process. Fortunately, he has left a legacy of exceedingly well qualified personnel to continue that activity, as well as the service to clients seeking assistance in Polygraph testing in case investigations.

Always of deep concern to Reid was the generally prevailing notion that practically anyone could become a Polygraph expert by learning how to operate the "lie-detector machine" and to be able to ask a series of

relevant-irrelevant questions. The "training" needed only a very short period of time. In seeking to remedy this regrettable situation, Reid conceived the idea of having state laws enacted which would require that Polygraph examiners be licensed and that certain minimal qualifications should be prescribed. He and his associates drafted the first such licensing bill, the one now law in Illinois, which has served as a model for those in some other states.

Not long after Reid had established his own laboratory, he embarked upon a project of developing a "paper and pencil test" to screen applicants for employment with respect to their proclivity to commit theft. After years of experimentation there evolved the Reid Report/Reid Survey, the one for testing applicants and the other for employees. That service is now known as the Reid Psychological Systems. Last year, in 1981, over 250,000 such tests were administered.

As an interrogator of criminal suspects, Reid was not content to merely use the presently employed interrogation techniques. Just as with Polygraph examinations, he realized that there could be improvements and he set about to develop them. In this respect, too, Reid infused some of his ideas into the second edition of my previously mentioned book, and more so into the third edition in which, as already stated, his named appeared as co-author. Our joint efforts ultimately culminated in the second one of two separate books, this one devoted exclusively to Criminal Interrogation and Confessions. It was published in 1962, with the authors listed respectively as Inbau and Reid. Then followed a second edition, 1967, which was made necessary by the 1966 decision of the United States Supreme Court in Miranda v. Arizona. Although every one of the techniques in the earlier edition conformed to the then existing law, the new requirement of Miranda warnings had to be inserted, and there was one highly effective technique that had to be deleted—the one by which a suspect could be "talked out" of his interest in remaining silent. The Court had decreed that since a custodial suspect had to be advised of his right to remain silent it was improper to attempt to change his mind. Then, in 1974, a few relatively minor changes were inserted into a reprint run of the book without the necessity of publishing a new edition.

A third edition of Criminal Interrogation and Confessions will appear in the latter part of 1982. Unfortunately, illness limited Reid's participation to the planning stage and to some of the manuscript of the earlier portion. His thoughts, however, will be perpetuated in the forthcoming edition. Moreover, they will be transmitted to the attendants at the seminars on interrogation conducted by John E. Reid and Associates on a regular basis in Chicago and regionally in various parts of the United States and Canada.

Thus far I have written about John E. Reid the professional; now a few words about the man himself.

Reid and I were the closest of friends for almost forty years. Many were the occasions when one of us needed help from the other. It was always forthcoming.

Reid was an honest man throughout his professional career, and he had the ability of evidencing that honesty without being offensive, which may seem like a rather strange way of describing one's honesty. I recall in particular one experience Reid encountered shortly after he established his own business in 1947. A prominent lawyer-politician attempted to pay Reid off for a favorable Polygraph report on his client. The matter was not a governmental one; it just happened that the client's lawyer was a politician with a lot of "clout." Reid could have become very irate about this, but he calmly shoved the tendered money back across his desk and said his negative report would stay as it was. The individual was never identified to me, nor was I interested in knowing. There also were a few other incidents of this nature during Reid's early professional career, but soon there were no more—or, at most, perhaps a very few. Reason? As Reid said to me, after the few early encounters word went out that "This Reid guy is an on-the-square S.O.B." Reid viewed this as a high compliment, and I agreed. It also discouraged future attempts to buy him off.

Another attribute of Reid's that is worth noting at this point was his great respect for confidentiality, irrespective of whether the confidence was reposed by the police or defense counsel, or by anyone else.

John Reid was a friendly man, and also a kind and considerate one. This may seem odd to some persons who knew of his being a master interrogator of criminal suspects, one who could obtain thousands of confessions from criminal offenders, including over three hundred killers, which confessions, of course might result in severe punishment. But this is precisely one of the reasons for Reid's tremendous success. He could sit down alone with a brutal murderer, an arsonist, or a child rapist and not display any hatred toward that person; indeed, he had none, regardless of his own professional appraisal of the offender. That lack of hatred, and an understanding of the frailty of human beings, would become apparent to the suspect, and it became easier for him to confess to Reid rather than to someone else exhibiting feelings of hate or disgust.

Reid never physically abused or threatened to abuse a suspect, nor did he ever use interrogation techniques that were apt to induce innocent persons to confess. It was not his nature, and he did not have to be told of the legal prohibition against such practices.

Another indication of Reid's friendly nature was a unique gesture he used upon being introduced to a person whom he knew he liked or would like. As his right hand gripped the other person's right hand he would lightly grasp with his left hand that person's arm between elbow and wrist. It was as if his left hand electronically uttered "I like you fellow!"

Reid was a man thoroughly dedicated to his profession. He insisted upon high quality in examiner training and subject testing. He also admonished all trainees and staff members that their primary obligation in any given case situation was to the person being tested. Unless the examiner felt confident of his diagnosis the report should be an indefinite one; moreover, if error occurred it should be admitted. And in the course of interrogations, nothing should be said or done that might provoke a confession from an innocent person.

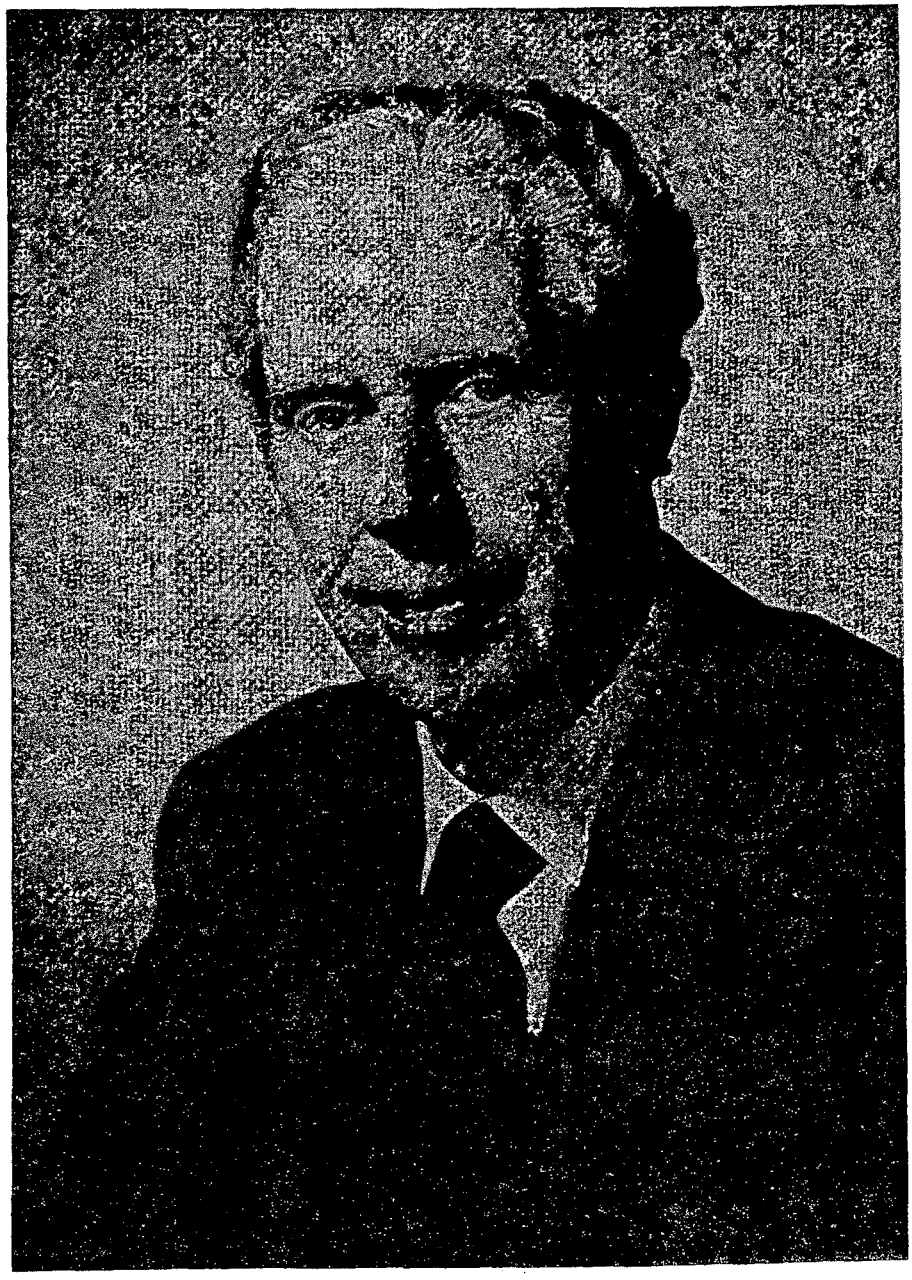
In closing this tribute, as an academic I might say of John "Ave Atque Vale," but he would not have liked it, nor would I, so let it be the clear yet heartfelt equivalent "Hail and Farewell."

[1] 36 J. Grim. L. & Crimonology 201 (1945).

[2] 37 J. Grim. L. & Criminology 542 1947).

[3] P. 15. The first edition appeared in 1942.

In Memoriam



1910 - 1982

Historical Note
A. R. Luria: Motor Reactions and Lie Detection in the 1920s

Norm Ansley [1]

Some time after 1923, when A.R. Luria was 24-years-old, he arrived in Moscow to work at the Moscow Institute of Psychology. His work involved projects that built on his experience with motor reactions. There was a theory held by the Institute's Director, S. Kbrnalov, that there was a finite amount of energy available for a task, and that mental effort and physical effort competed for the use of energy. Thus, increased mental effort would interrupt or distort motor activity. This appeared to be true in Luria's laboratory work. Using Jung's work on word-association, subjects were directed to engage in a motor project response simultaneously with each verbal associative response. (Jung, 1905, 1910) This project began an intensive period of research that lasted many years.

Working with Alexei N. Leontiev, their experimental procedure was as follows: A research assistant told a story to several subjects about a thief who broke into a church by climbing through a window and who then stole a golden candle stick, an icon, and a crucifix. Those subjects and others who did not know the story were given tests in which they were asked to respond to a list of about seventy words. Ten of the words were critical to the story. While giving associative words in response the subjects also squeezed a bulb with their right hand. The object was to determine which subjects knew the story, from the combined record of motor and verbal responses to the critical words. Luria said the laboratory model was quite successful, and later applications were in the criminal justice system.

Luria subsequently studied actual or suspected criminals. He believed that if he knew the details of the crime, the details could be used as the critical stimuli in the combined motor test, and from the test results determine who was guilty. During several years of study they collected data on more than fifty subjects, most suspected of murder.

They found that "strong emotions prevent a subject from forming stable automatic motor and speech responses ... It appeared as if subjects influenced by strong emotions adapted to each situation in a unique way and did not settle into a stable reaction pattern." Luria said the work was of "practical value to criminologists, providing them with an early model of the lie detector. (Luria 1979)

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[1] This article is reprinted from the March 1992 issue of Polygraph.